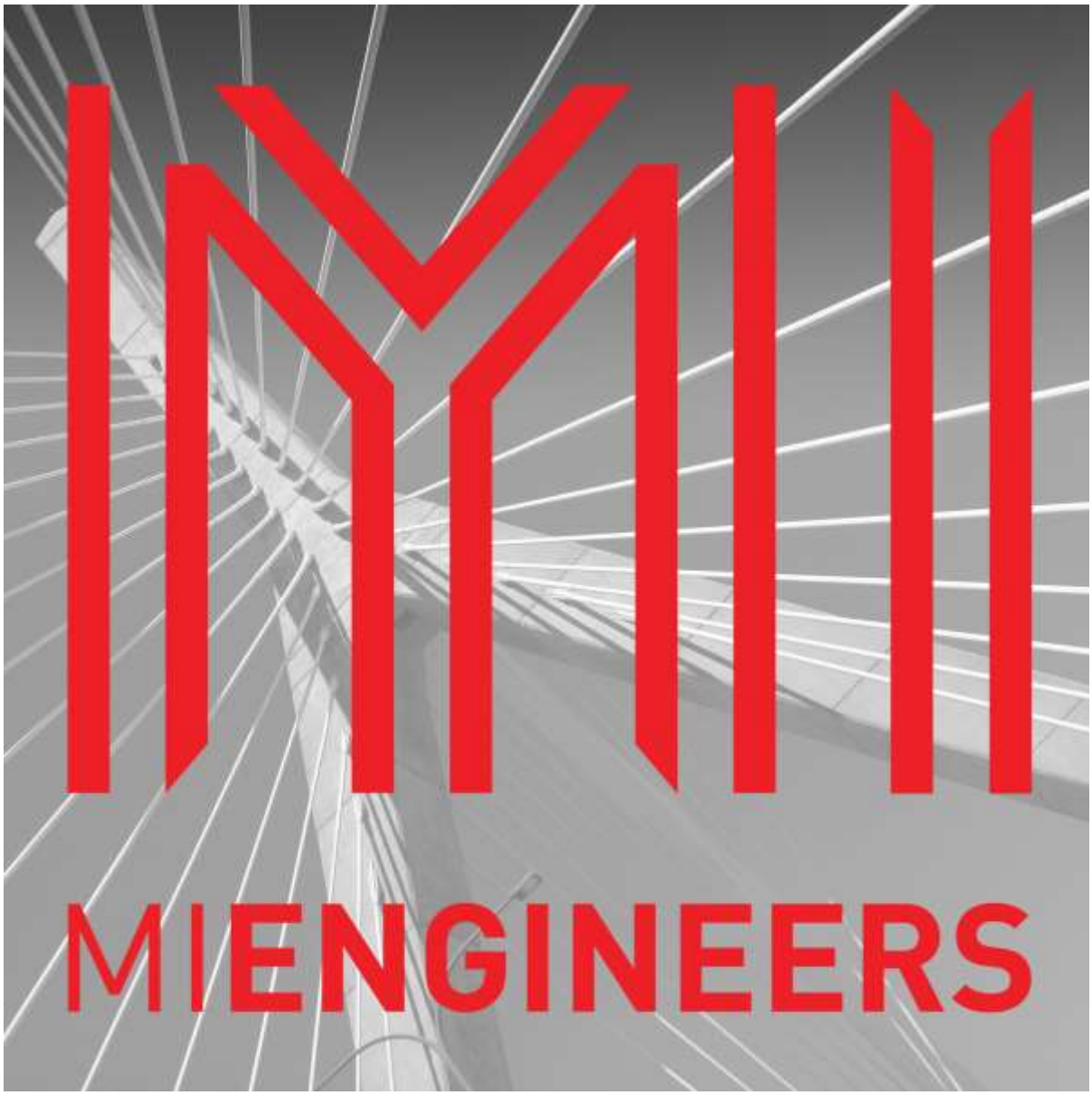

Structural Inspection Report

Hotham House

65 Hotham Road, Kirrawee, NSW 2232

Prepared for: David Wenkart
Executive Director & Deputy Chief Executive
Macquarie Health Corporation

Report Number: DN190017.R2

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Limitations Statement

The sole purpose of this report and the associated services performed by MIEngineers is in accordance with the scope of services set out in the contract between MIEngineers and the Client. That scope of services was defined by the requests of the Client, by the time and budgetary constraints imposed by the Client, and by the availability of access to the site.

MIEngineers derived the data in this report primarily from site visits, discussions with the Client, information provided by the client and/or Government Authority and current methodologies. The passage of time, manifestation of latent conditions or impacts of future events may require further exploration at the site, subsequent data analysis, and re-evaluation of the findings, observations and conclusions expressed in this report.

In preparing this report, MIEngineers has relied upon and presumed accurate information (or absence thereof) provided by the Client and others identified herein. Except as otherwise stated in the report, MIEngineers has not attempted to verify the accuracy or completeness of any such information.

The findings, observations and conclusions expressed by MIEngineers in this report are not, and should not be considered, an opinion concerning anything other than as outlined in the scope of works. No warranty or guarantee, whether express or implied, is made with respect to the data reported or to the findings, observations and conclusions expressed in this report. Further, such data, findings, observations and conclusions are based solely upon site conditions and information in existence at the time of the investigation.

Executive Summary

The inspection revealed significant structural defects throughout the house. The general physical condition of the structure is compromised, requiring extensive repairs and remediation to try and bring it back to its original appearance and structural soundness. Defects were observed in critical elements as evident by structural movement, including wet rot and possible termite activity in areas not able to be reasonably accessed and inspected. The structure appears dilapidated with limited future usage. Timber floor construction is for domestic loading, suitable for inpatient usage, however the facility should not be used for any other purpose without a detailed structural investigation as it will require strengthening.

In the author's opinion, this facility's inpatient usage does not possess unique structural features that warrant preservation. The piecemeal repair practices used makes the lifespan and usage of the facility limited. To maintain its present occupational usage will require a well-planned regular repair and maintenance programme. This should include a detailed review and upgrade of the present subfloor site drainage system. Remediation will require significant time and effort and will prove difficult to implement and will be costly.

Should there be a decision to make good the problems found, there is a convincing argument that it is best to demolish and rebuild. Should it be rebuilt, the significant unique fabric and appearance of the house can be sensibly represented in a new structure using current best building practices.

Commission

MIEngineers was commissioned by David Wenkart, Executive Director & Deputy Chief Executive, Macquarie Health Corporation on 8th July 2019 to conduct a visual inspection with the purpose of preparing a structural report including identification of structural defects and the provision of advice regarding repair of those defects and possible barriers to achieving proper repairs. This report does not intend to describe the house defects fully but rather a general explanation of the relevant aspects of causes of deterioration to provide the reader with a better appreciation of the problems found.

The inspection was carried out on 9th July 2019 by Emil Toussis of this firm in the presence of Rowann O'Mullane, Hospital Director of President Private Hospital.

Existing documents

To assist with writing this report, the client provided the following:

1. A copy of the Heritage Statement of Significance dated 24th May 2019
2. A copy of the Fuma Pest Inspection Report dated 26th September 2017
3. Prior to the investigation we sought to review existing drawings so that clues to deterioration may be revealed. Unfortunately, such records were unobtainable or never fully documented.
4. Limited useful information was obtained through discussion with Rowann O'Mullane.

General Historical Background

The Federation Hotham House was built circa 1912. Subsequent alterations and additions have been made at different times since then. It is noted that the Ballroom at the southern end of the original house was added circa 1918-1920. The quality of construction varies considerably, each alteration and addition having unique problems which relate to the construction techniques used to accommodate changes on this relatively steep site location. Based on different materials used it appears that the last major alterations and additions constructed were made on the western side of the house, being the construction of the kitchen/ dining room areas and toilet facilities.

It is evident that the as-built alterations and additions caused significant changes to the original site levels, completely altering the design of the stormwater overland flow system, exacerbating stormwater problems in and around the house over many years. Poor stormwater drainage practices have most likely contributed to soil scouring and the formation of the present subfloor watercourse system. The formation of watercourses to allow excessive stormwater to flow under the subfloor area has scoured and saturated the soil in several areas and allowed water to pond freely, which has caused damage such as foundation movement and brick cracking.

It is assumed that in the past ninety-nine years piecemeal repairs have been undertaken as evident by the various standards of workmanship and patchwork of materials to repair the damaged roof, brickwork and timber verandas.

We understand that in recent years the house has been generally maintained but have received no information about the removal of hazardous contaminates such as lead paint and asbestos. The recent Fuma Pest Inspection report dated 2017 indicates that the treatment for termite damage was successfully addressed with no visual evidence of new termite nest activity.

Construction description

This single-story house comprises single and full cavity brickwork with conventional timber floor construction supported on engaged and isolated brick piers. The roof comprises timber framework supporting a hipped and gabbled metal roof construction. The more recent construction, being the covered walkway, is located to the north and western sides of the house.

Observations of typical damage

An inspection was undertaken internally and externally including the sub-floor area, all conducted from safe accessible areas.

The observed defects have been photographed and tabulated in *Defects Table 1* appended to this report. Also included in Defects Table 1, for guidance only, the classification of deterioration to wall defects and severity as may be derived from AS 2870-2011 Residential Slabs and Footings. We have not attempted to classify each individual defect other than provide a description in the body of this report. As can be appreciated, deterioration is an ongoing process and levels of damage need to be monitored regularly.

Reported Issues

Water leakage

It is reported that in times of heavy rain the timber-framed windows have a major water leakage problem. The leak seems to originate from cracks and gaps around the window frame, which are simply inspected and repaired for rotten wood as may be required, with gaps filled with silicon caulking material and then continually monitored until the next rainstorm. The heritage order prevents windows to be removed, hindering the problem from being effectively addressed and fixed.

Brick cracking

Minor to severe brick cracking is widespread, mostly present in brickwork above windows and corners of walls as evidenced by the extent of remedial patch work. Damage has been caused by poor site drainage provisions, differential soil movement, and the rotation and pulling of the brickwork. It appears that brick cracking is more prevalent in the south-east corner of the house than elsewhere, with significant attempts having been made to repair these cracks, with some success.

It is noted that in some locations repaired brick cracks have re-opened and appear active and most likely will progressively become worse with any further ground movement.

Internal Inspection

Roof void above the gymnasium room

i. A visual inspection of the roof void through the manhole revealed a reasonably standard timber framework arrangement comprising of timber rafters and struts, battens to support and fix the metal roof, timber post, ceiling hangers and joists to support the compressed fibre cement ceiling.

   Estimated timber sizes as tabulated below:

Rafter size and spacing	90 x 40 @ 600 Cts
Timber battens	70 x 25
Timber beam	210 x 40
Ceiling hangers	200 x 40
Ceiling joists	90 x 40 @ 600 Cts
Roof struts and bracing	90 x 40

ii. The corrugated metal roof sheets appear severely damaged, water has penetrated through the joints in many locations and has caused a problem as evidenced by the excessive rust and efflorescence stains. *Refer to Photos 2 to 6 inclusive*.

iii. There is visual evidence that timber support members, where exposed to water, have rotted and have been repaired. Some of the members are critical roof supports and will require a detailed site investigation to ensure their structural integrity has not been impaired. *Refer to Photo 3*

iv. One critical roof support member is showing signs of structural distress in the form of a severe horizontal split. *Refer to Photos 4 &5*

Ceiling above the gymnasium room

i. There is evidence that the timber beam with a clear span of 6.0 m approx. across the room, which supports a point load imposed by the timber post above, has deflected beyond acceptable limits, thus causing the ceiling in this area to distort and sag. *Refer to Photo 10.*

ii. The sag in the ceiling is most pronounced where the ceiling meets the southern wall. In this location the sag is estimated to be in the order of 70 mm. *Refer to Photos 10 &11.*

iii. The two hanger beams that have a clear span across the room supporting the ceiling joist also appear to have deflected beyond acceptable limits.

iv. The ceiling panels consists of compressed fibre material and may contain asbestos fibres. *Refer to Photos 8 &9.*

Floor to the gymnasium room

i. In one area of the floor it felt springy underfoot, and a subsequent subfloor investigation revealed that an isolated brick pier support was deliberately removed to allow clear passage for the construction of a stormwater trench.

ii. The gymnasium vinyl floor appears to be in reasonable condition but needs to be thoroughly investigated by a specialist contractor as the vinyl may contain asbestos products.

Ceiling to the Dirty Utility Room

i. There is evidence of extensive water stains at the junction of the ceiling and western wall, most likely caused by failure of the roof sheeting and/ or roof flashing in this area. *Refer to Photos 12 & 13*

ii. It is reported that Item (i) above is well known to the occupants as the water stains keep reappearing after each general maintenance period.

Walls to gymnasium room

There is visual evidence of extensive brick remediation having been undertaken above most windows and doors. Damage appears to be brick movement either caused from differential footing settlement and/ or from expansion forces caused by the effect of rusting of the steel arch bar spanning across each opening. *Refer to Photo 60.*

External Inspection

General Roof

i. We understand that in early roof construction, “Pressed Metal Roof Tiles” profiles were commonly used and fixed over corrugated sheeting, which may have been used on Hotham House. This is to be confirmed by a roof specialist as it may contain asbestos fibres in its manufacture. On the day of the inspection the roof material was not inspected. If the “Pressed Metal Roof Tiles” are not in reasonable condition, there is a risk that the fibres will escape into the atmosphere. *Refer to Photos 15 & 17.*

ii. The roof over the western portion of the house above the toilets and kitchen/dining areas comprises a conventional timber and metal roof construction with a nominal slope to the eaves gutter. *Refer to Photo 19.*

iii. The covered walkway also comprises conventional timber and metal roof construction with a single slope to the eaves gutter located on the southern end.

External access ramps

i. A timber access ramp was constructed on the western side of the house to replace the original concrete steps into the kitchen/dining room areas. It is evident that the original site levels were altered to allow for construction of the ramp, but in doing so the sub-floor air vents have been covered / and or obstructed and no longer operate as they should. *Refer to Photo 45.*

ii. To the north, the concrete ramp that joins the existing timber verandah has moved and settled unevenly, causing a tripping hazard. Poor surface drainage provisions in this area have eroded the soil under the ramp, where soil has been washed away forming a large cavity under the ramp. *Refer to Photos 20 &21.*

iii. It is evident that the present pathways to the western side generally fall toward the house. Paths are catchments for surface water and no proper drainage provisions are evident to effectively collect and discharge into a proper site drainage system. *Refer to Photo 19.*

Garden Area located on the western side

i. The mature garden bed established *(refer to Photo 48)* has interfered with the footing system and is considered a problem for the following reasons:

   a) Constant watering without an effective drainage system can lead to over-saturation of the foundations and in times of prolonged dry spells, plants need water and their roots search for moisture, subjecting the underlaying soils to drying and shrinking, consequently removing support from under the footings.

   b) Introduced topsoil may have covered the brick weep holes and cross air ventilation holes in the walls.

ii. A water tap (without an overflow relief gully) and A/C drain pipes are located and fixed to the wall. Even small water leakages from these will seep under the footings and run along the existing watercourse trenches saturating the subfloor areas, which can be responsible for serious erosion. *Refer to Photos 46 &47.*

Brick wall on eastern side

i. New brick movement was observed on the north-east corner of the building, adjacent the roof DP. Damage is in the form of slight step cracking in the mortar beds in the body of the wall. The most likely cause of this is the subsidence of the footing under. The brickwork walls will resist the stress created by loss of support by bridging the gap until the brick mortar bedding fails. This typically occurs in older masonry as they are susceptible and have little resistance to vertical movement. *Refer to Photo 37.*

ii. There is evidence of old tree root growth under the footing. The growth most likely has exerted lateral forces to initiate the present brick cracking and movement. The old tree roots remain but should be totally be removed as termites may infest and continue nesting activities. *Refer to Photo 31.*

iii. Differential footing movement has caused damage to main curved stairs. The likely cause is poor drainage in this area, which needs to be investigated before remedial work is contemplated. Once drainage is improved, the movement should be measured and monitored over a period of time. Once the movement has been stabilised and considered static, remedial repairs can be carried out. *Refer to Photos 27 &32.*

iv. The verandah roof where it attaches to brick wall is in poor condition and needs attention and remediation. In this location the roof sheeting is severely rusted and the roof flashing is missing or not working as it should as it is affected by the severe rust causing the deterioration of the roof sheeting. The timber wall plate supporting the roof is fixed by a masonry anchor to the wall which appears severely rusted. All the anchors along this wall need to be checked to ensure they have structural capacity to deal with all imposed service loads. *Refer to Photos 24 &25.*

Brick wall on southern side

i. It is evident that some old brick repairs in this wall have not worked and have since opened up again. This needs to be further investigated as the high-level strip footing will need to be partially underpinned to a lower underlaying stable ground, to be determined by a site geotechnical investigation. *Refer to Photo 41*

ii. The gutter on the southern side appears corroded and should be replaced as it spills water to the ground causing problems. *Refer to Photo 41.*

iii. A visual inspection in the brick cavity wall revealed that the brick ties appear in a poor corroded condition or are missing.

Sub-Floor Inspection

i. An inspection revealed the subfloor is used for storage and is mostly full of debris. The subfloor area should be totally cleared and debris removed from site. At the same time very carefully examine areas of low clearance, poor ventilation and badly drained or damp portions of the subfloor area, as termites prefer such areas. *Refer to Photos 50 to 55 incl.*

ii. White ant capping is missing throughout and is required to maximise protection against termites. If there is a termite infestation, the mud tunnels they create are visible on the cap. *Refer to Photos 50 to 55 incl.*

iii. An isolated brick pier support appears to have been removed to make way for the construction of a watercourse trench. The floor bearer now spans twice as far across to the next isolated pier. *Refer to Photo 53.*

iv. The present subfloor watercourse system as-built channels water directly towards the south-east corner of the house causing erosion and saturation of the ground that has significantly damaged the brickwork. *Refer to Photo 51.*

v. It is evident that the isolated brick piers supporting the timber floor have been affected by erosion caused by water saturated foundations. The piers have tilted and lost contact with the bearers they support, as evidenced by the timber packing used to wedge level the floor back to almost horizontal. *Refer to Photo 52.*

Potential Repair Methods

i. It should be noted that termite infestation inspection, as reported by Fuma Pest on 26th September 2019, was not extensive due to limited sub-floor access and may not have clearly identified all the damage to date.

ii. A primary factor contributing to damage in the timber floor is poor sub-floor ventilation and general site drainage. Subsequent extensive alterations and additions made after 1912 entailed modifying the site levels; this action has compromised the effectiveness of the air vents as observed on site. To effectively rectify this problem site levels will need to be readjusted; however, this will prove difficult to achieve without significantly disturbing the adjacent structures and drainage system.

iii. Old construction methods will have contributed to the problems observed; this includes the omission of dampproof course, white ant capping and inadequate cross air ventilation to maintain constant soil moisture conditions under the floor. Note that current code requirements have doubled the previous volume of air stipulated to effectively cross vent under floors. Retrofitting an affective damp proof wall system can be time consuming and very costly, whilst white ant capping may be difficult to install without removing some of the existing floor altogether.

iv. Based on our visual observation, since 1918 there has been site drainage issues including damage related to the house. It is prudent that the whole site drainage system be thoroughly investigated, reviewed and amplified under and around the house. Water must not be allowed to pond underneath the floor as it is detrimental to the performance of the timber floor and footing elements.

v. It is apparent that brick walls and isolated piers are built on high level concrete pads and footings; these are founded on the underlaying slight to moderately reactive clay soil. Differential soil moisture conditions can be caused by extreme weather patterns, thus high level footings can be subject to severe shrink swell actions, and such actions can generate enough force to cause bricks to crack (as observed). In areas of brick damage, high level footings may require underpinning.

vi. It is evident that in areas of severe to moderate brick cracking it has prompted significant remediation in the form of replacing brickwork and repointing, but may be ineffective in the long term as there is evidence of further brick movement such as old repairs re-opening. This will require further investigation to arrest further movement. *Refer to Item vii below*.

vii. To arrest further foundation and brick movement will require a detailed geotechnical site investigation to identify the underlaying soil classification and provide recommendations as to the most cost-efficient structural underpinning system to implement. The most common method of underpinning is concrete mass pads or steel screw piles to a predefined established depth of uniform material. At this depth, the moisture conditions are stable and unaffected by extreme prolonged weather conditions. The spacing of these piles is related to the load they support and strength of the existing footing system to be underpinned.

viii. The roof gutters require maintenance and may need to be replaced; they have tilted away from the house causing an overflow situation, particularly during heavy storms, which means that the water will spill straight down onto the foundation below, as evidenced by the splash marks against some brick walls. As previously mentioned, excessive free water around or near high level strip footings can saturate the ground and cause structural damage. Roof drainage needs to be investigated; the total replacement of gutter downpipes may be necessary.

ix. Roof downpipes situated in areas of brick movement will need a thorough inspection below ground to ensure the pipe connections are intact and working as intended, otherwise in times of heavy rain water is freely discharged in these areas with the potential to cause structural damage to the footings and walls. An experienced plumber can check and report on the condition of the site stormwater drainage system including plumbing, sewer and water for leakages by using a camera apparatus.

Conclusion / Recommendations

i. Considering the age of this house (built circa 1918), the subsequent piecemeal fashion of constructed alterations and additions, the poor general site drainage system present and old construction practices used, all these factors will ultimately reduce the life span and usage of the house. Planned ongoing repairs and maintenance will be significant and difficult to achieve and will be costly. To make good the problems found, there is a convincing argument that it is best to demolish and replace the building.

ii. In the authors opinion, a new house can be successfully constructed to express an aesthetic heritage fabric like the original house, with the advantage of applying current building practices and code requirements.

iii. We have read the report prepared by Fuma Pest and concur with the site condition and recommendations made within this report.

iv. Due to difficulties and access limitations, it was not possible to inspect each sub-floor area thoroughly. This was not considered a problem since reasonable prediction can be made of the general structural condition.

v. Considering the age of the house it would be prudent to commission a specialist contractor to undertake a wall survey to assess whether the wall ties and straps to hold the roof down within the wall cavities are in good condition and doing their job properly, i.e. provide stability, tying the two leaves of masonry together and holding down the roof adequately under earthquake loading. Wall tie replacement may become necessary, which can be achieved by using remedial or retrofit wall ties manufactured in stainless steel to ensure long life protection in the future.

vi. As the long-term structural performance of the house is related to a good working roof and ground stormwater system around and underneath of the house, it would be prudent to thoroughly investigate. The investigation should extend to the existing surface and underground stormwater system, augment or improve as may be necessary, effectively connect, collect and discharge to the present Council system.

vii. Most “Pressed Metal Roof Tiles” contain asbestos until proven otherwise. Mastic or bitumen was the most common material used to adhere the stone chip to the pressed metal. The presence of asbestos can only be confirmed through sampling and testing by an accredited laboratory in accordance with the Health and Safety at Work (Asbestos) Regulations 2016 and the Approved Code of Practice. A specialist company should be engaged to undertake sampling, testing and remediation. If the Pressed Metal Roof Tiles remain in good condition and are left undisturbed, cleaning or removal during maintenance, there is no significant health risk. Risk only arises when adhesive expires or stone chips become dislodged whereby asbestos fibres may become airborne and can be breathed into the lungs.

viii. All exposed roof and steel elements must be protected to satisfy the requirements as set out in Australian Standard AS2312.1, Category C: Medium. This category mainly covers coastal areas with low salinity and extends from the shoreline to about 3 to 6 kilometres inland, such as this site.

ix. The manufacture and application of the vinyl flooring used throughout the house may contain asbestos. Asbestos was used in the manufacture of vinyl sheet products up until the mid-1970s and remaining stocks of asbestos-containing flooring continued to be sold into the late '70s or early '80s. Therefore, there is a possibility that the vinyl floor in Hotham House could contain asbestos material. A specialist company should be engaged to undertake sampling, testing and remediation where needed.

x. As Hotham house was built circa 1912, the ceiling may comprise of a building product of that period, with trading names such as AC sheet, fibre cement sheet, fibromay; all these sheets were manufactured with asbestos fibres. The product description is “smooth, flat fibre cement sheet that is painted on-site to create a flat panel look”; this describes the ceiling panel inspected over the gymnasium room. A specialist company should be engaged to undertake sampling, testing and remediation where needed.

Summary

i. We have concluded that Hotham House is basically structurally unstable and will require substantial maintenance. To proceed further will require a thorough structural investigation to determine its structural integrity. This investigation will require assistance from material specialists to understand the nature and condition of the building elements containing asbestos, including costs to remediate if required.

ii. We recommend the following approach and can assist the client upon request to investigate and how best to evaluate the following three options and how best to reinstate Hotham House to an acceptable serviceable condition. Option 2 will result in a lower level building maintenance.

Generally, repair cost estimates should be obtained from current cost guides provided by The Australian Institute of Quantity Surveyors. We should emphasize that precise cost estimates are very difficult given the nature of the work, specific limitations on working hours and the lack of details. Figures stated in this report are for general guidance on the possible order of costs available at the time of reporting. We believe costs would vary considerably from contractor to contractor depending on their workload and related experience.

Proposed Repair Procedures

We have provided indicative quotations for three repair options as follows:

- **Option 1**: Ongoing maintenance as currently provided but upgrade with better methods of repair.
- **Option 2:** Remedial repairs, involving repair of damaged brickwork and replacement using accepted repair techniques as well as repair of other structural elements.
- **Option 3:** Demolish and repair

Option 1

Ongoing maintenance comprises only that work which is essential for structural stability and safety. This option assumes that the existing metal roof remains and is remediated as needed, and the existing ceiling remains intact.

i. Roof drainage management.
ii. Site stormwater water management.
iii. Brickwork remediation
iv. Window and door steel lintels

Estimated total ongoing maintenance repair costs, say $100,000

The items listed above will be additional work covered by the general Hotham House maintenance.

Option 2

i. Roof replacement /management.
ii. Site stormwater water management.
iii. Brickwork remediation
iv. Partial underpinning

Estimated total ongoing maintenance repair costs, say $450,000

The items listed above will be additional work covered by the general Hotham House maintenance.

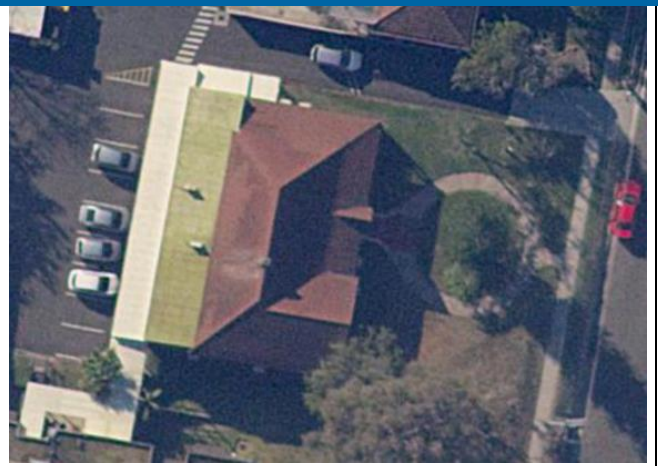
Option 3

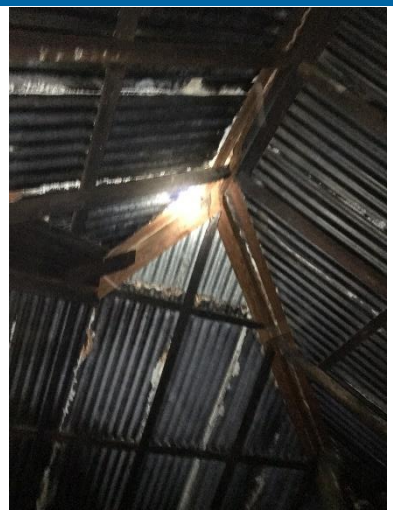
Totally demolish, site remediation and replace to replicate original historical fabric of Hotham House.

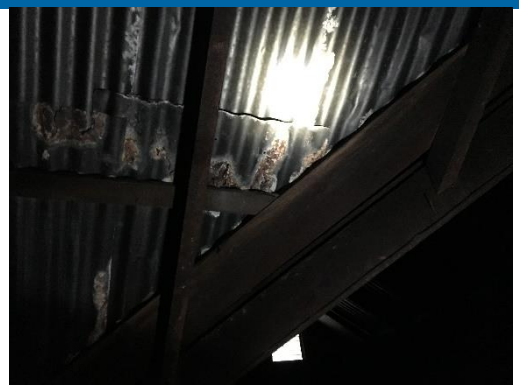
Estimated cost, say $ 1,200,000 to $1,600,000

Appendix 1: Structural Defects Table 1

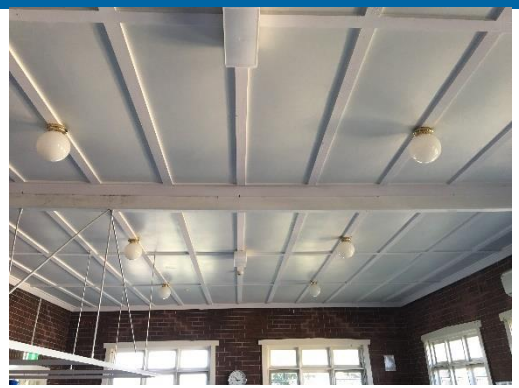
DEFECTS TABLE 1

Item No.	Component	Observation Assessment	Recommended Work Upgrade	Photo No.	Photographic Observation	Condition Grade
Hotham House	Aerial Photo	Hotham House roof, showing three different types of construction		1		N/A
1	General view of the gymnasium roof valley	At roof valley there is excessive roof water penetration through joints in the roof sheeting	Repair/ replace sheeting, as may be required to stop timber rotting. Continue with the ongoing programmed maintenance regime	2		Type 2

Item No.	Component	Observation Assessment	Recommended Work Upgrade	Photo No.	Photographic Observation	Condition Grade
2	General view of the gymnasium roof, ridge flamework	Excessive roof water penetration through joints in roof sheeting. It appears that remedial structural repairs were undertaken to strengthen the damage timber, this critical connection is to be investigated to ensure its integrity is maintained	Repair/ replace sheeting, as may be required to stop further timber rotting. Continue with the ongoing programmed maintenance regime	3		Type 2
3	General view of the gymnasium roof, ridge flamework	Refer to item 2 above	Refer to item 2 above	4		Type 2

Item No.	Component	Observation Assessment	Recommended Work Upgrade	Photo No.	Photographic Observation	Condition Grade
4	General view of the damaged gymnasium roof sheeting	Excessive roof water penetration through joints in roof sheeting	Repair/ replace sheeting, as may be required to stop timber rotting. Continue with the ongoing programmed maintenance regime	5		Type 2
5	General view of the gymnasium damaged condition of the roof sheeting	Refer to item 2 above	Refer to item 2 above	6		Type 2
6	General view of the gymnasium ceiling, showing the main centre post roof support	Under the post the ceiling timber support beam has deflected excessively	Ceiling timber beam will require strengthening	7		Type 3

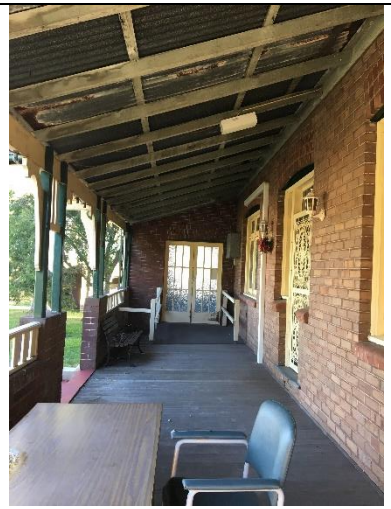
Item No.	Component	Observation Assessment	Recommended Work Upgrade	Photo No.	Photographic Observation	Condition Grade
7	Ceiling manhole to the gymnasium roof void	Detail of the removed manhole panel	A specialist company should be engaged to undertake sampling, testing for asbestos fibres	8		N/A
8	Ceiling manhole to the gymnasium roof void	Refer to item 7 above	Refer to item 7 above	9		N/A
9	Close up view of the gymnasium deflected timber beam that supports the ceiling and roof post above	The beam has excessive deflection, check for structural integrity, will need strengthening	Continue with the programmed maintenance regime	10		Type 3

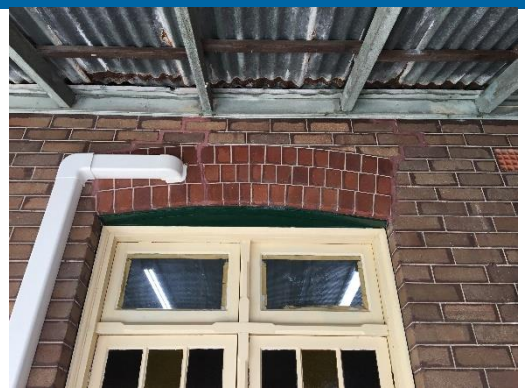
Item No.	Component	Observation Assessment	Recommended Work Upgrade	Photo No.	Photographic Observation	Condition Grade
10	Close–up view of the gymnasium ceiling construction. Strips correspond to the joints in the sheet	Ceiling is sagging	Continue with the programmed maintenance regime.	11		Type 3
11	Ceiling to the Dirty Utility Room	Extensive water stains is an indication of failure of the roof sheeting / flashing	Check the condition of the roof flashing make good as necessary Continue with the programmed maintenance regime.	12		Type 2
12	Ceiling to the Dirty Utility Room	Refer to item 11 above	Refer to item 11 above	13		Type 2

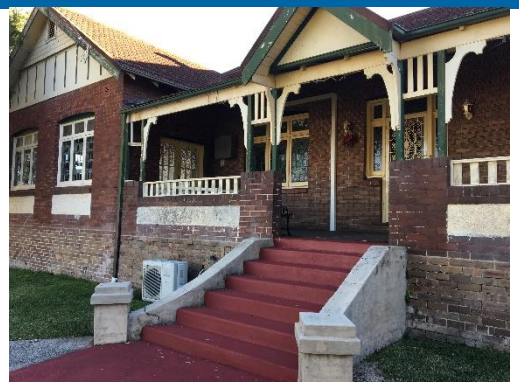
Item No.	Component	Observation Assessment	Recommended Work Upgrade	Photo No.	Photographic Observation	Condition Grade
13	Close up view of the Northern elevation, showing the various stages of roof construction	The concrete access ramp to the verandah has moved and settled causing a tripping hazard. Soils under the ramp has eroded creating a void under the concrete slab	Repair and stabilise against further settlement of the concrete ramp	14		Type 2
14	View of the north-East corner of the house	The general condition of the verandah floor was not thoroughly check due to lack of clearance space.	A specialist company should be engaged to undertake a detailed condition assessment of the “Pressed Metal Roof Tiles”.	15		Type 2
15	View of the North-West corner of the house	Surface water runoff is generally directed towards the house.	Check effectiveness of the stepped roof flashing where abutting brickwork Review and upgrade surface site drainage system	16		Type 2

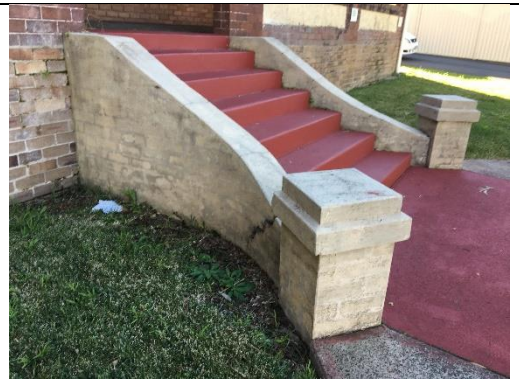
Item No.	Component	Observation Assessment	Recommended Work Upgrade	Photo No.	Photographic Observation	Condition Grade
16	Roof barge board and roof flashing	Various roof elements appear in disrepair	Review and replace roof components and make good as required to stop water damage	17		Type 2
17	North- East Elevation of the Hotham House	View of the relative roof levels and material used and type of construction. Natural surface levels fall towards the house	Review and reassess to improve roof and site drainage system.	18		Type 2
18	Eastern Elevation	Refer to item 17 above	Refer to item 17 above	19		Type 2

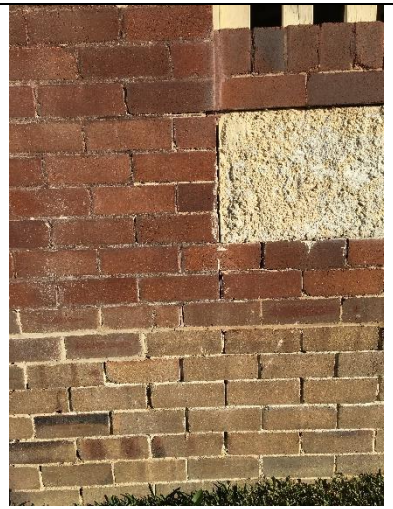
Item No.	Component	Observation Assessment	Recommended Work Upgrade	Photo No.	Photographic Observation	Condition Grade
19	Corner of the concrete access ramp	Eroded soil under the concrete ramp causing a large void to form and loss of slab support	Review and remediate the site drainage, collect and affectively connect and discharge into the existing piped drainage system	20		Type 2
20	Corner of the concrete access ramp	Erosion of soil and slab settling will continue to occur and eventually will become a serious trip hazard.	Refer to item 17 above	21		Type 2

Item No.	Component	Observation Assessment	Recommended Work Upgrade	Photo No.	Photographic Observation	Condition Grade
21	The timber verandah deck structure located on the norther side of the house	Deck and the isolated brick pier have moved and settled as evident by the amount of packing used,	All pier under the deck are to be reconstructed after site drainage issues are resolved and rectified. Install white ant capping to satisfy good building practices	22		Type 2
22	View of the eastern verandah looking south	View of the timber skillion roof framework construction	Check on the condition of all the masonry wall anchor fixing to the timber wall plate and roof strapping holding the roof down.	23		Type 2

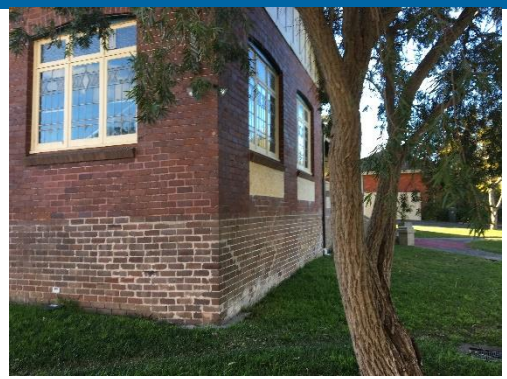
Item No.	Component	Observation Assessment	Recommended Work Upgrade	Photo No.	Photographic Observation	Condition Grade
23	The Northern wall elevation, of the house under the verandah	Roof sheeting and timber is water damaged. Remediated brick crack above the window.	Remove and replace roof sheeting and flashing as necessary and make good to resolve present roof water issues	24		Type 2
24	The Northern wall elevation, of the house under the verandah	Refer to Item 23 above.	Carefully examine all the masonry bolt fixings supporting the roof structure above for rust, treat and paint as required to maintain the structural integrity of the roof against wind uplift .	25		Type 2
25	South-East corner elevation of the house	Brik damage has been previously repaired, more brick movement / damage is evident requiring remediation	Review and remediate the site drainage, collect and affectively connect and discharge into the existing piped drainage system prior to brick remediation	26		Type 2

Item No.	Component	Observation Assessment	Recommended Work Upgrade	Photo No.	Photographic Observation	Condition Grade
26	South-East elevation of the house	Refer to item25 above	Refer to item25 above	27		Type 2
27	South-East elevation of the house	Refer to item25 above	Refer to item25 above	28		Type 2
28	North-East corner elevation of the house	Refer to Item 25 above	Refer to Item 25 above	29		Type 2

Item No.	Component	Observation Assessment	Recommended Work Upgrade	Photo No.	Photographic Observation	Condition Grade
29	View of the South-East corner of the house	Extensive brick damage remediation undertaken. Brick efflorescence an indication of raising damp, the presence of excessive ground moisture	Review and remediate the site drainage, collect and affectively connect and discharge into the existing piped drainage system	30		Type 2
30	View of the Eastern elevation the house	Brick efflorescence an indication of raising damp, the presence of excessive ground moisture The remains of tree root beneath the footing and movement and associated stepped brick cracking	Refer to Item 29 above	31		Type 2
31	Stair brick wall	Rotational movement and damage to the stair brickwork	Refer to Item 30 above	32		Type 2

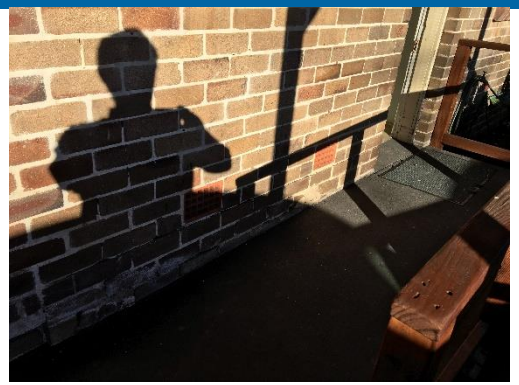
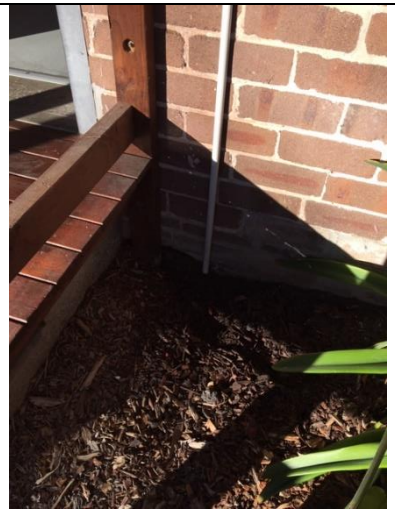
Item No.	Component	Observation Assessment	Recommended Work Upgrade	Photo No.	Photographic Observation	Condition Grade
32	Looking West, the front verandah	Extensive brick damage remediation undertaken In this location the timber lattice work including gutter are disrepair.	Review and remediate the roof drainage, collect and affectively connect and discharge into the existing piped drainage system	33		Type 2
35	Looking West, the front verandah	There is footing movement and associated stepped brick cracking. Brick cracking is in the order of < 5.0 mm. With reference to AS2870 Classification of damage with reference to walls, fall is the category of slight	Review and remediate the site drainage, collect and affectively connect and discharge into the existing piped drainage system prior to brick remediation	34		Type 2

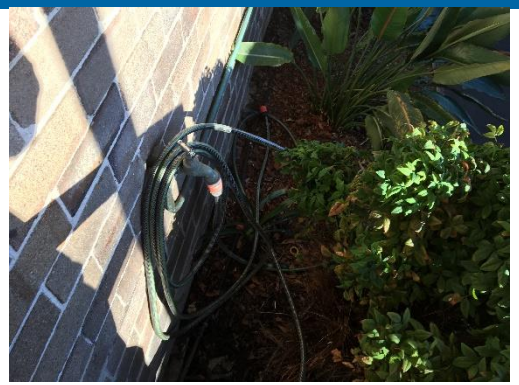
Item No.	Component	Observation Assessment	Recommended Work Upgrade	Photo No.	Photographic Observation	Condition Grade
36	Looking West, the front verandah	Refer to item 35 above	Refer to item 35 above	35		Type 2
37	Looking West, the front verandah	Refer to item 35 above	Refer to item 35 above	36		Type 2
38	View of the North-East corner of the house	Footing settlement/ movement with associated stepped brick cracking	Review and remediate the site drainage, collect and affectively connect and discharge into the existing piped drainage system Check connection to DP below ground	37		Type 2

Item No.	Component	Observation Assessment	Recommended Work Upgrade	Photo No.	Photographic Observation	Condition Grade
39	View of the South-East corner of the house	Extensive brick damage remediation undertaken. Mature tall tree located within close proximate of the damaged corner, extent of tree root system matches canopy area	Investigate and consult a tree arborist and establish the need for the installation of tree root barriers to stop footing damage	38		Type 2
40	Southern elevation of house	Roof drainage is in disrepair the gutter and DP's may need to be replaced. In times of heavy rain, the gutters must overflow as evident by the soil splash marks against the wall	Review and remediate the roof drainage, collect and affectively connect and discharge into the existing piped drainage system	39		Type 2

Item No.	Component	Observation Assessment	Recommended Work Upgrade	Photo No.	Photographic Observation	Condition Grade
41	South -West corner of the house	The roof drainage in this location is in disrepair and not working properly. It appears that there is mold growth on the wall, an indication that the roof drainage problem has existed for some time	Investigate the cause of the problem and make good as required, the fascia board needs replacing	40		Type 2
42	Southern elevation of the house, where the gymnasium roof meets the Dirty Utility room roof	Evidence that the previously brick repairs have not worked, and new stepped cracks have opened in the same location, emanating from the corner of the window. The steel lintel bar has rusted	Review and remediate the site drainage, collect and affectively connect and discharge into the existing piped drainage system prior to brick remediation. Wire brush the lintel clean treat and paint and protect against rust	41		Type 2

Item No.	Component	Observation Assessment	Recommended Work Upgrade	Photo No.	Photographic Observation	Condition Grade
43	Southern elevation of the house, below gymnasium window	Refer to item 42 above	Review and remediate the site drainage, collect and affectively connect and discharge into the existing piped drainage system prior to brick remediation.	42		Type 2
44	Southern elevation of the house	Access manhole located below the Dirty Utility room	Check the DP's connection below the ground	43		Type 2
45	Southern elevation of the house	Water tap and gully located to this wall	N/A	44		N/A

Item No.	Component	Observation Assessment	Recommended Work Upgrade	Photo No.	Photographic Observation	Condition Grade
46	Western wall, where the timber access ramp starts	Ramp constructed in front of the air vents obstructing air flow under the subfloor area.	Investigate how to improve air flow under the subfloor area	45		Type 2
47	Western wall, end of the access ramp	A/C Unit pipe discharge water in the garden bed	Pipe and discharge water away form house footings	46		Type 2

Item No.	Component	Observation Assessment	Recommended Work Upgrade	Photo No.	Photographic Observation	Condition Grade
48	Western wall	A garden water tap is attached to this wall with out a gully	Plumber to be engaged to install a gully to satisfy code plumbing requirements	47		Type 2
49	Western wall	An established garden bed exists against the wall. Not recommended by good building practices.	Review the need for this garden. It is evident that in the subfloor area behind this wall the ground is saturated, disturbing the soil moisture conditions to the structural detriment of the footings	48		Type 2
50	Subfloor area below the raised garden bed	The brick wall is wet, and the soil is saturated.	Refer to Item 49. above	49		Type 2

Item No.	Component	Observation Assessment	Recommended Work Upgrade	Photo No.	Photographic Observation	Condition Grade
51	Subfloor area below the Dirty Utility Room	It is evident that subfloor cross ventilation is not existent the ground is moist and wet	Review and install cross ventilation using mechanically forced ducted air.	50		Type 2
52	Subfloor area below the South-east corner of the gymnasium floor	In times of heavy rain this portion of the subfloor area collects all the runoff from the uphill side of the property. It would mostly explain the extensive brick damage done to the corner of the house.	Review and remediate the site drainage, collect and affectively connect and discharge into the existing piped drainage system	51		Type 2
53	Subfloor isolated brick piers supporting the gymnasium floor	Soil erosion caused by stormwater runoff under the subfloor area has caused instability to the isolated piers. Some piers are out of vertical while others have settled.	Refer to item 55 above, and thoroughly investigate the condition of all isolated piers and make good to affectively support the gymnasium timber floor	52		Type 2

Item No.	Component	Observation Assessment	Recommended Work Upgrade	Photo No.	Photographic Observation	Condition Grade
54	Subfloor isolated brick piers supporting the gymnasium floor	An isolated brick pier has been demolished and removed to make way for a stormwater drainage channel. The bearer supporting the timber floor above spans twice as far and is the same size and is working twice as hard under service load	Investigate and replace the isolated pier immediately. The gymnasium floor above this area is bouncy under foot and may disturb some occupants.	53		Type 1
55	Subfloor isolated brick piers supporting the gymnasium floor	General soil erosion under stormwater channel flow conditions, has caused settlement and movement to the isolated brick piers. We note that white ant capping is missing throughout the subfloor area, this is not acceptable practice.	Check all displaced isolated pier to ensure bearers are full supported, use timber hardwood wedges to fill gaps between the underside of the timber bearer and top of the brick pier. Retrofit white ant capping	54		Type 2

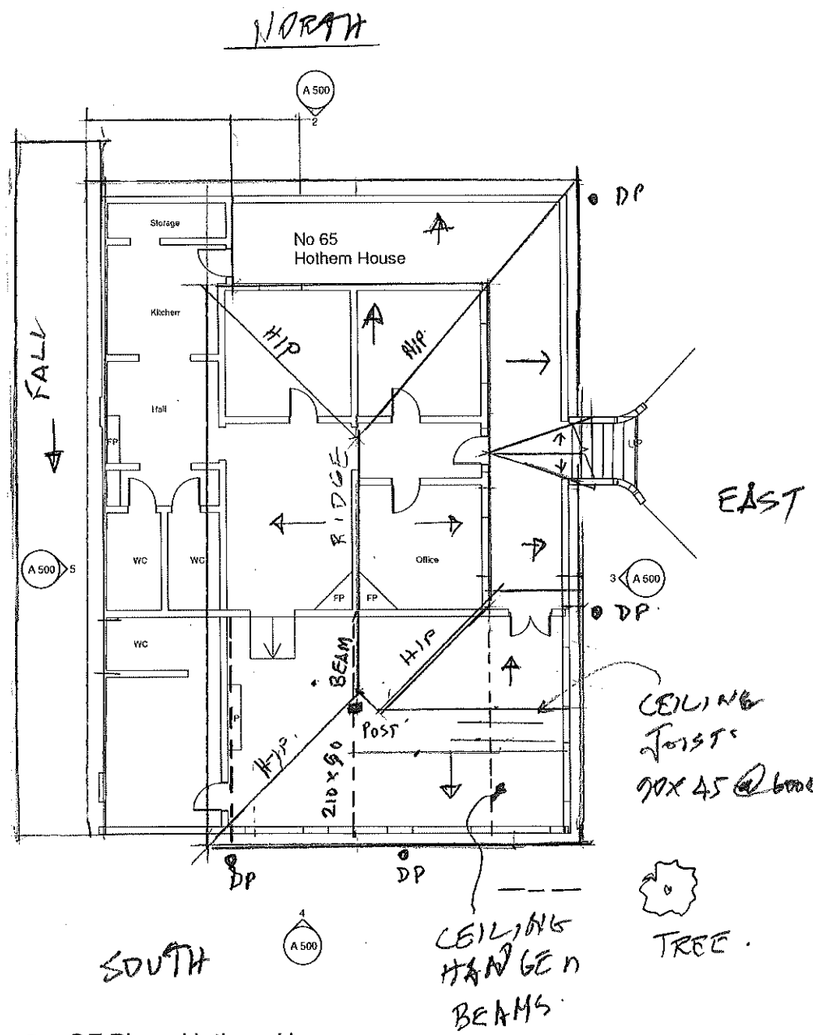
Item No.	Component	Observation Assessment	Recommended Work Upgrade	Photo No.	Photographic Observation	Condition Grade
56	Subfloor engaged/ isolated brick piers supporting the gymnasium floor	Over the years, it appears that the sub-floor area has been used as storage space. There is evidence that car body parts and other debris fill most the sub-floor area.	To prevent white ant activity, it is good practice to remove and dispose all debris from site.	55		Type 2
57	Subfloor stormwater channel directs flow from under the norther office areas	There appears to be a system of stormwater channels und the house. Generally, channels sizes vary in dimension, but approximately they are in the order of 0.5 x 0.3 deep	Review and remediate the site drainage, collect and affectively connect and discharge into the existing piped drainage system	56		Type 2

Item No.	Component	Observation Assessment	Recommended Work Upgrade	Photo No.	Photographic Observation	Condition Grade
58	Subfloor view of the dividing wall between the gymnasium and offices	It appears that to allow free stormwater to flow a channel was dug including cutting and removing a portion of the concrete footing under the dividing wall exposing the reinforcement. Water flow is directed towards the South-East corner of the house	Removing a portion of a footing is not good practice, this needs to be further investigated. It may require structural remediation work.	57		Type 3
63	Subfloor view under the office rooms	The timber floor construction appears of similar construction to the rest of the house.	Adequate cross air ventilation will not satisfy current code requirements and needs further investigation.	58		Type 2
64	Subfloor view under the office rooms	Timber floor construction is of different construction to the rest of the house.	Adequate cross air ventilation will not satisfy current code requirements and needs further investigation.	59		Type 2

Item No.	Component	Observation Assessment	Recommended Work Upgrade	Photo No.	Photographic Observation	Condition Grade
65	Remediated brickwork	Typical Damage above windows and doors	Review and remediate the site drainage, collect and affectively connect and discharge into the existing piped drainage system	60		Type 2

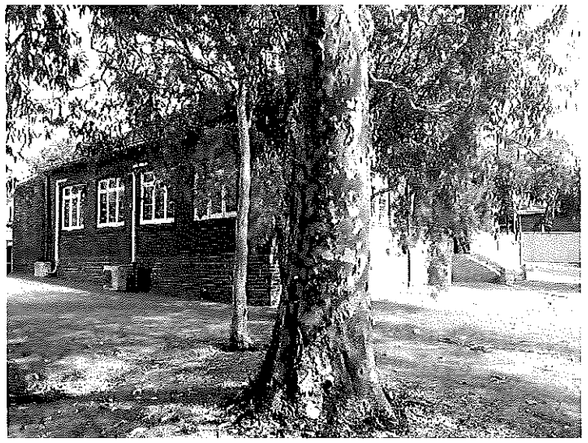
Category	Description	Colour on Drawings	Typical Characteristics	Prioritisation
Type 1	Low Level Damage		Local damage No influence on load capacity Slight brick defects	Attention required between 4 – 6 years
Type 2	Medium Level Damage		Local extensive damage Slight influence on load capacity Moderate brick defects	Attention required between 2 – 4 years
Type 3	High Level Damage		Large scale damage Strong influence on load capacity Extensive brick defects	Attention required within next 6 -24 months

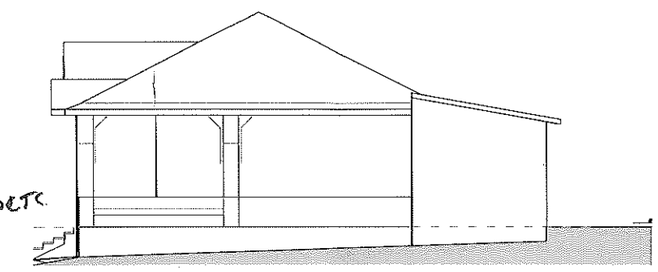
Appendix 2: Sketch Drawings



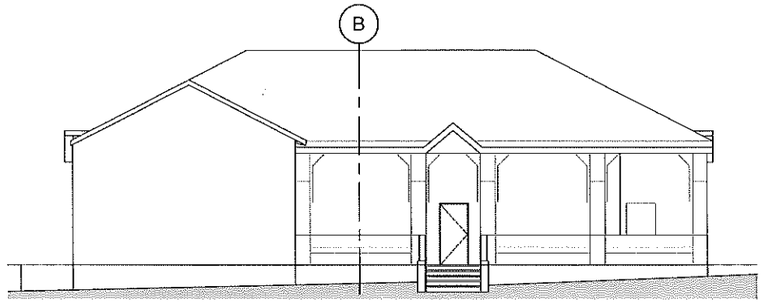
1 / A 500 GF Plan - Hothem House
1 : 100

ROOF PLAN

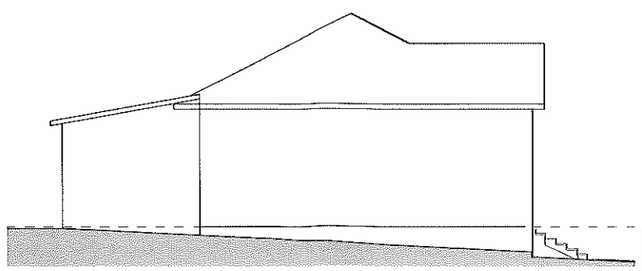




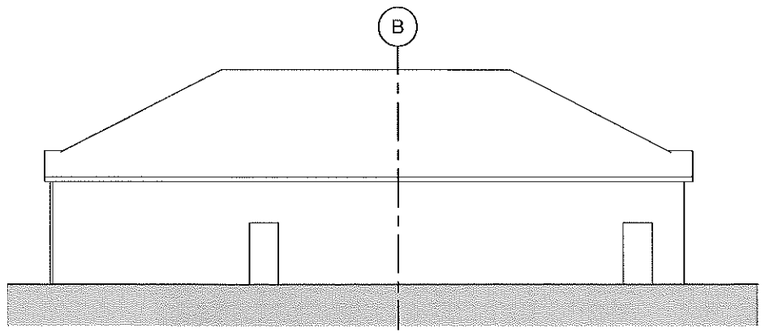
2 / A 500 Hotham House - North Elevation
1 : 100



3 / A 500 Hotham House - East Elevation
1 : 100



4 / A 500 Hotham House - South Elevation
1 : 100



5 / A 500 Hotham House - West Elevation
1 : 100

Consultant Team:

Traffic Engineer:	ML Traffic Engineers	- Ph. 02 8004 2434
BCA Consultant:	Blackett Maguire and Goldsmith	- Ph. 02 9211 7777
Electrical Consultant:	Erbas and Associates	- Ph. 02 9437 1022
Hydraulic Consultant:	Erbas and Associates	- Ph. 02 9437 1022
Mechanical Services Engineer:	Erbas and Associates	- Ph. 02 9437 1022
Structural Engineer:		
Landscape Architect:	Dunlop Thorpe & Co.	- Ph. 02 9283 6577
Surveyor:		

Amendment Issue:

No.	Description	Date

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Macquarie HEALTH CORPORATION

Additions & Alterations to President Private Hospital

Macquarie Health Corporation

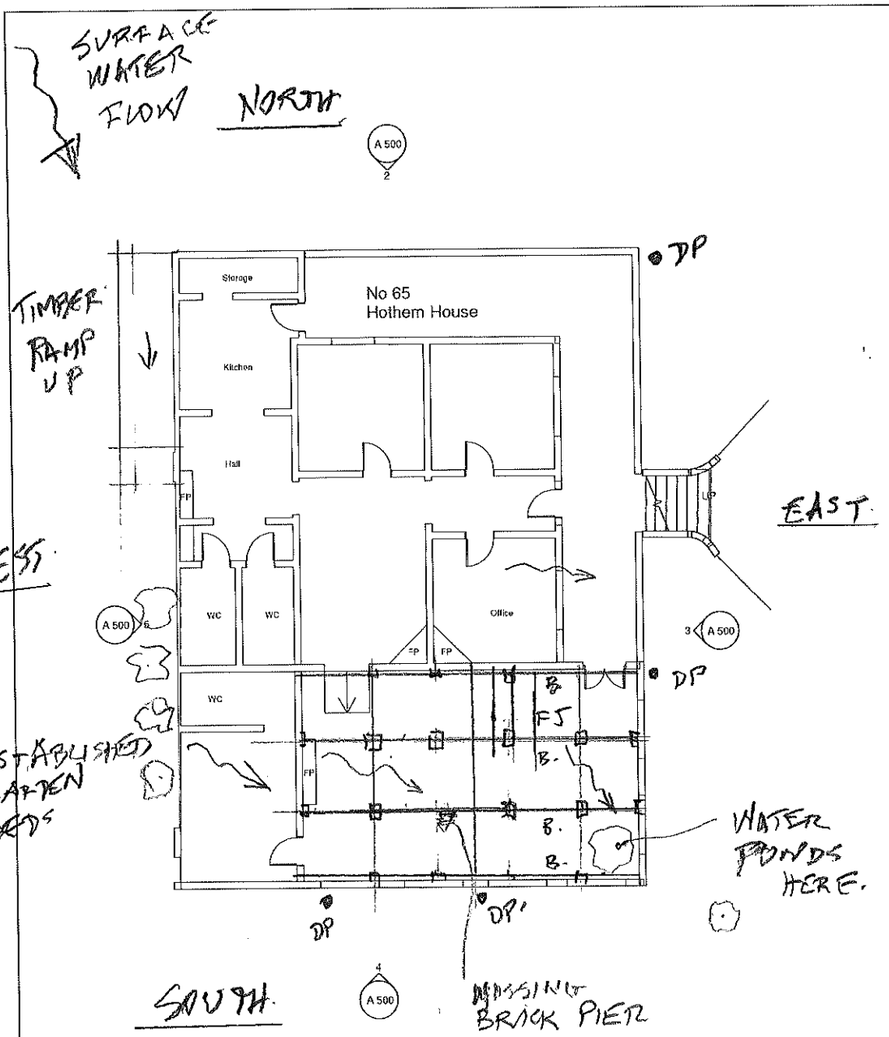
369-381 President Ave, 61-65 Hotham Rd, 2-4 Bidurgal Ave Kirrawee NSW

N

NORTH POINT

Hotham House

Project number	MacHealth-06	A 500	
Date	13/05/2019		
Drawn by	NG	Scale @ A1	Plot stamp: 07/07/2019 15:15:09
Checked by	SP	1 : 100	Version: 1

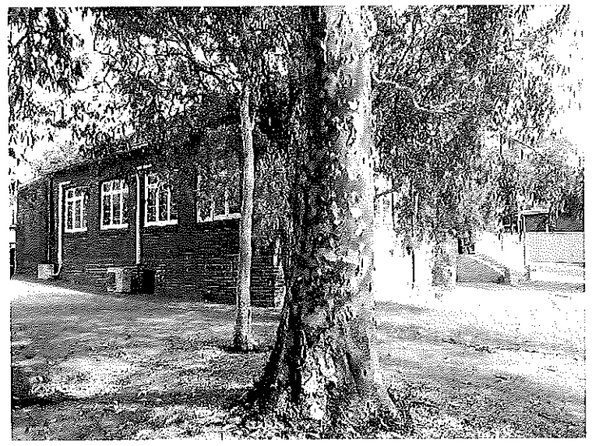


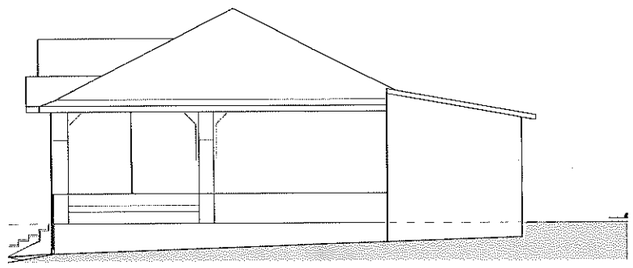
1 A 500 GF Plan - Hothem House
1 : 100

B FLOOR BEARER (125 x 50)

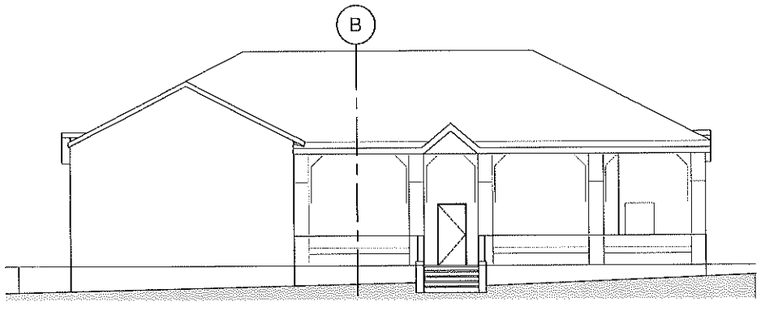
FJ FLOOR JOIST (50x 40 @ 600 CTS)

TIMBER FLOOR PLAN

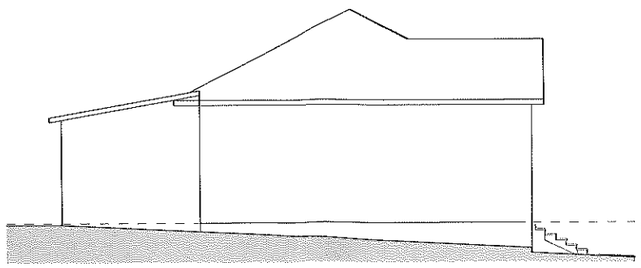




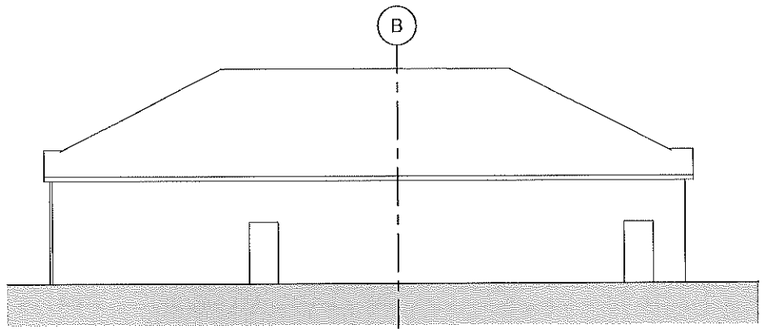
2 A 500 Hotham House - North Elevation
1 : 100



3 A 500 Hotham House - East Elevation
1 : 100



4 A 500 Hotham House - South Elevation
1 : 100



5 A 500 Hotham House - West Elevation
1 : 100

Consultant Team:

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Mechanical Services Engineer:	Erbas and Associates	- Ph. 02 9437 1022
Structural Engineer:		
Landscape Architect:	Dunlop Thorpe & Co.	- Ph. 02 9283 6677
Surveyor:		

Amendment Issue:

No.	Description	Date

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