BEFORE INDEPENDENT HEARING COMMISSIONERS IN CHRISTCHURCH

TE MAHERE Ā-ROHE I TŪTOHUA MŌ TE TĀONE O ŌTAUTAHI

IN THE MATTER of the Resource Management Act 1991

AND

IN THE MATTER of the hearing of submissions on Plan Change 14 (Housing and Business Choice) to the Christchurch District Plan

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STATEMENT OF PRIMARY EVIDENCE OF STEPHEN JAMES HOGG ON BEHALF OF CHRISTCHURCH CITY COUNCIL

HERITAGE ENGINEERING

CITY-WIDE QUALIFYING MATTERS: HISTORIC HERITAGE

Dated: 11 August 2023

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EXECUTIVE SUMMARY

1. My full name is **Stephen James Hogg**. I am employed as Technical Director, Buildings at Aurecon's Christchurch office.

2. I have prepared this statement of evidence on behalf of the Christchurch City Council (the **Council**) in respect of matters arising from submissions on Plan Change 14 to the Christchurch District Plan (the **District Plan**; **PC14**).

3. My evidence addresses structural engineering matters raised in the following submissions, which seek changes to the Schedule of Significant Historic Heritage Places (**Schedule**):

   (a) Submission #1092 – Harley Chambers (137 Cambridge Terrace, Heritage Item 72, Heritage Setting 309);

   (b) Submission #874 – Daresbury Homestead (9 Daresbury Lane, Heritage Item 602, Heritage Setting 185); and

   (c) Submission #1037 – Antonio Hall (Former Holy Name Seminary incorporating the former Dwelling Baron's Court/Kilmead, Motor House and setting; 265 Riccarton Road, Heritage Item 463, Heritage Setting 203).

4. Having performed site inspections and reviewed the relevant documentation available for these two sites, I have concluded the following:

   (a) Submission #1092: In my opinion, it is feasible, from an engineering perspective, to repair or strengthen the building of Harley Chambers; or to retain the façade as part of a new build development. Make safe temporary works are also required to eliminate life safety hazards.

   (b) Submission #874: In my opinion, it is feasible, from an engineering perspective, to repair or strengthen the building of Daresbury Homestead. The building is dangerous, not inhabitable and requires a level of strengthening equivalent to 67% NBS if the building is to be restored to a habitable condition. However, it is feasible to repair the building. The structural engineering required to reinstate Daresbury Homestead to a habitable state will result in the substantial loss of original exterior and interior heritage fabric, however, this can be salvaged in part and used to create a replica.

(c) Submission #1037: In my opinion, it is feasible, from an engineering perspective, to repair both buildings comprising Antonio Hall from fire damage. However, additional works would be required to strengthen the building to 67% NBS.

5. I have not provided opinions on the cost of reinstatement of the buildings or the economic feasibility of reinstatement as this will be addressed through the quantity surveying evidence of **Mr Gavin Stanley.**

INTRODUCTION

6. My full name is **Stephen James Hogg**.

7. I am currently employed by Aurecon, a national engineering consultancy. My job title is Technical Director, Buildings. At Aurecon I have primary responsibility as a design director for new building design and for structural assessment of existing buildings. I am part of a team of five technical directors supervising thirty-five engineering staff.

8. The Council has requested that I provide structural engineering technical evidence on the submissions seeking that the Harley Chambers and Daresbury Homestead buildings be removed from the Schedule.

9. To prepare this evidence, I have reviewed relevant existing reports, considered potential alternative methodologies where appropriate and attended a site visit. My opinions have been informed from this information and my own experience.

10. In preparing this evidence for Harley Chambers I have:

(a) Completed an on site inspection of the Harley Chambers building on Tuesday 18 July 2023;

(b) Reviewed the submission #1092 by Cambridge 137 Limited;

(c) Reviewed the following reports:

(i) Quoin Structural Consultants, Letter, 12 July 2023 (**Appendix A**);

(ii) Quoin Structural Consultants, Structural Report to Accompany Assessment of Environmental Effects & Resource Consent Application, 13 December 2017;[1]

[1] Due to the length of this report it has not been appended but can be made available to the Panel on request.

(iii) Centraus Structural Consulting, Heritage Structural Restoration Feasibility Report, 14 July 2023 (**Appendix B**);

(iv) Structex Metro Ltd, Letter, 10 October 2013 (**Appendix C**);

(v) Endel Lust Civil Engineer Ltd, Engineering Report, March 2013 (**Appendix D**);

(vi) Smart Alliances Ltd, Harley Chambers Heritage Impact Assessment, November 2017;[2]

(vii) Rhodes & Associates Estimate Review Report, 17 July 2023;[3]

(viii) AECOM, Cost Estimate of Options, 22 September 2017;[4] and

(ix) A selection of original structural engineering drawings provided to me by Christchurch City Council (**Appendix E**).

11. In preparing this evidence for Daresbury Homestead I have:

(a) Completed an on site inspection of the Daresbury Homestead Building on Tuesday 18 July 2023;

(b) Reviewed the submission #874 by Daresbury Limited;

(c) Reviewed the following reports:

(i) Quoin Structural Consultants, Structural Assessment Report, 17 May 2019;[5]

(ii) Notes by Win Clark on site inspection dated 13 July 2012 (**Appendix F**);

(iii) Dave Pearson Architects, Heritage Assessment and Defects/Remedial Work Schedule, 19 June 2019 (**Appendix G**); and

(iv) Rhodes and Associates, Repair Quotation Review, 17 July 2023 (**Appendix H**).

[2] Due to the length of this report it has not been appended but can be made available to the Panel on request.
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QUALIFICATIONS AND EXPERIENCE

12. I hold the qualification of Bachelor of Engineering from the University of Canterbury and I am a Chartered Engineer and member of Engineering New Zealand as well as being an International Professional Engineer.

13. I started my career in 1988 with Holmes Consulting in Wellington where I worked for 10 years as a consulting engineer. After that I was principal of my own engineering consultancy for nine years. I merged that consultancy with Aurecon (known then as Connell Wagner) in 2008. In all I have over 35 years' experience as a consulting engineer specialising in building structures.

14. I have worked and lived in Christchurch since 2011 relocating from my Wellington base to assist with, initially, engineering assessments of damaged buildings, and subsequently repair and rebuild work.

15. I am a member of the Structural Engineering Society New Zealand (Inc) (**SESOC**)

CODE OF CONDUCT

16. While this is a Council hearing, I have read the Code of Conduct for Expert Witnesses (contained in the 2023 Practice Note) and agree to comply with it. Except where I state I rely on the evidence of another person, I confirm that the issues addressed in this statement of evidence are within my area of expertise, and I have not omitted to consider material facts known to me that might alter or detract from my expressed opinions.

SCOPE OF EVIDENCE

17. My statement of evidence addresses the submissions seeking removal of the following Heritage Items from the Schedule:

    (a) Submission #1092 by Cambridge 137 Limited, which seeks to remove Harley Chambers;

    (b) Submission #874 by Daresbury Limited, which seeks to remove Daresbury Homestead; and

    (c) Submission #1037 by Mr Avi, which seeks to remove Antonio Hall.

18. My evidence addresses the structural engineering matters relevant to these submissions; that is, whether there are viable engineering options to repair the buildings to safe and useable condition.

SUBMISSION #1092 – HARLEY CHAMBERS

19. The submitter seeks removal of Harley Chambers Heritage Item (78) and the associated Heritage Setting (309) from the Schedule.

20. The structural engineering grounds the submitter has provided in support of the removal are:

    (a) The building has an assessed seismic strength of 15% NBS with critical structural weaknesses of unreinforced masonry walls and a severely damaged column at the north-eastern corner.

    (b) Engineering solutions are feasible but are extremely invasive on heritage fabric.

    (c) The building is an earthquake prone building with a deadline for completing seismic work of 14 June 2025.

    (d) Building is only of 'some' and limited significance due to considerable alterations undertaken since its construction, earthquake damage and subsequent squatter damage.

21. I attended a site visit to the Harley Chamber Building on Tuesday 18 July 2023 with Ms Amanda Ohs, Mr Gavin Stanley and Mr Dave Pearson and Mr Michael Doig. The building was subject to a visual inspection. No removal of linings or invasive investigation were conducted.

22. The following general description of the building is given in the documents I have reviewed, which is consistent with my observations from the site visit:

    (a) The building was constructed over a period between 1929 to 1932 in two stages with a north building section and a south building section. The join between the building sections occurs at the doors and lobby to Cambridge Terrace.

    (b) The suspended floors are reinforced concrete 'waffle' type floor slabs at the first and second floors and at roof level.

    (c) The concrete floors are supported by reinforced concrete perimeter beams and columns at the exterior walls and some steel beams and steel columns to the interior.

(d) The exterior heritage façade wall elevations along Cambridge Terrace and Worcester Boulevard comprise of concrete beams and columns with decorative plaster finishes and a substantial portion of windows.

(e) There are unreinforced masonry interior and exterior walls.

(f) There is obvious cracking damage to the structure caused by foundation settlement and earthquake shaking.

23. I understand the building is recognised as being earthquake prone with deadline for completing seismic work of 14 June 2025.

24. I consider design documentation can be completed for strengthening or new build construction with a retained façade prior to 14 June 2025. I cannot confirm if construction can also be completed within this timeframe. An experienced contractor could provide a construction programme to support opinions on construction timeframe.

25. In the Quoin Structural Consultants 13 December 2017 Report, they describe:

(a) the building structure;

(b) investigations completed;

(c) structural damage caused by the Canterbury earthquake sequence;

(d) assessment of post-earthquake strength;

(e) critical structural weaknesses;

(f) expected geotechnical conditions likely to be encountered for repair and strengthening options; and

(g) a structural engineering concept design for repair and strengthening to 34% NBS, 67% NBS and 100% NBS and for façade retention as part of a new build.

26. My comments below relate to the Quoin Structural Consultants 13 December 2017 Report:

(a) I consider the post-earthquake seismic strength of 15% NBS as assessed by Quoin Structural Consultants is likely to be dependable. I have not completed any analysis but have formed this opinion based

on my site inspection, the age and construction type of the building and my own experience. I see no reason to doubt its reliability.

(b) In my opinion the engineering concept designs prepared by Quoin Structural Consultants for repair and strengthening to 34% NBS, 67% NBS and 100% NBS and for façade retention as part of a new build development are all realistic and feasible. I cannot identify any structural engineering reason repair and strengthening of the options presented by Quoin Structural Consultants cannot be achieved.

(c) I consider 67% NBS to be a reasonable target level of strengthening if the building were to be repaired and strengthened for commercial office or retail use.

(d) The repair and strengthening will be invasive to the interior of the building. Existing heritage fabric such timber floors, door frames and trims and window frames can be salvaged and refurbished. The building will need to be stripped back to bare structure to enable concrete repair and strengthening. All walls will need all linings and timber trim/window frames removed. All ceilings will need to removed. The timber ground floor will need to be removed. The basement slab will also need to be removed and it is possible that the basement will need to be rebuilt or infilled. The extent of strip out and rebuilding would also remove all contamination and damage caused by squatters.

(e) Following completion of repairs and strengthening salvaged heritage fabric can be reinstated.

(f) The heritage façade on Cambridge Terrace and Worcester Boulevard will need to be stripped back to bare substrate, concrete repairs will need to be completed and the façade will need to be repainted/coated. This approach will restore heritage features to the façade.

(g) With reference to the geotechnical conditions needing to be addressed in any repair, strengthening or new build option, I was the Aurecon structural design director responsible for the design and construction of the adjacent new building at 141 Cambridge Terrace. I have knowledge of the geotechnical investigation conducted on that site. It is reasonable to assume the ground conditions encountered will be similar. I can confirm the geotechnical conditions assumed by Quoin Structural Consultants are consistent with the conditions encountered at 141

Cambridge Terrace. Based on my experience I consider any repair and strengthening option considered will require founding of the structure onto the gravel stratum approximately 3.0m below the surface. This will require complete removal of the ground floor to allow installation of piles. Less intrusive methods using cement grout soil mixing to transfer foundation loads to the lower gravel stratum could also be used. I have used this method with my involvement as the structural design director for the relevelling of the Christchurch Art Gallery, St Pauls' Church, Tai Tapu and St Aidan's Church, Bryndwr.

(h) The severe damage reported to the northeast corner column can be made safe by installing temporary props. This will remove this identified critical structural weakness. Temporary propping will not limit the ability to repair this part of the building.

(i) Unreinforced brick parapets can be secured to remove this critical structural weakness.

(j) Unreinforced brickwork in the lift shaft above level two can be secured with temporary face load members to remove this critical structural weakness.

(k) Interior and exterior unreinforced masonry walls can be temporarily secured for face load actions to remove this critical structural weakness.

(l) If the critical structural weaknesses are removed as described above, I consider the building will be in a suitable condition for repairs and strengthening to be conducted by a suitably experienced contractor.

27. In the Quoin Structural Consultants letter dated 12 July 2023 (**Appendix A**), they describe the current day condition of the building compared to the 2016 observations. I make the following comments on that letter:

(a) The report notes safety concerns about the visible cracks in the northeast corner column and potential for instability in a moderate earthquake. This safety concern could be removed by sufficient temporary propping to eliminate the risk of column instability. Quoin Structural Consultants agree there is no concern of overall building instability. I am unsure why make safe temporary propping has not been installed to date.

(b) Concerns about the proximity of the barricade fence being too close to the building. This is not a structural engineering concern but a safety matter for the public walking past the building to eliminate the possible risk posed by small pieces of spalling concrete.

(c) Extent of cracking over the front entry apron canopy appears worse now than in 2016 and potential causes are identified. This issue can be addressed by investigation and further temporary make safe works if required.

(d) Possible ongoing settlement of the northeast corner indicated by observed widening of cracks below the window since 2016. The suggested make safe temporary propping to the northeast corner will eliminate any safety risk caused by ongoing settlement prior to possible repair and strengthening being undertaken.

(e) The fire that occurred in the southwest corner at ground level may have caused damage to the concrete and reinforcement at the soffit face of the waffle slab floor. There has been no investigation to confirm if damage has occurred. Propping the floor will eliminate any perceived risk of reduced floor capacity. Carbon fibre laminate strengthening solutions can be developed to reinstate full floor capacity without the need to demolish this portion of the floor.

28. The Quoin Letter of 13 December 2017 recommends that the building should be deconstructed for the reasons set out below in italics. I have commented on these reasons below.

(a) *"The north-east corner could partially collapse, in its current condition under a moderate* earthquake *shaking."* I disagree with this statement as temporary make safe propping should be installed to eliminate risk of partial collapse. There is no risk of overall building collapse.

(b) *"The concrete canopy apron directly adjacent to the east side footpath is significantly* cracked *and could partially collapse under moderate earthquake shaking."* I disagree with this statement as no investigation has been undertaken to confirm its stability and, in any case, make safe temporary propping can be installed to eliminate this risk.

(c) *"The building in the long term is unlikely to be repaired because it is not economic to do so. Hence it will continue to degrade."* I agree the building will continue to degrade if no action is taken to repair. I have

not considered the economics of repair and strengthening as this is addressed by the quantity surveying evidence of **Mr Gavin Stanley**.

(d) *"It was evident during our inspection that the building was being occupied by unauthorised people. This is a great concern given the structural condition of the building, and that the internal environment is a health* hazard*."* I agree with this statement and note that it is not easy to make the derelict building secure from unauthorised use because boarded up windows within the lightwell are away from public view and could therefore be easily removed, allowing access.

(e) *"The poor condition of the brick parapets to the rear sides of the building* mean *that there is a safety risk to the fire egress path of the adjacent building when this adjacent building on Worcester Boulevard is occupied. There is further risk to damage to this private property that has not been purchase by Cambridge 137 Limited."* I consider the parapets can be protected against the risk of collapse in a moderate earthquake by installing temporary support structures to eliminate this hazard.

(f) In my opinion there is no immediate structural engineering reason for the building to be deconstructed. Make safe temporary works are required to eliminate life safety hazards identified by Quoin Structural Consultants, which would enable strip out, repairs and strengthening to proceed.

29. The Centraus Structural Consulting Heritage Structural Restoration Feasibility Report dated 14 July 2023 (**Appendix B**) addresses the structural condition of the existing heritage building. Statements from Section 3.1 of the Report are set out in italics below, along with my comments. I have responded to other sections in my evidence above.

(a) *"Due to the current state of the original building, it is evident that the entirety of the* original *building will need to be deconstructed to provide for the safety of the building site."* I disagree with this statement because the building is not at risk of total collapse as acknowledged by Quoin Structural Consultants. Make safe temporary propping where necessary can be installed to remove seismic risk.

(b) *"The concrete floors and columns have extensive damage and expressed deterioration due to water infiltration and corrosion. This*

corrosion and damage *have caused a severe deterioration of the overall capacity of the structural elements*." I disagree in part because there has been no identified corrosion of reinforcement within the building. Quoin Structural Consultants and Centraus Structural Consultants have speculated water ingress may be degrading reinforcing typically at crack locations. In any case if reinforcement was degrading it is repairable and not a critical structural weakness the effects the feasibility to repair the building.

(c) *"The concrete floors appear that they are required to be removed and replaced to ensure proper capacity. The new floors also support the internal and external columns and walls and need to be present to maintain* structural *integrity."* I disagree because there is no evidence in Quoin Structural Consultants reporting to suggest the floors (except for the limited area of fire damaged floor which does not need removal as I have noted above) are damaged or need to be removed.

(d) *"The existing damage to the northern column provides for a potential collapse hazard in a future event. As the damage is extensive the column would require to be rebuilt and will have to be removed. The stability of* the *building is therefore compromised by the column issues."* I disagree because I support Quoin Structural Consultants opinion and consider the building is not at risk of total collapse. The northeast column is damaged and requires temporary propping to eliminate the risk to life safety. After temporary propping, the column can be repaired.

(e) *"The stability of the parapets and supporting elements are also of suspected structural stability and will need to be removed and replaced."* I disagree because I support Quoin's opinion that the parapets that face onto Cambridge Terrace and Worcester Boulevard comprise of reinforced concrete. It is my opinion that they are safe. Other unreinforced masonry parapet infills can be temporarily secured and made safe to resist seismic loads.

(f) *"It is noted during our inspection there is extensive damage and deterioration damage due to the earthquake forces and continued weathering. It is therefore expected that there will be extensive replacement required. Based upon our review and the proximity to the original building construction the safety of any works within the*

structure is suspect and unclear if even possible. As there are several areas which are extensively deteriorated, and no finishes remain intact it is highly likely that a remote deconstruction would be the only safe method available to work near the building." I disagree because I support Quoin's opinion that the building is not at risk of total collapse and as such the building does not require demolition from a structural engineering perspective. If make safe temporary works were installed the overall building could be stripped out and decontaminated. This would allow for a safe working environment for construction workers to repair and strengthen the building.

30. In my opinion there is no immediate structural engineering reason for the building to be deconstructed. Make safe temporary works are required to eliminate the life safety hazards identified by Quoin Structural Consultants and Centraus Structural Consulting, which will enable strip out, repairs and strengthening to proceed.

31. In summary, it is my opinion that it is not unreasonable or inappropriate, from an engineering perspective, to include the building in the Schedule because it is feasible, from an engineering perspective, to repair and strengthen the building or to retain the façade as part of a new build development. Make safe temporary works are, however, required to eliminate life safety hazards.

SUBMISSION #874 – DARESBURY HOMESTEAD

32. Daresbury Limited (submitter #874) seeks removal of the Daresbury Homestead Heritage Item (185) and associated Heritage Setting (602) from the Schedule.

33. The structural engineering grounds the submitter has provided in support of this removal are:

    (a) Daresbury Homestead has been heavily damaged by the Canterbury earthquakes and has sat in limbo since 2011.

    (b) The extent of restoration works could result in the loss of significant heritage fabric so that it would be a replica and not authentic restoration.

    (c) Extensive repair work is required to make the building structurally sound and requires deconstruction of the remaining heritage fabric.

(d) The building is dangerous, not inhabitable, well below building code standards.

(e) Much of the building's heritage features are already lost.

(f) Repairing and bringing up to code requirements will result in further loss of heritage fabric due to the scale and extent of structural engineering work needed.

34. I attended a site visit to the Daresbury Homestead on Friday 21 July 2023 with Ms Amanda Ohs, Mr Gavin Stanley and Mr James Milne. The building was subject to a visual inspection. No removal of linings or invasive investigation were conducted.

35. The following general description of the building is given in the documents I have reviewed, which is consistent with my observations from the site visit:

(a) The homestead is a three-storey house with forty rooms and was constructed between 1897 and 1901.

(b) The lower storey walls are double and/or triple brick exterior load bearing walls 200mm to 360mm thick to the ground floor, with perimeter unreinforced concrete footings. Walls are typically strapped on the inside face with 75mm thick timber framing.

(c) The floors are timber-framed, as are the internal partitions with internal linings of lath & plaster. The internal ground floor framing is supported on intermediate piles. Small areas of the ground floor have been replied or underpinned.

(d) The first-floor perimeter walls of the main building are timber post & beam with infill brickwork that has a white pebbledash plaster finish on the outside between the posts which are painted black.

(e) The roof is clay tiled supported on timber framing.

36. The Quoin Structural Consultants Structural Assessment Report dated 17 May 2019 describes:

(a) the building structure;

(b) geotechnical conditions;

(c) structural damage caused by the Canterbury earthquake sequence;

(d) assessment of pre-earthquake strength; and

(e) structural engineering concept design for repair and strengthening to 67% NBS.

37. I set out below specific observations from this Report in italics, with my comments alongside:

(a) *"The exterior brick walls are extensively cracked to all sides of the house. This includes various vertical, horizontal, and diagonal cracks in the mortar* courses *and many of the cracks pass through individual bricks. The cracks are likely to extend through the full thickness of the double/triple brick in many locations*." Based on my observations during the site visit I agree that the exterior brick walls are extensively damaged on all sides of the house. It is not possible to repair the cracking and structural integrity of the damaged walls whilst they remain in place. If the walls are removed, then some bricks can be salvaged, and a brick veneer can be installed over new timber framed walls as shown in the Quoin Concept Strengthening Details on Sketch SKR9.

(b) *"Various* sections *of the exterior brick walls have laterally displaced approximately 10-20mm in the plane of the wall and some sections 10-20mm out of plane. These failed walls are in a dangerous condition that could result in partial collapse of sections of the building under a moderate to large earthquake."* Based on my observations I agree the bricks have displaced and the house is in a dangerous condition when subjected to seismic loads. It is not possible to repair the misalignment and severe cracking in the damaged brick walls whilst they remain in place.

(c) *"The foundations have differentially settled in some areas of the residence."* I did not undertake any survey of floor levels. However, I agree based on my observations that some cracking patterns in exterior walls are evidence of foundations settlement.

(d) *"All the brick chimneys partially collapsed and were removed down to roof level* following *the main earthquake*." I can confirm there are no brick chimneys standing.

(e) *"There are a large number of cracks in the walls and ceilings to the interior of the residence at all the floor levels. Most of the cracks have*

penetrated the GIB *board, lath, and plaster, where visible, especially at the first-floor level."* This is consistent with my site observations.

(f) *"The exterior cladding above the first-floor level that comprises of pebble dash* decorative *plaster over brick infill has suffered some significant and widespread damage. The damage noted above has compromised the weather-tightness of the cladding system, plus the brick infill has loosened between the timber stud/ transom framing."* This is consistent with my site observations and is a weather tightness issue. Any reinstatement will require removal of the damaged areas and likely reinstatement with a code compliant cladding system to match the existing appearance.

(g) *"Damage to roof tiles due to the collapse (full or partial) of the chimneys and slippage movement of the roof tiles."* This is consistent with my site observations and is a weather tightness issue. I consider all roof tiles will need to be removed, timber framing supporting members checked, repaired, replaced, and realigned and salvaged tiles reinstated, or replacement tiles installed.

(h) *"Other damage to elements and finishes includes, but not limited to: Bent and cracked lead framed windows, Cracks and movement gaps to internal fireplace surrounds, Ceiling damage due to post-earthquake water damage and broken windows to middle stairwell, Movement gaps to fixed joinery."* This is consistent with my site observations. I consider all internal wall linings and ceiling linings will need to be removed to allow replacement of structural wall bracing systems. This will also enable full inspection of the structural substrate and removal of water damaged damp linings.

(i) *"Quoin recommends that the damaged ground level exterior brick walls be removed and replaced with timber framed walls with an exterior* brick *veneer to reinstate the architectural aesthetic. The extent of these walls includes all the brick walls to the two and three storey sections of the residence and to the large height Dining Hall."* I agree with this approach because of the severity of cracking; where there are large crack widths within a cross matrix of brick bonds it is not possible to reliably reinstate the structural integrity of the cracked brickwork by epoxy injection. In addition, the severely cracked and displaced

sections of brickwork cannot be realigned and reinstated without removal and replacement. Further comments on this aspect are:

(i) For areas of damaged brick walls that are not displaced out of alignment a feasible alternative repair option can be achieved by leaving the exterior walls "as is"; removing all internal linings; and applying a shotcrete spray of a 100mm layer of reinforced concrete over the interior face of all exterior brick walls. New foundations would need to be incorporated with the shotcrete walls. This system has been used by Aurecon to reinstate parts of St Faith Church in New Brighton. I have also observed this approach being taken at the earthquake damaged Geleta factory in Woolston, which was constructed from unreinforced brick. Noting that foundation settlement will remain, and the cracked exterior brick walls are assumed as formwork only. The cracks would then undergo selective brick replacement and repointing to mask damage. Based on my experience of similar projects, I consider this approach is likely to be equivalent cost to wall replacement, with the benefit of retaining the exterior brick heritage fabric.

(ii) Strengthening with composite fibre overlay on the interior face is also a possibility to strengthen brickwork but I have no experience in using this system on solid brick bracing walls. I cannot add further opinion on the feasibility of this system serving as a seismic bracing function.

(j) "Quoin recommends removing and replacing the existing unreinforced foundations beneath the exterior ground floor walls that are to be reconstructed." I agree with this recommendation. If a shotcrete wall option is considered, then new strip foundations would be located under all shotcrete walls and not under the external brick portions because they would remain "as is where is" and be attached to the shotcrete walls.

(k) *"Quoin recommends that the existing unreinforced chimney pads be removed and replaced with reinforced foundation pads that are sized to support the new steel trussed frames for the reconstructed chimneys.* The *steel frames form part* of *the lateral resisting systems for the building, together* with *the sheet braced walls and steel portal frames*

and require enlarged pads at some locations." I agree, noting that the reinstatement of the chimneys will need to be a lighter weight replica of the original.

(l) Quoin have assessed that supplementary steel frames are required for the building to achieve an assessed earthquake strength of 67% NBS or more. I have not completed any analysis or calculations to validate the strengthening scheme Quoin have proposed, however, based on my knowledge and experience I agree with the general scope and methodology proposed to achieve 67% NBS.

38. In Mr Clark's notes following on site inspection dated 13 July 2012 (**Appendix F**) Mr Clark describes:

(a) the earthquake related damage; and

(b) repair and retrofit options.

39. My comments below relate to Mr Clark's notes, with Mr Clark's comments shown in italics:

(a) The damage described by Mr Clark is consistent with that described in the Quoin Structural Consultants Report, which I have addressed above.

(b) *"Win Clark notes damage due to the Darfield (Canterbury) earthquake sequence that started on 4th September 2010 has caused extensive damage throughout the dwelling. However, apart from the Northwest area of the main building, the damage is generally secondary in nature and can be relatively readily repaired. In my opinion, the main structure is sound and is not in a state of near collapse."* I disagree that the damage is secondary in nature. I disagree that the main structure is sound. I consider the structure is susceptible to partial collapse in a moderate or larger earthquake in some locations where walls are severely damaged. Quoin Structural Consultants have identified areas in a dangerous condition as: (i) west wall to dining hall; (ii) west wall and west ends of the south and north walls to the lounge; (iii) north wall at north-west corner of family room. I agree with these areas are in a dangerous condition. The duration of any future earthquake shaking will have a significant effect on the stability of the building in these locations.

40. The repair and retrofit options itemised by Mr Clark are as follows:

(a) *"West Side, North Section: Prop the first floor to allow demolition of the brickwork to the ground floor. Provide new foundations and reconstruct brick masonry back up to first floor level. Apply composite fabric to the inner face of the brickwork to enhance its load carrying capacity* and *upgrade the fixings to the main structure. Re-level floors and fix perimeter to walls. Repair brickwork and plaster finish to first floor area around the South side*." I agree that the building can be propped then damaged sections of brick can be removed and replaced. However, I disagree that replacement is limited to the replacement of the West Side, North Section. The exterior brick walls around the house are damaged on all faces. All damaged brick walls will require all sections of damaged brickwork to be repaired. This scope of work is covered in the Quoin Structural Consultants' scope of repair.

(b) *"Reconstruct chimneys with appropriate strengthening (internal galvanized steel tube grouted in place) and tying into the roof and first floor* framing*. Provide and fix stainless steel reinforcing into every third horizontal mortar joints of the chimneystack*." I disagree because I consider the chimney stacks should be replaced with a lightweight replica to provide a more robust repair and reduce localised seismic demands onto the bracing structure in future earthquakes.

(c) *"Provide* additional *tying of the roof and floor framing into the supporting wall framing*." I agree with this recommendation.

(d) *"*Determine *what additions internal bracing is required to selected walls throughout the building to provide an acceptable earthquake resistance for the building. Strip the lath & plaster off these walls and reline with sheet bracing material properly nailed. Provide, fit, and fix additional 'hold-downs' at each end of the bracing walls, for the full height of the building down into new anchor piles*." I agree and I consider the Quoin scope of work addresses this.

(e) *"Enhance the diaphragm capacity of the timber-framed floors and roof structure where required. This may consist of plywood overlay connected into the perimeter and internal walls*." I agree with this recommendation and expect this would be required to reach 67% NBS, however, the floor diaphragm enhancement is not included in the Quoin

Structural Consultants concept design for 67% NBS. This is additional scope that would need to be included.

(f) *"Repair and relay roof tiles."* I agree with this recommendation and in addition, note that it is likely that roof framing will require realignment and repair.

(g) *"*Repair *and make good the exterior cladding and decorative elements."* I agree with this recommendation.

(h) *"*Repair *and make good the interior finishes and decorative elements."* I agree with this recommendation.

41. In conclusion, it is my opinion that it is not unreasonable or inappropriate, from an engineering perspective, to include the building in the Schedule because, from an engineering perspective, it is feasible to repair and strengthen the building.

42. In my opinion the building is dangerous, not inhabitable and requires a level of strengthening equivalent to 67% NBS if it is to be restored to a habitable condition.

43. The structural engineering required to reinstate Daresbury Homestead free of damage and to a habitable state will result in the substantial loss of original exterior and interior heritage fabric. However, this can in part can be salvaged and used to create a replica. I expect the loss of existing heritage fabric if the building was to be reinstated according to Quoin Structural Consultants' 67% NBS concept to be as follows:

(a) All exterior brick walls that are damaged to be removed and replaced with new timber framing and replica brick veneer from salvaged bricks. This will cause the consequential loss of all associated wall linings, ceilings, and foundations. I assume the windows and frames can be refurbished and re-used.

(b) Where exterior brick walls are retained, all internal linings to be removed and replaced with new studs, structural linings and brick walls' helifix tied to the studs.

(c) Walls that are timber post & beam with infill brickwork and a white pebbledash plaster finish plaster that are significantly damaged (as a minimum) to be entirely removed and replaced with a compliant

weather tight cladding system that repairs the wall bracing strength to a minimum of 67% NBS. The wall finishes can be reinstated as a replica. It is likely that when a detailed design for strengthening is documented the remaining infill brick walls will need to be removed and replaced with a replica to achieve the required face load and lateral bracing capacity.

(d) Retention of heritage wall panelling and ceiling panelling – I consider all heritage wall and ceiling panelling including fireplaces and surrounds will need to be removed and salvaged for later reinstatement. This will be necessary to cast new foundations for interior and exterior bracing and load bearing walls and to install bracing walls behind wall panelling. Ceiling panelling will need to be removed to allow wall linings to connect into new floor diaphragms.

(e) Brick chimneys to be replaced with replica chimneys using salvaged brick veneer.

(f) Removal of ground floor timber framing and flooring to allow access to cast new foundations and re level.

(g) New ply overlay to upper two levels to improve floor diaphragm and connection to bracing walls.

(h) Removal and replacement of all ceilings where water or earthquake damaged, or for strengthening work. I expect this to result in most of the lath/gib ceilings needing replacement.

44. The impact on the heritage fabric caused by the scope of the above repair and strengthening works will be addressed by the evidence of **Mr William Fulton**.

SUBMISSION #1037 – ANTONIO HALL

45. I have not visited the site but have read the following reports:

(a) Lewis and Barrow Ltd, Strengthening Options for Buildings at 265 Riccarton Road, Christchurch, 26 January 2013 (**Appendix I**); and

(b) Miyamoto Engineers, Letter – 65 Riccarton Road – Antonio Hall building – Post-fire structural inspection, 22 December 2021 (**Appendix J**).

46. I discussed the engineering factors associated with the documented fire damage to the chapel and accommodation wing with Ms Amanda Ohs on 28 July 2023. I advised that based on my experience and with reference to the photographs of the fire damaged buildings and the reports available, it would be physically possible to engineer a repair solution for both buildings. This would involve the removal of damaged fabric (eg burnt areas of the roof of the chapel and accommodation wing) and its replacement 'like for like' along with replacement of lost elements such as the end wall of the chapel.

47. The Lewis and Barrow Engineers Report dated 26 January 2013 (**Appendix H**) identifies that the original undamaged seismic capacities for the chapel was 8.5% NBS and the accommodation wing was 18% NBS.

48. The fire damage repairs I have suggested would improve the seismic strength of the repaired buildings. However, additional works would be required to strengthen the building to a minimum of 67% NBS.

11 August 2023

Stephen James Hogg

APPENDIX A - QUOIN STRUCTURAL CONSULTANTS, LETTER, 12 JULY 2023

Quoin Structural Consultants
Level 2, 138 Victoria Street
Christchurch 8013
PO Box 25 438
Christchurch 8144
03 968 4925
quoin.co.nz

12 July 2023

Michael Doig
Citadel Property Limited
on behalf of Cambridge 137 Limited
Level 1
236 High Street
Christchurch 8011

By Email: michael@citadel.nz

Dear Michael

Harley Chambers, Cambridge Terrace, Christchurch

As requested, Quoin Structural Consultants (Quoin) inspected the Harley Chambers Building on 13 June 2023 to assess its current condition and provide comment on the public safety of the Building. The inspection was completed by Brett Gilmore (CPEng).

The most recent previous inspection of the building completed by Quoin (Brett Gilmore) was on 13 December 2016. This inspection and review was summarised in the Quoin letter dated 21 December 2016.

This letter provides an update to the 2016 Letter (included here in black text), with new observations and comments include in 'green' text. Where possible, Quoin has compared recent photos with photos taken in 2016.

We confirm that Brett Gilmore, Chartered Engineer from Quoin Structural Consultants (Quoin), inspected the property known as Harley Chambers on 13 December 2016, and makes the following observations and comments.

1. The building has suffered some additional damage since my last inspection of the building on 13 December 2016. It is apparent that the building is degrading further over time.

2. The additional damage we observed includes but is not limited to the following:

   (a) Significant extension and widening of horizontal crack near the base of the north-east column, directly adjacent to the footpath. We know that this column had previously settled and had a crack, but the crack is much wider now and extends all of the way through the column.

   Crack appears to be similar to previous 2016 inspection. Quoin notes that the reinforcing of the column section includes widely spaced stirrup reinforcing.

Such horizontal cracks when located between stirrups, which is likely, are considered dangerous and could result in a more sudden-type failure of the column under moderate lateral earthquake loading.

If a moderate-large earthquake were to occur in Christchurch (estimate magnitude 6.0 or greater) then this column could fail and cause partial collapse of this corner of the building.

The building itself will not fall over as a whole, but debris could fall out onto the footpath. The suspended floors are well reinforced and perimeter beams tie into the column at each floor level, but the uncertain nature of earthquakes means that we have to expect that some significant damage could occur.

At the very least, this column and corner needs to be propped and braced.

Further to our discussion on 18 December 2016, Quoin recommends installation of a barricade on the footpath at least 1m from building and extend it 5m away from the corner. This might link up with barricade at the entry. See (b) below.

A barricade fence was installed adjacent to this section and is currently in place. However, it is noted that the barricade is located hard up against the building and does not have the suggested 1m minimum gap (see photo below).

It appears that it is not possible to ensure that the barricade is maintained at the recommended safe distance from the building.

(b) The joint between the north and south sections of the building appears to have widened by approximately 5mm.

At the top of the joint at parapet level, facing Cambridge Terrace, it appears that there could be some loose concrete. It is difficult to tell without being able to get closer to inspect. This section was cleaned out after a previous earthquake, but given its location and proximity to the footpath then this should be checked again.

We also observed widening of cracks in the front concrete canopy apron over the entry off Cambridge Terrace, which is adjacent to the gap noted above. We do not know exactly how this is constructed so we have to proceed with

caution. The extent of cracking to this section appears to be significantly worse than when inspected in December 2016, which has possibly been caused by ingress of water and the effects of thermal variations over time on the previous cracks. The cracks occur at the mitred corners, so the apron slab may be susceptible to severe damage and possible collapse in a moderate earthquake, depending on the condition of the reinforcing.

Quoin recommends providing temporary fences/barricade approximately 1m away from building to provide safety from any falling debris. The apron is not too high above footpath so 1m should be adequate. Further investigation can be undertaken in due course if required.

A barricade fence was installed adjacent to this section and is currently in place. However, it is noted that the barricade is located hard up against the building and does not have the suggested 1m minimum gap (see photo below). It appears that it is not possible to ensure that the barricade is maintained at the recommended safe distance from the building, likely because the location of such barricade impacts greatly on the width of the public footpath.

This means that if any part of the canopy apron were to spall, or collapse under a moderate earthquake, then the barricade may not prevent serious injury to the passing public.

Quoin recommends immediate reinstatement of the barricade fence at 1m distance from the front face, or demolition of the apron canopy, or installation of temporary propping beneath the canopy.

(c) The cracks at the base of the parapet are more visible than they used to be. The parapets that face onto Cambridge Terrace and Worcester Boulevard comprise of reinforced concrete. It is our opinion that they are safe.

(d) There appears to be a number of new cracks in the front facade to Cambridge Terrace and Worcester Boulevard (plaster over concrete structure), or maybe older cracks that have widened and/or extended. Since our last inspection, these are worsening such that ongoing degradation from wind and rain could cause spalling of the plaster/concrete. We note that this is directly adjacent to the footpath and worst along Cambridge Terrace.

The very wide cracks in the east facade beneath the northern-most lowest window, adjacent to the north-east column noted in (a) above, appear to have

widened slightly since 2016. This suggests possible ongoing settlement of the corner column. It is noted that the basement at this same corner of the building remains full of water.

With the basement being full of stagnant water for long periods of time, and having been through numerous attempts to dewater, plus the settlement that has occurred and that appears to be ongoing, there is likely to be added degradation to the structure that includes but may not be limited to:

i. More extensive contamination of the concrete to the basement walls and base slab.

ii. Added degradation of the reinforcing, typically at the crack locations.

iii. Added stresses in the corner column and adjacent beams, over the height of the building, as caused by the settlement. Such cumulative added stresses reduce the residual strength of the affected column and adjacent beams.

A barricade may be required at some stage. As noted above, a barricade is in place, albeit hard up against the building and not 1m away from the building as is the suggested minimum distance should small debris fall from the building.

Quoin recommends a closer inspection be completed to assess if any material is loose and this should include the close inspection noted in (b) above.

(e) A fire occurred in the south-west corner of the north section of the building at ground level.

The ceiling has been burnt out and it appears that the soffit of the concrete floor above was exposed to the fire.

Also, extensive spalling occurred to the plaster finishes of the internal breeze block wall.

This has likely resulted in a reduction in loadbearing capacity of the floor in this localised area.

(f) Temporary timber infill to a north side window appears to have fallen out towards the adjacent building at 141 Cambridge Terrace.

3. As you are aware, we have inspected the building numerous times, and Quoin have completed a detailed structural assessment of the building. The building was previously assessed to be:

- North section assessed as 15-40% x NBS in its damaged state and 25-55% x NBS in its undamaged state.
- South section assessed as 34% x NBS in its damaged state and 37% x NBS in its undamaged state. The building in its current condition has degraded further and will continue to go so.

It is noted that the building was originally constructed in two sections. The gap seen from the Cambridge Terrace is the joint between the two sections.

The building, as a whole, is Earthquake Prone.

From our inspection on 13 December 2016, the condition of the north-east corner column is very poor and this would reduce the assessed current condition of the north section to less than 15% x NBS.

4. We note that Quoin was involved in the scoping the repairs required to the building, and this included strengthening back to 34% x NBS. The cost estimates confirmed that it was not economic to repair the building, with the cost of repair being more than the cost of a rebuild.

5. When the adjacent new building was recently constructed, we had to get the north parapet and brick infill to the north wall removed to ensure safety on the adjacent site. These emergency works were approved by CERA under Section 38 of the Building Act and the works completed. At this time, Quoin (previously Structex Metro Ltd) recommended that the north section of the building be deconstructed due to the poor structural condition of the building and its very low assessed % x NBS. This recommendation preceded our knowledge of the cost of repairs.

The deconstruction did not proceed.

Quoin's opinion remains the same, that the north section of the building is not economic to repair, and when combined with the south section, the building as a whole is not economic to repair.

Quoin

6. It is Quoin's professional opinion that the building as a whole should be deconstructed. The main reasons include:

   (a) The north-east corner could partially collapse, in its current condition under moderate earthquake shaking.

   (b) The concrete canopy apron directly adjacent to the east side footpath is significantly cracked and could partially collapse under moderate earthquake shaking.

   (c) The building in the long term is unlikely to be repaired because it is not economic to do so. Hence it will continue to degrade.

   Several parties, including Quoin and other Professionals between 2011-2017, and other independent Professionals (not including Quoin) between 2017-2023, have looked at options to strengthen, repair, and refurbish the building. It appears that it is not economic to do so.

   (d) It was evident during our inspection that the building was being occupied by unauthorised people. This is a great concern given the structural condition of the building, and also that the internal environment is a health hazard.

   There are other risks in the building that include falling debris (ceilings, plaster, damaged breeze blocks, etc), plus brick parapets to the rear sides of the building, plus asbestos in some materials, plus the basement remains part filled with water.

   We note also that the previous owner's representative (Valour Properties) have been one of the most responsible building owners throughout all of the earthquakes with ensuring that safety to occupants and the public. But even with this clear focus, it has been impossible to prevent some unauthorised people entering the building.

   This creates a high level of stress for the new Building owners, Cambridge 137 Limited and myself as the Structural Engineer responsible for providing advice, structural condition and safety, as we know the building is dangerous but cannot fully control it.

   Little has changed since Quoin's last inspection in 2016. The building should not be entered without full PPE, of which the new building Owner sensibly insists on for any authorised access.

   Further, unauthorised persons have caused a fire to the interior of the building resulting in some weakening of the structure. Any such occurrence in the future could result in far more severe damage and injury to people.

   (e) The poor condition of the brick parapets to the rear sides of the building mean that there is a safety risk to the fire egress path of the adjacent building when this adjacent building on Worcester Boulevard is occupied. There is further risk to damage to this private property that has not been purchase by Cambridge 137 Limited.

7. Given the obvious damage to the building, any further detailed assessment of the external facades directly adjacent to the footpaths that could be undertaken to survey the extent of any areas of loose plaster and/or debris would be regarded as commercially wasteful. There are several areas which pose a potential fall risk to the footpath and action should be taken immediately to reinstate the 1m barrier. It is evident that the heritage features of the façade are now extensively damaged.

   This follows the apparent ongoing degradation of the building exterior as ongoing differential thermal effects and weathering appear to degrade the exterior plaster/concrete at the crack and joint locations.

We understand the new owners share our view that the building should be deconstructed. We strongly recommend that such action proceed with urgency to mitigate the risk that this building poses to stakeholders and the public.

I am available to meet with any parties if this helps them understand the safety issues and what it would take to repair Harley Chambers.

If you have any queries then please let me know.

Yours sincerely
Quoin Structural Consultants Ltd

Brett Gilmore CPEng #139988
Director & Senior Structural Engineer
B.Eng (Hons)(Civil); CMEngNZ; Int PE

APPENDIX B - CENTRAUS STRUCTURAL CONSULTING, HERITAGE STRUCTURAL RESTORATION FEASIBILITY REPORT, 14 JULY 2023

Heritage Structural Restoration Feasibility Report

Cambridge 137 LTD

Harley Chambers
137 Cambridge Terrace
Central City, Christchurch

JN: 230154A

14th July 2023

Woods Mill, 14 Wise Street, Level 1, Addington, Christchurch 8024
PO Box 1040, Christchurch Central 8140

www.centraus.co.nz

TABLE OF CONTENTS

1 GENERAL

1.1 OBJECTIVE

This heritage structural restoration feasibility report is a document which addresses the structural condition of an existing heritage building as requested by the building owner Cambridge 137 LTD. This assessment is provided with the following inclusions:

- Observations of the general condition of the structure.
- Considering the required building work to restore the structure.
- Developing a budget cost associated to accomplish the works.
- Considering the potential safety in design issues to restore the structure.

The outcome of this assessment report is to illustrate to the client what the potential reinstatement plan could be going forward for their heritage building.

1.2 SCOPE

The subject building known as the Harley Chambers is located at 137 Chambers Terrace, Central City, Christchurch. The building has major damage from the Canterbury Earthquake sequence from 2010-2012 (As well as the Kaikoura Earthquake in 2016) as well as weathering deterioration due to watertightness issues caused by this damage. The building is a two-storey timber and brick masonry structure which is unrepaired and has been vacant since the earthquake sequence in 2010.

The scope of this report is to assess the building in its current condition to determine what damage/deterioration currently exists and how the building could be restored. We have reviewed two letter reports by Quoin Engineers dated 21 December 2016 and 12 July 2023 as attached as Appendix B and A, respectively.

2 THE STRUCTURE

2.1 GENERAL

The building is located at 137 Cambridge Terrace, Central City, Christchurch. The main driveway entrance is off the corner of Worcester Street at the south-east corner of the property. There is also a secondary walkway entrance from Worchester Street at the South side of the property. The building footprint is approximately 720 sqm. Per floor for a total of approximately 1440sqm. See Figure 1 below for an overhead view of the site.

Figure 1 General Site Plan

The subject building is a Heritage Category 2 listed building as noted in Heritage New Zealand - Welcome to Heritage New Zealand. *"Constructed in 1929 and extended in 1934, the three storeyed commercial building known as Harley Buildings (or Harley Chambers) on the corner of 137 Cambridge Terrace and Worcester Street, Christchurch, has social and historical value as purpose-built professional rooms for dentists and doctors. It has architectural value as an example of a design by Christchurch architect, G T Lucas, and technological value for its electrical installation and regulated heating system which was innovative for the time. In 1924 Arthur Suckling, a dental surgeon, had shifted to begin practicing from premises on the corner of Worcester Street and Cambridge Terrace, formerly the residence of Dr Manning."*

As noted by Heritage New Zealand the building is concrete and originally constructed in 1929 and extended in 1934 as a medical use building. We have not had an opportunity to review any original construction documents. The roof and floors are noted in the reports to be concrete supported on concrete columns and beams with brick infill. The foundations reportedly have a partial basement and deeper foundation. Figure 2 below is a picture of the exterior elevation of the corner of the building illustrating the current condition of the major damage or deterioration.

As noted in the Quoin Structural letters the building has a current strength rating of 15%-40%NBS for the North Building and 34%NBS for the Southern Building. The damage and deterioration of the building leads to several items of safety concerns in future events and even structural capacity.

Figure 2 Google Earth photos of building south-east elevation

The building was built at two times with an addition. The construction appears to be of similar structural configuration.

Figure 3 Google Earth photos of building south elevation – Worcester Side

2.2 EXISTING BUILDING CONDITION

Centraus conducted an in-person site visit on the 4th of July 2022. The site visit was limited to the exterior of the building. As there is inherent danger entering the building due to its existing structural elements experiencing excessive damage due to the Canterbury earthquake and decay.

The Quoin Structural Engineering letters attached provide an extensive list of observations made on site and some of those elements were reviewed on site and through the writings of Quoin Structural Engineers as attached herein.

The in-person site visit allowed each of the buildings elements to be assessed to determine their current condition. Each of the elements are described below:

Existing Concrete Walls and Columns

The existing concrete elements have major damage with multiple cracks running through the columns and walls. The damage started with the earthquakes in 2010-2011 as noted in the original reports. There has been ongoing deterioration of the elements due to water intrusion and lack of maintenance.

Figure 4 Google Earth photos of building east elevation – Cambridge Side

Existing Roof and Floor Elements

The existing roof and floor concrete elements had some damage. The ongoing deterioration due to water intrusion and fires in the building has caused additional damage, The building has major water tightness issues which has likely led to of concrete reinforcing corrosion. The support of this roof and floor framing is currently questionable and without access into the building to properly evaluate the condition and provide any necessary temporary supports and shoring it may be not be considered to be adequate or safe.

3 REPAIR FEASIBILITY AND DEMOLITION REQUIREMENTS

The Harley Chambers located at 137 Cambridge Terrace is listed as a Category 2 Heritage building by Heritage New Zealand. Therefore, the building is considered to be a significant asset and, therefore, should be restored if possible. This is a major component of our assessment as well as the safety in design and cost implications of any issues associated to preserve and restore the structure.

It is noted that Quoin Structural Engineering letter dated 21 Dec. 2016 that the building:

> *"It is Quoin's professional opinion that the building as a whole should be deconstructed. The main reasons include:*
>
> *a) The north-east corner could partially collapse, in its current condition.*
> *b) The building in the long term is unlikely to be repaired because it is not economic to do so. Hence it will continue to degrade.*
> *c) It was evident during our inspection that the building was being occupied by unauthorised people. This is a great concern given the structural condition of the building, and also that the internal environment is a health hazard.*
> *There are other risks in the building that include falling debris (ceilings, plaster, damaged breeze blocks, etc), plus brick parapets to the rear sides of the building, plus asbestos in some materials, plus the basement remains part filled with water.*
>
> *We note also that the owner's representative (Valour Properties) have been one of the most responsible building owners throughout all of the earthquakes with ensuring that safety to occupants and the public. But even with this clear focus, it has been impossible to prevent some unauthorised people entering the building.*
>
> *This creates a high level of stress for Valour Properties, the building owner, and myself as the structural engineer responsible for providing advice, structural condition and safety, as we know the building is dangerous but cannot fully control it.*
>
> *d) The poor condition of the brick parapets to the rear sides of the building mean that there is a safety risk to the fire egress path of the adjacent building when this adjacent building on Worcester Boulevard is occupied."*

3.1 AREAS REQUIRING REPAIR

Based upon our review it is noted that the building has experienced major earthquake damage as well as extensive deterioration due to its current condition. This results in a condition where a large percentage of the building will require extensive removal and replacement to repair the building structural systems. This is necessary as the structural system has had significant structural damages from the Canterbury earthquake and deterioration from water tightness issues and other damages due to fires.

Due to the current state of the original building, it is evident that the entirety of the original building will need to be deconstructed to provide for the safety of the building site. The current condition is not considered safe for entry. For the original building the following elements are discussed:

- The concrete floors and columns have extensive damage and expressed deterioration due to water infiltration and corrosion. This corrosion and damage have caused a severe deterioration of the overall capacity of the structural elements. The concrete floors appear that they are required to be removed and replaced to ensure proper capacity. The new floors also support the internal and external columns and walls and need to be present to maintain structural integrity.

- The existing damage to the northern column provides for a potential collapse hazard in a future event. As the damage is extensive the column would require to be rebuilt and will have to be removed. The stability of the building is therefore compromised by the column issues.

- The stability of the parapets and supporting elements are also of suspected structural stability and will need to be removed and replaced.

It is noted during our inspection there is extensive damage and deterioration damage due to the earthquake forces and continued weathering. It is therefore expected that there will be extensive replacement required. Based upon our review and the proximity to the original building construction the safety of any works within the structure is suspect and unclear if even possible. As there are several areas which are extensively deteriorated, and no finishes remain intact it is highly likely that a remote deconstruction would be the only safe method available to work near the building.

3.2 COST

We understand that in every repair and rehabilitation build, cost has a large influence on the feasibility of a project. As this is a heritage building it is generally considered that the allowable budget will usually higher than standard projects due to the retainage of the historical and cultural significant aspects of the building.

As discussed in Section 3.1 restoration of the Harley Chambers would likely require majority of the building to be removed and replaced. It is our opinion, that there will be a need for extensive removal of the building in demolition. If any rehabilitation works would commence after that it would be in the terms of re-creation and not rehabilitation of the building. In order to provide for a suitable re-creation, if at all possible due to current building code requirements, it would be a very expensive endeavour as period construction technology and methodology would need to be implemented to match the original condition of the building. Due to current building code requirements a substantial amount of the older materials may not be able to be reused either due damage from the Canterbury Earthquakes or deterioration from water tightness issues. This leads to expensive uncommon materials having to be sourced.

The extremely expensive and code restricting recreation process of the building is a major implication preventing the building from being recreated.

3.3 SAFTEY DURING DEMOLITION WORKS

The demolition process of a heritage building is generally noted to be a critical process as the existing construction materials need to be maintained to be utilized into any rehabilitation as new materials would not be suitable. Demolition processes also need to be conducted in a safe manner to ensure safety during construction.

While it is noted that roof, floors and walls are extensively damaged, and therefore, in a condition which could not be reused, it may not be possible to retrieve those materials. Where possible, if these historically significant materials could be retrieved it is recommended that they be preserved during the demolition process.

The existing roofs, floors and walls gravity structure is extremely deteriorated due to earthquake damage and continued weather tightness issues with the structure. This creates an inherent danger that the roof and floors may collapse putting any excess load on the roof and floors during demolition. The existing concrete and brick walls and the columns supporting the roof and floor gravity load and prevent collapse. The existing columns and walls have suffered major damage from the Canterbury earthquakes and are currently mostly deteriorated and are currently needing to be braced by temporary braces.

To safely retain the existing building, the work to repair and enter the building would require the removal of the upper loads from the top down putting no excess load on roof and floors. In our opinion, the safety of any operation within close proximity to the street would render the system unstable and cause it to collapse. Due to structural instability, it our recommendation to demolish the entire roof and floors including the and walls as the safety of the operation is paramount.

4 CONCLUSION

The Harley Chambers is a category 2 heritage building located at 137 Cambridge Terrace, Central City, Christchurch. The building has significant historic and cultural value and should be restored if possible and practical.

Our inspection of the current condition of the building noted major Earthquake damage and deterioration to the building's structural support elements and architectural finishes. Based upon these observations and requirements for safety in design is our opinion that the majority of the building need to be demolished from a remote position. This is due to the safe of the entry into the building or immediately around the building, to be impossible in its current condition.

As the building will largely be demolished as a result of these works the rehabilitation of the Heritage building will not be possible. The resulting works would then be a re-creation of the building. Due to current building code requirements this re-creation would not be of the same materials and configurations and will need to be a facsimile of the original building constructed of newer materials.

The cost associated with these works also appears to be major issue as the demolition required will result in the elimination of the building in its entirety.

In our opinion, the building poses a safety concern and an expedited effort should be made to maintain the site with limited access around the building. The continued deterioration of the building should be taken into account to also mitigate safety concerns with the removal of the hazard as soon as practical by removing the building. In the interim, limiting continued access adjacent to the building on the footpaths may need to be re-evaluated to maintain safety of the public around the building.

Yours sincerely,

Michael King

CMEngNZ (CPEng), IntPE (NZ), SE (Ca USA)

Senior Structural Engineer, Director

APPENDIX A: QUOIN LETTER – 12 JULY 2023

Quoin

Quoin Structural Consultants
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Christchurch 8013
PO Box 25 438
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quoin.co.nz

12 July 2023

Michael Doig
Citadel Property Limited
on behalf of Cambridge 137 Limited
Level 1
236 High Street
Christchurch 8011

By Email: michael@citadel.nz

Dear Michael

Harley Chambers, Cambridge Terrace, Christchurch

As requested, Quoin Structural Consultants (Quoin) inspected the Harley Chambers Building on 13 June 2023 to assess its current condition and provide comment on the public safety of the Building. The inspection was completed by Brett Gilmore (CPEng).

The most recent previous inspection of the building completed by Quoin (Brett Gilmore) was on 13 December 2016. This inspection and review was summarised in the Quoin letter dated 21 December 2016.

This letter provides an update to the 2016 Letter (included here in black text), with new observations and comments include in 'green' text. Where possible, Quoin has compared recent photos with photos taken in 2016.

We confirm that Brett Gilmore, Chartered Engineer from Quoin Structural Consultants (Quoin), inspected the property known as Harley Chambers on 13 December 2016, and makes the following observations and comments.

1. The building has suffered some additional damage since my last inspection of the building on 13 December 2016. It is apparent that the building is degrading further over time.

2. The additional damage we observed includes but is not limited to the following:

   (a) Significant extension and widening of horizontal crack near the base of the north-east column, directly adjacent to the footpath. We know that this column had previously settled and had a crack, but the crack is much wider now and extends all of the way through the column.

   Crack appears to be similar to previous 2016 inspection. Quoin notes that the reinforcing of the column section includes widely spaced stirrup reinforcing.

Quoin

Such horizontal cracks when located between stirrups, which is likely, are considered dangerous and could result in a more sudden-type failure of the column under moderate lateral earthquake loading.

If a moderate-large earthquake were to occur in Christchurch (estimate magnitude 6.0 or greater) then this column could fail and cause partial collapse of this corner of the building.

The building itself will not fall over as a whole, but debris could fall out onto the footpath. The suspended floors are well reinforced and perimeter beams tie into the column at each floor level, but the uncertain nature of earthquakes means that we have to expect that some significant damage could occur.

At the very least, this column and corner needs to be propped and braced.

Further to our discussion on 18 December 2016, Quoin recommends installation of a barricade on the footpath at least 1m from building and extend it 5m away from the corner. This might link up with barricade at the entry. See (b) below.

A barricade fence was installed adjacent to this section and is currently in place. However, it is noted that the barricade is located hard up against the building and does not have the suggested 1m minimum gap (see photo below).

It appears that it is not possible to ensure that the barricade is maintained at the recommended safe distance from the building.

(b) The joint between the north and south sections of the building appears to have widened by approximately 5mm.

At the top of the joint at parapet level, facing Cambridge Terrace, it appears that there could be some loose concrete. It is difficult to tell without being able to get closer to inspect. This section was cleaned out after a previous earthquake, but given its location and proximity to the footpath then this should be checked again.

We also observed widening of cracks in the front concrete canopy apron over the entry off Cambridge Terrace, which is adjacent to the gap noted above. We do not know exactly how this is constructed so we have to proceed with

Quoin

caution. The extent of cracking to this section appears to be significantly worse than when inspected in December 2016, which has possibly been caused by ingress of water and the effects of thermal variations over time on the previous cracks. The cracks occur at the mitred corners, so the apron slab may be susceptible to severe damage and possible collapse in a moderate earthquake, depending on the condition of the reinforcing.

Quoin recommends providing temporary fences/barricade approximately 1m away from building to provide safety from any falling debris. The apron is not too high above footpath so 1m should be adequate. Further investigation can be undertaken in due course if required.

A barricade fence was installed adjacent to this section and is currently in place. However, it is noted that the barricade is located hard up against the building and does not have the suggested 1m minimum gap (see photo below). It appears that it is not possible to ensure that the barricade is maintained at the recommended safe distance from the building, likely because the location of such barricade impacts greatly on the width of the public footpath.

This means that if any part of the canopy apron were to spall, or collapse under a moderate earthquake, then the barricade may not prevent serious injury to the passing public.

Quoin recommends immediate reinstatement of the barricade fence at 1m distance from the front face, or demolition of the apron canopy, or installation of temporary propping beneath the canopy.

(c) The cracks at the base of the parapet are more visible than they used to be. The parapets that face onto Cambridge Terrace and Worcester Boulevard comprise of reinforced concrete. It is our opinion that they are safe.

(d) There appears to be a number of new cracks in the front facade to Cambridge Terrace and Worcester Boulevard (plaster over concrete structure), or maybe older cracks that have widened and/or extended. Since our last inspection, these are worsening such that ongoing degradation from wind and rain could cause spalling of the plaster/concrete. We note that this is directly adjacent to the footpath and worst along Cambridge Terrace.

The very wide cracks in the east facade beneath the northern-most lowest window, adjacent to the north-east column noted in (a) above, appear to have

Quoin

widened slightly since 2016. This suggests possible ongoing settlement of the corner column. It is noted that the basement at this same corner of the building remains full of water.

With the basement being full of stagnant water for long periods of time, and having been through numerous attempts to dewater, plus the settlement that has occurred and that appears to be ongoing, there is likely to be added degradation to the structure that includes but may not be limited to:

i. More extensive contamination of the concrete to the basement walls and base slab.

ii. Added degradation of the reinforcing, typically at the crack locations.

iii. Added stresses in the corner column and adjacent beams, over the height of the building, as caused by the settlement. Such cumulative added stresses reduce the residual strength of the affected column and adjacent beams.

A barricade may be required at some stage. As noted above, a barricade is in place, albeit hard up against the building and not 1m away from the building as is the suggested minimum distance should small debris fall from the building.

Quoin recommends a closer inspection be completed to assess if any material is loose and this should include the close inspection noted in (b) above.

(e) A fire occurred in the south-west corner of the north section of the building at ground level.

The ceiling has been burnt out and it appears that the soffit of the concrete floor above was exposed to the fire.

Also, extensive spalling occurred to the plaster finishes of the internal breeze block wall.

This has likely resulted in a reduction in loadbearing capacity of the floor in this localised area.

Quoin

(f) Temporary timber infill to a north side window appears to have fallen out towards the adjacent building at 141 Cambridge Terrace.

3. As you are aware, we have inspected the building numerous times, and Quoin have completed a detailed structural assessment of the building. The building was previously assessed to be:

   - North section assessed as 15-40% x NBS in its damaged state and 25-55% x NBS in its undamaged state.
   - South section assessed as 34% x NBS in its damaged state and 37% x NBS in its undamaged state. The building in its current condition has degraded further and will continue to go so.

   It is noted that the building was originally constructed in two sections. The gap seen from the Cambridge Terrace is the joint between the two sections.

   The building, as a whole, is Earthquake Prone.

   From our inspection on 13 December 2016, the condition of the north-east corner column is very poor and this would reduce the assessed current condition of the north section to less than 15% x NBS.

4. We note that Quoin was involved in the scoping the repairs required to the building, and this included strengthening back to 34% x NBS. The cost estimates confirmed that it was not economic to repair the building, with the cost of repair being more than the cost of a rebuild.

5. When the adjacent new building was recently constructed, we had to get the north parapet and brick infill to the north wall removed to ensure safety on the adjacent site. These emergency works were approved by CERA under Section 38 of the Building Act and the works completed. At this time, Quoin (previously Structex Metro Ltd) recommended that the north section of the building be deconstructed due to the poor structural condition of the building and its very low assessed % x NBS. This recommendation preceded our knowledge of the cost of repairs.

   The deconstruction did not proceed.

   Quoin's opinion remains the same, that the north section of the building is not economic to repair, and when combined with the south section, the building as a whole is not economic to repair.

Quoin

6. It is Quoin's professional opinion that the building as a whole should be deconstructed. The main reasons include:

   (a) The north-east corner could partially collapse, in its current condition under moderate earthquake shaking.

   (b) The concrete canopy apron directly adjacent to the east side footpath is significantly cracked and could partially collapse under moderate earthquake shaking.

   (c) The building in the long term is unlikely to be repaired because it is not economic to do so. Hence it will continue to degrade.

   Several parties, including Quoin and other Professionals between 2011-2017, and other independent Professionals (not including Quoin) between 2017-2023, have looked at options to strengthen, repair, and refurbish the building. It appears that it is not economic to do so.

   (d) It was evident during our inspection that the building was being occupied by unauthorised people. This is a great concern given the structural condition of the building, and also that the internal environment is a health hazard.

   There are other risks in the building that include falling debris (ceilings, plaster, damaged breeze blocks, etc), plus brick parapets to the rear sides of the building, plus asbestos in some materials, plus the basement remains part filled with water.

   We note also that the previous owner's representative (Valour Properties) have been one of the most responsible building owners throughout all of the earthquakes with ensuring that safety to occupants and the public. But even with this clear focus, it has been impossible to prevent some unauthorised people entering the building.

   This creates a high level of stress for the new Building owners, Cambridge 137 Limited and myself as the Structural Engineer responsible for providing advice, structural condition and safety, as we know the building is dangerous but cannot fully control it.

   Little has changed since Quoin's last inspection in 2016. The building should not be entered without full PPE, of which the new building Owner sensibly insists on for any authorised access.

   Further, unauthorised persons have caused a fire to the interior of the building resulting in some weakening of the structure. Any such occurrence in the future could result in far more severe damage and injury to people.

   (e) The poor condition of the brick parapets to the rear sides of the building mean that there is a safety risk to the fire egress path of the adjacent building when this adjacent building on Worcester Boulevard is occupied. There is further risk to damage to this private property that has not been purchase by Cambridge 137 Limited.

Quoin

7. Given the obvious damage to the building, any further detailed assessment of the external facades directly adjacent to the footpaths that could be undertaken to survey the extent of any areas of loose plaster and/or debris would be regarded as commercially wasteful. There are several areas which pose a potential fall risk to the footpath and action should be taken immediately to reinstate the 1m barrier. It is evident that the heritage features of the façade are now extensively damaged.

   This follows the apparent ongoing degradation of the building exterior as ongoing differential thermal effects and weathering appear to degrade the exterior plaster/concrete at the crack and joint locations.

We understand the new owners share our view that the building should be deconstructed. We strongly recommend that such action proceed with urgency to mitigate the risk that this building poses to stakeholders and the public.

I am available to meet with any parties if this helps them understand the safety issues and what it would take to repair Harley Chambers.

If you have any queries then please let me know.

Yours sincerely
Quoin Structural Consultants Ltd

B A Gilmore.

Brett Gilmore CPEng #139988
Director & Senior Structural Engineer
B.Eng (Hons)(Civil); CMEngNZ; Int PE

APPENDIX B: QUOIN LETTER – 21 DECEMBER 2016

Quoin

Quoin Structural Consultants
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Christchurch 8013
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Christchurch 8144
03 968 4925
quoin.co.nz

21 December 2016

Dr Gerard McCoy QC SCB and Rosie Hobbs
Valour Properties Limited
PO Box 2838
Christchurch 8140

By Email: valourproperties@xtra.co.nz

Dear Gerard & Rosie

Harley Chambers, Cambridge Terrace, Christchurch

We confirm that Brett Gilmore, Chartered Engineer from Quoin Structural Consultants (Quoin), inspected the property known as Harley Chambers on 13 December 2016, and makes the following observations and comments.

1. The building has suffered some additional damage since my last inspection of the building on 29 June 2015. It is apparent that the smaller magnitude earthquakes and/or larger earthquakes located further away (Kaikoura) are having a degrading effect on the building.

2. The additional damage we observed includes but is not limited to the following:

   (a) Significant extension and widening of horizontal crack near the base of the north-east column, directly adjacent to the footpath. We know that this column had previously settled and had a crack, but the crack is much wider now and extends all of the way through the column.

   If a large earthquake were to occur in Christchurch (estimate magnitude 6.0 or greater) then this column could fail and cause partial collapse of this corner of the building.

   The building itself will not fall over as a whole, but debris could fall out onto the footpath. The suspended floors are well reinforced and perimeter beams tie into the column at each floor level, but the uncertain nature of earthquakes means that we have to expect that some significant damage could occur.

   At the very least, this column and corner needs to be propped and braced.

   Further to our discussion on 18 December 2016, Quoin recommends installation of a barricade on the footpath at least 1m from building and extend it 5m away from the corner. This might link up with barricade at the entry. See (b) below.

Quoin

(b) The joint between the north and south sections of the building appears to have widened by approximately 5mm.

At the top of the joint at parapet level, facing Cambridge Terrace, it appears that there could be some loose concrete. It is difficult to tell without being able to get closer to inspect. This section was cleaned out after a previous earthquake, but given its location and proximity to the footpath then this should be checked again.

We also observed widening of cracks in the front concrete canopy apron over the entry off Cambridge Terrace, which is adjacent to the gap noted above. We do not know exactly how this is constructed so we have to proceed with caution.

Quoin recommends providing temporary fences/barricade approximately 1m away from building to provide safety from any falling debris. The apron is not too high above footpath so 1m should be adequate. Further investigation can be undertaken in due course if required.

(c) The cracks at the base of the parapet are more visible than they used to be. The parapets that face onto Cambridge Terrace and Worcester Boulevard comprise of reinforced concrete. It is our opinion that they are safe.

(d) There appears to be a number of new cracks in the front facade to Cambridge Terrace and Worcester Boulevard (plaster over concrete structure), or maybe older cracks that have widened and/or extended. Since our last inspection, these are worsening such that ongoing degradation from wind and rain could cause spalling of the plaster/concrete. We note that this is directly adjacent to the footpath and worst along Cambridge Terrace.

A barricade may be required at some stage.

Quoin recommends a closer inspection be completed to asses if any material is loose and this should include the close inspection noted in (b) above.

3. As you are aware, we have inspected the building numerous times, and Quoin have completed a detailed structural assessment of the building. The building was previously assessed to be:

- North section assessed as 15-40% x NBS in its damaged state and 25-55% x NBS in its undamaged state.
- South section assessed as 34% x NBS in its damaged state and 37% x NBS in its undamaged state. The building in its current condition has degraded further and will continue to go so.

It is noted that the building was originally constructed in 2 sections. The gap seen from the Cambridge Terrace is the joint between the two sections.

The building, as a whole, is Earthquake Prone.

From our inspection on 13 December 2016, the condition of the north-east corner column is very poor and this would reduce the assessed current condition of the North section to less than 15% x NBS.

Quoin

4. We note that Quoin was involved in the scoping the repairs required to the building, and this included strengthening back to 34% x NBS. The cost estimates confirmed that it was not economic to repair the building, with the cost of repair being more than the cost of a rebuild.

5. When the adjacent new building was recently constructed, we had to get the north parapet and brick infill to the north wall removed to ensure safety on the adjacent site. These emergency works were approved by CERA under Section 38 of the Building Act and the works completed. At this time, Quoin (previously Structex Metro Ltd) recommended that the North Section of the building be deconstructed due to the poor structural condition of the building and its very low assessed % x NBS. This recommendation preceded our knowledge of the cost of repairs.

   The deconstruction did not proceed.

   Quoin's opinion remains the same, that the North Section of the building is not economic to repair, and when combined with the South section, the building as a whole is not economic to repair.

6. It is Quoin's professional opinion that the building as a whole should be deconstructed. The main reasons include:

   (a) The north-east corner could partially collapse, in its current condition.

   (b) The building in the long term is unlikely to be repaired because it is not economic to do so. Hence it will continue to degrade.

   (c) It was evident during our inspection that the building was being occupied by unauthorised people. This is a great concern given the structural condition of the building, and also that the internal environment is a health hazard.

   There are other risks in the building that include falling debris (ceilings, plaster, damaged breeze blocks, etc), plus brick parapets to the rear sides of the building, plus asbestos in some materials, plus the basement remains part filled with water.

   We note also that the owner's representative (Valour Properties) have been one of the most responsible building owners throughout all of the earthquakes with ensuring that safety to occupants and the public. But even with this clear focus, it has been impossible to prevent some unauthorised people entering the building.

   This creates a high level of stress for Valour Properties, the building owner, and myself as the structural engineer responsible for providing advice, structural condition and safety, as we know the building is dangerous but cannot fully control it.

   (d) The poor condition of the brick parapets to the rear sides of the building mean that there is a safety risk to the fire egress path of the adjacent building when this adjacent building on Worcester Boulevard is occupied.

Quoin

7. If the Harley Chambers building is not to be deconstructed, then Quoin recommends that undertake earthquake securing works to the north-east corner of the building as soon as possible. Plus, added work will need to be undertaken to ensure that the building cannot be occupied by unauthorised people, plus other securing works may be required to elements such as the brick parapets.

We are not sure how much background information the Christchurch City Council has on Harley Chambers. It may be useful to provide them with copies of the DEE, and correspondence with CERA.

I am available to meet with any parties if this helps them understand the safety issues and what it would take to repair Harley Chambers.

If you have any queries then please let me know.

Yours sincerely
Quoin Structural Consultants Ltd

Brett Gilmore CPEng #139988
Senior Structural Engineer &
Director
B.Eng (Hons)(Civil); MIPENZ; Int PE

APPENDIX C - STRUCTEX METRO LTD, LETTER, 10 OCTOBER 2013

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po box 25 438
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new zealand

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metro@structex.co.nz
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10 October 2103

Dr Gerard McCoy QC SCB &
Rosie Hobbs
Valour Properties Ltd
PO Box 2838
Christchurch 8140

By Email: valourproperties@xtra.co.nz

Dear Gerard & Rosie

Re: Harley Chambers Building, 137 Cambridge Terrace, Christchurch
Continuing Concerns Regarding Occupancy, Damage to Building & Construction of New Adjacent Building

1. Introduction

As requested, Structex Metro Limited have completed an inspection of the exterior of the Harley Chambers Building with the main aim of providing further advice to you on its current structural condition, damage, and safety of the building relative to the people around it.

This follows the letter received from CERA dated 27 September 2013 regarding continuing concerns regarding occupancy and safety of the building, and the letter received from Aurecon dated 8 October 2013 that expresses significant concerns about the north wall of the Harley Chambers Building that is located directly adjacent to the new building that is to be constructed at 141 Cambridge Terrace.

The following is a summary of our recent observations and assessment of the building and response to the letters received from both CERA and Aurecon.

This letter/report assumes that the readers are familiar with the form of construction of the building and the assessments and reports completed to date. Copies of the above noted letters from CERA and Aurecon are attached, plus a copy of the Detailed Engineering Evaluation Report completed by Structex Metro Limited dated 8 November 2011.

2. Inspection Completed by Structex Metro Limited

Structex Metro Limited completed our recent inspection of the Harley Chambers Building on 30 September 2013.

A brief summary of our observations and comments are as follows:

(a) The inspection comprised of a walkover review of the exterior of the building only.

(b) Since the last inspection completed by Structex Metro Limited on 25 June 2012, the condition of the building has degraded further on all sides. This generally includes additional cracks in the exterior plaster finishes at locations where damage had not previously been observed, plus significant cracks and degradation of the north wall.

(c) The north wall in particular, that is located on the north boundary, has suffered significant additional damage. This includes:

  (i) Significant horizontal wide crack near base of the parapet.

  (ii) Diagonal shear cracks in the wall at the lower storey.

  (iii) Regular spaced horizontal cracks at approximately 1m centres, plus widespread random cracks generally throughout the elevation as a whole.

  (iv) New vertical crack at the north-east corner (north face), which may be at an interface between the concrete corner column and brick infill.

  (v) New horizontal crack at north-east corner (east face) near base of parapet.

(d) To the remainder of the north wall that is set back from the boundary, a large number of additional cracks noted throughout the elevation.

(e) To the east, south and west elevations, additional cracks noted and/or have widened at the base of the parapet to the roof and generally throughout the elevations in the large wall/pier elements.

3. Assessment of Additional Damage & Response to CERA & Aurecon Letters

The key items of concern raised by CERA and Aurecon and subsequent comments and responses from Structex Metro Limited are as follows:

(a) CERA Concerns

(i) The Detailed Engineering Evaluation Report (DEE) completed by Structex Metro Limited dated 8 November 2011 *'is preliminary only and out-dated as it was prepared before a series of major aftershocks, also the report does not provide the Excel summary'.*

Structex Metro Limited agrees that the report is out of date. Our most recent inspection of the exterior of the building confirms that further degradation of the building as a whole has occurred.

The DEE report comprised of a quantitative analysis of the North building, and assessed the building in both an undamaged and damaged state.

In the undamaged state, the North building was assessed at 25%-55% x NBS (New Building Standard).

In the damaged state the North building was assessed at 15%-40% x NBS.

The building has been assessed by Structex Metro Ltd as being earthquake prone with strength ≤33% x NBS.

With the additional damage observed in Structex' recent inspection, this is unlikely to change the previous assessment as it was assumed then that the main damaged brick infill walls would not contribute to the over lateral resistance in the damaged state.

However, we reiterate that the building was assessed as being earthquake prone and the lateral resisting strength in parts of the North building could be as low as 15% x NBS.

The summary spreadsheet will be completed and forwarded in due course.

(ii) *'The building appears to have received substantial earthquake related damage, has Critical Structural Weaknesses, and its estimated NBS is less than 33%, therefore the building is earthquake prone and potentially dangerous.'*

Structex Metro Limited agrees.

(iii) *'CERA will leave in place the existing Notice under Section 45 of the Canterbury Earthquake Recovery Act limiting access to and around the building to that of emergency purposes, damage assessment or making safe.'*

Structex Metro Limited agrees that these restrictions remain in place.

It is noted that the North building has suffered significantly more damage than the South building which is mainly due to differences in the construction. The North building has a larger number of interior heavy unreinforced masonry block walls, plus includes the main stair and lift wells and basement.

It is also noted that the alley way space between the west side exterior wall of Harley Chambers and the adjacent building to Worcester Boulevard acts as an emergency fire egress route to the adjacent building.

(iv) *'You, as the building's owner are required to take all practical steps to ensure the safety of the building and the people around it. These steps should follow any recommendations of your engineer and may include restricting access into and around the building by fencing, placing warning signs or other means.'*

Structex Metro Limited provides comments as follows:

- The Harley Chambers building comprises of a North and South building that are separated by a nominally small joint.

- The North building has suffered significant damage and has been assessed by Structex Metro Ltd as earthquake prone and potentially dangerous, with lateral resisting strength ≤33% x NBS.

- The South building has suffered less damage and is in a better overall condition. A detailed quantitative analysis of the South building has not been undertaken. Given that it has a lesser number of interior heavy unreinforced masonry block walls then the lateral resisting strength will be higher than the North building. It may have an assessed strength ≥34% x NBS (to be confirmed).

- The scope and cost of repairs have been assessed in detail. The estimated costs to repair and/or strengthen the building to ≥34% x NBS are very large. We understand that there is some disagreement with the Insurer regarding the extent of the repairs and costs.

  It is Structex Metro Limited's opinion that the repair of the North building is uneconomic. In addition, the north-east corner of the building has suffered higher differential settlements than the rest of the building. The feasibility of re-levelling this corner of the building is questionable and at the very least would be complex and costly.

- The north section of the wall directly adjacent to the boundary has degraded significantly. The parapet needs to be removed and the unreinforced brick infill removed or significantly secured to allow the safe construction of the new adjacent building to be undertaken. This needs to be completed immediately.

- The South building is not likely to pose a danger to the public or people around it, at this stage. However, its condition needs to be monitored regularly.

- To date, the condition of the North building, while very poor, has not required Structex Metro Limited to advise on whether it should be deconstructed or not. The height to width aspect ratio is low, and there is residual capacity within the concrete frames and unreinforced masonry block structure, so the risk of instability has been assessed as low.

However, with the construction of the new building on the adjacent site at 141 Cambridge Terrace about to commence, and the significant degradation of the north wall to the North building of Harley Chambers, then immediate action is required.

While there is some disagreement between the owner and their Insurer regarding the extent of the earthquake repairs and associated costs, it is the opinion of Structex Metro Limited that the earthquake repairs to reinstate the North building back to its pre-earthquake condition will not be economically viable.

- Taking into account the above noted issues, Structex Metro Limited recommends that the North building of Harley Chambers be deconstructed as soon as possible. This will ensure the following:

    - The safety concerns raised by Aurecon regarding the construction of the new building at 141 Cambridge Terrace will be addressed.

    - Elimination of hazards associated with the main parapets that front onto Cambridge Terrace footpath (currently part fenced) and road, where cracks at the base of the parapets and at the north-east corner junction with the concrete frame have increased and degradation is ongoing.

    - Provides a safe fire egress from the adjacent building at Worcester Boulevard so that they could exit across the site to Cambridge Terrace instead of along the alley way access that is directly adjacent to the South building of Harley Chambers that has unreinforced brick parapets.

    - Provides a rational approach to addressing the repairs to the North building, in the opinion of Structex Metro Limited.

(b) Aurecon Concerns

(i) *'Work along the Harley Chambers boundary is unsafe.'*

Refer to comments made in 3(a)(iv).

(ii) *'Unable to inspect structure to the interior section of the building adjacent to 141 Cambridge Terrace boundary to confirm stability of the wall and integrity of the floor and roof diaphragm connections.'*

Refer to comments made in 3(a)(iii). Restricted access is recommended.

Given the damage and current condition of the north wall, the parapet is at risk of collapse, plus there is a risk of partial collapse of the brick infill to this wall, especially in a large earthquake.

Therefore the risks to personal safety of investigating the integrity of the floor and diaphragm connections is high.

Refer comments and recommendations made in 3(a)(iv) to address the issues of safety to all parties, with recommendation for full deconstruction of the North building of Harley Chambers as soon as possible.

(iii) *'We have significant concerns for life safety to personnel working close to Harley Chambers and the possibility of further damage to the building due to vibration affects from driving sheet piles adjacent to weakened and already damage building.'*

Structex Metro Limited shares these concerns. Refer comments in 3(a)(iv).

(iv) *'We are concerned the construction work will be stopped….'*

Reiterating our previous recommendation, it is recommended that the North building to Harley Chambers be deconstructed as soon as possible. This may require approval and/or assistance from CERA.

4. Summary & Recommendations

A brief summary of our recent inspection and assessment is as follows; together with recommendations by Structex Metro Limited.

(a) Concerns have been raised by both CERA and Aurecon regarding safety to people around the building, including personnel working on the adjacent site to the north boundary as part of the construction of a new building at 141 Cambridge Terrace.

(b) The Harley Chambers building has suffered additional damage since it was last inspected by Structex Metro ltd on 25 June 2012. Significant additional damage has occurred to the north wall of the North building.

(c) The building has been assessed as being earthquake prone and potentially dangerous, with lateral strength ≤33% x NBS. Parts of the North building could be as low as 15% x NBS.

(d) The condition and stability of the north wall to the North building of Harley Chambers poses a life safety danger to people around the building.

(e) It is the opinion of Structex Metro Limited that the North building of Harley Chambers is uneconomic to repair.

(f) Structex Metro Limited recommends that the North building to Harley Chambers be deconstructed as soon as possible. This addresses the issues raised concerning life safety danger to people around the building, including fire egress from the adjacent building in Worcester Boulevard.

(g) To avoid potential stoppage of construction work on the adjacent site at 141 Cambridge Terrace, assistance will be required from CERA to action the deconstruction of the North building.

This letter/report needs to be forwarded to CERA as soon as possible, and your Insurers will also need to be notified.

If you, CERA, or other parties require clarification of any of the above, or need to meet to discuss, then please contact the undersigned.

Yours sincerely
Structex Metro Ltd

Brett Gilmore CP Eng (# 139988)
B.Eng (Hons)(Civil)
Senior Structural Engineer &
Director
MIPENZ; PE (USA) Int PE

Attachments:

1. Copy of CERA letter dated 27 September 2013
2. Copy of Aurecon letter dated 8 October 2013
3. Copy of Detailed Engineering Evaluation Report dated 8 November 2011.

APPENDIX D - ENDEL LUST CIVIL ENGINEER LTD, ENGINEERING REPORT, MARCH 2013

STUDIO 21
ENDEL LUST
CIVIL ENGINEER LTD

Studio B21 The Arts Centre
Telephone 366-9989
Facsimile 366-7165
P.O. Box 21121 Christchurch

Engineering Report
Harley Building
137 Cambridge Terrace, Christchurch
for Sidera Ltd

1. Preliminary

This Consultancy has been retained by above Company, on behalf of the insurers, to provide a second opinion with respect to repair methodology (and therefore costings), on the above building following the seismic activity in the Christchurch area from September 2010 through to December 2012.

A Detailed Engineering Evaluation Report has been prepared by Consulting Engineers 'Structex Metro Ltd'. This report was prepared for Valour Properties Ltd. The 'second opinion' report may refer to the 'Structex Report' where appropriate but it is not intended to criticize the 'Structex Report' nor is this 'second opinion' intended as a peer review of the 'Structex Report'.

The building has been previously inspected by this Consultancy (pre-earthquake) as will be discussed further in this report. The latest inspection was carried out 23 January 2013.

This report is primarily concerned with the 'structure' of the building, and, an assessment of the remedial work will be discussed in broad outline, and, while other aspects of construction may be discussed, this is not intended as a full 'Building Report'.

2. Background

This Consultancy carried out an assessment of Harley Chambers in 2002. This was as part of a Building Consent Application for a prospective tenant in the North Section of the building. A copy of the 2002 assessment report is appended to this report. This development did not proceed and that Building Consent Application was cancelled.

This assessment contains relatively detailed descriptions of elements of construction of the building. The basic description of the structure is then taken as read and it is not proposed to repeat this basic description of the structure.

Harley Chambers is a 'heritage' building and has a Category II Listing in the New Zealand Historic Places Trust Register, and, is also listed as a Category 3 Heritage building in the Christchurch City Council's City Plan.

In 2002 when the earlier report was prepared the current Design Loading Code was NZS 4203. This was replaced in 2004 by NZS/AS 1170 in respect of earthquake loads and this new Code was further changed, by Parliamentary Decree, on 19 May 2011.

This change was primarily limited to the Christchurch area where a load factor 'z' (Zone Hazard Factor) was increased from 0.22 to 0.3. The earlier assessment of the building, in terms of percentage of 'Code', will have to be modified and this will be done later in this report.

These Code changes have increased the basic threshold for a building to be determined as not 'earthquake prone'. In basic terms an 'earthquake prone' building is defined as a structure that would not 'survive' a 'moderate earthquake'. A moderate earthquake is defined as an earthquake that will generate forces on the site equivalent to one-third of those that would be determined for a new building on the site. This is commonly referred to as 33% NBS (New Building Standard). This figure is rounded up to 34% NBS in some documents.

3. Legislation & Policy Factors

The legislative requirements for existing buildings in terms of strengthening is that the 33% NBS threshold is required to be achieved if the building is to undergo alterations that require a Building Consent.

The Christchurch City Council has, in its Earthquake Prone Buildings Policy, adopted a policy that requires a 67% NBS threshold be achieved. While this policy is couched in language that suggests this is a target, the reality is that Consent Applications have not been approved unless 67% NBS was achieved.

The Insurance Council of New Zealand has challenged this policy in a Court of Law and the recent judgement was in favour of the Applicant (i.e. The Insurance Council). At the time of preparing this report it is not known whether the Respondents will appeal this decision. It seems probable that the 67% NBS threshold will not be mandatory and, if so, the extent of strengthening required may be significantly less than recent assessments of buildings.

It is possible the Owners may wish to strengthen to a higher standard but obviously this extra cost would not be covered by Insurance.

The Christchurch City Council Policy document mentioned above is committed to maintaining the heritage character of Heritage buildings. Within this policy there is some discretion regarding strengthening of Heritage buildings. This discretion extends to the method and level of strengthening. No effective indications will be possible on this matter until such time when a relatively detailed proposal can be presented to the Council.

It is important to note that most of the discussion above is predicated on the understanding that there will not be a change of use for the building. The current use is taken as professional and commercial offices, which are categorised in the Design Code NZS/AS 1170 as Importance Level 2 (IL2).

4. Documentation

The following documentation has been made available or has been referred to in developing this assessment of the building -

(i) Copies of the original 1931 Architects plans have been obtained via the MacMillan-Brown Library at the University of Canterbury.
The Architect noted on the plans is G.T. Lucas.
The plans contain extensive information on the reinforcing in the various reinforced concrete members.

(ii) Detailed Engineering Evaluation Report - Structex Metro Ltd

(iii) Costings and Budget Estimates – Davis Langdon New Zealand Ltd

(iv) Report Harley Chambers (2002) – Endel Lust Civil Engineer Ltd

(v) Copy Floor Levels Ground & First Floor – Boss Construction

5. Notes on Building

This section of this report will not be another description of the structure and construction of Harley Chambers. The previous (2002) report adequately describes the structure and there is no need to repeat this here. Some aspects of the construction and structure require clarification for later reference in this report.

Harley Chambers was built in two halves and there are some variations in the construction that alter the assessment of each half.

The Northern 'half' was built in 1928 and a broad outline of the structure is -

(i) Reinforced Concrete 'waffle' roof slab, second floor slab and first floor slab.
A metal tray roofing on timber structure has been built over the waffle roof slab.

(ii) These slabs are supported on reinforced concrete frames around the exterior of the building with an 'internal' concrete encased structural steel frames running East-West and secondary frames running North-South.

(iii) Internal partition walls are of an unreinforced hollow concrete block with a plaster render finish.

(iv) Similarly external walls comprise brick infills to the concrete frames referred to in (ii). These also are finished with a plaster render.

(v) A basement under the Eastern half has reinforced concrete walls and floor. The ground floor section over the basement is of reinforced concrete.

(vi) The rest of the ground floor is timber on joists and bearers on insitu concrete piles.

(vii) The parapet to the Street frontage (to the East) is of reinforced concrete while the parapets to the other walls are of plastered solid double brick between the reinforced concrete columns that extend up beyond the roof.

(viii) The stairs and lift well walls are generally of reinforced concrete.
The walls to the lift shaft above roof level were of brick.

The Southern half of the building was built in 1933 and was designed so as to match the original Northern Section. While most of the construction is very similar there are however some notable differences. Referring to the list above the Southern half structure in broad outline is –

(i) Floor Slabs are as described above. The roof slab is 'exposed' but does have a membrane coating over.

(ii) Floor slabs are supported on reinforced concrete frames to the exterior walls and on reinforced concrete internal walls.

(iii) A number of internal partition walls, to all floors, are of reinforced concrete. All other partition walls are timber frame with lathe and plaster linings except for any modern' alterations which are Gib lined. The plans that accompany the 2002 report indicate these internal concrete walls.

(iv) External wall infill appear to be of brick with a plaster render.

(v) There is no basement under the Southern section.

(vi) The ground floor is timber and the sub floor construction is as described above except for a small toilet block that has a concrete floor.

(vii) Parapet construction appears to be similar to that in the Northern half with a reinforced concrete parapet to the street frontages and plastered brick parapets elsewhere.

(viii) There are no stairs and no lift well in the Southern half of the building. There is a relatively small shaft that may have housed a dumb waiter and this has reinforced concrete walls on at least two sides.

It is evident, post earthquake, that there has never been any real connection between the two buildings. That is, there were no reinforcing bars or bolted plates to join the two building sections. A short piece of steel channel has been installed across this join at the parapet level but this was installed post September 2010 earthquake.

6. Ground Conditions & Existing Foundations

At this stage no actual geotechnical investigation has been commissioned as the time constraints on producing this report would not have allowed sufficient time for this.

The original plans note 'good shingle bottom approx 7' 6" (or 2.3M) from ground level'. On this basis the Basement floor and relatively large footings in the Northern half of the building bear on a good gravek substrata.

This Consultancy was involved in the strengthening to the neighbouring building on Worcester Boulevard (Worcester Chambers) and investigations there confirmed a thin layer of topsoil, where the original surface still exists, to approx 0.30M depth with graded sand below this to a depth of 2.4 to 3.0M. The gravel below this has been confirmed by others to extend down to a depth of approx 8.0 to 10.0M.

The sands below the surface would be categorised as having a moderate susceptibility to liquefaction under seismic loads. Despite this no liquefaction has been observed on this site through all the seismic activity to date.

The perimeter foundations extend approx 600mm to 1.0M into the ground and bear on a sand substrata.

Original plans indicate these foundations to be approx 1.20M wide in an invert 'T' shape with the upper stem approx 500mm wide x 500mm deep and a spread footing approx 600mm deep.

The 'spread' footing is reinforced with 4-24 min dia rods and the upper stem is reinforced with 2 – 20mm dia rods. There is no indication of any stirrups or links in the perimeter foundation.

The foundation to the hollow block walls in the Northern half of the building have been previously checked and these are not as shown on the original plans. The actual foundations are invert 'T' shaped with a spread footing approx 750mm wide. The foundation stem is approx 330mm thick to allow for the hollow concrete blocks (approx 130mm thick) plus a 100mm timber plate either side. Based on the details for the other similar foundations it is expected this footing is likely to have at least three reinforcing bars in the spread footing.

The classification of the site subsoil, in terms of the 'Design Code' NZS/AS 1170 would be 'Class D' for earthquake design.

7. 'Damage'

At the time of the inspection the basement was substantially full of water and it was not possible to inspect this area of the building. It is understood a spring was activated by the earthquake shaking, near the North-East corner of the site. As a consequence there appears to be recent settlement in the North-East corner of the building.

The following is a broad outline of the damage observed –

(i) The brick sides to the lift shaft that project above the roof have collapsed. This brick work has been removed and there appears to be no danger from falling masonry.

(ii) The reinforced concrete stairs show cracking and spalling of the underside concrete near the top of each flight.
The stair flights have been 'tied' to the concrete floor landings as a safety precaution.

(iii) An 'impact' crack in the parapet to part of the North facing wall. This appears to be damage caused by the recent demolition of the neighbouring building at 141 Cambridge Terrace.

(iv) Significant separation and spalling of plaster along the vertical join between the North and South buildings. This is more pronounced on the second floor with more obvious separation on the East side of the building.

(v) Cracking and spalling of plaster render to internal block cracks in the Northern half of the building. Some of this spalling is due to investigation of these walls. This investigation has confirmed diagonal cracking in some of these block infill panels. There is also opening up of cracks along the horizontal join between the infill block and the concrete beam over (either in the waffle floor or a structural beam to a frame).

(vi) Superficial cracking in linings to internal timber frame walls. These are a mixture of lathe & plaster and Gib board lined, depending on the age of the internal partitioning.

(vii) There is some differential settlement around the building but, apart from the North-East corner, this was assessed as largely historic.

(viii) It is clear that the concrete walls to the Basement must be cracked sufficiently to allow for the ingress of water but it is not known the extent of cracking that may have been historic and what is due to earthquake shaking.

8. Assessment

Before remedial work is discussed an assessment of the building is required to determine not only the extent, but also the 'level', of remedial work, and possibly strengthening, that will be required.

(a) Gravity Loads

The deeper footings and Basement floor/foundations bear on a gravel substrata which could be assigned an ultimate bearing capacity of 600 KPa.

Similarly the external perimeter foundations, and the foundation to the internal concrete walls in the Southern half of the building, bear on a sand substrata. This sand substrata could be assigned an ultimate bearing capacity of 300 KPa. This value would be typically reduced, to allow for seismic loading on sand and for assessment purposes it would be recommend that an ultimate bearing capacity of 180KPa is used.

A quick assessment of the worst case deep pad in the Northern half of the building has determined an expected maximum bearing pressure under this pad of approx 500 KPa. This is comfortably less than 600 KPa and therefore is assessed as acceptable.

A similar assessment for an external wall or internal concrete wall indicates an expected maximum bearing pressure under the foundation of 170 KPa. These footings are close to their optimum size and given usual factors of safely would be assessed as acceptable. This bearing capacity for a sand substrata will reduce further if the sand substrata becomes very wet as in the North-East corner of the building where a spring has been activated.

(b) Seismic Loads

The assessment carried out in 2002 determined the Northern half of the building to be approx 68% of the current design Code at that time. Similarly the Southern half of the building was determined to be approx 85% of the then current design Code. These figures were obtained by assessing the capacity of the reinforced concrete columns using the assumptions outlined in the 2002 report prepared by this Consultancy.

Transposing these values to the 2004 Code (NZS/AS 1170) and allowing for the change in 'z' factor outlined earlier these percentages reduce to approx –

49% NBS for the Northern half of the building, and
61% NBS for the Southern half of the building

A more detailed design check will be necessary to fully assess the effect of the 'damage', described above, on these assessments. Given that the main structural elements do not show any noticeable signs of damage, a qualitative assessment of the overall building suggests the Northern half of the building may now be at 40% NBS but with a possible smaller reduction in the Southern half to 55% NBS.

The building is then assessed as -

40 - 49% NBS for the Northern half of the building, and
55 - 61% NBS for the Southern half of the building

The collapse in the projection of the lift well, and the cracking and spalling in the concrete stairs will of course mean the building can only be given limited access but these are not critical structural weaknesses that might affect the basic building structure.

The building is then assessed as not earthquake prone as defined in the 2004 Amendment to the Building Act. Full public access to the building however cannot be granted until repairs and remedial work have been carried out.

9. Repairs & Remedial Work

This section of the report will just deal with structural work in broad outline and cosmetic work such as painting and redecoration will not be itemised.

The remedial work required to restore the building to at least its pre earthquake condition is described in broad outline as -

(i) Rebuild the extension of the Lift Tower above the roof line. This should be possible with a 'light' steel frame, timber framing and a Hardies sheet cladding.

The 'exterior' wall of the lift shaft has windows that may need to be 'filled-in' for compliance with current 'fire' Code. this could be achieved with infill solid filled reinforced concrete block, plastered to match the existing finish on the building.

(ii) Carry out concrete repairs to underside of stairs (e.g. 'Fosroc Renderoc' or 'Sika Mono Top' system).

Install steel plates to underside of stair/floor connection with plates bolt fixed to underside stair and to underside floor slab and connections. Specific design will be required for these plates.

(iii) Dismantle and rebuild the brick parapet section on part of the North wall. Use Helifix ties to pin down the parapet to the concrete roof slab and use a reinforced plaster system over the brick – e.g. 'Mapei Plaintop HDM Maxi'.

(iv) Remove loose plaster bricks etc in vertical separation gaps between North & South buildings. Connection detail between the two will require more detailed investigation and design. For pricing purposes a suggested connection system is to use 150 x 150 x 10 steel angles or 300 x 10mm steel flats, each 300mm long with 4 – 18mm dia holes for M16 bolts to be epoxy fixed into either side of the gap, that is into either building half. It is estimated three such connections at each wall join for each floor plus at least two such joins into the parapets. That is approx 40 such connections in total.

(v) In the Northern half of the building remove all hollow block infill wall sections that have diagonal cracking and replace with 140mm reinforced solid filled concrete block walls. Reinforce these wall sections with H12 bars vertically at 400 c/c and D12 bars at 600mm c/c horizontally. Epoxy starters and beam or column ties into surrounding concrete frame, or into existing foundation.

Finish walls off on both sides with plaster render to match existing.

Block wall sections to be replaced are to be site verified. **Note** the installation of the block wall sections will result in an increase in the 'strength' of the Northern half of the building. An assessment of this will not be possible until the extent of the walls to be replaced is known. It is expected that this should result in the Northern half of this building achieving a percentage NBS very close to that of the Southern half.

(vi) Generally superficial cracking in linings to internal timber frame walls would be required in accordance with Gib Publications - '*Guidelines for Repairing Gib Plasterboard Linings in Wind or Earthquake Damaged Properties'*.

(vii) The differential settlement around the North-East corner is of some concern and the part of the building that projects here past the Basement should be underpinned.

Underpinning could be easily achieved using screw piers around this part of the building. Screw piers to be situated under each existing concrete column (i.e. six piers in total). Maximum Ultimate (i.e. factored) load per pier is estimated at 500 kN. Screw piers should achieve satisfactory torque a short distance into the gravel substrata or at a depth of 2.5 – 3.0M.

Screw pier/foundation connections to later detail. If access onto the neighbouring North site is possible then screw piers can be placed from 'outside' the building.

Alternatively machine reach in from the windows on the East & West walls should be possible to install piers 'inside' the existing foundation. This alternative will require lifting part of the timber floor and replacing the floor when piers are in place.

As a long term objective it is recommended that all of the outer perimeter foundation should be underpinned with screw piers.

(viii) It is understood the 'spring' has been 'capped' but this will need to be checked before any foundation or basement work is commenced.

Pump water out of Basement and set up 'well-pointing if necessary to maintain a dry basement while remedial work is carried out.

When basement walls and floor are exposed Engineer to examine cracks and determine if any extra remedial work is required. Fill cracks with suitable epoxy resin. 'Waterproof' walls and floor of basement using a suitable product that can be applied to the internal face of the concrete walls and floor –

e.g. 'Hitchens Vandex' (if available), or –
'Equus Penetron', or –
'Aquron 2000'

10. Strengthening

Strengthening over and above the remedial work outlined above will be dependant on the proposed use and as a consequence the layout of the repaired building. If a change of use is proposed then the extent of strengthening required will require some discussion and negotiation with the Christchurch City Council as to what will be an acceptable percentage NBS to be achieved.

If a change of use is not proposed then the target of 67% NBS may be a requirement of the Owners. It is not possible to be specific on the work required to achieve this but given the repaired building will be at about 50-60% NBS the relatively small increase to achieve 67% NBS should be relatively easy to achieve.

It is envisaged this would require replacement of more internal hollow block walls with reinforced concrete block walls in the Northern half of the building and the installation of some structural steel frames in the Southern half of the building.

11. Conclusions

The structure of Harley Chambers is assessed as not earthquake prone following the seismic activity in Christchurch from September 2010 through to February 2013.

This report has described in broad outline a repair strategy to restore the building to at least its pre earthquake condition.

With the repair work completed, it is estimated the building will be at about 50-60% NBS but further detailed analysis will be required to determine this more accurately.

Further strengthening to achieve a higher percentage NBS has only been discussed in brief. Extra strengthening would vary depending on a number of variables (proposed use of building, proposed layout of walls and costs) and this was considered to be beyond the brief of this report.

The building in its present state is assessed as suitable for limited access for Contractors and Consultants. The structure has been 'made safe' but damage to stairs and the lift well mean that the building cannot be assessed as suitable for public use.

It should be noted that the structural works will require a Resource Consent and a Building Consent. The Building Consent Application will trigger consideration of other issues (access for disabled, a fire safety summary, an update of services and possibly an assessment of insulation for the building). It is assumed these issues will be dealt with by other Consultants and they have not been considered in this report.

Endel Lust B.Sc., M.E., M.I.P.E.N.Z., CP Eng., Int PE
Chartered Professional Engineer No 36240
March 2013

APPENDIX

Earlier report on Existing Building - Cnr Worcester Street & Cambridge Terrace 'Harley Chambers' dated June 2002 with :

- A4 Ground Floor
- A4 First Floor Plan
- A4 Second Floor Plan

Report on Existing Building
Corner Worcester Street & Cambridge Tce
'Harley Chambers'

1.Preliminary

The above building is a three-storey structure which is currently leased as a number of separate offices, medical rooms and teaching spaces.

The teaching spaces are to be all concentrated on the three floors at the North-West corner of the building and this is to involve removing a number of existing internal walls and building new internal walls to form three separate classrooms on each floor.

The existing internal walls to this part of the building are of hollow-core reinforced masonry and therefore the alterations will affect the lateral bracing of the building.

A report is therefore necessary which assesses the existing 'strength' of the building and addresses how the bracing that will be lost can be replaced within the altered building. While from a town-planning aspect the proposed alteration does not constitute a change of use; the alterations will result in a more intensive use of the building with higher occupancy rates than intended for the original building. Section 46 of the Building Act therefore needs to be considered in terms of the structural behaviour of the building as nearly as is reasonably practical to the same extent as if it were a new building.

2.Description Structure of Building

The building as it stands today was built in two stages. The first stage was built in 1928 and comprised approximately the Northern 'half' of the building. The second stage (Southern 'half') was built in 1933.

The first stage was a stand alone three-storey building which included the lift shaft and the main stairs. This stage comprised concrete frames to the external walls. These frames are infilled with cavity brick and block construction, the external face of which have been finished with a plaster render. Internal walls are generally of hollow core, unreinforced masonry comprising blocks that are approx 130mm thick.

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reinforced with 2-22mm dia bottom bars to the longer spans (approx 6.2m) and 2-20mm dia bars to the shorter spans (approx 5.6m-6m). These beams also have 2-12mm dia top bars plus 2-10mm dia stirrups at approx 350mm c/c. In the secondary directions the beams are reinforced with 1-16mm dia bottom bar and 2-16mm dia top bars with 10mm dia stirrups again at approx 350 c/c.

While this description suggests substantial reinforcement to the 'waffle' floor & roof slabs, unfortunately the original plans do not suggest that the bars are tied into the supporting elements (walls & frames).

The reinforced concrete frames to the external walls comprise concrete columns between windows and therefore at varying spacings between 3m and 4m centres. These columns are generally 600mm x 300mm and reinforced with 6-20mm dia bars plus 'No. 6' (approx 5mm dia) steel wire hoops (stirrups) at 250mm c/c. These columns support reinforced concrete beams around the edge of the floor & roof slabs. These beams are 300mm wide and 875mm deep. These beams are reinforced with 4-24mm dia bottom bars and 2-20mm dia top bars with 10mm dia '? ' shaped stirrups (i.e. not closed stirrups) at 250mm c/c by the columns and at 600mm c/c elsewhere.

These external walls, and frames, are supported on reinforced concrete foundation beams approx 400mm wide with a continuous wider footing of 1.20m width. The overall depth of the foundation beam is approx 1m and is reinforced with 2-20mm dia top bars and 4-24mm dia bottom bars but with no stirrups.

The internal structural frame legs are supported on separate reinforced concrete pads approx 3m x 3m square and 1.2m deep and reinforced with 24mm dia bars at 200mm c/c both ways near the bottom of the pad.

The internal block walls are supported as foundation beams 330mm wide with continuous wider footing of 730mm width. The overall depth of this foundation beam is 625mm but there is no information on the reinforcing in this beam.

The plans that are available indicate reinforcing (12mm & 10mm dia) in the aprons & wall sections to the street frontages but there is no information on spacing of such bars.

The 'perimeter' beam to the roof slab extends up beyond the roof line to form a parapet approx 1.5m above the roof. Site inspection confirmed reinforcing in this parapet with at least one exposed 12mm dia vertical bar.

The plan attached to this report shows the basic plan and structural elements as described above.

described above, are assessed as adequate to support the building loads.

3.Floor Loads

An important assessment for the perceived 'change of use' will be an assessment of the live load capacity of the suspended 'waffle' reinforced concrete floors.

The current 'Design Loading' Code – NZS 4203 sets out design live loads for various spatial occupancies. 'Educational' – class rooms are to be designed for a basic live load of 3.0 KPa and offices for general use – 2.5 KPa.

The suspended waffle floor slab has been checked based on the information outlined in the previous section and based on the following assumptions: -

'concrete strength'	fc'	=	15 MPa
reinforcing steel yield strength	fy	=	250 MPa

and using a relatively conservative design approach the maximum calculated super imposed live load on this floor system is 3.28 KPa. This is greater than 3.0 KPa and therefore the existing 'waffle' type suspended reinforced concrete floors are assessed as acceptable for the higher design load associated with an 'educational' use.

4.The Building Act

The proposed alterations to the building will require compliance with Section 38 of the Building Act.

This section of the Act requires that the whole building will –

(a) 'Comply with the provisions of the building code for means of escape from fire, and for access and facilities for use by people with disabilities..... as nearly as is reasonably practicable to the same extent as if it were a new building and

(b) Continue to comply with the other provisions of the building code to at least the same extent as before the alteration. '

In structural terms this means that the building structure cannot be 'weakened' and an assessment is required to ensure the building is not 'earthquake prone'. A definition of an 'earthquake prone' building is outlined in Section 66 of the Act, and this is a building that would not survive a 'moderate earthquake'. A 'moderate earthquake' is also defined in the Act and this is a relatively low intensity earthquake.

earthquake'.

The building as described is clearly not an unreinforced masonry structure as such, although it does contain some 'infill' elements and some internal walls that are of unreinforced masonry. An assessment has been carried out on the basic concrete frames as described earlier in so far as is possible within the information available.

Based on an elastically responding structure with a structural ductility factor of $\mu = 1.25$ and a seismic coefficient of $C = 0.37$ the design capacity of the structural elements is calculated as 68.8% of capacity required using current design loads. This assessment allows for the expected increased design floor live loads and includes an allowance for a strength reduction factor.

This assessed capacity is for the North 'half' of the building being that part of the building which contains some sections of unreinforced masonry. The South 'half' has reinforced concrete internal walls which will have some shear capacity and therefore would 'prop' the existing reinforced concrete columns in their 'weak' direction. These wall sections are 250mm thick to ground & first floor and 200mm thick to the second floor by 3m high and therefore will have good shear capacities but will increase the capacity of the South half of the building to about 85% of current code requirements.

Existing foundations are of substantial mass concrete with extensive reinforcing but lacking any stirrups or ties. There is however a network of interconnecting foundation beams and it could be expected that these are reasonably well tied together. (This is evidenced by the lack of any differential settlement). Foundations are assessed as adequate with no seismic strengthening required.

The design capacity of the elements discussed above could be increased significantly if the reinforced concrete frames could be assessed as having limited ductility. While there could be some justification for such an assumption (based on the significant amount of reinforcing) unfortunately there is a lack of 'tying in reinforcing' and the 'containment reinforcing' (stirrups) are at relatively wide centres and such an assumption would not be prudent.

The ductility, in particular to the North half of the building, could be significantly improved by the installation of some reinforced shear walls (concrete or block). Better tying of floors to concrete frames would also assist the seismic resistance of the building. This could be easily achieved as the 'waffle' floor, and roof slabs offer numerous, and regular, beam positions where to tie the floors to the perimeter concrete frames. These ties could be drilled and epoxied rods or 'Helifix' ties could be used to improve the overall ductility performance of the building structure.

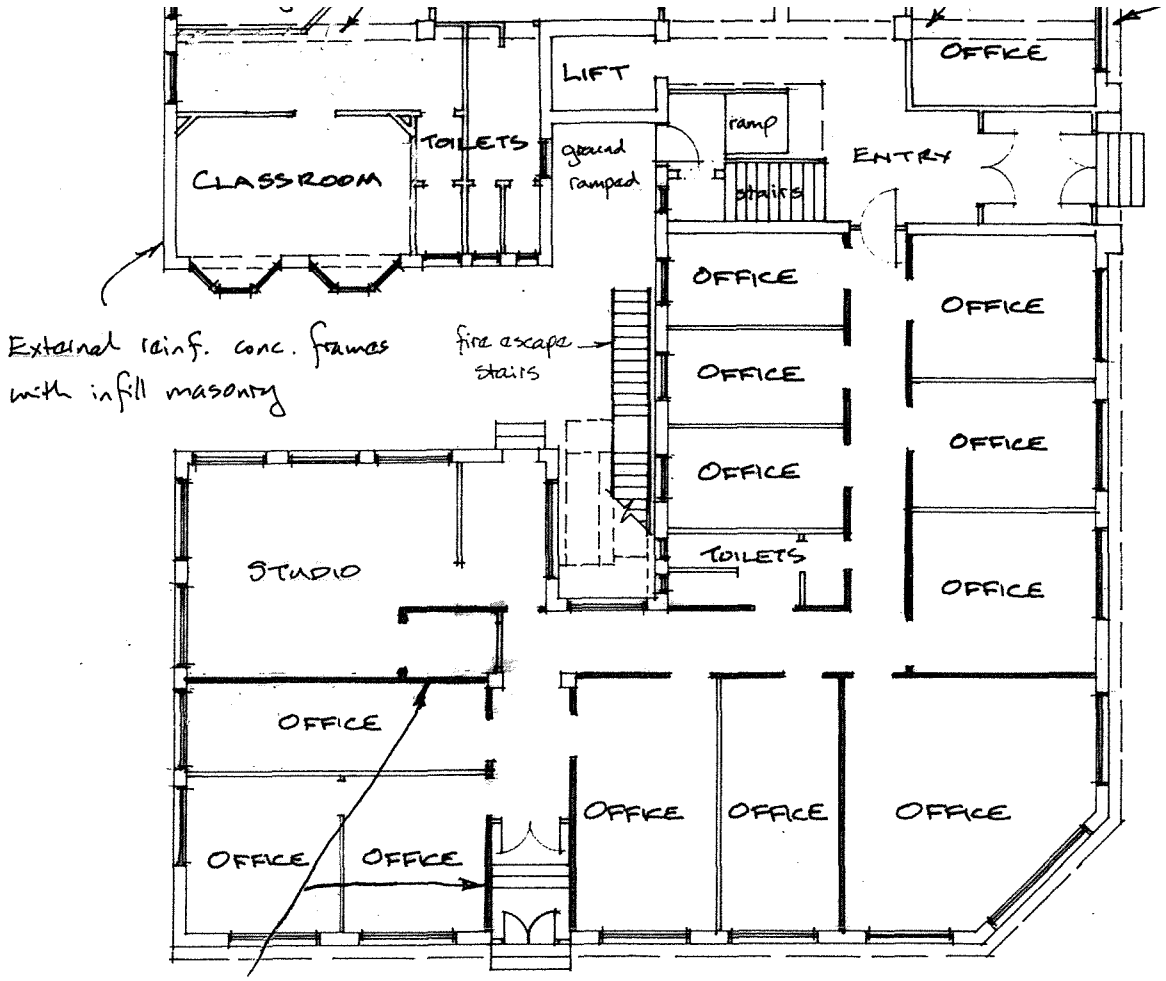
therefore not necessary at this time as a consequence of the proposed internal alterations to part of the North half of the building.

The internal alterations are to comprise removing some existing internal hollow core block walls and install new walls to create new class room spaces. It is recommended that these new walls should be of reinforced concrete block. While these new walls will be relatively economic to build, especially if they replace existing hollow core block walls on their existing foundations, they will also offer very effective sound proofing between class rooms. More importantly these new reinforced concrete blockwalls will significantly improve the seismic capacity of the North part of the building.

It is further recommended that as other tenancies are upgraded in the North half of the building that a similar approach of replacing hollow core block walls, with new reinforced block walls, should be adopted to eventually achieve a building that will be up to current code in terms of its seismic resistance. **Note** given the present level of seismic resistance this is <u>not</u> a requirement but a recommendation.

A longer term goal for the Owners is worth recording here is with some relatively simple securing it is considered that the whole building could be brought up to current code standard. The extra tying of the concrete floor & roof slabs can be achieved quite simply by installing 'pins', or 'Helifix ties', at 750 c/c (that is at beam centres to the waffle slabs) around the perimeter of the building. This would remove all doubt in respect of the extent of existing tie reinforcing and would achieve a building close to current code seismic requirements.

Endel Lust
<u>June 2002</u>



'HARLEY CHAMBERS' - GROUND FLOOR PLAN

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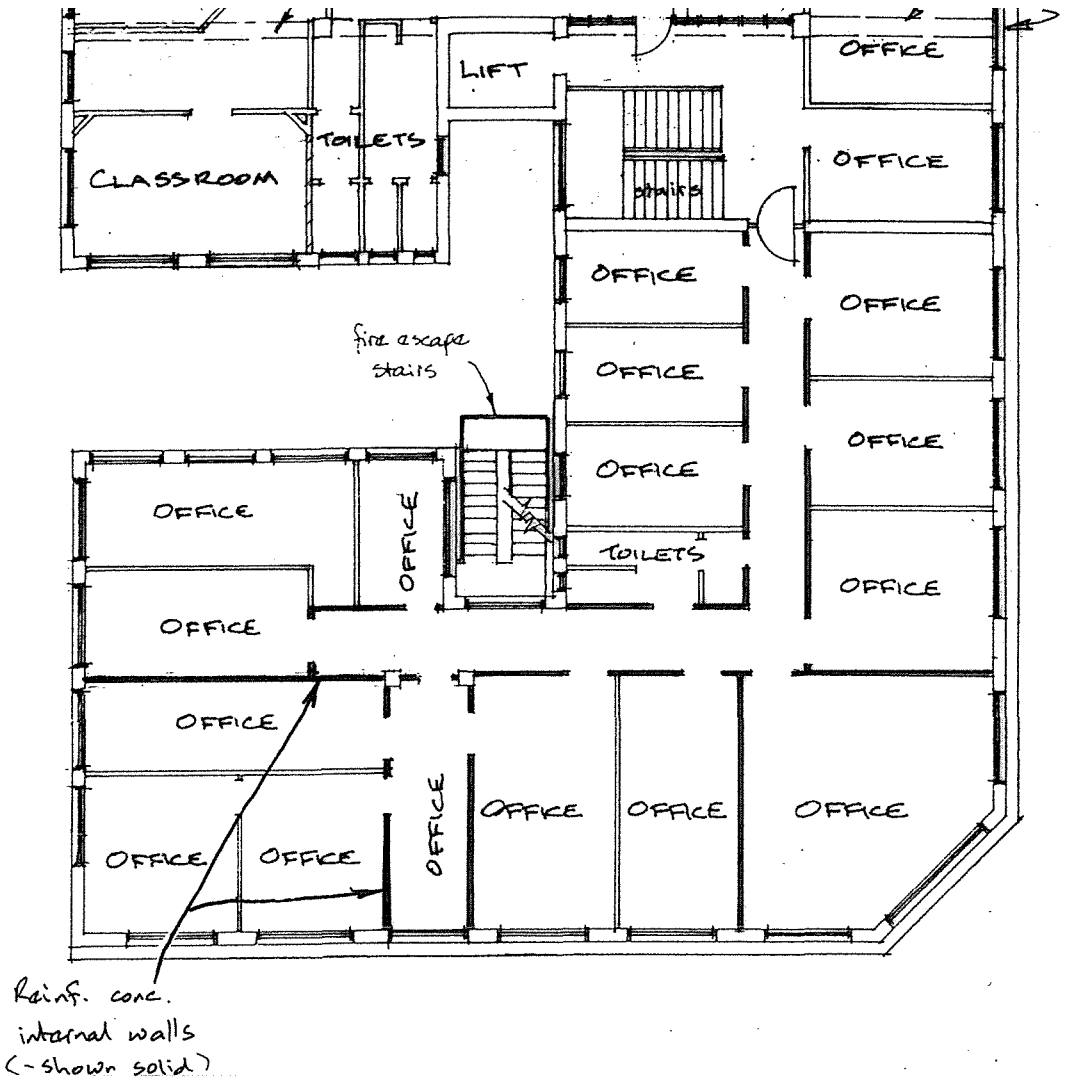
	DATE: 24/6/2002	APPROVED:		



CAMBRIDGE TERRACE

WORCESTER STREET

'HARLEY CHAMBERS' - FIRST FLOOR PLAN

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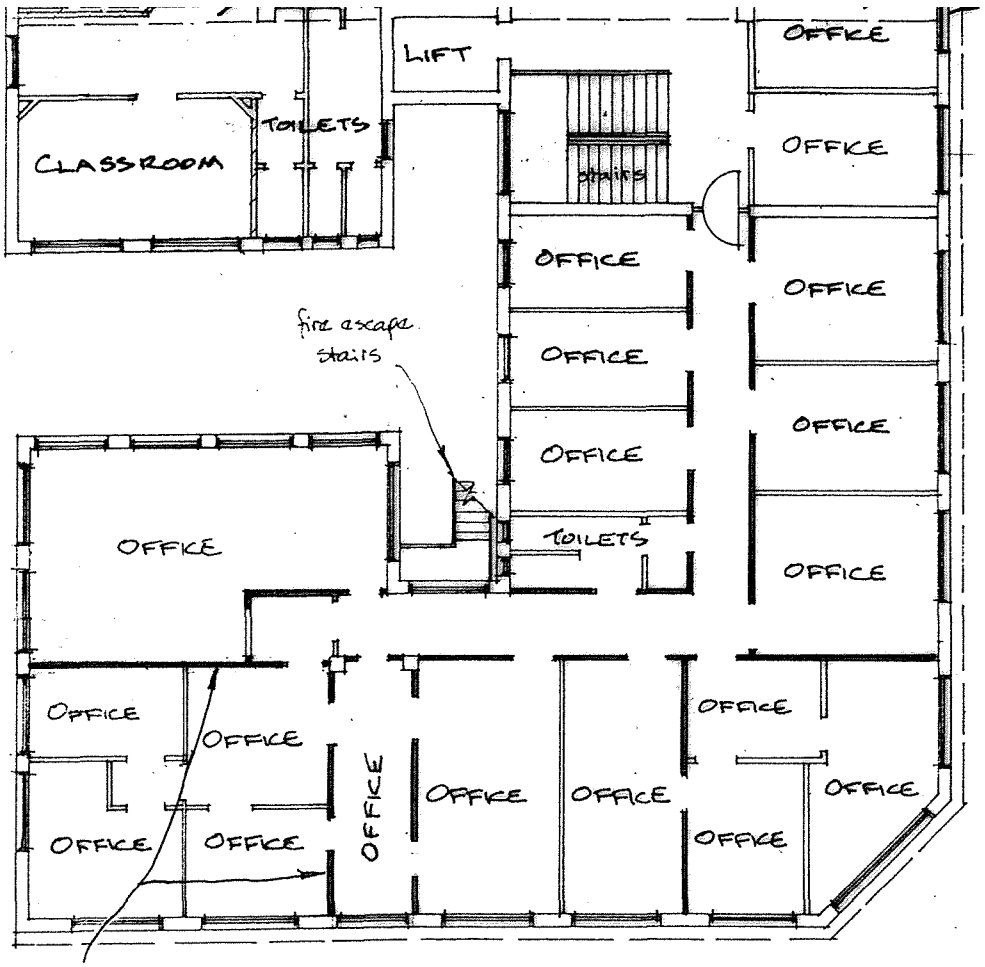

CAMBRIDGE TERRACE

WORCESTER STREET

'HARLEY CHAMBERS' - SECOND FLOOR PLAN

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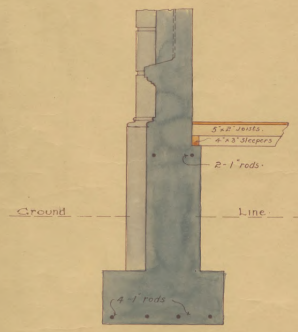
	DATE: 24/6/2002	APPROVED:		

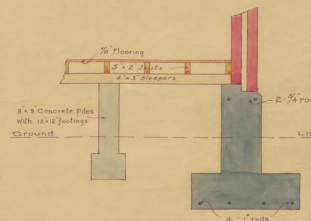
APPENDIX E - A SELECTION OF ORIGINAL STRUCTURAL ENGINEERING DRAWINGS PROVIDED FROM CHRISTCHURCH CITY COUNCIL

PLAN OF EXTENSIONS TO HARLEY CHAMBERS CHRISTCHURCH

DRAWING No. 1



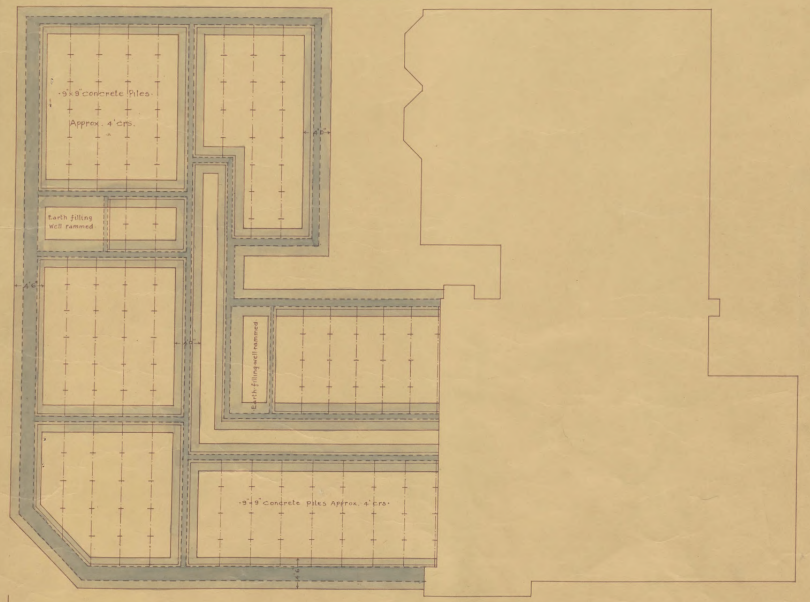
SECTION THROUGH FRONT WALL FOUNDATION
Showing average depth
Scale ½" = 1 Foot



TYPICAL FOUNDATIONS Showing average depth of all foundations other than front wall
Scale ½" = 1 Foot

DIGBY'S COMMERCIAL COLLEGE

RIGHT OF WAY



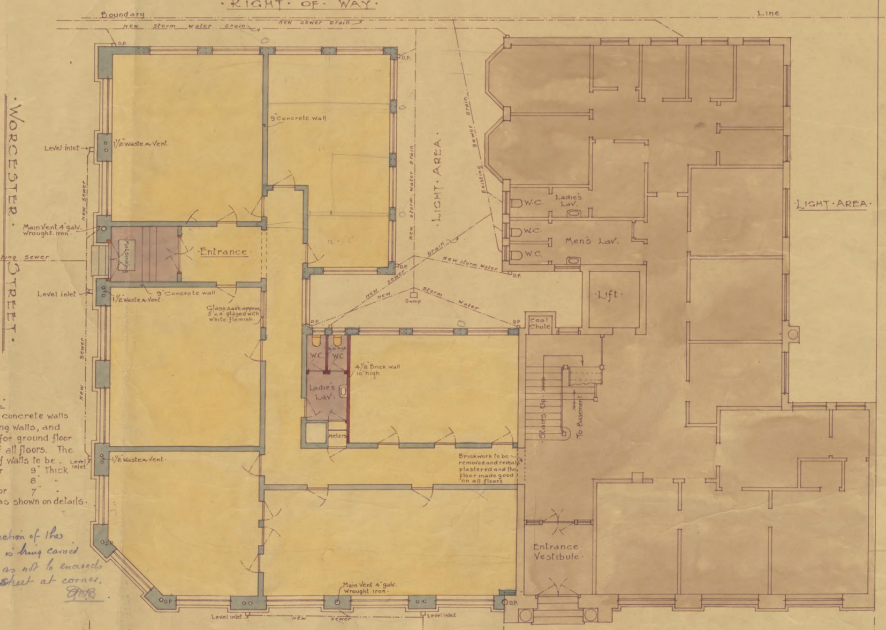
FOUNDATION PLAN

Scale ⅛" = ONE FOOT

IMPORTANT NOTICE
EXAMINE POST AND TELEGRAPH DEPARTMENT'S UNDERGROUND CABLING PLANS BEFORE COMMENCING WORK.

NOTE
The internal concrete walls are all bearing walls, and the layout for ground floor is typical of all floors. The thickness of walls to be:-
Ground Floor 9" thick
First Floor 6" "
Second floor 7" "
Reinforced as shown on details.

The erection of this building is being carried out so as not to encroach on the street at corners.



GROUND FLOOR PLAN

CAMBRIDGE TERRACE

"DANGER" ELECTRIC WIRES

This permit does not exempt the holder from giving to the Inspector of Scaffolding the notice required by the Scaffolding and Excavation Act 1905

CHRISTCHURCH CITY COUNCIL
Approved subject to the By-Laws
JUN 1956
City Engineer

It is possible that this portion of the project will be lowered with a concrete bonnet when the additions were made. The project as handed in is not as shown on sheet 4.
16/9/70

G.T. LUCAS
ARCHITECT

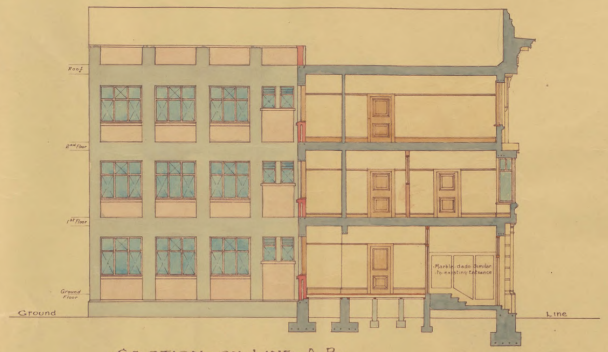
PLAN OF EXTENSIONS TO HARLEY CHAMBERS CHRISTCHURCH

DRAWING No. 2

WEST ELEVATION FACING RIGHT OF WAY

NOTE

All three floors to be subdivided and fitted up as shown on first floor plan prices for this work to be scheduled as set out in the specifications



SECTION ON LINE A B

7210 sf wood walls on floors.

FIRST FLOOR PLAN

SCALE 1/8" = ONE FOOT

SECOND FLOOR PLAN

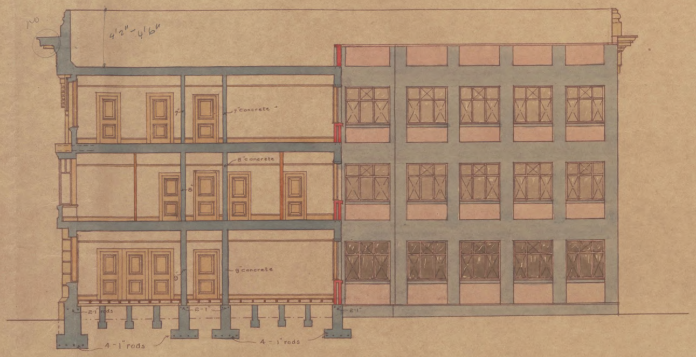
G T LUCAS
ARCHITECT

PLAN OF EXTENSIONS TO HARLEY CHAMBERS CHRISTCHURCH

DRAWING No. 3

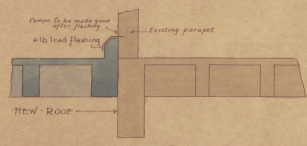
ELEVATION TO WORCESTER STREET

CORNER ELEVATION



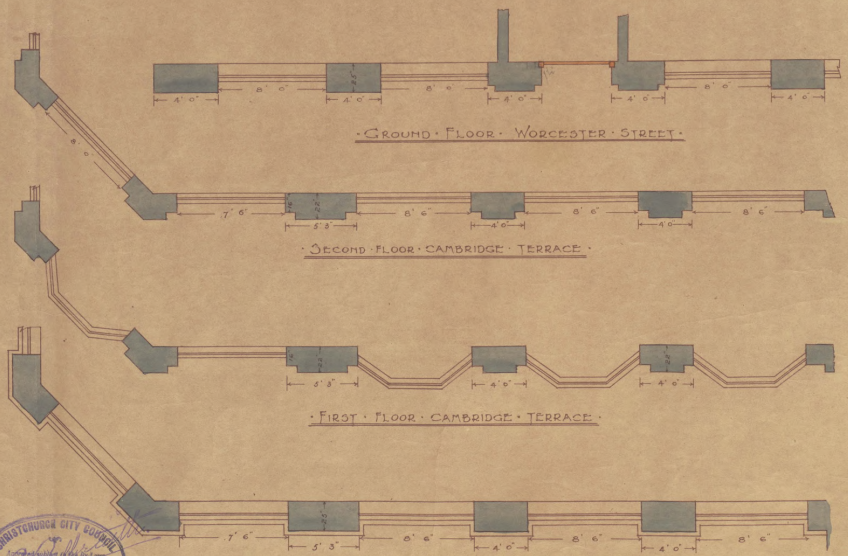
SECTION ON LINE C D

ELEVATION ON TO LIGHT AREA facing north



½" DETAIL SHOWING METHOD OF JOINING NEW ROOF TO OLD BUILDING

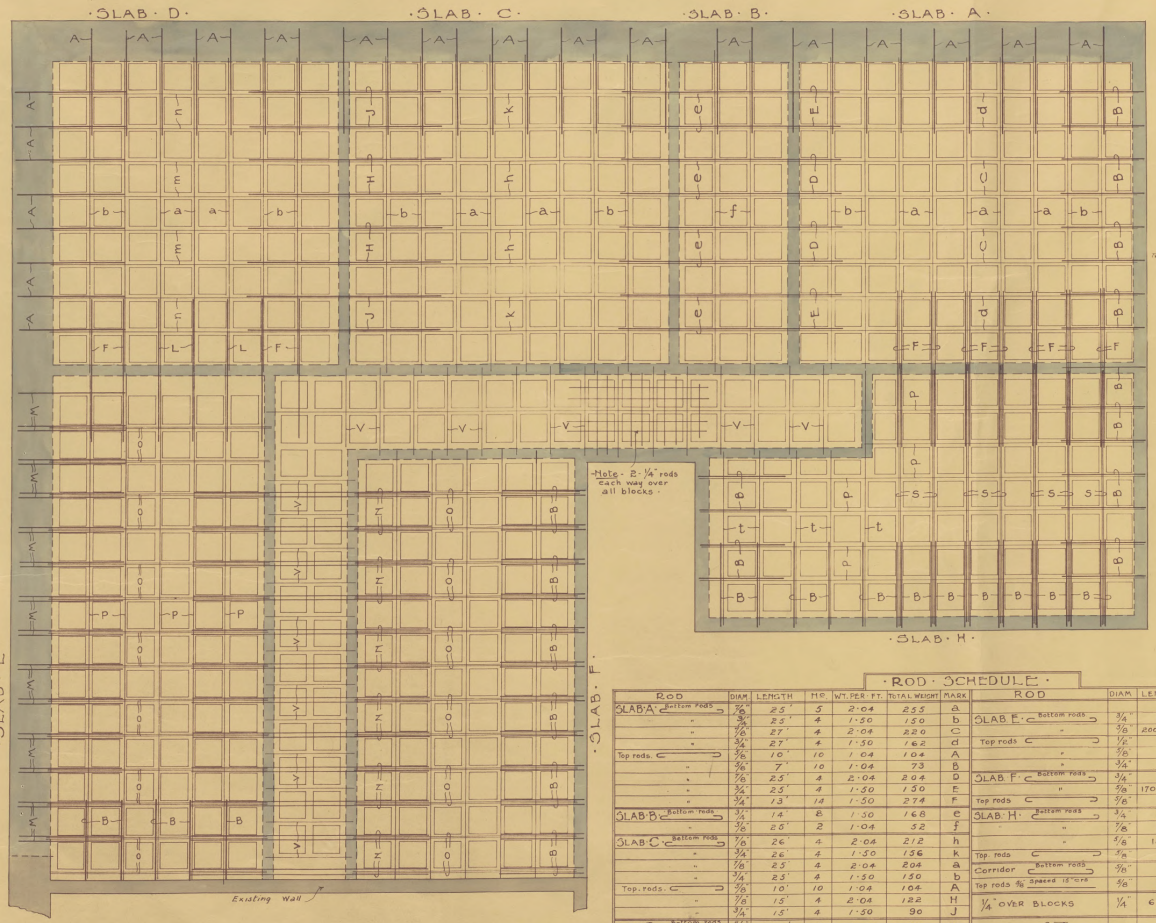
ELEVATION TO CAMBRIDGE TERRACE



G. T. LUCAS
ARCHITECT

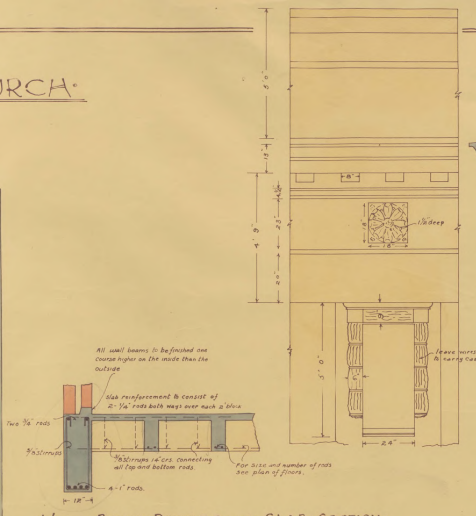
PLAN OF EXTENSIONS TO HARLEY CHAMBERS CHRISTCHURCH

DRAWING No. 4

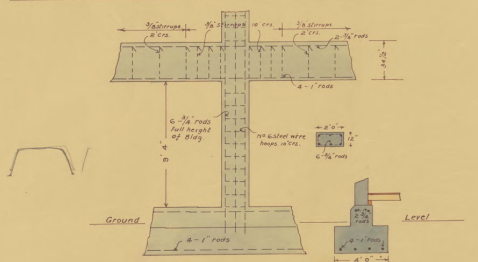


TYPICAL FLOOR DETAILS for 1ST FLOOR 2ND FLOOR and ROOF

SCALE ¼" = 1 FOOT

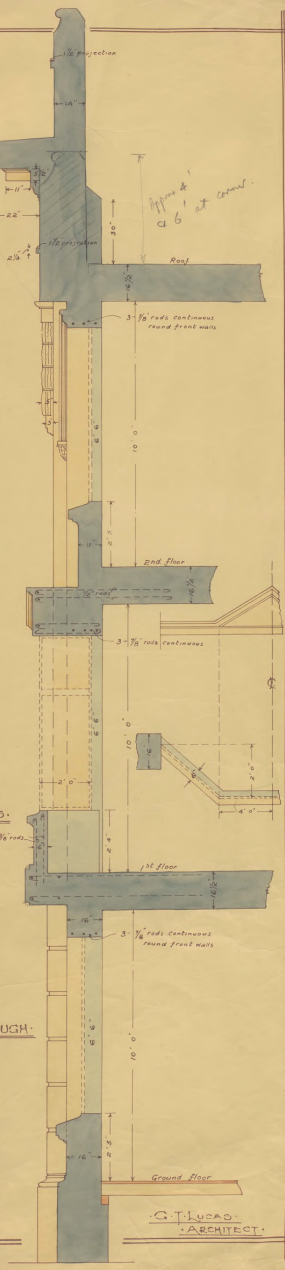


WALL BEAM DETAILS and SLAB SECTION



TYPICAL DETAILS OF WALL COLUMNS and FOUNDATIONS

SCALE ¼"



½" SCALE SECTION THROUGH FRONT ELEVATION

ROD SCHEDULE

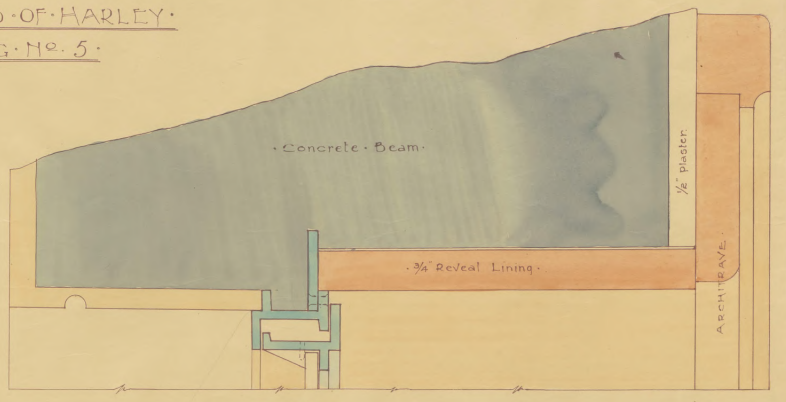
ROD	DIAM	LENGTH	NO	WT. PER FT.	TOTAL WEIGHT	MARK
SLAB A Bottom rods	⅜"	25'	5	2·04	255	a
"	⅜"	25'	4	1·50	150	b
"	⅜"	27'	4	2·04	220	c
"	¾"	27'	4	1·50	162	d
Top rods	⅜"	10'	10	1·04	104	A
"	⅜"	7'	10	1·04	73	B
"	⅜"	25'	4	2·04	204	D
"	¾"	25'	4	1·50	150	E
"	¾"	13'	14	1·50	274	F
SLAB B Bottom rods	¾"	14'	8	1·50	168	e
"	⅜"	26'	2	1·04	52	f
SLAB C Bottom rods	⅜"	26'	4	2·04	212	h
"	¾"	26'	4	1·50	156	k
"	⅜"	25'	4	2·04	204	a
"	¾"	25'	4	1·50	150	b
Top rods	⅜"	10'	10	1·04	104	A
"	⅜"	15'	4	2·04	122	H
"	¾"	15'	4	1·50	90	J
SLAB D Bottom rods	⅜"	24'	4	2·04	196	m
"	¾"	24'	4	1·50	144	n
"	⅜"	25'	3	2·04	153	a
"	¾"	25'	4	1·50	150	b
Top rods	⅜"	10'	16	1·04	167	A
"	⅜"	13'	4	2·04	106	L
"	¾"	13'	2	1·50	39	F
				Total	3,805	

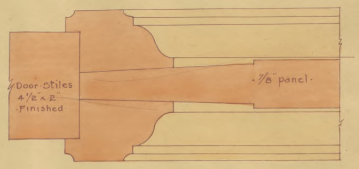
ROD	DIAM	LENGTH	NO	WT. PER FT.	TOTAL WT.	MARK
					3,805	
SLAB E Bottom rods	¾"	18'	30	1·50	810	O
"	⅜"	200 R.FT.		1·04	205	P
Top rods	½"	10'	28	0·67	190	M
"	⅜"	7'	5	1·04	650	B
"	¾"	18'	24	1·50	650	N
SLAB F Bottom rods	¾"	18'	24	1·50	650	O
"	⅜"	170 R FT.		1·04	176	P
Top rods	⅜"	7'	29	1·04	196	B
SLAB H Bottom rods	¾"	20'	14	1·50	420	S
"	⅞"	14'	5	2·04	142	t
"	⅝"	180 R FT		1·04	187	P
Top rods	⅜"	7'	29	1·04	210	B
Corridor Bottom rods	⅝"	7'	28	1·04	205	V
Top rods ⅝" Spaced 15" crs	⅝"	19'	34	1·04	670	
¼" OVER BLOCKS	¼"	6100 R.FT.		0·17	1040	
Stirrups	⅜"	1'6"	650	0·38	370	
Stirrups	⅜"	3'2"	180	0·38	220	
				TOTAL	10796 · 4·8tons	

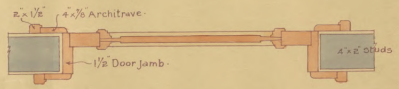
G. T. LUCAS ARCHITECT

DETAILS OF HARLEY

DRAWING No. 5

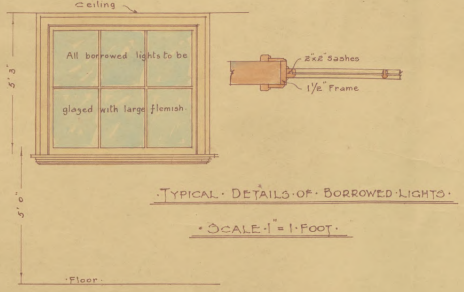






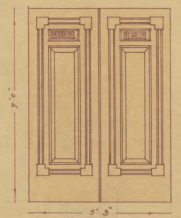
SECTION A-B THROUGH INTERNAL DOORS

SCALE 1½" = 1 FOOT

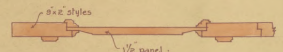


TYPICAL DETAILS OF BORROWED LIGHTS

SCALE 1" = 1 FOOT

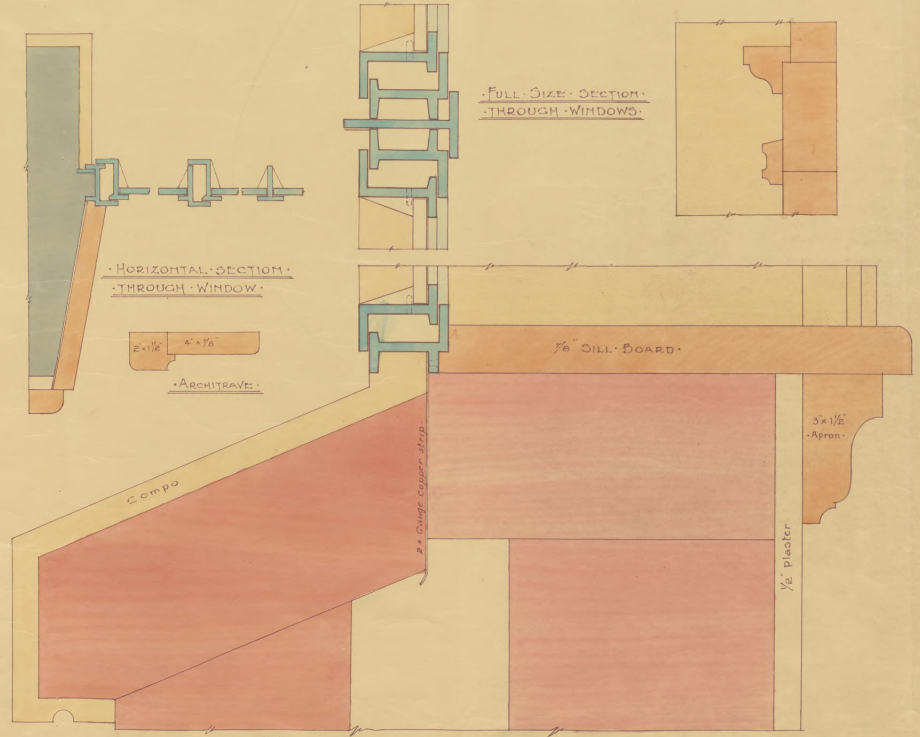


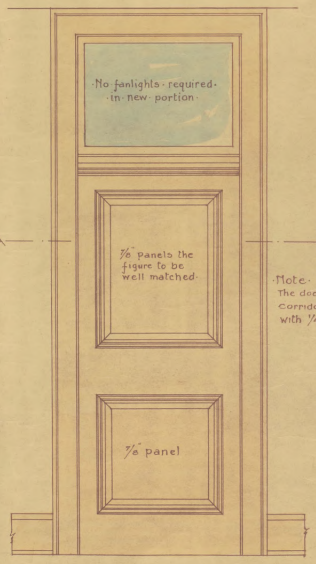
Scale ½" = 1 Foot



DETAIL OF ENTRANCE DOORS

SCALE ½" = 1 FOOT

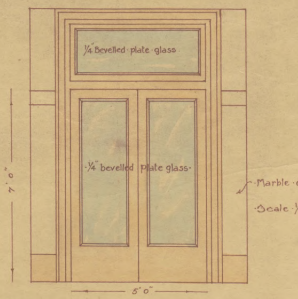




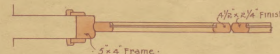
Note. The doors onto Corridor to be glazed with ¼" Flemish

TYPICAL DETAIL OF INTERNAL DOORS

SCALE 1" = 1 FOOT



Scale ½" = 1 Foot



Scale 1" = 1 Foot

G. T. LUCAS
ARCHITECT

APPENDIX F - NOTES BY WIN CLARK ON SITE INSPECTION DATED 13 JULY 2012

Daresbury (dwelling)

67 Fendalton Road, Christchurch

NZHPT: Category I

Owner:

Notes by Win Clark on site inspection dated 13th July 2012

This report is based on a 1-½ hours 'walk-by' inspection of the building exterior and part interior, my knowledge of materials and construction used for similar types of buildings and their potential performance during a significant earthquake event. No 'opening up' or testing of materials was carried out, nor review of construction drawings. There may be variations to the construction and material noted below, but the overall assessment is valid.

The report has been prepared for the sole use of New Zealand Historic Places Trust, to assist in their assessment of the dwelling. The details and conclusions of this report are not intended for any other purpose or use by any other parties. There may not be sufficient information for the purpose of other parties or other uses. The professional engineering services provided are performed using a degree of care and skill normally exercised, under similar circumstances, by reputable consultants practicing in this field at this time. No other warranty, expressed or implied, is made as to the professional advice presented in this report.

Form and Materials of Construction

The 2-storey dwelling has additional rooms in the large roof space, and a part basement. In the southwestern area from the main building there are two one-storey extensions with rooms built into the roof space.

Construction of the perimeter walls to the ground floor of the main building is unreinforced brick masonry supported on brick footings. The floors are timber-framed, as are the internal partitions with internal linings of lath & plaster. The first-floor perimeter walls of the main building are timber post & beam with infill brickwork that has a white pebbledash plaster finish on the outside between the posts which are painted black. Again internal linings are lath & plaster. The roof is generally clay tiled supported on timber framing. The gable ends have extensive decorative element formed with exposed timber and plaster pebbledash finish between.

The single storey extensions have unreinforced brick masonry up to windowsill level, timber post and beam above to eaves level with exposed decorative brickwork between or pebbledash plaster finish on the brickwork. The gable ends are similar to the main building, with the roof timber-framed supporting clay tiles. Around the South side of the extensions, through to the main East face, the unreinforced brickwork is taken up to eaves level.

All the chimneys are constructed in unreinforced brick masonry.

Earthquake Related Damage

Damage due to the Darfield (Canterbury) earthquake sequence that started on 4th September 2010 has caused extensive damage throughout the dwelling. However, apart from the Northwest area of the main building, the damage is generally secondary in nature and can be relatively readily repaired. In my opinion, the main structure is sound and is not in a state of near collapse. If it was, windstorms in the last 18-months would have exacerbated the earthquake damage; this is not the case.

The main damage observed consists of:

- All chimneys have collapsed down to roof or first floor level. Extensive secondary damage has occurred particularly where the masonry from the chimneys has impacted on the roof tiles.
- West perimeter wall of the main building at the Northern end has settled on each side of the french doors causing significant cracking and distortion of the brickwork. This settlement has distorted the floors in this area. At the South corner, and around to the South side at first floor level, the plaster cladding and supporting brickwork has fallen out.
- West side of Southern extension, the brickwork under the window has been damaged and tended to rotate outwards.
- Numerous cases of cracking on the exterior where relative movement has occurred between adjacent elements such exposed timber posts and pebbledash plaster, and cracking of brickwork.
- Numerous cases of cracking in the interior where relative movement has occurred between adjacent wall elements, or wall to ceiling junctions.
- Significant damage to the roof tiles, particularly on the North-facing slope. This consists of the tiles becoming loose due to the shaking and distortion of the roof framing.

Repair and Retrofit

Elements of the main structure that could be observed appeared to be in good condition, and the structure has withstood the effects of the earthquakes very well, with the damage as noted above. Obviously the high intensity of the ground shaking has caused distortion of the building frame, but has not greatly affected its integrity.

It is suggest that an outline scope of work would include:

- West Side, North Section: Prop the first floor to allow demolition of the brickwork to the ground floor. Provide new foundations and reconstruct brick masonry back up to first floor level. Apply composite fabric to the inner face of the brickwork to enhance its load carrying capacity, and upgrade the fixings to the main structure. Re-level floors and fix perimeter to walls. Repair brickwork and plaster finish to first floor area around the South side.
- West Side, spandrel under window: demolish brickwork and reconstruct on new foundations with additional tying to framing behind.
- All Exterior Brickwork: Install transverse tying of the brick masonry through the brick wythes into the timber framing adjacent or behind the brickwork.
- Reconstruct chimneys with appropriate strengthening (internal galvanized steel tube grouted in place) and tying into the roof and first floor framing. Provide and fix stainless steel reinforcing into every third horizontal mortar joints of the chimneystack.

- Provide additional tying of the roof and floor framing into the supporting wall framing.
- Determine what additions internal bracing is required to selected walls throughout the building to provide an acceptable earthquake resistance for the building as a whole. Strip the lath & plaster off these walls and reline with sheet bracing material properly nailed. Provide, fit and fix additional 'hold-downs' at each end of the bracing walls, for the full height of the building down into new anchor piles.
- Enhance the diaphragm capacity of the timber-framed floors and roof structure where required. This may consist of plywood overlay connected into the perimeter and internal walls.
- Repair and relay roof tiles.
- Repair and make good the exterior cladding and decorative elements.
- Repair and make good the interior finishes and decorative elements.

It is strongly recommended that the temporary weather protection be enhanced immediately where damage has occurred to exterior wall and roof cladding. This is to minimize further deterioration of the building fabric that could significantly add to the repair cost.

Strengthening to 67% of New Building Standard (NBS) can readily be achieved. The work as noted above is extensive, but significantly less expensive than a rebuild.

Win Clark
BE(Civil) CPEng IntPE(NZ)

APPENDIX G - DAVE PEARSON ARCHITECTS, HERITAGE ASSESSMENT AND DEFECTS/REMEDIAL WORK SCHEDULE, 19 JUNE 2019

DARESBURY

67 FENDALTON ROAD,

FENDALTON, CHRISTCHURCH

HERITAGE ASSESSMENT AND DEFECTS/REMEDIAL WORK SCHEDULE

19.06.2019

dave pearson architects
83 Victoria Road, P.O. Box 32-318, Devonport
Auckland, New Zealand, Ph. (09)445 8544
email dave@heritagearchitects.co.nz

DARESBURY

67 FENDALTON ROAD,

FENDALTON, CHRISTCHURCH

HERITAGE ASSESSMENT AND DEFECTS/REMEDIAL WORK SCHEDULE

Prepared By:

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Devonport, Auckland, New Zealand
admin@dpaarchitects.co.nz
Ph. (09) 445 8544

Contents

1 INTRODUCTION

Subject and Purpose of Report

This report concerns a building located at 67 Fendalton Road, Fendalton, Christchurch, known as Daresbury or Daresbury Rookery. The building was constructed between 1897 and 1901 and was designed by prominent architect Samuel Hurst Seager in the Arts and Crafts/Tudor Revivalist style.

The building underwent some seismic strengthening in 2004/2005. The work included placing concrete in the upper section of the six large chimneys which were a notable heritage feature of the building. In the 2010 earthquake, the top section of one of the chimneys collapsed and fell through the roof. The upper sections of each of the remaining chimneys were later removed by crane. Three of these are still intact and lying in the garden.

This report is in the form of a Heritage Assessment and is followed by a list of defects and necessary remedial work.

Legal Description

The land on which the building currently stands is described as Lot 2 DP 49363 (CT CB29B/842), Canterbury Land District.

Heritage Protection

Heritage New Zealand Pouhere Taonga

The building is listed by Heritage New Zealand Pouhere Taonga as a Category 1 Historic Place, Register number 3659. It was first listed on 2 April 1985.

Christchurch District Plan

The dwelling and setting are included in the Christchurch District Plan Appendix 3 Schedule of Heritage Items as a Group 1 - Highly Significant Heritage Item (heritage item number 185, heritage setting number 602). The interiors of the building are not included in the listing.

Commission and Authorship

This Heritage Assessment has been prepared in support of an application to the National Heritage Preservation Incentive Fund administered by Heritage New Zealand Pouhere Taonga for funding for work proposed to ensure Daresbury survives for the future.

The report was written by Dave Pearson, principal of DPA Architects, and Alex Pirie, Graduate Architect of DPA Architects, heritage and conservation architects of Devonport, Auckland.

Information Sources

The historical information in this report has been taken from the existing Heritage New Zealand Pouhere Taonga List Entry for Daresbury and the *Heritage Assessment – Statement of Significance: Heritage Item 185* report written by Christchurch City Council in 2014. Other sources which informed this document can be found in the bibliography at the conclusion of this report. Where a footnote has been referenced to a section heading this indicates that the majority of that section is based on information from a single source.

2 HISTORICAL BACKGROUND

History of Daresbury[1]

This house was built for George Humphreys, a prominent Christchurch businessman and co-founder of wine and spirits merchants Fletcher Humphreys. The 25 acre section had previously been part of the Deans' family's original Riccarton property (the Deans were among the first Pakeha to settle permanently on the Canterbury Plains). At one time it was known as the 'Daresbury Rookery' due to the vast numbers of rooks that had made their home in the neighbouring bluegums. These birds are said to have disappeared after a snowstorm in 1945 damaged the trees. The name 'Daresbury' came from Humphreys' wife's house in Scotland but is also a village and civil parish in Cheshire, England, which features many buildings of similar design.

Daresbury and its extensive gardens overlooking the Waimairi stream, 1902.
Source: Christchurch City Libraries

The three-storey house has 40 rooms and was constructed between 1897 and 1901. The lower storey is built of brick, and the upper storey is half timbered. It was designed by Samuel Hurst Seager (1855-1933) who was one of the earliest architects to seek to design buildings with a specifically New Zealand character. However, in a 1900 article, Seager commented that architects would need to continue to follow the models from 'the mother country' as there were insufficient examples to follow in New Zealand. In the same article he commented on the 'ephemeral and inartistic character' of New Zealand houses; Daresbury can be seen as his attempt to combat this problem by following British trends.

With its half-timbered gables, slightly cantilevered upper floor, leadlights and tiled roof, Daresbury is characteristic of a number of houses in Christchurch designed for affluent professionals around the turn of the century. The style of such houses was the result of the Arts and Crafts movement in Britain, as experienced and diluted by New Zealand-based architects who had trained in, or immigrated from, Britain. The Arts and Crafts movement in architecture grew out of the Gothic revival interest in traditional construction and the moral worth of honest toil. One of the principles of the Arts and Crafts movement was the idea that architects should look to the vernacular architecture of the local area for inspiration. In New Zealand, however, architects working in this way often looked to English vernacular styles.

[1] *Heritage New Zealand Pouhere Taonga List Entry – Daresbury*

The dining room within Daresbury.
Source: Christchurch City Libraries

The association between the surrounding land and the house was also an important characteristic of Arts and Crafts architecture. Daresbury's garden, although reduced now by various subdivisions, has always been, and still is, an important part of the overall place. The house is set on a lawn which slopes down towards the Waimairi Stream and in 1932 its garden won the annual Christchurch Horticultural Society garden competition. Daresbury remained in the hands of Humphrey's descendants until 1985. It is significant as an example of Seager's domestic work and as a representative of the 'Old English' style house, which became a notable part of Christchurch's architectural heritage. Daresbury also reflects the lifestyle of the wealthier residents of Christchurch at the turn of the century.

There have been many changes to Daresbury since its original construction, most notably the addition of the billiard room and lobby to the southwest of the original building. Although the date for this is unknown it can be assumed to be an early addition due to the quality of the construction and craftsmanship exhibited in the building.

People Associated with the Place

Seager, Samuel Hurst[2]

Seager (1855-1933) studied at Canterbury College between 1880-1882. He trained in Christchurch in the offices of Benjamin Woolfield Mountfort (1825-1898) and Alfred William Simpson before completing his qualifications in London in 1884. In 1885, shortly after his return to Christchurch, he won a competition for the design of the new Municipal Chambers, and this launched his career.

[2] *Heritage New Zealand Pouhere Taonga List Entry – Daresbury*

Seager was renowned for his domestic architecture. He was one of the earliest New Zealand architects to move away from historical styles and seek to design with a New Zealand character. The Sign of the Kiwi, Christchurch (1917) illustrates this aspect of his work. He is also known for his larger Arts and Crafts style houses in Christchurch, including Daresbury.

Between 1893 and 1903 Seager taught architecture and design at the Canterbury University College School of Art. He was a pioneer in town planning, having a particular interest in the "Garden City" concept. Some of these ideas were expressed in a group of houses designed as a unified and landscaped precinct on Sumner Spur (1902-14).

Seager was an internationally respected authority on the lighting of art galleries, inventing what was known as the 'topside lighting system' where light is reflected onto gallery walls from above instead of with artificial lighting, a system which is now used in art galleries throughout the world.[3] The lobby in the billiard room addition to the house shows likely evidence of Seager's lighting experience.

Seager was president of the New Zealand Institute of Architects in 1926 and a member of the council and chairman of the Canterbury branch at various times between 1911 and 1926.[4] He was also a pioneering advocate for the preservation of historic buildings and, as a writer and lecturer, promoted a wider understanding of architecture and its history.

For many years Seager was the dominating force in directing the course of architectural development in the city of Christchurch, having a major influence in determining the domestic character of the city, especially between the turn of the century and the outbreak of war.[5]

Influential Visitors

During the Humphreys' tenure Daresbury was used as a temporary vice-regal residence for two Governors-General in the 1940s (Lords Newall and Freyberg) and guests at the house included Lord Fisher, Archbishop of Canterbury, and the Duke of York, later George VI.[6]

[3] *Samuel Hurst Seager, Te Ara*

[4] *Samuel Hurst Seager, Te Ara*

[5] *Architecture in Christchurch, The Press, 1934*

[6] *Heritage New Zealand Pouhere Taonga List Entry – Daresbury*

Governor General Sir Cyril Newall and Lady Newall, on the lawn at Daresbury Rookery in 1941.
Source: Alexander Turnbull Library

Architectural Style and Influences

Daresbury's architectural style can most closely be attributed to the Arts and Crafts and Tudor Revivalist styles, popular at the time and inspired by the vernacular houses of a similar style in Britain. Elements characteristic of this style include steeply pitched-roofs, half-timbering often infilled or complemented with herringbone brickwork at the ground floor, tall mullioned windows, high chimneys, overhanging or jettied first floors above pillared porches and dormer windows, all elements which are evident in Daresbury.[7]

The quality of the place is accurately described by an article written in 1934 entitled 'Architecture in Christchurch', published by The Press:

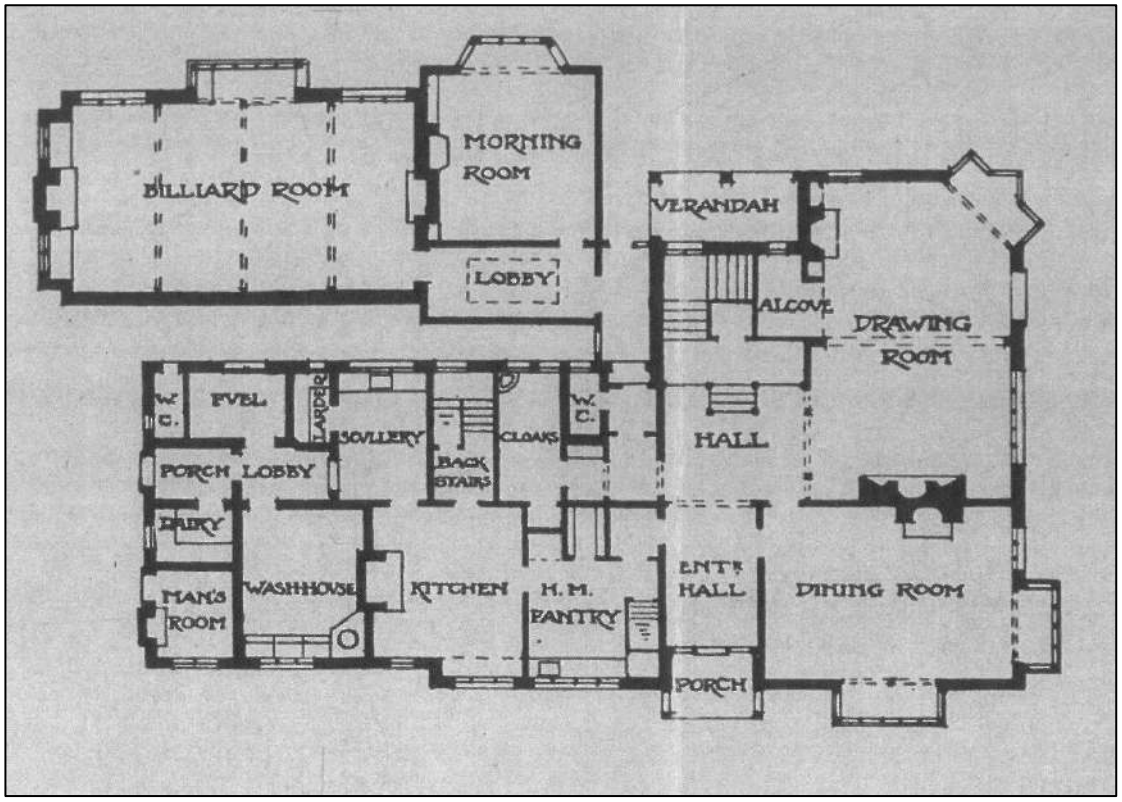
'The Perfect Tudor Dwelling

Perhaps the most charming of all the older houses in Christchurch is Daresbury Rookery, which is a perfect reproduction of a half-timbered Tudor dwelling. Every aspect of it is in keeping with the type on which it is modelled and its beauties are enhanced by delightful surroundings. Its English shingled roof of flat quarry tiles, its leaded windows, overhanging gables, and charming porch reproduced to perfection the atmosphere of that period in architecture when comfortable and spacious manor houses were taking the place of the severe castles and Norman keeps which dominated England for many years after the Conquest.[8]'

[7] *https://en.wikipedia.org/wiki/Tudor_Revival_architecture*
[8] *Architecture in Christchurch, The Press, 1934*

3 DESCRIPTION OF THE PLACE

Internal Layout and Changes/Modifications



Floor plan of Daresbury, date unknown.
Source: Unknown

The main rooms within the original building at ground floor level included a drawing room, dining room, entry hall and porch, kitchen and pantry, scullery, washhouse, dairy and a man's room. There were other smaller rooms for toilets, storage and circulation. Of these spaces, the dining room, entry hall and porch and staircase are the only areas which have not undergone significant modification.

A cellar exists below the original pantry (now the expanded kitchen) and is still there today. The billiard room, the morning room and the lobby in the south-western addition were not part of the original construction of Daresbury but are likely to have been added soon afterwards as the quality of craftsmanship and materials used are of the same standard as the original building. A small addition in the form of a garage was constructed much later to the south of the main building which is not included in the above drawing.

At first floor level, the building comprised a series of bedrooms and bathrooms which remains the situation today. Locating communal and services spaces on the ground floor while keeping private living quarters upstairs and away from public areas was traditional practice for the time period.

Over time, changes were made to the building as needs changed and different occupants moved through the building. In particular, the kitchen was modified and additional bathroom spaces were constructed. A number of internal walls were demolished at some point in the southern section of the building to reconfigure the original man's room, dairy, washhouse and porch lobby into one enlarged space. The northern portion of the building remains true to its original layout, as does the billiard room addition.

Similar Buildings

Mona Vale

The Mona Vale homestead located close by is another Arts and Crafts/Tudor Revival building of a similar size and scale in Christchurch. It was designed by Joseph Clarkson Maddison and built in 1899-1900. The place features similar extensive gardens, designed by notable Canterbury landscape architect Alfred Buxton.[9] It's half-timbered gables, leadlights, steeply pitched tiled roof, tall chimneys and extensive gardens are all shared characteristics with Daresbury. Mona Vale was purchased by the council in 1969 when there was a threat of it being demolished and subsequently it has proved to be a very popular public venue and park, often used for weddings and public functions. It underwent extensive refurbishment following the Canterbury earthquakes.

Mona Vale and its gardens.
Source: Christchurch City Libraries

Current Condition of Daresbury

Daresbury suffered severe damage during the Canterbury Earthquakes and as a result, the place is in poor overall condition. Section 5 of this report outlines the damage and remedial work required to the different internal spaces of Daresbury, as well as to each of the exterior elevations and the roof. In general, there is evidence of cracked and displaced brickwork in the external façade and a number of windows have been boarded up to prevent moisture from entering the building after they were damaged in the earthquakes. The stucco cladding at first floor level has cracked and sections have split away from their timber frames. Some gutters have failed and sections of the roof have been boarded over where chimneys fell through during the earthquakes and have not been re-clad.

Some areas of the external walls which were damaged in the seismic events have been relined with waterproofing materials as a temporary measure in an effort to exclude moisture. Internally, much of the plasterboard has cracked under seismic stress and there is evidence of dry rot within some of the timber panelling likely caused by moisture ingress as a result of a chimney collapsing through the roof. Elsewhere, tile have been broken and gutters have failed. There is evidence of fungal growth within some areas of the house and areas of internal wall linings have been damaged extensively.

[9] *http://www.monavale.nz/about-1*

General weathering includes evidence of efflorescence on the bricks at ground floor level and there is considerable evidence of biological growth on the clay roof tiles, as well as areas of brickwork surrounding downpipes and brickwork in close proximity to vegetation.

4 HERITAGE ASSESSMENT

Heritage Significance Assessment

This Heritage Significance Assessment describes the overall significance of Daresbury and its associated values. It takes into account the significance of the site and surrounds and the elements of which the building is comprised. The primary criteria are based on those in use by the Christchurch District Plan and the assessment is based on information provided in the 2014 Statement of Significance for Daresbury written by the Christchurch City Council.[10]

Historical and Social Value

A building may have historic significance through its association with a particular person, group, organization, institution, event, phase or activity; the continuity and/or change of a phase or activity; social, historical, traditional, economic, political or other patterns.

Daresbury is a significant Christchurch homestead associated with many notable historical figures and also demonstrates the history of land development in Christchurch.

Daresbury was originally built between 1897 and 1901 for prominent businessman George Humphreys (1848 – 1934), the co-founder of Christchurch wine and spirits merchants Fletcher Humphreys & Co. The company operated a well-known wine and liquor store on Bealey Avenue and had offices within Cathedral Square. Humphreys was also the consular agent for France in Christchurch and had considerable investments within the hotel industry.

Daresbury remained in the Humphreys family after George's death until 1985, despite large subdivisions of land in 1930 and 1954 respectively which greatly reduced the original plot of land. Daresbury was twice used as a temporary vice-regal residence for two Governors General in the 1940s (Governors Newall and Freyberg), and other influential guests included Lord Fisher, Archbishop of Canterbury, and the Duke of York, later George VI. The house was originally known as the Daresbury Rookery after a large colony of rooks settled in the surrounding bluegums until the trees were damaged in a snowstorm in 1945 and the colony departed permanently.

The place also represents the history of the wider development of the area. Over time, the 25-acre plot was divided into increasingly smaller sections and thus became part of a denser residential, urban environment which now surrounds it, with the dwelling and setting now existing on an 0.91-acre site. This demonstrates the historic pattern of land development in Christchurch over the course of the last century.

The place is also significant for its association with architect Samuel Hurst Seager, who made a significant contribution to the evolution of New Zealand architecture, both as a practitioner and a theorist. Daresbury is considered to be Seager's most outstanding English Domestic Revival style house, much of the detailing inspired by the philosophy of the Arts and Crafts movement.

Daresbury is significant through its association with notable individuals and consequently it is considered to have **exceptional historical and social significance**.

Cultural and Spiritual Value

Elements having social significance are able to demonstrate cultural, spiritual, or traditional behavioural patterns.

The place demonstrates the changing cultural traditions and patterns of domestic lifestyles for affluent Christchurch citizens during the time period, as well as the preference towards

[10] *Heritage Assessment – Statement of Significance: Heritage Item 185, Christchurch City Council, 2014*

traditionally 'British' architectural style houses for those who could afford them. The house's original traditional layout expanded over the years, demonstrating the changes in culture and domestic lifestyle of a family of a high socioeconomic standing of their time.

Daresbury demonstrates evolving behavioural patterns and family lifestyles over time and is assessed as having **considerable cultural and spiritual significance.**

Architectural and Aesthetic Value

A building may have architectural and aesthetic values that demonstrate or are associated with design values, form, scale, colour, texture and material of the place.

Daresbury was designed by prominent architect Samuel Hurst Seager in the Arts and Crafts and Tudor Revivalism styles. Despite suffering considerable damage from the Canterbury Earthquakes in 2010, the majority of the building still largely retains its original form.

Elements which are of note include the half-timbered gables, cantilevered upper floor, leadlight fenestration and a tiled roof with tall brick chimneys and decorative chimney pots which were mostly destroyed in the earthquakes. The internal architectural details are equally impressive, with elegant timber panelling throughout the building and an ornate central staircase, as well as the billiards room which features a series of arched roof trusses. A number of leadlight skylights feature within the internal spaces. A significant amount of alteration has taken place to the building over time, especially to kitchens and bathrooms, but a large amount of original heritage fabric is still in-situ.

Largely through its association with Samuel Hurst Seager and as a notable example of the Arts and Crafts style, the place is considered to have **exceptional architectural and aesthetic value.**

Technological and Craftsmanship Value

A building may have values that demonstrate or are associated with: the nature and use of materials, finishes and/or technological or constructional methods which were innovative, or of notable quality for the period.

Daresbury is notable for the quality of construction and techniques of the period. Externally, the brick cladding, half-timbered upper storey and clay roof tiles are all indicators of a high standard of craftsmanship. Internally, particularly in areas such as the dining room, billiard room and staircase, the craftsmanship and attention to detail is of exceptional quality, with the timber panelling, leaded glass windows and fireplaces all exhibiting outstanding levels of craftsmanship.

The arched braces within the billiard room, although a slightly later addition to the original building, demonstrate technological knowledge as a way of achieving greater spans without the need for additional posts and supporting columns.

As an example of a building that used superior building materials and employed high standards of construction, Daresbury is assessed as having **considerable technological and craftsmanship significance.**

Contextual Value

A building may have contextual values that demonstrate or are associated with: a relationship to the environment (constructed and natural) setting, a group, precinct or streetscape; a degree of consistency in terms of scale, form, materials, texture, colour, style and/or detailing in relationship to the environment (constructed and natural), setting, a group, precinct or streetscape; a physical or visible landmark; a contribution to the character of the environment (constructed and natural) setting, a group, precinct or streetscape.

Despite being contained within the residential block and hidden from the street, the building contributes significantly to the character of the area. Although the original property has been subdivided many times over its history, the size of the land Daresbury sits on dwarfs that of the small modern residential buildings that surround it. Its gardens take up the majority of the block with the Waimariri stream running through the centre of the property. The gardens were based on the concept of the traditional 'Old English' garden style, and its grandeur won the Christchurch Horticultural Society's annual competition of 1932.

Daresbury sits in close proximity to Mona Vale, another example of a domestic Arts and Crafts/Tudor Revivalist residence of a similar quality, size and scale and together they contribute to the overall character and history of the area.

Daresbury and its setting have **considerable contextual significance** as one of the few remaining large-scale houses built at the turn of the twentieth century as well as its considerably larger land plot size and extensive gardens.

Archaeological and Scientific Value

A building may have archaeological values that demonstrate or are associated with: potential to provide archaeological information through physical evidence; an understanding about social historical, cultural, spiritual, technological or other values or past events, activities, people or phases.

Daresbury and its setting are of some archaeological significance because they have the potential to provide archaeological evidence relating to past building construction methods and materials, and human activity on the site, including that which occurred prior to 1900. It is considered to have **moderate archaeological value.**

Summary Statement of Heritage Significance

Daresbury and its setting are notable as a turn of the 20th century large Arts and Craft/Tudor Revivalist inspired residence and its use as a vice-regal residence.

Daresbury is considered to have **exceptional historical and social significance** for its association with influential businessman George Humphreys, prominent architect Samuel Hurst Seager and visitors and guests to the homestead over the years. It also has **exceptional architectural and aesthetic value** as an outstanding example of a dwelling designed in the Arts and Crafts style.

The place has Daresbury has **considerable technological and craftsmanship significance** due to the quality of its construction and detailing. It has **considerable cultural and spiritual significance** for its ability to demonstrates evolving behavioural patterns and family lifestyles over time. It also has **considerable contextual significance** for its extensive gardens which are unusual within its context and its group value as a large homestead alongside others of similar pedigree, such as nearby Mona Vale.

The **dwelling and setting have considerable architectural significance** as an outstanding example of English Domestic Revival style and Arts and Craft inspired detail. Daresbury and its setting also have potential **archaeological significance** as the site was occupied prior to 1900.

Overall, Daresbury and its setting are considered to have **exceptional significance**.

5 DEFECTS AND REMEDIAL WORK

Building Exterior - Historic Photographs


East elevation and main entrance (left), and view from south east (right).


View from south west before billiard room (left), and view from north west after billiard room constructed (right).


Close up of main entrance (left) and view of north west corner (right). Note corner window in drawing room and balcony in gable end, now infilled with a window.

Building Exterior - Contemporary Photographs

View from north east.

North elevation.

View from north west.

West elevation (right).

West elevation showing billiard room at right.

Roofscape

The majority of the roof is sheathed with what are likely to be original flat terracotta tiles, traditionally known as Rosemary tiles. Some have scalloped lower edges. The ridges are capped with crested ridge tiles.

Historical view of Daresbury. Note chimneys.

In the centre of the roof is a well which has been lined with a proprietary rubberised membrane, known as Butynol. It is not known if the well is original, although it appears there has always been access to the roof. Elsewhere are two areas sheathed with galvanised sheet with raised ribs.

Aerial view of Daresbury (left). Note areas of metal trough roofing and well in centre of the roof.
Roof tiles (right). Note scalloped tiles and crested ridge tiles.

Views of roofscape. Note areas of metal trough roofing and membrane roofing with water ponding. The photograph at right shows the roof access hatch which appears to be original.

Roofscape Defects

Prior to the earthquakes, a significant feature of the roofscape was a series of six tall decorative chimneys. At some stage in the past, the top section of the chimneys had been filled with concrete in a misguided attempt at structurally strengthening them.

All six chimneys suffered catastrophic failure in the earthquakes. Due to the concrete that has been placed in them, the top section of one particular chimney fell as a unit resulting in extensive damage to the tiled roofs and roof structure. The interior of the building has been extensively damaged due to water ingress.

Other defects include broken and missing tiles and tiles that have slipped down the roof. Some ridge tiles have also been damaged. An area which was damaged when a chimney collapsed has been temporary patched with plywood sheets.

Water is ponding on the Butynol roof, although it is not known if this is a consequence of the house settling following the earthquakes.

Fallen chimney tops.

West elevation (left). Note plywood patch on roof indicating former location of chimney.
West elevation (right). Note failure of internal gutter resulting in extensive internal water damage.

External Defects

The ground floor of Daresbury has walls constructed of Homebush bricks made in Canterbury. The walls comprise an outer skin of a double brick wythe, a cavity and an inner skin comprising a single wythe. The bricks were laid in a lime based mortar and then pointed with a harder dark coloured mortar. The upper storey has a timber frame which was infilled with bricks in a technique known as brick nogging. Externally a pebble dash plaster was laid over the bricks and timber facings were fixed over the timber framing (see last image).

The photographs that follow provide an indication of the types of damage that have occurred to the external walls but are representative only and do not include every defect. Defects include crushing and fracturing of bricks, movement along mortar joints, movement at window heads, loss of mortar and outward displacement of bricks.

The structural engineer requires that the brickwork on the lower floor be dismantled to enable new foundations to be constructed. The inner wythe will then be replaced with timber framing. On the upper floor, the brick nogging is to be removed to reduce the load on the foundations.






ROOM SCHEDULE

The following sheets describe the spaces having the greatest significance and outline the work that might be required to return them to a good condition.

Room G-01

This room was the original dining room. It is an extraordinary room and remains generally intact and in relatively good condition. It has high heritage values with significant features that include the elaborately panelled ceiling, the fireplace and surrounds and the timber dadoes.

Defects

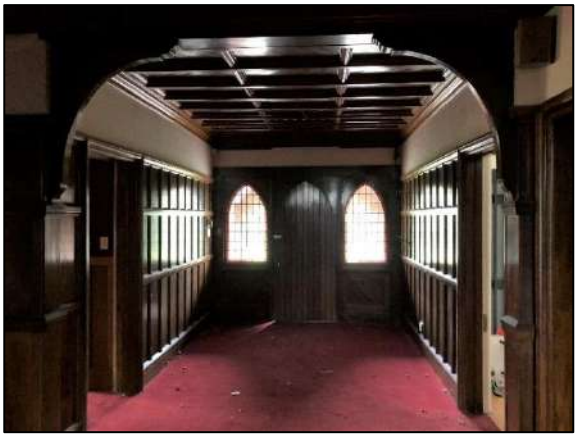
Defects as a result of the earthquakes include cracks in the plaster wall linings and movement between the bricks in the fireplace. Other defects include sun damage to varnished surfaces and bowing leadlight windows

Proposed Work

The external walls including joinery are proposed to be deconstructed to enable new foundations to be constructed, as required by the structural engineer. To enable this to occur, the internal walls including timber panelling and the first section of the timber ceiling will need to be carefully dismantled. The ceiling and wall panelling will be reinstated once the external walls have been reconstructed to return the room to its original form as near as possible.

Room G-02

This space is the main entry hall to the house. It remains essentially as constructed. It has high heritage values with significant features that include the beamed ceiling, timber dadoes and newel posts and railings at the bottom of the stairs.



Defects

Defects as a result of the earthquakes include extensive water damage to wall panelling and trim due to roof leaks after an internal gutter between the two gables on the western façade failed.

Proposed Work

Proposed work will include repairs to substrates as required, followed by replacement of water damaged timber panelling and trim with new timber of the same species finished to match the original.

Room G-03

This room was originally two spaces, namely the kitchen and the pantry. The area has been extensively modified with walls removed to make an enlarged kitchen. A basement cellar remains under what was originally the pantry space. The fire surround, wall linings and fittings are not original. The space is considered to have minimal heritage value.




Defects

Defects as a result of the earthquakes include extensive damage to wall surfaces and trim and window reveal due to roof leaks after a chimney collapsed and fell through the roof. Cracks are also evident in the plaster wall surfaces.

Proposed Work

The external walls complete with joinery will be dismantled to enable new foundations to be constructed as required by the structural engineer. The walls will then be reconstructed and repairs made to the ceiling and floor where these have suffered structural and water damage. The collapsed chimney is unlikely to be rebuilt due to cost constraints.

The space has been extensively modified over time and very little heritage fabric remains on view. This area is likely to remain the kitchen with new linings and new fittings being installed. Any heritage fabric that is uncovered during the course of the work will be recorded.

Room G-04

This room was originally three spaces, namely the washhouse, a man's room and a dairy. The area has been extensively modified with walls removed to make an enlarged space. It now contains no heritage fabric and has minimal heritage value as part of the original building.

Defects

Minor defects only are present in this area including cracks in ceiling and wall surfaces.

Proposed Work

As it has little heritage value, this space has the potential to be used for other purposes. The chimney that served this space and the adjacent kitchen is unlikely to be rebuilt due to cost constraints.

Rooms G-13, G-14, G-15

These spaces originally comprised a scullery, the back stairs and an area for cloaks. The area has since been modified although the stairs remain in their original location. The area has moderate heritage value.

Defects

These spaces have been extensively water damaged following the Canterbury earthquakes due to the failure of an internal gutter. Damage has occurred to walls and ceilings and extensive fungal growth is also present.

Proposed Work

The priority is to ensure that repairs are carried out to the roof and gutter where water has been entering the building. Following that, work is likely to include removal of all fungal growth and treatment and repair of substrates and linings.

Room G-18

This passage was constructed to connect the original house to the later addition. It has a timber dadoes and trim and a plaster arch and moulding. It has moderate heritage value

Defects

Following the failure of an internal gutter, the walls and ceiling of the passage have been extensively water damaged with mildew and fungal growth evident on the walls and ceiling and dry rot in the wall panelling.

Proposed Work

The priority is to ensure that repairs are carried out to the roof and gutter where water has been entering the building. This will be followed by the replacement of water damaged timber panelling and trim with new timber of the same species finished to match the original.

Room G-19

This space was constructed as the lobby to the billiard room which was a later addition to the main building. It features timber dadoes and trim, a timber ceiling and a stained glass rooflight. The room overall has moderate heritage value.

Defects

This area has sustained minor damage as a result of a possible roof leak.

Proposed Work

Proposed work is likely to include minor repairs to fabric once the leak has been located and repaired.

Room G-20

This space was an addition that was constructed as a billiard room. It remains generally as constructed, although the fireplace at the northern end may have been added subsequently. It is a spectacular space with high heritage values. Heritage fabric includes the timber trusses, the beamed ceiling, timber sarking and dadoes and the fireplaces.




Defects

Defects as a result of the earthquakes include cracks in plasterwork and some spalling plaster. Movement has occurred in various locations. The chimney at the southern end of this space has collapsed and dampness is evident in the alcove above the fireplace and also at the north east corner. Cracks are also evident on the brick surround to the southern fireplace. Other defects include sun and moisture damage to joinery sashes, doors and sills.

Proposed Work

The chimney at the southern end of the Billiard Room is proposed to be rebuilt. Once this has occurred, flashings will be made good to exclude moisture. Work will then be undertaken to remedy internal defects including repairing of cracks in plasterwork. The brick fire surround will also be repaired with joints mortared as required.

The fireplace at the northern end of this space appears to have been added later. Due to cost constraints, it is unlikely that the chimney will be able to be rebuilt although the fire surround could be retained.

Room G-21

This space was part of the addition and is labelled as a morning room on an early plan. It remains generally as constructed and has high heritage values. Heritage fabric includes the timber panelled ceiling, timber dadoes and the fireplace.

Defects

Defects as a result of the earthquakes include cracks in plasterwork at various locations. The brick fireplace also incurred minor damage. Other defects include sun and moisture damage to joinery sashes, doors and sills.

Proposed Work

Proposed work is likely to include remedial work to cracked plaster. Remedial work will also be carried out to timber joinery, doors and sills. The fireplace in this space appears to have been constructed at the same time as the room. Due to cost constraints, it is unlikely that the chimney will be able to be rebuilt although the fire surround could be retained.

Room G-22

This space was labelled as a Drawing Room on an early plan. It appears that it could be subdivided by sliding or folding doors to create two spaces. It was obviously a highly fashionable room, designed to impress visitors to the house.

The room has since been extensively modified with little heritage fabric now remaining. The beamed ceiling may still exist above the later ceiling in the eastern section of this space. Both fireplaces have been extensively modified, although some original tiles have been discovered behind a later fire surround at the eastern end of this space. In its present form this space has little heritage value although some of its heritage values could potentially be recovered.

The existing fire surround at the eastern end of the room is a later modification and conceals tiles from an earlier fire surround. The fireplace on the southern wall is also not original. The fabric around this fireplace has been extensively water damaged after the chimney above collapsed.

Defects

Defects as a result of the earthquakes include extensive damage to wall and ceiling surfaces and trim due to roof leaks after a chimney collapsed and fell through the roof. Cracks are also evident in the plaster wall surfaces. Other defects include sun and moisture damage to joinery in the west wall.

Proposed Work

Proposed work is likely to include repairs to wall and ceiling surfaces to remedy earthquake and water damage. The eastern fireplace and the chimney above will be retained and consideration will be given to restoring the fireplace to its earlier form by exposing the tiles. The later ceilings in this area could also be removed to expose the earlier beamed ceiling if this is found to still exist.

It is not proposed to retain the chimney on the southern wall due to cost constraints and the non-original fire surround will be removed.

Main Stairs

The main stairs are essentially as constructed. Heritage fabric includes arches, timber dadoes, newel posts and timbered ceilings. The stairs are considered to have high heritage values.

Defects

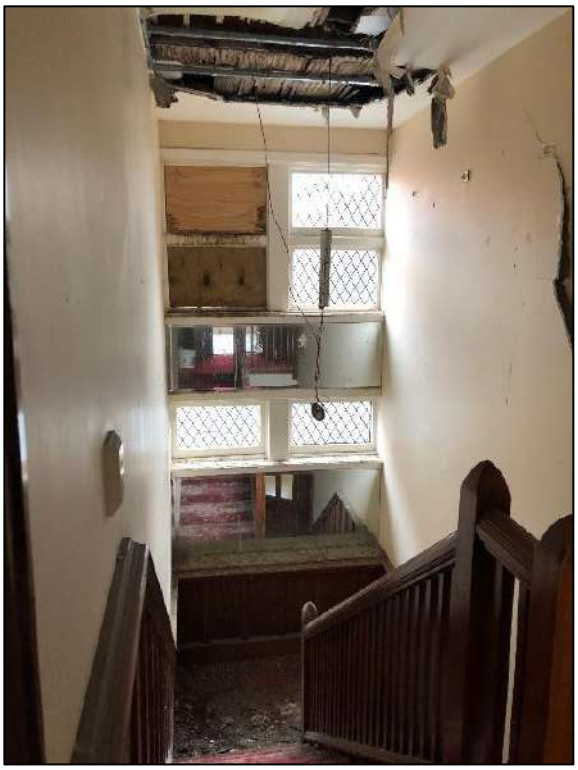
Defects as a result of the earthquakes include minor damage to ceilings and more extensive damage to wall panelling and trim due to roof leaks after a chimney collapsed and fell through the roofs. Defects include fungal damage, mould, decay and dry rot. Lath and plaster wall linings have also been water damaged.

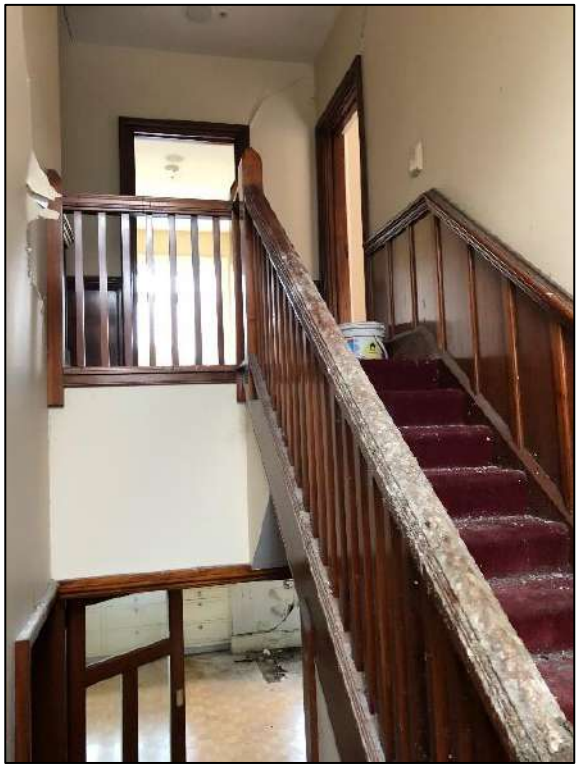
Proposed Work

Following repairs to the roof, remedial work to the stairs is likely to include replacement of water damaged ceilings and wall panelling and trim. Fabric damaged by decay, mould and fungal growth will be replaced.

Back Stairs

The back stairs would originally have been used by the servants to access the upper floors. They are generally as constructed, although a mirror has been added to the windows. Heritage fabric includes the stairs, the handrail and newel posts. The back stairs are considered to have moderate significance.





Defects

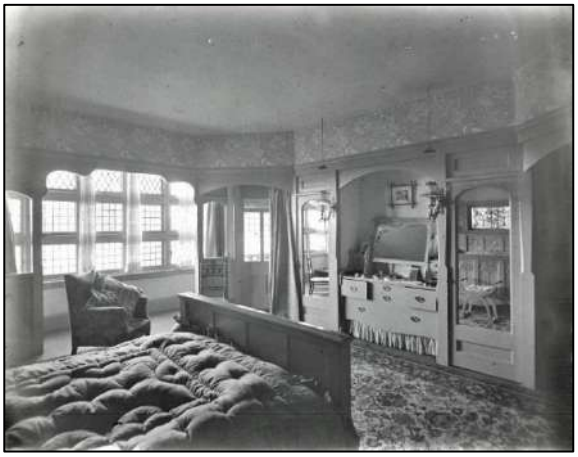
Following the earthquakes, defects include extensive damage to the ceiling and plasterboard wall surfaces due to roof leaks, possibly caused by a failed gutter. Leadlight sashes are missing.

Proposed Work

Following repairs to the roof, remedial work to the stairs is likely to include replacement of water damaged ceilings and wall panelling and trim. Missing sashes should be reinstated or new ones provided.

Room 1-01

This room appears to always have been a bedroom. It is reasonably original although alcoves and fittings have been removed from the south wall. More recently, an ensuite has been added in the north west corner of this space. Surviving heritage fabric includes the fireplace and surround and the alcove at the doorway. The space is considered to have moderate heritage values.



Defects

Defects as a result of the earthquakes include cracks in the plasterwork and evidence of movement between plasterwork and timber trim. Some leadlight windows are broken.

Proposed Work

Remedial work is likely to include repairs to plasterwork and trim. Broken windows will be repaired.

Room 1-02

This room was possibly a child's bedroom adjacent to the main bedroom. It appears reasonably original although an en-suite has been added, accessed off this space. Heritage fabric includes the arch to the alcove and the panelled door. The space has moderate heritage values.

Defects

Defects as a result of the earthquakes include cracks in the plasterwork and evidence of movement between plasterwork and timber trim. A leadlight window sash is also missing.

Proposed Work

Remedial work is likely to include repairs to plasterwork and trim. The missing sash should be reinstated or a new one provided.

Room 1-03

This room was probably always a bathroom. It appears reasonably original with heritage fabric that includes floor and wall tiles. A bath with a shower enclosure and a bidet of unknown provenance remain. The room is considered to have high heritage value.

Defects

Defects as a result of the earthquakes include cracks in the plasterwork and evidence of movement at wall and floor junctions and between tiles. Some tiles have become dislodged and some have broken.

Proposed Work

Remedial work is likely to include repairs to plaster wall surfaces. Damaged tiles should be repaired and dislodged tiles re-fixed.

Room 1-05

The original configuration and use of this room is not known. The fireplace and the panelled door are the only items of heritage value. This space is considered to have some heritage value.

Defects as a result of the earthquakes include extensive damage to the ceiling and plasterboard wall surfaces due to roof leaks after a chimney collapsed and fell through the roofs. Some evidence of movement is apparent between the tiles and the bricks to the fireplace.

Proposed Work

Due to cost constraints, it is not proposed to reconstruct the chimney above this room. The fireplace could therefore be removed and the space reconfigured. Remedial work is likely to include repairs to wall and ceiling surfaces following remedial work to the roof. The fire surround could be retained as a non-functional artefact.

Room 1-07

This room was also probably a bedroom. It appears generally as constructed although the cupboard in the corner has probably been added. A fire hose reel has also been provided. The room is considered to have some significance.

Defects

Defects as a result of the earthquakes include cracking in ceiling and wall surfaces. There is also evidence of past water leaks in the area around the fire hose reel, possibly due to a failed internal gutter. A sash has been boarded up where the leadlight glazing has been damaged.

Proposed Work

Remedial work is likely to include repairs to ceiling and wall surfaces following remedial work to the roof. Damaged joinery should be repaired.

Room 1-08

This room was possibly originally two smaller rooms. Heritage fabric within the room includes a panelled door and the fireplace. It is considered to have some significance.

Defects

Defects following the earthquakes include water leaks in the ceiling along the line of the west wall and more extensively above and below one of the windows, probably due to a failed internal gutter. Extensive mould growth is apparent above and below the window. Some windows are also broken.

Proposed Work

Due to cost constraints, it is not proposed to reconstruct the chimney above this room. The fireplace could therefore be removed or retained as a non-functional artefact.

Other remedial work is likely to include repairs to wall and ceiling surfaces after the roof has been repaired. Repair work should be undertaken to the windows.

Room 1-09

Room 1-09 is an "L" shaped space off which opens an ensuite. Originally, it was probably two individual rooms. Items of heritage value include a panelled door and a fireplace. The space is considered to have some significance. The adjacent ensuite has no significance.

Defects

Earthquake damage includes visible cracks in walls and the ceiling. Extensive water damage has occurred to the soffit to the bow window in the north wall, possibly the result of broken tiles. There is some evidence of movement within the brick fireplace and some unevenness is apparent in the floor.

Proposed Work

Due to cost constraints, it is not proposed to reconstruct the chimney above this room and the fireplace could be removed. External remedial work is likely to include repairs to the roof over the bow window. Internal work may include repairs to the soffit to the bow window following repairs to the roof above. Wall and ceiling surfaces will also need to be repaired.

The unevenness in the floor should be investigated and remediated.

Room 1-11

The landing is generally as constructed although the ensuite to room 1-02 may have been added. Items of heritage value include the plaster ceiling with timber battens, the dado panelling, timber arches and the lower section of the stairs leading to the second floor. The area is considered to have moderate significance.

Defects

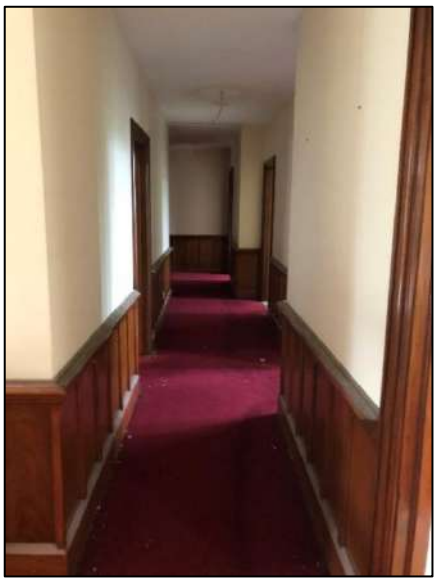
The floor is uneven, probably as a result of the earthquakes. Some cracks are evident in the plasterboard walls and one sheet is loose. The ceiling panels are also sagging.

Proposed Work

Remedial work is likely to include repairs to the ceiling and walls. The unevenness in the floor should be investigated and remediated.

Room 1-12

The hallway is as constructed although the ensuite to room 1-02 may have been added. Items of heritage value include the plaster ceiling with timber battens and the dado panelling. The area is considered to have moderate significance.



Defects

Defects include cracks in the plaster wall and ceiling surfaces and evidence of movement at wall and ceiling junctions. Some unevenness in the floor is also evident.

Proposed Work

Remedial work is likely to include repairs to the ceiling and walls. The unevenness in the floor should be investigated and remediated.

Stairs to Second Floor and Landing 2-05

The stairs and upper landing are generally as constructed. A further set of stairs from this area leads up to the roof. Items considered to have heritage value include the dado panelling to the stairs and the stained-glass window at the first landing. The area is considered to have moderate significance.

Defects

Defects include damage to plaster wall surfaces caused by water ingress as the result of a failed gutter and a collapsed chimney. In particular, the small stained-glass window up the stairs has sustained extensive damage to the sash and the reveals.

Proposed Work

Remedial work is likely to include repairs to the ceiling and walls and the stained-glass window following repairs to the roof and gutters.

Rooms 2-01, 2-02 and 2-03

These rooms were possibly originally quarters set aside for servants. Space 201 has been converted into a media room. Other than a pair of fireplaces, and some doors, there is little heritage fabric remaining in these areas. As some of the chimneys are not proposed to be reconstructed, the fireplaces could be removed or retained for their heritage value.

Defects

Defects include cracked ceilings and wall linings. Water leaks are evident in Rooms 201 and 202.

Proposed Remedial Work

Remedial work is likely to include repairs to the ceiling and walls and following repairs to the roof area.

APPENDIX H - RHODES AND ASSOCIATES, REPAIR QUOTATION REVIEW, 17 JULY 2023

Rhodes +Associates
Quantity Surveyors
Cost Consultants
rhodesqs.co.nz

Christchurch office
+64 3 366 1202
PO Box 1607, Cashel Street
Christchurch 8140
New Zealand

Queenstown office
+64 3 442 7706
PO Box 840, Queenstown 9348
New Zealand

17 July 2023

Te Hononga Civic Offices
53 Hereford Street
CHRISTCHURCH 8013

Attn: Amanda Ohs (e: Amanda.ohs@ccc.govt.nz)

Dear Amanda

3380/002 – REPAIR QUOTATION REVIEW – HIN 185 – 9 DARESBURY LANE, 67 FENDALTON

Please find enclosed our repair quotation review for Daresbury and Setting at 9 Daresbury Lane, 67 and 67B Fendalton Road.

Should you have any queries, please do not hesitate to contact the writer

Yours faithfully

Gavin Stanley BSc QS NZIQS (Affil)
Project Cost Consultant
Rhodes + Associates Limited

Rhodes
+Associates

Quantity Surveyors
Cost Consultants

3380/002 - HIN 185 - 9 DARESBURY LANE

Repair Quotation Review

17 July 2023

Christchurch City Council

QUALITY ASSURANCE INFORMATION

Report: REPAIR QUOTATION REVIEW

Document: HIN 185 - 9 DARESBURY LANE

Ref: 3380/002

Date: 17 July 2023

Client: CHRISTCHURCH CITY COUNCIL

Lead QS: GAVIN STANLEY

Ver:	Date:	Prepared By:	Reviewed By:
	17/07/2023	Gavin Stanley	Phil Griffiths

EXECUTIVE SUMMARY

Rhodes + Associates Limited have been appointed by Christchurch City Council to provide a review of Milne Constructions Quotation dated 03 July 2019 for the repair of Daresbury and Setting at 9 Daresbury Lane, 67 and 67B Fendalton Road.

This report has been prepared specifically for Christchurch City Council. Rhodes + Associates Limited accepts no liability in the event this report is used for any other purpose or by any other party.

CLARIFICATIONS AND EXCLUSIONS

Rhodes + Associates Limited have not been requested to produce an estimate for the repair of Daresbury and Setting at 9 Daresbury Lane, 67 and 67B Fendalton Road and as such we have been requested to carry out a high-level review of the documentation from Milne Construction provided by Christchurch City Council. Allowances have been made for escalation given the submission date of Milne Constructions quotation.

We would confirm that Rhodes + Associates were not able to visit site prior to completing this review.

Building Description

The building was constructed between 1897 and 1901 and has a GFA of approximately 1,643 m2 (measured in accordance with NZIQS guidelines, see Appendix A) and is constructed on three levels. The structure consists of a mixture of brick and stucco walls with clay roof tiles.

Procurement

- It has been assumed the market is competitive with no adjustment included for inflationary factors associated with a major event
- The works are to be negotiated with a fixed lump sum contract

Review

This review has been carried out by Gavin Stanley, Senior Quantity Surveyor with Rhodes + Associated Limited who has a BSc in Quantity Surveying, 30+ years' experience and is an Affiliate Member of the NZIQS.

The review has been based upon Milne Construction's quotation dated 03 July 2019 (Appendix B) which covers repair works in accordance with Quoin Structural Consultants Structural Assessment Report dated 17 May 2019.

Rhodes + Associates have made no allowances for any further works to cover any additional deterioration to the building beyond the date of the quotation.

Methodology

For simplicity we have carried out our calculations for construction escalation costs based on the 'New Zealand standard conditions of contract for building and civil engineering construction NZS 3910:2013', in particular 'Appendix A – Cost fluctuation adjustment by indexation' of that contract (see Appendix C for copy).

Indices are required for the calculations which are updated on a quarterly basis and are published by Statistics New Zealand. The indices are available on their website ***http://archive.stats.govt.nz/infoshare/***

> *L and L[1] – 'Labour Cost Index; Private Sector: Industry Group – Construction: All Salary and Wages Rates' (see Appendix E for relevant indices)*
>
> *M and M[1] – 'Producers Price Index; Inputs: Industry Group - Construction' (see Appendix E for relevant indices)*

This report is required to calculate escalation to July 2023. Unfortunately, indices by Statistics New Zealand have only been produced up to the quarter ending March 2023, we have allowed for additional estimated escalation up to the third quarter of 2023 (See Appendix E for Indices).

Milne Construction Daresbury House – Reduced Repair Option 3 July 2019

Please note we have carried out escalation calculations on Milne Construction's quotation which includes an element of external works, as below and shown in Appendix D - Option 1.

Milne Construction – 2019 (including escalation) $6,488,129 excluding GST

We have carried out limited checks on certain elements of the escalated estimate and did observe the following:

- The hourly rate applied is fair and reasonable
- In general, the rates for standard works we have reviewed (i.e., foundations, framing, GIB works, decoration) appear to be slightly higher than expected but would not have a major impact on the overall estimate
- There are many rates that we have not been able to adequately analyse due to the lack of detail within the description.
- Where bespoke elements have been included (e.g., deconstruction of chimneys, general salvage works, re-construction/re-fitting of heritage items) the value of these works are higher than anticipated, this may be as a result of the number of hours allowed by Milne Construction which may contain additional risk, although making additional allowances for risk or including additional works not clearly defined within their descriptions. Examples as follows:
    - Remove, dispose all chimney stacks inside structure. Labour allowed 810 hrs which equates to 18 weeks of labour (based on a 45 hr week). This does on the face of it seem to be excessive, although we are unable to confirm exactly what is included within this work without consulting Milne Construction.
- There are also elements contained within the estimate which we would not have included within a repair estimate i.e., replacement of curtains
- This estimate has not been carried out on a like for like basis, it allows to keep the same look externally but does allow for altered interior layout including finishes.
- We also suspect that there is an amount of betterment allowed for in the quote.

We would also note that the method of calculating Margins, Contingencies, Professional Fees, Project Management and P&G by Milne Construction differs from the method we would have used as. Difference in calculations are shown in Appendix F – Option 1 and Option 2.

When escalating Appendix D - Option 2 there would be an overall increase from $6,488,129 to $6,657,818 or and additional $169,689 over Milne Constructions quote.

<u>Percentages applied</u>

We would make comment on percentages applied as follows:

Margins 7.5%

We would expect margins around 8% and in this case 7.5% would appear to be reasonable

Contingencies 10%

Generally, a 10% Contingency would be fair and reasonable, although in this case we would assume that a good element of risk has been included within the rates and as such the contingency could be reduced

Professional Fees 5%

5% for Professional fees appears to be too low for this type of project and we would expect fees to be between 10% to 15% for this project

Project Management 2.15%

This should be included within P&G (see below)

P&G 5%

Generally, we would expect around 12% for P&G, there are several P&G items which have been included elsewhere within the quote which would have been included within our 12%.

- For comparison we have applied these adjustments as shown in Appendix F - Option 3 and escalation calculation Appendix D - Option 3, which have the effect of increasing the overall escalated rebuild budget from $6,488,129 to $6,875,781 excluding GST an overall increase of $387,652 over Milne Constructions quote.

Betterment

Within Milne Constructions quotation we are aware of certain items which may be classed as betterment, i.e., works over and above that which was originally in place prior to the earthquakes (excluding necessary structural works to meet the requirements of the NBS targeted).

Milne Construction stated within their Quotation 'Allowances have been made to return all aspects of the exterior to visually appear similar to pre-earthquake with the interior having an altered layout including finishes', it would be fair to assume that the interior would be subject to a certain amount of betterment.

For the purposes of this review the quotation provided would need to reflect the works required to bring the structure up to the required NBS level using current building techniques and based on a standard of finish no greater or lesser than that prior to the earthquakes. Ideally to do this we would need to omit any item which would be deemed as betterment and substitute those items with elements matching those pre-earthquakes. To carry out this we would need further detail to establish what elements are classed as betterment.

We would suspect given the photographs we have received from Christchurch City Council that the following items may be classed either wholly or in part as betterment:

HVAC – Supply and install ducted central heating $42,355 (escalated $50,710)
Fire system – supply and install $65,000 (escalated $77,823)
Curtains – Supply and install $72,913 (escalated $87,297)
Note all figures above exclude Margins, Contingencies, Professional Fees and P&G and some allowances should still be made for reinstatement of the existing elements

Replacement cost

Given the type of building and standard of finishes included we would allow a high-level replica replacement cost of around $8,000/m2 (subject to further detail) which based on an approximate GFA of 1,643 m2 equates to an estimated replacement cost of around $13,144,000 excluding GST

DOCUMENTATION

- Quoin Structural Consultants
  - Structural Assessment Report – 17 May 2019
- Milne Construction
  - Repair Estimate – 3 July 2019
- DPA Architects
  - Drawing Set – June 2019

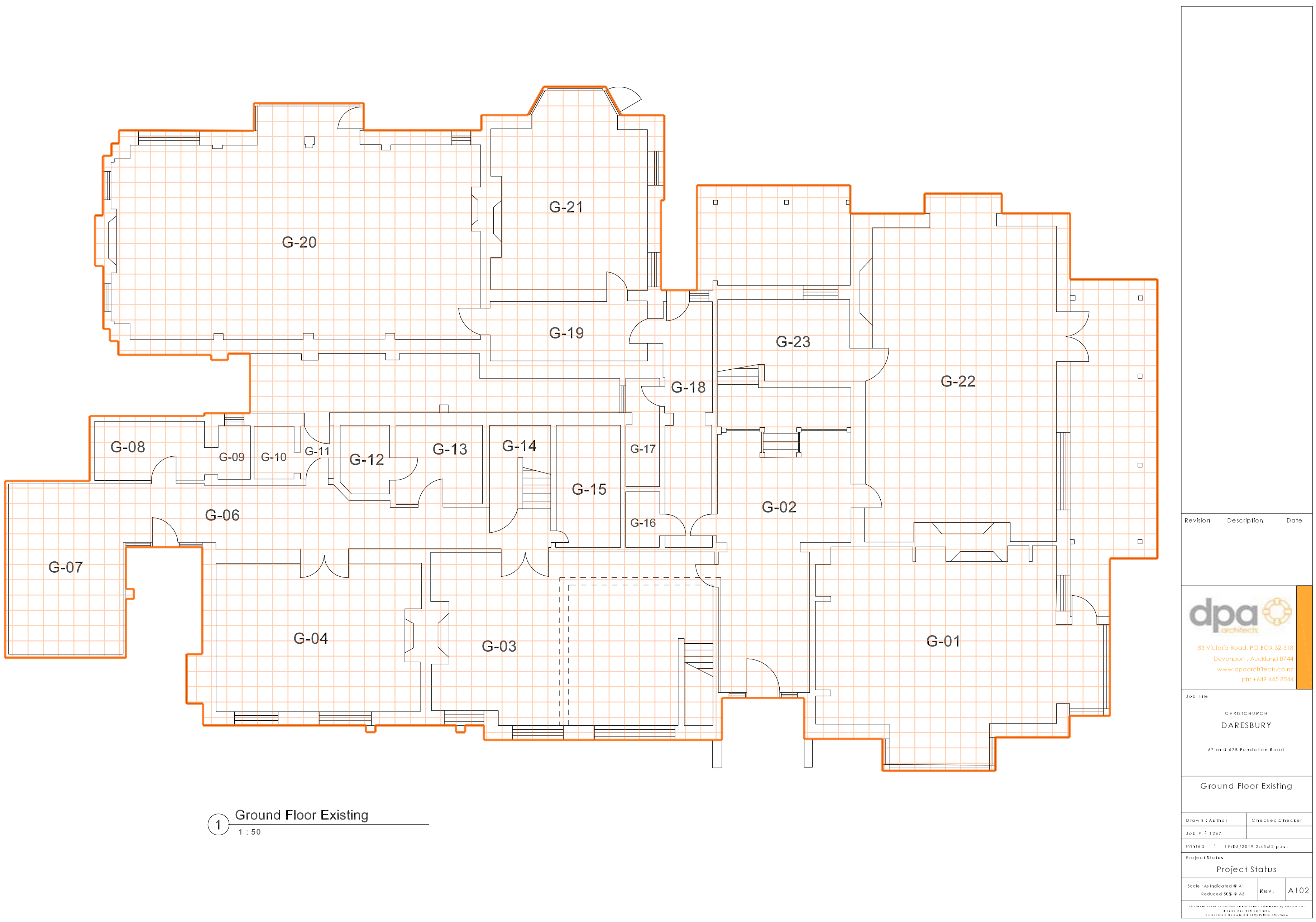
Appendix A

GFA Calculations In Accordance With NZIQS Guidelines

CostX Drawing

Project: Christchurch City Council
Building: 3380/002 - Daresbury House

Drawing: DPA Architects\A102 - Ground Floor Existing
Filename: R:\CostX Drawings\3CH\3CH 33\3380 Heritage Plan Change\3380_002 3 Daresbury Lane\Daresbury 9 HIGs application - DPA Architects 19-06-19 Drawi

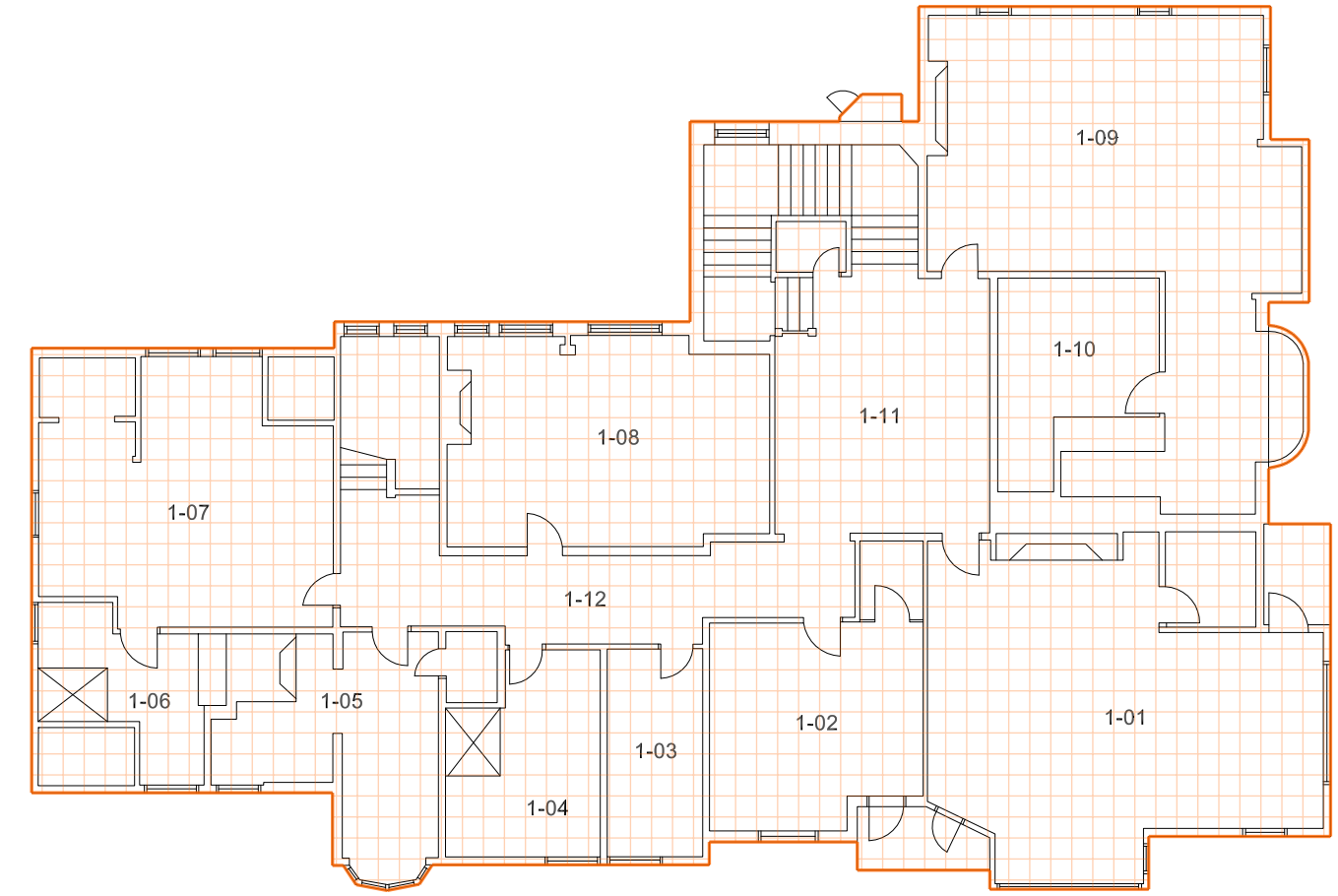


Legend
R0\E00 Standards
R0E00 GFA 800 m2

CostX Drawing

Project: Christchurch City Council
Building: 3380/002 - Daresbury House

Drawing: DPA Architects\A104 - First Floor Existing
Filename: R:\CostX Drawings\3CH\3CH 33\3380 Heritage Plan Change\3380_002 3 Daresbury Lane\Daresbury 9 HIGs application - DPA Architects 19-06-19 Drawi



1 First Floor Existing
1 : 50

Legend

R0\E00 Standards
R0E00 GFA 599 m2

Revision Description Date

dpa architects
83 Victoria Road, PO BOX 32-315
Devonport, Auckland 0744
www.dpoarchitects.co.nz
ph: +649 445 8544

Job Title
CHRISTCHURCH
DARESBURY
67 and 67B Fendalton Road

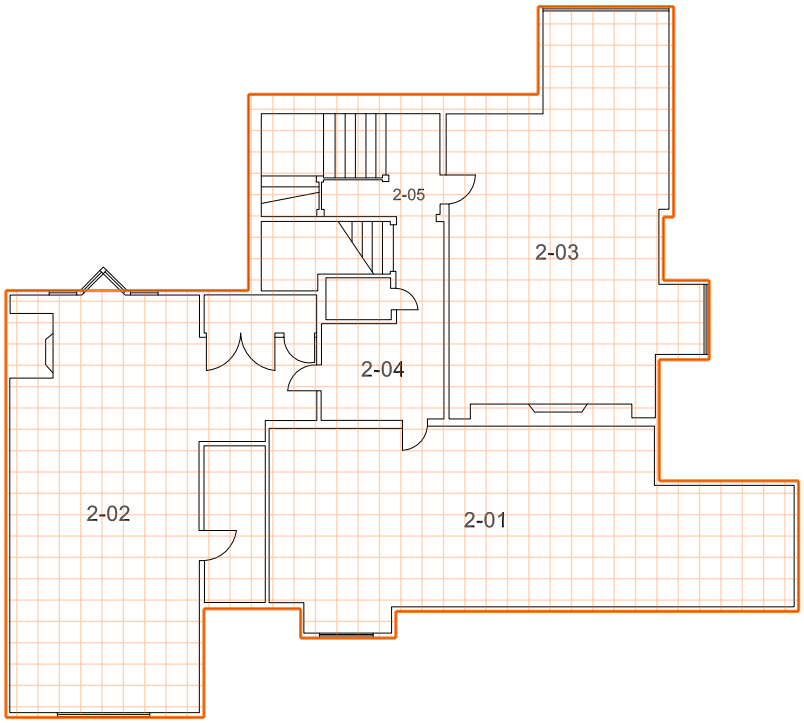
First Floor Existing

Drawn: AUWer | Checked: Director
Job #: 1267
Printed: 19/06/2019 3:16:03 p.m.
Project Status
Project Status
Scale: As Indicated @ A1 Reduced 50% @ A3 | Rev. | A104

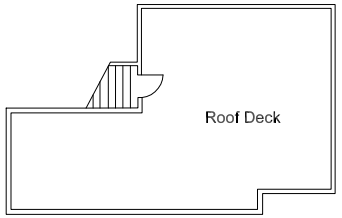
CostX Drawing

Project: Christchurch City Council
Building: 3380/002 - Daresbury House

Drawing: DPA Architects\A106 - Second Floor Existing
Filename: R:\CostX Drawings\3CH\3CH 33\3380 Heritage Plan Change\3380_002 3 Daresbury Lane\Daresbury 9 HIGs application - DPA Architects 19-06-19 Drawi



1 Second Floor Existing
1 : 50



Legend

R0\E00 Standards
R0E00 GFA 244 m2

Revision	Description	Date

dpa architects
83 Victoria Road, PO BOX 32-315
Devonport, Auckland 0744
www.dpaarchitects.co.nz
ph: +649 445 8544

Job Title
CHRISTCHURCH
DARESBURY
67 and 67B Fendalton Road

Second Floor Existing

Drawn: AUWer	Checked: Director
Job #: 1267	
Printed: 19/06/2019 3:47:22 p.m.	
Project Status: Project Status	
Scale: As Indicated @ A1 Reduced 50% @ A3	Rev. A106

Appendix B

Milne Construction Quotation

Address	Daresbury House - Reduced Repair Quotation
Property Reference #	Lot 2 DP49363 & Lot 3 DP49363
Valuation #	22015 11001
Customer Name	Journey Holdings Limited
Customer Adress	PO Box 3158, Waikuku Beach 7448
Customer Email	bronwyn@southernscreenworks.co.nz
Customer Phone	03 3181198
Main Contact Person	James Milne - Milne Construction Ltd
Work Phone	03 3514085
Mobile	021 423423
Date	3/07/2019

This Quotation has been prepared to carry out Engineered Design by Quion to repair the Building to a minimum of 67% of the Current Building Code. Allowances have been made to return all Aspects of the Exterior to Visually appear similar as pre-Earthquake with the Interior having an Altered Layout including Finishes. This would be done using current Building Techniques. Foundation would be a Concrete Steel Reinforced Grid Foundation with Timber Piles. The Structural Walls would be Timber Framed with Structural Steel Portals and Beams where required. Chimney Structures would be replaced with Structural Steel Frames; Fibreglass and Slip Brick Replica Chimneys installed to Two Areas where PreExisting Chimneys stood; Five Chimneys being deleted. Ply Bracing installed to all Exterior. The Exterior Cladding would be a combination of Red Brick Veneer (using 20% of Existing) and Pebbled Ash Plaster with Timber Facings on a Fibre Cement Sheet including a 20mm Cavity. The Roof Covering would be Terracotta Tiles, using 65% of Existing. New Ply, Membrane and Battons would be installed prior to Tile Reinstatement/Installation. All Metal Gutter to be replaced; reusing Cast Iron Rainheads where possible. Interior Linings would be a combination of New Gib & Existing Rimu Panelling Reinstalled. Four Brick Fireplaces to be carefully removed/refitted where possible. All care would be taken to Preserve Joinery and Fixtures for Reinstatement where able. Insulation to be installed in all Floors, Walls and Ceilings.

Site Preparation	$	519,730.00
SubStructure	$	562,654.00
Walls & Framing	$	445,470.10
Cladding	$	554,563.30
Roof	$	587,262.00
G01	$	55,496.38
G02	$	38,686.70
G03	$	59,024.74
G04 - New Garage	$	25,643.00
G05	$	4,252.00
G06 - Merged with G04	$	-
G07 - Merged with G04	$	-
G08 - Merged with G04	$	-
G09 - Merged with G04	$	-
G10 - Merged with G04	$	-
G11 - Merged with G04	$	-
G12 - Merged with G04	$	-
G13	$	11,491.00
G14	$	17,068.00
G15	$	6,704.00
G16	$	8,685.00
G17	$	8,104.00
G18	$	16,531.50
G19	$	14,941.00
G20	$	43,232.00
G21	$	20,912.00
G22	$	36,430.00
G23	$	8,369.70
G-Cellar	$	1,000.00
F01	$	31,707.10
F02	$	18,810.50
F03	$	16,767.00
F04	$	21,762.50
F05	$	14,071.50
F06	$	22,354.50
F07	$	15,081.00
F08	$	12,554.50
F09	$	22,396.00
F10	$	24,150.00
F11	$	15,629.00
F12	$	14,284.00
F13	$	25,903.00
S01	$	20,741.00
S02	$	43,967.00
S03	$	15,778.00
S04	$	15,077.00
S05	$	18,460.00
Contents	$	82,913.00
Sanitary Plumbing & Gas	$	76,784.00
Mechanical Services	$	42,355.00
Fire Services	$	65,000.00
Electrical Services	$	114,230.00
Drainage	$	28,600.00
Exterior	$	168,402.00
Allowances	$	185,676.87
Sub Total Excluding GST	**$**	**4,179,704.89**
Margins	$	313,477.87
Contingencies	$	417,970.49
Professional Fees	$	208,985.24
Project Management	$	90,000.00
P&G	$	208,985.24
Sub Total Excluding GST Including Margins, Contingencies and P&G	**$**	**5,419,123.73**
GST	**$**	**812,868.56**
Total	**$**	**6,231,992.29**

James Milne
DIRECTOR
P: 03 351 4085
M: 021 423 423
A: PO Box 232, Cashel Street, Central Christchurch 8140
www.milneconstruction.co.nz
E: james@milneconstruction.co.nz

Area	Aspect	Repair	Measurement	Sub-Cont'	Hours	Qty	Rate	Unit	Measure	Rate	Sub Total	Materials	Area Total	Comments	Sub-Totals
Site Prep	Establishment	Establishment - Storage Containers	6x 40 Foot	$ 27,000.00	hr	300	$ 50.00				$ 15,000.00	$8,000.00	$ 50,000.00		
Site Prep	Establishment	Establishment - Site Office		$ 6,000.00							$ -		$ 6,000.00		
Site Prep	Sediment Control	Sediment Control - Install Perimeter Sediment Control and Monitor		$ 10,000.00							$ -		$ 10,000.00		
Site Prep	Salvage	Salvage - Internal Doors to be Catalogued, Removed and Stored Carefully for Reuse	39		hr	110	$ 50.00				$ 5,500.00	$585.00	$ 6,085.00		
Site Prep	Salvage	Salvage - Exterior Windows, Skylights and Doors including Garage Door and Wrought Iron Gate to be Catalogued, Removed and Stored Carefully for Reuse	62x Windows 10x Ext Door 3x Skylights		hr	375	$ 50.00				$ 18,750.00	$950.00	$ 19,700.00		
Site Prep	Salvage	Salvage - Rimu, Mahogony and Oak Timber Wall Panelling including G01-4 Fireplace Joinery to be Catalogued, Removed and Stored Carefully for Reuse	362.01 m2		hr	500	$ 50.00				$ 25,000.00	$585.00	$ 25,585.00		
Site Prep	Salvage	Salvage - Cellar Door to be Catalogued, Removed and Stored Carefully for Reuse		$ 450.00	hr	4	$ 50.00				$ 200.00	$50.00	$ 700.00	Note: No Key, Locksmith Required	
Site Prep	Salvage	Salvage - Cool Room to be Catalogued, Removed and Stored Carefully for Reuse		$ 450.00	hr	16	$ 50.00				$ 800.00	$100.00	$ 1,350.00	DeGas Refridgeration Unit	
Site Prep	Salvage	Salvage - Gas Fire Places to be Catalogued, Removed and Stored Carefully for Reuse	14	$ 1,600.00	hr	70	$ 50.00				$ 3,500.00	$500.00	$ 5,600.00	Gasfitter	
Site Prep	Salvage	Salvage - Oak and Rimu Ceiling Panelling to be Catalogued, Removed and Stored Carefully for Reuse	187.64 m2		hr	243	$ 50.00				$ 12,150.00	$585.00	$ 12,735.00		
Site Prep	Salvage	Salvage - Kitchen Joinery to be Catalogued, Removed and Stored Carefully for Reuse			hr	50	$ 50.00				$ 2,500.00	$950.00	$ 3,450.00		
Site Prep	Salvage	Salvage - Laundry Joinery including Butlers Sink to be Catalogued, Removed and Stored Carefully for Reuse			hr	30	$ 50.00				$ 1,500.00	$200.00	$ 1,700.00		
Site Prep	Salvage	Salvage - General Joinery, Shelving and Cupboards to be Catalogued, Removed and Stored Carefully for Reuse			hr	120	$ 50.00				$ 6,000.00	$200.00	$ 6,200.00		
Site Prep	Salvage	Salvage - Staircases and Balustrading to be Catalogued, Removed and Stored Carefully for Reuse			hr	80	$ 50.00				$ 4,000.00	$200.00	$ 4,200.00		
Site Prep	Salvage	Salvage - Feature Posts, Beams, Arches and Corbells to be Catalogued, Removed and Stored Carefully for Reuse			hr	120	$ 50.00				$ 6,000.00	$950.00	$ 6,950.00		
Site Prep	Salvage	Salvage - Bathroom Joinery & Fixtures to be Catalogued, Removed and Stored Carefully for Reuse. Disposal of Items being Replaced	8 x Towel Rails 3 x Toilet Roll Holders 1x Bidet 6 x Shower Mixer 2 x Shower Rose 6 x Shower Slide 3 x Basin & Taps 2 x Bath & Mixer Bath & Shower Freestanding 2 x Bath Surround 2 x Mirrors 1x Mirror Cabinet 6 x Shower Glass 9 x Toilet 8 x Vanity 8 x Waste		hr	80	$ 50.00				$ 4,000.00	$200.00	$ 4,200.00		
Site Prep	Floor	Floor - Remove, Dispose Red Wool Carpet	804.16 m2		hr	85	$ 50.00				$ 4,250.00	$3,000.00	$ 7,250.00	Note: PPE Required	
Site Prep	Floor	Floor - Remove and Dispose Solid Oak Parquet with Border	38.74 m2		hr	6	$ 50.00				$ 300.00	$100.00	$ 400.00		
Site Prep	Floor	Floor - Remove and Dispose Tiles including Shower Base	64.8 m2		hr	60	$ 50.00				$ 3,000.00	$700.00	$ 3,700.00		
Site Prep	Wall Linings	Wall Linings - Remove Combination of Gib, Lath & Plaster, Battens and Dispose	1343.37 m2		hr	671	$ 50.00				$ 33,550.00	$5,850.00	$ 39,400.00		
Site Prep	Wall Linings	Wall Linings - Remove and Dispose Tiles	246.23 m2		hr	123	$ 50.00				$ 6,150.00	$2,250.00	$ 8,400.00		
Site Prep	Wall Linings	Wall Linings - Remove and Store Fabric Panelling	54 Panels		hr	54	$ 50.00				$ 2,700.00	$700.00	$ 3,400.00		
Site Prep	Wall Linings	Wall Linings - Remove and Dispose Hardies Villaboard	246.23 m2		hr	123	$ 50.00				$ 6,150.00	$1,260.00	$ 7,410.00		
Site Prep	Wall Linings	Wall Linings - Remove and Dispose Brick and Brick/Timber/Plaster Combination	1428 m2		hr	642	$ 50.00				$ 32,100.00	$7,000.00	$ 39,100.00	1428 m2 Minus 10% for Openings	
Site Prep	Ceiling Linings	Ceiling Linings - Remove Combination of Gib, Lath & Plaster, Battens, Coved Sections and Dispose	657.10 m2		hr	328	$ 50.00				$ 16,400.00	$3,150.00	$ 19,550.00		
Site Prep	Ceiling - Moulding	Ceiling - Remove and Store Rimu Detailed Moulding	77.6 m		hr	120	$ 50.00				$ 6,000.00	$510.00	$ 6,510.00		
Site Prep	Ceiling Linings	Ceiling - Remove and Store T&G Detailed	13 m2		hr	25	$ 50.00				$ 1,250.00	$225.00	$ 1,475.00		
Site Prep	Curved Ceiling Scotia	Curved Ceiling Scotia - Remove, Store Oak	26 Panels		hr	18	$ 50.00				$ 900.00	$250.00	$ 1,150.00		
Site Prep	Picture Rail	Picture Rail - Remove and Dispose	52.3m		hr	26	$ 50.00				$ 1,300.00	$250.00	$ 1,550.00		
Site Prep	Dado Rail	Dado Rail - Remove and Dispose Oak	23m		hr	8	$ 50.00				$ 400.00	$150.00	$ 550.00		
Site Prep	Seating Platform	Seating Platform - Remove and Dispose Two Step Up	16 m2		hr	18	$ 50.00				$ 900.00	$250.00	$ 1,150.00		
Site Prep	Skirting	Skirting - Remove and Dispose MDF	319m		hr	40	$ 50.00				$ 2,000.00	$250.00	$ 2,250.00		
Site Prep	Chimneys	Chimneys - Remove, Dispose All Chimney Stacks inside Structure			hr	810	$ 50.00				$ 40,500.00	$5,000.00	$ 45,500.00		
Site Prep	Sub-Floor	Sub-Floor - Remove, Dispose Timber including all Piles	546 m2		hr	340	$ 50.00				$ 17,000.00	$4,200.00	$ 21,200.00		
Site Prep	Ground Works	Ground Works - Excavate Sub-Floor to New Clearances	164 m3		hr	300	$ 50.00				$ 15,000.00	$4,920.00	$ 19,920.00		
Site Prep	Porch Structure	Porch Structure - To Entrance, Remove and Store	3600W x 3000H		hr	40	$ 50.00				$ 2,000.00	$950.00	$ 2,950.00		
Site Prep	Balcony Structure	Balcony Structure - Remove and Store including Balustrade and Floo			hr	40	$ 50.00				$ 2,000.00	$950.00	$ 2,950.00	EF	
Site Prep	Boiler Plant Room	Boiler Plant Room - Remove Plant and Structure including Concrete Pi			hr	60	$ 50.00				$ 3,000.00	$950.00	$ 3,950.00		
Site Prep	Wall Cladding	Wall Cladding - Carefully Remove Triple Course Exterior Red Brick, Salvaging where able	435 m2		hr	870	$ 50.00				$ 43,500.00	$18,000.00	$ 61,500.00		
Site Prep	Wall Cladding	Wall Cladding - Remove Plaster and Red Brick In-Fill, Dispose	421 m2		hr	200	$ 50.00				$ 10,000.00	$4,900.00	$ 14,900.00		
Site Prep	Brick Paving	Brick Paving - Remove and Dispose Border with Paved Brick In-Fil	329.6 m2	$ 13,160.00							$ -		$ 13,160.00		
Site Prep	Corbells	Corbells - Remove and Store	77		hr	150	$ 50.00				$ 7,500.00	$250.00	$ 7,750.00		
Site Prep	Deck	Deck - Remove and Dispose Hardwood with Perimeter Foundation and Detailed Moulded Board	25 m2		hr	20	$ 50.00				$ 1,000.00	$700.00	$ 1,700.00		
Site Prep	Downpipes	Downpipe - Remove and Store Cast Iron with Rainhead and Colorsteel Combination	74.4m		hr	63	$ 50.00				$ 3,150.00	$100.00	$ 3,250.00		
Site Prep	Mouldings	Mouldings - Remove and Store Timber to Bay Window, 70mm and Verandah	47m		hr	10	$ 50.00				$ 500.00	$100.00	$ 600.00		

Site Prep	Plaster Mouldings	Plaster Mouldings - On-Site Mould Impression of Floral Mould Impression 400x400 (10) and Samuel Hirst Seager (2)		$ 1,800.00	hr	4	$ 50.00				$ 200.00	$100.00	$ 2,100.00	Plastercraft	
Site Prep	Sub-Floor Vents	Sub-Floor Vents - Remove and Salvage Terracotta	Floor 12 Wall 2		hr	20	$ 50.00				$ 1,000.00	$100.00	$ 1,100.00		
Site Prep	Verandah Structure	Verandah Structure - Remove and Store Post, Beam, Arch Structure including Roof Framing	40m2		hr	60	$ 50.00				$ 3,000.00	$500.00	$ 3,500.00	NG-14	
Site Prep	Balcony Structure	Balcony Structure - Remove and Store Deck and Balustrade	2000W x 3000H x 1000D		hr	40	$ 50.00				$ 2,000.00	$500.00	$ 2,500.00	NF-10	
Site Prep	Verandah Structure	Verandah Structure - Remove and Dispose 4 Posts, Waterproofed, Dummy Rafters, Mouldings, T&G Soffit, Membrane Roof and Balustrading	2700W x 6000L 23m2		hr	50	$ 50.00				$ 2,500.00	$500.00	$ 3,000.00		
Site Prep	Site Prep G06, G07, G08	Site Prep G06, G07, G08 - Demolish and Dispose	38m2					m2	38.00	$ 95.00	$ -	$500.00	$ 500.00		
Site Preparation Sub-Total															$ 519,730.00
Site Prep	Foundations	Foundations - Remove and Dispose Existing where Replacement is Required	269m	$ 23,500.00							$ -		$ 23,500.00		
SubStructure	Foundations	Kings House Removals to Lift and Prop Structure and Relocate on New Framework:		$ 233,444.00									$ 233,444.00		
SubStructure	Foundations	Foundations - Supply and Install Type One 450x550 Foundation Footing including Upstand, Excavation, Reinforcing Steel, Formwork, Concrete and Placing						m3	20.00	$ 1,840.00	$ 36,800.00		$ 36,800.00		
SubStructure	Foundations	Foundations - Supply and Install Type Two 330x550 Foundation Footing including Upstand, Excavation, Reinforcing Steel, Formwork, Concrete and Placing						m3	7.00	$ 1,840.00	$ 12,880.00		$ 12,880.00		
SubStructure	Foundations	Foundations - Supply and Install Type Three 500x500 Foundation Footing including Excavation, Reinforcing Steel, Formwork, Concrete and Placing						m3	15.00	$ 1,840.00	$ 27,600.00		$ 27,600.00		
SubStructure	Foundations	Foundations - Supply and Install Type Four 150x500 Foundation Footing including Excavation, Reinforcing Steel, Formwork, Concrete and Placing						m3	0.40	$ 1,840.00	$ 736.00		$ 736.00		
SubStructure	Foundations	Foundations - Supply and Install Type Five 400x400 Foundation Footing including Excavation, Reinforcing Steel, Formwork, Concrete and Placing						m3	6.00	$ 1,840.00	$ 11,040.00		$ 11,040.00		
SubStructure	Foundations	Foundations - Supply and Install Type Six 500 RC Pad Foundation Footing including Excavation, Reinforcing Steel, Formwork, Concrete and Placing						m3	15.00	$ 1,840.00	$ 27,600.00		$ 27,600.00		
SubStructure	Foundations	Foundations - Supply and Install Type Seven 450x500 Foundation Footing including Upstand, Excavation, Reinforcing Steel, Formwork, Concrete and Placing						m3	0.60	$ 1,840.00	$ 1,104.00		$ 1,104.00		
SubStructure	Foundations	Foundations - Supply and Install Garage Slab to South East Corner 7.3x10m						m2	73.00	$ 890.00	$ 64,970.00		$ 64,970.00		
SubStructure	Sub-Floor	Sub-Floor - Supply and Install Bearers, Joists, Polythene and Sheet Flooring						m2	473.00	$ 260.00	$ 122,980.00		$ 122,980.00		
SubStructure Sub-Total															$ 562,654.00
Wall Framing	Wall Framing	Wall Framing - Supply and Install New Timber Framing 150x50 Exterior Brick Walls						m2	435.00	$ 98.00	$ 42,630.00		$ 42,630.00		
Wall Framing	Wall Framing	Wall Framing - Supply and Install New Timber Framing 100x50 Interior Walls						m2	294.00	$ 88.00	$ 25,872.00		$ 25,872.00		
Wall Framing	Framing	Framing - Adjust First and Second Floors for Reconnection			hr	160	$ 50.00				$ 8,000.00	$4,050.00	$ 12,050.00		
Chimneys	Chimney Structures & Wall Framing	Chimney Structures & Wall Framing Supply and Install New Steel		$ 198,218.10	hr	400	$ 50.00				$ 20,000.00	$6,500.00	$ 224,718.10		
Chimneys	Chimney Structures	Chimney Structures - Supply and Install Block Work and Concrete Breasts to Five Chimneys		$ 2,800.00	hr	80	$ 50.00				$ 4,000.00	$1,350.00	$ 8,150.00		
Mid-Floors	Floor Joists	Floor Joists - Carry out Target Repairs including Flooring to Eliminate Deflection Issues			hr	160	$ 50.00				$ 8,000.00	$3,150.00	$ 11,150.00		
Wall Framing	Wall Framing	Wall Framing - Straighten Exterior Only			hr	240	$ 50.00				$ 12,000.00	$500.00	$ 12,500.00		
Wall Framing	Insulation	Insulation - Supply and Install Walls, Interior Walls, Ceiling and Floors					$ 25.00	m2	3820.00	$ 20.00	$ 76,400.00		$ 76,400.00		
Brick Work	Fireplaces	Fireplaces - Pulling Down and Numbering Bricks of Fireplaces, Relaying of Four Fireplaces		$ 32,000.00							$ -		$ 32,000.00	Team Brick	
Walls and Framing Sub-Total															$ 445,470.10
Wall Cladding	Bracing	Wall Cladding - Ply Bracing including All Hold Downs and Strapping						m2	846.00	$ 75.00	$ 63,450.00		$ 63,450.00		
Wall Cladding	Building Paper	Building Paper - Supply and Install including Flashing Tape to All Openings						m2	846.00	$ 15.00	$ 12,690.00		$ 12,690.00		
Site	Salvage	Salvage - ReFit Exterior Windows, Skylights and Exterior Doors	62x Windows 10x Ext Door 3x Skylights		hr	400	$ 50.00				$ 20,000.00	$1,755.00	$ 21,755.00	Note: Wrought Iron Gate KeyPad requires Locksmith	
Site	Salvage	Salvage - Supply and Install Missing Catches, Stays and Handles to Exterior Windows, Skylights and Doors including New Garage Doors and Existing Wrought Iron Gate			hr	150	$ 50.00				$ 7,500.00	$5,250.00	$ 12,750.00		
Wall Cladding	Cavity Battons	Cavity Battons - Supply and Install to Plaster Areas including All Flashing						m2	421.00	$ 45.00	$ 18,945.00		$ 18,945.00		
Wall Cladding	Flashing	Flashing - Remove, Dispose and Replace Ledge Flashing to North/West Gable	3m		hr	12	$ 50.00				$ 600.00	$600.00	$ 1,200.00		
Wall Cladding	Lintels	Lintels - Supply and Install			hr	40	$ 50.00				$ 2,000.00	$2,300.00	$ 4,300.00		
Wall Cladding	Sub-Floor Vents	Sub-Floor Vents - Reinstall Terracotta	Floor 12 Wall 2		hr	20	$ 50.00				$ 1,000.00	$1,900.00	$ 2,900.00		
Wall Cladding	Fibre Cement Board	Fibre Cement Board - Supply and Install to Plaster Areas						m2	421.00	$ 75.00	$ 31,575.00		$ 31,575.00		
Wall Cladding	Facings	Facings - Supply and Instal						m	1197.00	$ 40.00	$ 47,880.00		$ 47,880.00		
Wall Cladding	Corbells	Corbells - Refit	77		hr	200	$ 50.00				$ 10,000.00	$700.00	$ 10,700.00		
Wall Cladding	Termination Moulding	Termination Moulding - Supply and Install						m	257.00	$ 65.00	$ 16,705.00		$ 16,705.00		
Wall Cladding	Fascia	Fascia - Repairs where Required	166.6m		hr	150	$ 50.00				$ 7,500.00	$2,500.00	$ 10,000.00		
Wall Cladding	Wall Cladding	Wall Cladding - Supply and Install Rock Cote Cement Sheet System with a Pebble Dash Finish including Painting with Resene X200	421 m2	$ 109,650.00							$ -		$ 109,650.00	Get Plastered	
Wall Cladding	Plaster Mouldings	Plaster Mouldings - Supply and Installation of Floral Mould Impression 400x400 (10) and Samuel Hirst Seager (2)		$ 13,200.00							$ -		$ 13,200.00	Plastercraft	
Wall Cladding	Mouldings	Mouldings - Refit Timber to Bay Window, 70mm and Verandah						m	47.00	$ 40.00	$ 1,880.00		$ 1,880.00		

Site	Salvage	Salvage - Prep and Paint Exterior Windows and Doors including Garage Door and Wrought Iron Gate	62x Windows 10x Ext Door					m2	217.62	$ 140.00	$ 30,466.80		$ 30,466.80		
Garage	Cladding	Cladding - Prep and Paint Weatherboard Gable to Garage Area	3.6 m2					m2	3.60	$ 35.00	$ 126.00		$ 126.00		
Wall Cladding	Facings	Facings - Prep and Paint						m	1197.00	$ 20.00	$ 23,940.00		$ 23,940.00		
Wall Cladding	Termination Moulding	Termination Moulding - Prep and Paint						m	257.00	$ 20.00	$ 5,140.00		$ 5,140.00		
Wall Cladding	Fascia	Fascia - Prep and Paint						m	166.60	$ 30.00	$ 4,998.00		$ 4,998.00		
Wall Cladding	Soffits	Soffits - Prep and Paint						m	314.50	$ 35.00	$ 11,007.50		$ 11,007.50		
Wall Cladding	Exposed Rafters	Exposed Rafters - Paint						m	63.00	$ 35.00	$ 2,205.00		$ 2,205.00		
Wall Cladding	Sill Bricks	Sill Bricks - Cutting out of Sill Bricks on Existing House		$ 4,500.00							$ -		$ 4,500.00	Team Brick	
Wall Cladding	Brick Work	Brick Work - Supply New Bricks, Supplying Sand, Cement and Ties, Cutting of Bricks, Laying of Bricks		$ 92,600.00							$ -		$ 92,600.00	Team Brick	
Cladding Sub-Total															$ 554,563.30
Roof	Roof Covering	Roof Covering - Remove Existing Metal to Flat Roof Areas, Re-Pitch Falls, Supply and Fit New Plywood ready for TPO Install			hr	200	$ 50.00				$ 10,000.00	$4,850.00	$ 14,850.00		
Roof	Roof Covering	Roof Covering - Straighten Existing Roof, Replace any Timbers required ready for Roofer			hr	160	$ 50.00				$ 8,000.00	$5,500.00	$ 13,500.00		
Roof	Roof Covering	Roof Covering - Supply and Install 1.5mm Enviro Clad TPO to all Upper and Lower Flat Roof Areas		$ 26,250.00							$ -		$ 26,250.00	Superior Roofing	
Roof	Roof Covering	Roof Covering - Remove Existing Plain Clay Roof Tile, Sort, Clean, Pallet. Supply and Install 15mm T&G Plywood fixed direct to Trusses or Existing Sarking (straightened by Builder). Supply and Install Peel and Stick Membrane to Plywood. Install Counter Batton. Install Existing Plain Tiles, Ridgings and Finals. Supply and Install Lead Flashings to Aprons Chinmeys and Penetrations. Includes Deletion of Old Garage Structure		$ 328,922.00							$ -		$ 328,922.00	Superior Roofing	
Roof	Roof Covering	Roof Covering - Supply of Extra New Plain Clay Tiles to Replace Existing Tiles for Full Re-Roo		$ 88,750.00							$ -		$ 88,750.00		
Roof	Gutter	Gutter - Supply and Install New Copper						m	184.00	$ 60.00	$ 11,040.00		$ 11,040.00		
Roof	Chimneys	Chimneys - Supply and Install Replica Chimney Sleeves	2	$ 84,000.00							$ -		$ 84,000.00		
Roof	Downpipes	Downpipe - Refit Cast Iron with Rainhead and Colourstee Combination including Painting	74.4m		hr	220	$ 50.00				$ 11,000.00	$3,100.00	$ 14,100.00	Note: Some ReCasting of New may be Required	
Roof	Roof Covering	Roof - Remove, Dispose and Replace to Curved Bay Window	600W x 2000L 2m2		hr	40	$ 50.00				$ 2,000.00	$700.00	$ 2,700.00		
Roof	Roof Covering	Roof - Remove, Dispose and Replace Verandah	40m2				$ 50.00				$ -		$ -	See Superior Roofing above	
Roof	Roof Covering	Roof - Over Bay Window	1m2		hr	30	$ 50.00				$ 1,500.00	$1,100.00	$ 2,600.00		
Roof	Sewer Stack	Sewer Stack - Remove, Dispose and Replace Colourstee Façade and Rainhead, PVC 100mm	3.1m		hr	7	$ 50.00				$ 350.00	$200.00	$ 550.00		
Roof Sub-Total															$ 587,262.00
G01-1	Fireplace	Fireplace - Gas Back Splayed Corners Reinstall	1000W x 450D		hr	8	$ 50.00				$ 400.00	$250.00	$ 650.00		
G01-2	Hearth	Hearth - Winkleman with Feature Border Reinstall	1650W x 425D		hr	25	$ 50.00				$ 1,250.00	$1,300.00	$ 2,550.00		
G01-3	Mantel	Mantel - Small Heritage Brick Reinstall	1020H x 1650W		hr	25	$ 50.00				$ 1,250.00	$500.00	$ 1,750.00		
G01-4	Fireplace Joinery	Fireplace Joinery - Oak Joinery with Mirrors 'Qvoe', Copper Insert of Two Women Sitting on Chair x2 Reinstall and Polyurethane	9.87 m2 2264H x 4360W x 490D	$ 2,566.00	hr	60	$ 50.00				$ 3,000.00	$1,800.00	$ 7,366.00		
G01-5	Wall Panelling	Wall Panelling - Oak Reinstall and Polyurethane	26.4m2 5.208m x 400H & 18.79m x 1230H	$ 1,161.00	hr	105	$ 50.00				$ 5,250.00	$1,267.00	$ 7,678.00		
G01-6	Feature Joinery	Feature Joinery - Posts, Oak Beams & Oak Corbells Reinstall and Polyurethane	Posts x10 Beams 12.2m Corbells x 10	$ 1,161.00	hr	105	$ 50.00				$ 5,250.00	$500.00	$ 6,911.00		
G01-7	Dado Rail	Dado Rail - Oak Reinstall and Polyurethane	23m	$ 621.00	hr	14	$ 50.00				$ 700.00	$724.00	$ 2,045.00		
G01-8	Curved Ceiling Scotia	Curved Ceiling Scotia - Rebuild Curved Ceiling, Refit Oak (26) and Polyurethane	600H x 450W	$ 1,040.00	hr	59	$ 50.00				$ 2,950.00	$1,150.00	$ 5,140.00		
G01-9	Ceiling Panels	Ceiling Panels - Oak (Window 1100Lx2560W 2.82m2) Reinstall and Polyurethane	27m2 6600L x 4.08W	$ 1,188.00	hr	108	$ 50.00				$ 5,400.00	$1,296.00	$ 7,884.00		
G01-10	Skillon Oak Panels	Skillon Oak Panels - To Window Ceiling Reinstall and Polyurethane	3.68m2 1156W x 3180L	$ 182.00	hr	17	$ 50.00				$ 850.00	$198.00	$ 1,230.00		
G01-11	Power Points	Power Points - Clipsal Horizontal Single	Five								$ -		$ -	See Electrical Below	
G01-12	Phone Jack	Phone Jack - Clipsal Horizontal Single	One								$ -		$ -	See Electrical Below	
G01-13	Window	Window - Cedar with Rimu Frame, 3 Sashes Prep and Polyurethane	1364W x 771H Oak Reveal 250D	$ 224.00							$ -		$ 224.00		
G01-14	Bay Window	Bay Window - Leadlight to above Windows. Cedar Sashes & Revels, Brass Hardware Prep and Polyurethane x2	3176W x 1150D	$ 2,624.00							$ -		$ 2,624.00		
G01-15	Interior Door	Interior Door - Oak Panelled, Brass Ring Handle Prep and Polyurethane	922W x 2100H	$ 290.00							$ -		$ 290.00		
G01-16	Light Switch	Light Switch - 4 Gang	One								$ -		$ -	See Electrical Below	
G01-17	Curved Mantels	Curved Mantels - Oak x2 Reinstall and Polyurethane	350W x 180D & 425W x 220D	$ 450.00	hr	6	$ 50.00				$ 300.00	$80.00	$ 830.00		
G01-18	Floor	Floor - Red Wool Carpet Supply and Install	49.81m2					m2	49.81	$ 115.00	$ 5,728.15		$ 5,728.15	Feltex Grandoise 70oz Carpet	
G01-19	Wall Covering	Wall Covering - Supply and Install Textured Lining Paper, Painted to Walls, Coved/Curved Ceiling including New Gib	22.19m2					m2	22.19	$ 117.00	$ 2,596.23		$ 2,596.23		
G01 Sub-Total															$ 55,496.38
G02-1	Exterior Door	Exterior Door - Rimu Front Door & Side Leadlights Prep and Polyurethane	6.69m2 2850W x 2346H	$ 1,204.00							$ -		$ 1,204.00		
G02-2	Wall Panelling	Wall Panelling - Rimu Reinstall and Polyurethane	11.3m 25m2 2200H	$ 496.00	hr	45	$ 50.00				$ 2,250.00	$782.00	$ 3,528.00	5m2 Rotten	
G02-3	Feature Joinery	Feature Joinery - Posts, Beam & Arch Details to Feature Wall entering Lounge Reinstalling and Polyurethane	9.96m2 3545W x 2800H	$ 550.00	hr	50	$ 50.00				$ 2,500.00	$597.00	$ 3,647.00		
G02-4	Feature Joinery	Feature Joinery - Rimu Beam and 2x Large Rimu Corbell Reinstall and Polyurethane	Beam 2585W 1180 900x750	$ 520.00	hr	20	$ 50.00				$ 1,000.00	$300.00	$ 1,820.00		
G02-5	Feature Joinery	Feature Joinery - Hand Carved Newell, Post x2, Balustrade, Post x4 Corbells x6 Reinstall and Polyurethane	4455W x 2625H	$ 1,300.00	hr	62	$ 50.00				$ 3,100.00	$694.00	$ 5,094.00	Post & Corbell Rotten	
G02-6	Step & Landing	Step & Landing - Refit Stairs and Rebuild Landing	Step 1500W x 90D x 645 Rise Landing 4397W x 1386D		hr	45	$ 50.00				$ 2,250.00	$470.00	$ 2,720.00		
G02-7	Wall Panelling	Wall Panelling - Rimu Panelling to Landing Reinstall and Polyurethane	5.5m 870H	$ 211.00	hr	19	$ 50.00				$ 950.00	$336.00	$ 1,497.00	1.11m2 Rotten	

G02-8	Wall Covering	Wall Covering - Supply and Install Textured Lining Paper, Painted to Walls including Gil	15.7m2					m2	15.70	$ 117.00	$ 1,836.90		$ 1,836.90		
G02-9	Ceiling Panels	Ceiling Panels - Rimu with Detailed Double Scotia to Foyer Reinstall and Polyurethane	28.47m2 12.84 15.63	$ 1,252.00	hr	114	$ 50.00				$ 5,700.00	$1,366.00	$ 8,318.00		
G02-10	Ceiling Panels	Ceiling Panels - Rimu Panels with Moulding and Single T&G Diagonal Scotia Reinstall and Polyurethan	3.89m2	$ 171.00	hr	16	$ 50.00				$ 800.00	$187.00	$ 1,158.00		
G02-11	Feature Joinery	Feature Joinery - Rimu Pitched T&G Moulded Batten Scotia with Corbells and Posts Reinstall and Polyurethane	3m2 Corbells 4x Small 2x Large Posts x2	$ 265.00	hr	55	$ 50.00				$ 2,750.00	$660.00	$ 3,675.00		
G02-12	Floor	Floor - Supply and Install Red Wool Carpet	35.12 m2					m2	35.12	$ 115.00	$ 4,038.80		$ 4,038.80		
G02-13	Coat Hooks	Coat Hooks - Reinstall	Six		hr	2	$ 50.00				$ 100.00	$50.00	$ 150.00		
G02 Sub-Total															$ 38,686.70
G03-1	Floor	Floor - Solid Oak Parquet with Border Supply and Instal	38.74m2					m2	38.74	$ 351.00	$ 13,597.74		$ 13,597.74		
G03-2	Kitchen Joinery	Kitchen Joinery - Kitchen Cabinets and Doors Ornate Colonial Style, Painted. Reinstall and Repair Existing Kitchen with Modification		$ 21,000.00	hr		$ 50.00				$ -		$ 21,000.00		
G03-3	Rangehood	Rangehood - 'Rosieres' In-Built Reinstall	One		hr	7	$ 50.00				$ 350.00	$150.00	$ 500.00		
G03-4	Bench Tops	Bench Tops - White Corian, stepped in around Windows Reinstal	600-830W x 7100L	$ 6,500.00							$ -		$ 6,500.00		
G03-5	Fireplace	Fireplace - Gas Reinstal	730W x 500D		hr	8	$ 50.00				$ 400.00	$250.00	$ 650.00		
G03-6	Fire Surround	Fire Surround - Marble Surround & Hearth Reinstall	1800W x 1200H x 350D		hr	30	$ 50.00				$ 1,500.00	$2,100.00	$ 3,600.00		
G03-7	Wall Covering	Wall Covering - Supply and Install White Subway Ceramic Wall Tiles 100x400	5.29m2					m2	5.29	$ 250.00	$ 1,322.50		$ 1,322.50		
G03-8	Cellar Door	Cellar Door - Black Solid Steel Cage with Frosted Glass Backing Reinstal	1100W x 2122H		hr	5	$ 50.00				$ 250.00	$50.00	$ 300.00		
G03-9	Skirting	Skirting - Painted Mdf 230H Supply and Instal	9.5m					m	9.50	$ 55.00	$ 522.50		$ 522.50		
G03-10	Interior Door	Interior Door - Rimu Panelled Door and Architrave, 1/2 Paint - 1/2 Varnish to Kitchen/Entrance Prep and Polyurethane	810W x 1970H	$ 290.00							$ -		$ 290.00		
G03-11	Interior Door	Interior Door - Double French Door with Glass Panelling, 1/2 Paint - 1/2 Varnish to Kitchen/Servants Hallway Prep and Polyurethane/Pain	1700W x 1970H	$ 390.00							$ -		$ 390.00		
G03-12	Window	Window - Leadlight Prep and Polyurethane	2621W x 1236H	$ 504.00							$ -		$ 504.00		
G03-13	Window	Window - Leadlight Prep and Polyurethane	1644W x 1229H	$ 310.00							$ -		$ 310.00		
G03-14	Window	Window - Double Hung Sash Prep, Polyurethane and Repair	800W x 1375H	$ 168.00	hr	5	$ 50.00				$ 250.00		$ 418.00	Rotten	
G03-15	Wall Covering	Wall Covering - Straighten, Supply and Install Gib, Stopping and Pain	77.4m2					m2	77.40	$ 75.00	$ 5,805.00		$ 5,805.00		
G03-16	Ceiling	Ceiling - Straighten, Supply and Install Gib, Stopping and Pain	44.2m2					m2	44.20	$ 75.00	$ 3,315.00		$ 3,315.00		
G03-17	Plumbing	Plumbing - To Fridge									$ -		$ -	See Plumbing Below	
G03-18	Gas	Gas - To Stove									$ -		$ -	See Gas Below	
G03-19	Light Fitting	Light Fitting	Twenty								$ -		$ -	See Electrical Below	
G03-20	Speakers	Speakers	Two								$ -		$ -	See Electrical Below	
G03-21	Smoke Alarms	Smoke Alarms	Two								$ -		$ -	See Fire Below	
G03 Sub-Total															$ 59,024.74
G04-1	Floor	Floor - Supply and Install Garage Carpet	73m2					m2	73.00	$ 42.00	$ 3,066.00		$ 3,066.00		
G04-2	Garage Doors	Garage Doors - Supply and Install Double and Single Cedar including Framing		$ 7,380.00	hr	16	$ 50.00				$ 800.00	$590.00	$ 8,770.00		
G04-3											$ -		$ -		
G04-4											$ -		$ -		
G04-5											$ -		$ -		
G04-6											$ -		$ -		
G04-7	Wall Covering	Wall Covering - Supply and Install Gib, Stopping and Pain	73m2 2769H					m2	73.00	$ 75.00	$ 5,475.00		$ 5,475.00		
G04-8	Ceiling	Ceiling - Supply and Install New Gib, Stopping and Pain	73m2					m2	73.00	$ 75.00	$ 5,475.00		$ 5,475.00		
G04-9	Light Fitting	Light Fitting	Ten								$ -		$ -	See Electrical Below	
G04-10	Skirting	Skirting - Painted Mdf 230H Supply and Instal						m	38.00	$ 45.00	$ 1,710.00		$ 1,710.00	See Electrical Below	
G04-11	Security Alarm	Security Alarm	One								$ -		$ -	See Electrical Below	
G04-12											$ -		$ -	See Electrical Below	
G04-13	Window	Window - Open Sash Prep and Polyurethane	1654W x 1294H	$ 336.00							$ -		$ 336.00		
G04-14	Window	Window - Open Sash Prep and Polyurethane	1388W x 1119H	$ 231.00							$ -		$ 231.00		
G04-15	Interior Door	Interior Door - Rimu Double Solid French Door Prep and Polyurethane	1500W x 2000H	$ 580.00							$ -		$ 580.00		
G04 New Garage Sub-Total															$ 25,643.00
G05-1	Floor	Floor - Red Wool Carpet Supply and Install	6m2					m2	6	$ 115.00	$ 690.00		$ 690.00		
G05-2	Wall Panelling	Wall Panelling - Rimu Reinstall and Polyurethane	4.7m2 5.25m x 900H	$ 233.00	hr	21	$ 50.00				$ 1,050.00	$254.00	$ 1,537.00		
G05-3	Wall Covering	Wall Covering - Supply and Install Gib, Stopping and Pain	20m2					m2	20	$ 75.00	$ 1,500.00		$ 1,500.00		
G05-4	Ceiling	Ceiling - Supply and Install Gib, Stopping and Pain	7m2					m2	7	$ 75.00	$ 525.00		$ 525.00		
G05-5	Light Fitting	Light Fitting	Three								$ -		$ -	See Electrical Below	
G05-6	Speakers	Speakers	One								$ -		$ -	See Electrical Below	
G05 Sub-Total															$ 4,252.00
G06-1											$ -		$ -		
G06-2											$ -		$ -		
G06-3											$ -		$ -		
G06-4											$ -		$ -		
G06-5											$ -		$ -	See Electrical Below	
G06-6											$ -		$ -	See Electrical Below	
G06-7											$ -		$ -		
G06-8											$ -		$ -		
G06 Sub-Total															$ -
G07-1											$ -		$ -		
G07-2											$ -		$ -		
G07-3											$ -		$ -		
G07-4											$ -		$ -		
G07-5											$ -		$ -	See Electrical Below	
G07-6											$ -		$ -		
G07-7											$ -		$ -		
G07-8											$ -		$ -	See Electrical Below	
G07-9											$ -		$ -	See Electrical Below	
G07 Sub-Total															$ -
G08-1													$ -		
G08-2													$ -	Water Damaged	
G08-3													$ -		
G08-4													$ -	Water Damaged	
G08-5													$ -	See Electrical Below	
G08-6													$ -		
G08-7													$ -		
G08-8													$ -	See Electrical Below	
G08 Sub-Total															$ -
G09-1													$ -		
G09-2													$ -		
G09-3													$ -		
G09-4													$ -		
G09-5													$ -		
G09-6													$ -		
G09-7													$ -		
G09-8													$ -		
G09-9													$ -		

G09 Sub-Total															$ -
G10-1													$ -		
G10-2													$ -		
G10-3													$ -		
G10-4													$ -		
G10-5													$ -		
G10-6													$ -		
G10-7													$ -		
G10-8													$ -		
G10-9													$ -	See Electrical Below	
G10 Sub-Total															$ -
G11-1													$ -		
G11-2													$ -		
G11-3													$ -		
G11-4													$ -		
G11 Sub-Total															$ -
G12-1													$ -	Cool Store	
G12-2													$ -		
G12-3													$ -		
G12-4													$ -		
G12-5													$ -	See Electrical Below	
G12-6													$ -		
G12-7													$ -		
G12 Sub-Total															$ -
G13-1	Floor	Floor - Black Gloss Tiles. Supply and Install New Tiles including Underlay, Waterproofing and Underfloor Heating	6.0m2					m2	6	$ 435.00	$ 2,610.00		$ 2,610.00		
G13-2	Wall Covering	Wall Covering - Tan Tile to All Walls Supply and Instal	13.7m2					m2	14	$ 200.00	$ 2,740.00		$ 2,740.00		
G13-3	Cabinets	Cabinets - Melamine with Painted Door Fronts. Repair, Reinstall, Prep and Paint	Four	$ 1,440.00	hr	18	$ 50.00				$ 900.00	$400.00	$ 2,740.00		
G13-4	Butlers Sink	Butlers Sink - Large Porcelain with Black Stone Benchtop. Reinstall	4300L x 700D		hr	10	$ 50.00				$ 500.00	$300.00	$ 800.00		
G13-5	Window	Window - Large 3 Sash Supply and Install New, Prep and Polyurethane	2.3m2 2122W x 1100H	$ 372.00	hr	11	$ 50.00				$ 550.00		$ 922.00	Rotten	
G13-6	Wall Covering	Wall Covering - Supply and Install Gib, Stopping and Paint	10m2					m2	10	$ 75.00	$ 750.00		$ 750.00		
G13-7	Ceiling	Ceiling - Supply and Install Gib, Stopping and Paint	6.52m2					m2	6.52	$ 75.00	$ 489.00		$ 489.00		
G13-8	Interior Door	Interior Door - Rimu Solid Panel, 1/2 Paint and 1/2 Varnish. Prep and Varnish/Paint	910W x 2070H	$ 290.00							$ -		$ 290.00		
G13-9	Ironing Board	Ironing Board - Built-in. Reinsta	One		hr	3	$ 50.00				$ 150.00		$ 150.00		
G13-10	Light Fitting	Light Fitting	Two								$ -		$ -	See Electrical Below	
G13-11	Speakers	Speakers	One								$ -		$ -	See Electrical Below	
G13-12	Powerpoint	Power Points	Two								$ -		$ -	See Electrical Below	
G13 Sub-Total															$ 11,491.00
G14-1	Floor	Floor - Red Wool Carpet Supply and Install	7.9m2					m2	7.90	$ 115.00	$ 908.50		$ 908.50		
G14-2	Stairs	Stairs - 18 Step with Landing. Reinstall			hr	36	$ 50.00				$ 1,800.00	$630.00	$ 2,430.00		
G14-3	Wall Covering	Wall Covering - Rimu Wall Panelling Reinstall and Polyurethane	10.8m2 12m x 900H	$ 475.00	hr	45	$ 50.00				$ 2,250.00	$518.00	$ 3,243.00		
G14-4	Balustrading	Balustrading - Rimu Reinstall and Polyurethane	4m	$ 801.00	hr	28	$ 50.00				$ 1,400.00	$225.00	$ 2,426.00		
G14-5	Mirror	Mirror - Supply and Install New	Two 1900W x 800H					no	2	$ 448.00	$ 896.00		$ 896.00		
G14-6	Wall Covering	Wall Covering - Supply and Install Gib, Stopping and Paint	62m2					m2	62	$ 75.00	$ 4,650.00		$ 4,650.00		
G14-7	Window	Window - Leadlight, 6 Pane Prep and Paint	900W x 500H	$ 437.00							$ -		$ 437.00		
G14-8	Ceiling	Ceiling - Supply and Install Gib, Stopping and Paint	7.9m2					m2	7.90	$ 75.00	$ 592.50		$ 592.50		
G14-9	Skirting	Skirting - Painted Mdf 230H to Cupboard under Stairs Supply and Install	10m	$ 175.00				m	10	$ 45.00	$ 450.00		$ 625.00		
G14-10	Window	Window - Curved Prep and Paint	1200W x 900H	$ 195.00							$ -		$ 195.00		
G14-11	Fire Hose Reel	Fire Hose Reel	One								$ -		$ -	See Fire Below	
G14-12	Ceiling	Ceiling - Gib over Lath & Plaster Supply and Install Gib, Stopping and Paint	5m2					m2	5	$ 75.00	$ 375.00		$ 375.00	Cupboard Under Stairs	
G14-13	Interior Door	Interior Door - Rimu Solid Varnished Prep and Polyurethane	810W x 2100H	$ 290.00							$ -		$ 290.00	Cupboard Under Stairs	
G14 Sub-Total															$ 17,068.00
G15-1	Floor	Floor - Red Wool Carpet Supply and Install	8.1m2					m2	8.10	$ 115.00	$ 931.50		$ 931.50	Comms Room	
G15-2	Skirting	Skirting - Painted Mdf 230H Supply and Instal	11m					m	11	$ 45.00	$ 495.00		$ 495.00		
G15-3	Boards	Boards - Power Metering & Data Boards	Three								$ -		$ -	See Electrical Below	
G15-4	Wall Covering	Wall Covering - Supply and Install Gib, Stopping and Paint	28m2					m2	28	$ 75.00	$ 2,100.00		$ 2,100.00		
G15-5	Windows	Windows - Leadlight, 2 Pane. Supply and Install New, Prep and Paint	650W x 1060H	$ 933.00	hr	3	$ 50.00				$ 150.00		$ 1,083.00	Rotten	
G15-6	Shelving	Shelving - Painted Mdf. Reinstall, Prep and Paint	Three Sets of Six Shelves	$ 522.00	hr	9	$ 50.00				$ 450.00	$225.00	$ 1,197.00		
G15-7	Ceiling	Ceiling - Supply and Install Gib, Stopping and Paint	8.1m2					m2	8.10	$ 75.00	$ 607.50		$ 607.50		
G15-8	Interior Door	Interior Door - Rimu Solid, Stained and Polyurethane. Prep and Polyurethane	810W x 2100H	$ 290.00							$ -		$ 290.00		
G15-9	Light Fitting	Light Fitting	Three								$ -		$ -	See Electrical Below	
G15 Sub-Total															$ 6,704.00
G16-1	Floor	Floor - Black Tiles with Marble Border. Supply and Install New Tiles including Tile Backing, Waterproofing and Underfloor Heating	2m2					m2	2	$ 435.00	$ 870.00		$ 870.00		
G16-2	Wall Covering	Wall Covering - Tan Tile to All Walls Supply and Instal	15m2					m2	15	$ 200.00	$ 3,000.00		$ 3,000.00		
G16-3	Basin	Basin - Small Wall Hung Reinstall Vanity and Replace Taps	One	$ 550.00							$ -		$ 550.00		
G16-4	Toilet	Toilet - Freestanding. Supply and Install New	One	$ 1,100.00							$ -		$ 1,100.00		
G16-5	Accessories	Accessories - Towel Rail	One					no	1	$ 75.00	$ 75.00		$ 75.00		
G16-6	Accessories	Accessories - Toilet Roll Holde	One					no	1	$ 75.00	$ 75.00		$ 75.00		
G16-7	Wall Covering	Wall Covering - Supply and Install Gib, Stopping and Paint	15m2					m2	15	$ 75.00	$ 1,125.00		$ 1,125.00		
G16-8	Ceiling	Ceiling - Supply and Install Gib, Stopping and Paint	2m2					m2	2	$ 75.00	$ 150.00		$ 150.00		
G16-9	Interior Door	Interior Door - Rimu Frame Only. Supply and Install New Door. Prep and Polyurethane	810W x 2100H	$ 290.00	hr	4	$ 50.00				$ 200.00	$1,250.00	$ 1,740.00	No Door	
G16 Sub-Total															$ 8,685.00
G17-1	Floor	Floor - 'Winkleman' Antinque Tiles with Detail Supply and Instal	3.2m2					m2	3.20	$ 395.00	$ 1,264.00		$ 1,264.00		
G17-2	Wall Covering	Wall Covering - Detailed Antique Tiles, Various Colours. Supply and Install	8m2					m2	8	$ 395.00	$ 3,160.00		$ 3,160.00		
G17-3	Wall Covering	Wall Covering - Plastered Brick. Supply and Install Gib, Stopping and Paint	20m2					m2	20	$ 75.00	$ 1,500.00		$ 1,500.00		
G17-4	Basin	Basin - Small Wall Hung. Reinstall Vanity and Replace Taps	One	$ 550.00							$ -		$ 550.00		
G17-5	Toilet	Toilet - Antique 'Deluge' and System Supply and Reinstall Antique Toile	One	$ 1,100.00							$ -		$ 1,100.00	Stolen	
G17-6	Ceiling	Ceiling - Supply and Install Gib, Stopping and Paint	3.2m2					m2	3.20	$ 75.00	$ 240.00		$ 240.00		
G17-7	Interior Door	Interior Door - Rimu Panel with Glass Insert. Prep and Polyurethane	600W	$ 290.00							$ -		$ 290.00		
G17-8	Light Fitting	Light Fitting	Two								$ -		$ -	See Electrical Below	
G17 Sub-Total															$ 8,104.00

G18-1	Floor	Floor - Red Wool Carpet Supply and Install	12.3m2					m2	12.30	$ 115.00	$ 1,414.50		$ 1,414.50	Water Damaged Room	
G18-2	Wall Covering	Wall Covering - Rimu Wall Panelling Reinstall and Polyurethane	27m2	$ 1,188.00	hr	108	$ 50.00				$ 5,400.00	$1,296.00	$ 7,884.00		
G18-3	Interior Door	Interior Door - Rimu Stained with Leadlight Arch. Prep and Polyurethane	810W x 1970H	$ 290.00							$ -		$ 290.00		
G18-4	Exterior Door	Exterior Door - Rimu Stained with Leadlight Arch and Sidelight. Prep and Polyurethane	1400W x 1970H	$ 526.00							$ -		$ 526.00		
G18-5	Wall Covering	Wall Covering - Embossed Wallpaper, Painted. Supply Gib, Stopping, Embossed Wallpaper and Paint	22m2					m2	22	$ 117.00	$ 2,574.00		$ 2,574.00		
G18-6	Ceiling	Ceiling - Rimu. Supply and Install New, Prep and Polyurethane	5.6m2	$ 246.00	hr	22.00	$ 50.00				$ 1,100.00	$537.00	$ 1,883.00	Rotten	
G18-7	Ceiling	Ceiling - Lath & Plaster. Supply and Install Gib, Stopping and Pain	5.6m2					m2	5.60	$ 75.00	$ 420.00		$ 420.00		
G18-8	Archway	Archway - Timber and Brick. Rebuild Archway with Gib and Plaster			hr	14	$ 50.00				$ 700.00	$225.00	$ 925.00		
G18-9	Wall Covering	Wall Covering - Brick	49m2								$ -		$ -	Covered under Wall Framing	
G18-10	Feature Joinery	Feature Joinery - Square Rimu Opening. Reinstall, Prep and Polyurethane	1084W x 2057H	$ 144.00	hr	6	$ 50.00				$ 300.00	$171.00	$ 615.00		
G18-11	Light Fitting	Light Fitting	Two										$ -	See Electrical Below	
G18 Sub-Total															$ 16,531.50
G19-1	Floor	Floor - Red Wool Carpet Supply and Install	12m2					m2	12	$ 115.00	$ 1,380.00		$ 1,380.00		
G19-2	Wall Covering	Wall Covering - Rimu Wall Panelling Reinstall and Polyurethane	22m2	$ 968.00	hr	88	$ 50.00				$ 4,400.00	$1,056.00	$ 6,424.00		
G19-3	Wall Covering	Wall Covering - Embossed Wallpaper, Painted. Supply Gib, Stopping, Embossed Wallpaper and Paint	14m2					m2	14	$ 130.00	$ 1,820.00		$ 1,820.00		
G19-4	Wall Covering	Wall Covering - Brick and Timber	36m2								$ -		$ -	Covered under Wall Framing	
G19-5	Shelving	Shelving - Rimu, 2 Shelves. Reinstate and Polyurethane	1400W x 900H	$ 135.00	hr	7	$ 50.00				$ 350.00	$135.00	$ 620.00		
G19-6	Ceiling	Ceiling - Rimu. Reinstall and Polyurethane	12m2	$ 594.00	hr	54	$ 50.00				$ 2,700.00	$648.00	$ 3,942.00		
G19-7	Skylight	Skylight - Leadlight and Stained Glass, 8 Panes. Refit Timber Panelling and Beads, Polyurethane	1000W x 2800L	$ 261.00	hr	7	$ 50.00				$ 350.00	$144.00	$ 755.00		
G19-8	Track Lights	Track Lights	Eight								$ -		$ -	See Electrical Below	
G19 Sub-Total															$ 14,941.00
G20-1	Floor	Floor - Red Wool Carpet Supply and Install	76m2					m2	76	$ 115.00	$ 8,740.00		$ 8,740.00		
G20-2	Wall Covering	Wall Covering - Rimu Wall Panelling Reinstall and Polyurethane	52m2	$ 2,244.00	hr	208	$ 50.00				$ 10,400.00	$2,496.00	$ 15,140.00		
G20-3	Hearth	Hearth - Small Brick. Supply and Install	1500W x 400D								$ -		$ -	See Team Brick	
G20-4	Fireplace	Fireplace - Gas Splayed Corners Reinstall	1000W x 500D		hr	8	$ 50.00				$ 400.00	$250.00	$ 650.00		
G20-5	Mantle	Mantle - Oak with Mirror. Reinstall and Polyurethane	1800W x 1850H	$ 468.00	hr	12	$ 50.00				$ 600.00	$189.00	$ 1,257.00		
G20-6	Cupboard	Cupboard - Rimu & Cedar Pool Cue. Reinstall and Polyurethane	800W x 1500H	$ 234.00	hr	6	$ 50.00				$ 300.00	$135.00	$ 669.00		
G20-7	Window	Window - Leadlight. Prep and Polyurethane	1900W x 1400H	$ 430.00							$ -		$ 430.00		
G20-8	Window	Window - Bay Leadlight with Exterior Cedar Door 480W. Prep and Polyurethane	3300W x 1900H	$ 1,015.00							$ -		$ 1,015.00		
G20-9	Window	Window - Leadlight with Shutters. Prep and Polyurethane	1900W x 1400H	$ 478.00							$ -		$ 478.00		
G20-10	Window	Window - Leadlight Angled x2. Prep and Polyurethane	1100W x 1000H	$ 396.00							$ -		$ 396.00		
G20-11	Window	Window - Leadlight High x4. Prep and Polyurethane	600W x 1100H	$ 475.00							$ -		$ 475.00		
G20-12													$ -		
G20-13													$ -		
G20-14													$ -	See Team Brick	
G20-15													$ -		
G20-16	Wall Covering	Wall Covering - Brick	120m2								$ -		$ -	Covered under Wall Framing	
G20-17	Wall Covering	Wall Covering - Wallpaper, Painted. Supply Gib, Stopping and Pain	46m2					m2	46	$ 75.00	$ 3,450.00		$ 3,450.00		
G20-18	Interior Door	Interior Door - Rimu. Prep and Polyurethane	860W x 2100H	$ 290.00							$ -		$ 290.00		
G20-19	Ceiling	Ceiling - Detailed Rimu with Vaulted Ceiling Rafters. Repair Water Damaged Sections, Reinstall and Polyurethane	76m2 6700W x 11500L x 6500 Tall	$ 3,762.00	hr	90	$ 50.00				$ 4,500.00	$1,980.00	$ 10,242.00	Water Damaged Sections	
G20 Sub-Total															$ 43,232.00
G21-1	Floor	Floor - Red Wool Carpet Supply and Install	31m2					m2	31	$ 115.00	$ 3,565.00		$ 3,565.00		
G21-2	Wall Covering	Wall Covering - Rimu Wall Panelling Reinstall and Polyurethane	33m2	$ 1,452.00	hr	132	$ 50.00				$ 6,600.00	$1,584.00	$ 9,636.00		
G21-3	Window	Window - Leadlight x2. Prep and Polyurethane	1200W x 1600H	$ 621.00							$ -		$ 621.00		
G21-4	Window	Window - Bay with Exterior Door, Leadlight to Top Only. Prep and Polyurethane	2800W x 2300H	$ 1,043.00							$ -		$ 1,043.00		
G21-5	Hearth	Hearth - Brick	1070W x 400D								$ -		$ -	See Team Brick	
G21-6	Mantle	Mantel - Rimu. Reinstall and Polyurethane	1450W x 1450H	$ 207.00	hr	8	$ 50.00				$ 400.00	$150.00	$ 757.00		
G21-7	Fireplace	Fireplace - Gas. Reinstal	750W x 300D		hr	8	$ 50.00				$ 400.00	$250.00	$ 650.00		
G21-8	Interior Door	Interior Door - Rimu. Prep and Polyurethane	860W x 2100H	$ 290.00							$ -		$ 290.00		
G21-9	Wall Covering	Wall Covering - Brick and Timber	62m2								$ -		$ -	Covered under Wall Framing	
G21-10	Wall Covering	Wall Covering - Wallpaper, Painted. Supply Gib, Stopping and Pain	27m2					m2	27	$ 75.00	$ 2,025.00		$ 2,025.00		
G21-11	Ceiling	Ceiling - Supply and Install Gib, Stopping and Paint	31m2					m2	31.00	$ 75.00	$ 2,325.00		$ 2,325.00		
G21 Sub-Total															$ 20,912.00
G22-1	Floor	Floor - Red Wool Carpet Supply and Install	63m2					m2	63	$ 115.00	$ 7,245.00		$ 7,245.00		
G22-2	Skirting	Skirting - Bevelled, Painted Mdf 230H. Supply and Instal	22m					m	22	$ 45.00	$ 990.00		$ 990.00		
G22-3	Feature Joinery	Feature Joinery - Post & Beam Detailing. Reinstall and Polyurethane	40m	$ 1,980.00	hr	54	$ 50.00				$ 2,700.00	$2,160.00	$ 6,840.00		
G22-4	Picture Rail	Picture Rail - Double Moulded 150mm. Reinstall, Prep and Paint	22m					m	22	$ 50.00	$ 1,100.00		$ 1,100.00		
G22-5	Interior Door	Interior Door - Panelled, Painted. Prep and Paint	1000W x 2000H	$ 290.00							$ -		$ 290.00		
G22-6	Interior Door	Interior Door - Panelled, 1/2 Painted and 1/2 Varnish. Prep and Varnish/Paint	910W x 2000H	$ 290.00							$ -		$ 290.00		
G22-7	Fire Surround	Fire Surround - Rimu, Painted. Reinstall, Prep and Paint	3400W x 2200H	$ 342.00	hr	20	$ 50.00				$ 1,000.00	$350.00	$ 1,692.00		
G22-8	Hearth	Hearth - Small Brick	2800W x 500D								$ -		$ -	See Team Brick	
G22-9	Fireplace	Fireplace - Gas. Reinstal	1040W x 470D		hr	8	$ 50.00				$ 400.00	$250.00	$ 650.00		
G22-10													$ -	See Team Brick	
G22-11													$ -	See Team Brick	
G22-12													$ -		
G22-13													$ -	See Team Brick	
G22-14													$ -		
G22-15													$ -	Rotten	
G22-16	Cornice	Cornice - Rimu, Painted. Repair where Required, Reinstall, Prep and Paint	74m x 120H					m	74	$ 45.00	$ 3,330.00		$ 3,330.00		

G22-17	Wall Covering	Wall Covering - Supply and Install Gib, Stopping and Paint	87m2					m2	87	$ 75.00	$ 6,525.00		$ 6,525.00		
G22-18											$ -		$ -	Covered under Wall Framing	
G22-19	Window	Window - Rimu and Cedar. Prep and Paint/Polyurethane	3100W x 1900H	$ 954.00							$ -		$ 954.00		
G22-20	Exterior Door	Exterior Door - Cedar and Rimu French Doors. Prep and Paint/Polyurethane	1200W x 2100H	$ 410.00							$ -		$ 410.00		
G22-21	Window	Window - Cedar and Rimu Bay Window with Exterior French Door. Prep and Paint/Polyurethane	2500W x 2200H x 700D	$ 1,389.00							$ -		$ 1,389.00		
G22-22	Ceiling	Ceiling - Supply and Install Gib, Stopping and Paint	63m2					m2	63	$ 75.00	$ 4,725.00		$ 4,725.00		
G22 Sub-Total															$ 36,430.00
G23-1	Floor	Floor - Red Wool Carpet Supply and Install	5.38m2					m2	5.38	$ 115.00	$ 618.70		$ 618.70		
G23-2	Skirting	Skirting - Painted Mdf 230H. Supply and Install	8m					m	8	$ 45.00	$ 360.00		$ 360.00		
G23-3	Bar Joinery	Bar Joinery - Cabinet with Black Stone Bench Top. Reinstal	1600L x 610D x 40 Thick Cabinet 970W x 600D		hr	12	$ 50.00				$ 600.00	$200.00	$ 800.00		
G23-4	HWC	HWC - 'Rheem' 27/04/05 25 Litre Mains Pressure. Reinstal	405D x 385H	$ 350.00							$ -		$ 350.00		
G23-5	Sink Mixer	Sink Mixer - Supply and Install New	One								$ -	$550.00	$ 550.00		
G23-6	Feature Joinery	Feature Joinery - Rimu Detailed Panel with Glass Door. Reinstall and Polyurethane	805W x 1575H	$ 261.00	hr	4	$ 50.00				$ 200.00	$80.00	$ 541.00		
G23-7	Shelving	Shelving - Rimu, 4 Shelves. Reinstall and Polyurethane	860W x 500D	$ 144.00	hr	5	$ 50.00				$ 250.00	$50.00	$ 444.00		
G23-8	Corbells	Corbells - Rimu Detailed. Reinstall and Polyurethane	1560W x 600H	$ 135.00	hr	4	$ 50.00				$ 200.00	$100.00	$ 435.00		
G23-9	Wall Covering	Wall Covering - Supply and Install Gib, Stopping and Painting	20.3m2					m2	20.30	$ 75.00	$ 1,522.50		$ 1,522.50		
G23-10	Window	Window - Leadlight Obsure Exterior. Install New, Prep and Polyurethane	560W x 860H	$ 831.00	hr	6	$ 50.00				$ 300.00	$50.00	$ 1,181.00	Rotten	
G23-11	Ceiling	Ceiling - Supply and Install Gib, Stopping and Painting	6.5m2					m2	6.50	$ 75.00	$ 487.50		$ 487.50		
G23-12	Ceiling	Ceiling - Rimu Detailed Moulding. Reinstall and Polyurethane	21.6m					m	21.60	$ 50.00	$ 1,080.00		$ 1,080.00		
G23 Sub-Total															$ 8,369.70
GCellar-1	Wine Storage	Wine Storage - Remove, Store and Refit Terracotta Pipe			hr	16	$ 50.00				$ 800.00	$200.00	$ 1,000.00		
G-Cellar Sub-Total															$ 1,000.00
F01-1	Floor	Floor - Red Wool Carpet Supply and Install	39.74m2					m2	39.74	$ 115.00	$ 4,570.10		$ 4,570.10		
F01-2	Skirting	Skirting - Painted Mdf 230H Supply and Install	29m					m	29	$ 45.00	$ 1,305.00		$ 1,305.00		
F01-3													$ -		
F01-4													$ -		
F01-5													$ -		
F01-6													$ -	See Team Brick	
F01-7													$ -		
F01-8													$ -		
F01-9													$ -		
F01-10	Feature Joinery	Feature Joinery - Rimu, Detailed Post and Corbell Detail with 5x Wooden Insert Panels. Repair where Required, Reinstall, Prep and Paint	Posts x 5 Corbells & Arches x 13	$ 972.00	hr	50	$ 50.00				$ 2,500.00	$300.00	$ 3,772.00		
F01-11	Picture Rail	Picture Rail - 75mm Painted Rimu. Supply and Install New, Prep and Paint	30.3m					m	30.30	$ 25.00	$ 757.50		$ 757.50		
F01-12	Window	Window - Leadlight 21 Pane LHS Bay Window with a 1m Return. Prep and Paint	3300W x 1800H	$ 962.00							$ -		$ 962.00		
F01-13	Window	Window - Leadlight, 2 Pane with Arched Top Section. Prep and Paint	700W x 1400H	$ 158.00							$ -		$ 158.00		
F01-14	Window	Window - Leadlight, 4 Pane. Prep and Paint	2600W x 1400H	$ 589.00							$ -		$ 589.00		
F01-15	Vent	Vent - Detailed Ceiling Vent. Supply and Install New	One		hr	1	$ 50.00				$ 50.00	$20.00	$ 70.00		
F01-16	Exterior Door	Exterior Door - Leadlight, Rimu, 3 Pane. Prep and Paint	760W x 2100H	$ 290.00							$ -		$ 290.00		
F01-17	Exterior Door	Exterior Door - Leadlight, Rimu, 3 Pane. Prep and Paint	760W x 2100H	$ 290.00							$ -		$ 290.00		
F01-18	Ceiling	Wall Covering - Supply and Install Gib, Stopping and Paint	60m2					m2	60	$ 75.00	$ 4,500.00		$ 4,500.00		
F01-19	Interior Door	Interior Door - Rimu, Painted. Prep and Paint	860W x 2100H	$ 290.00							$ -		$ 290.00		
F01-20	Interior Door	Interior Door - Rimu, Painted. Prep and Paint	730W x 2100H	$ 290.00							$ -		$ 290.00	Bathroom Door	
F01-21	Floor	Floor - Black Tiles with Marble Border. Supply and Install New Tiles including Tile Backing, Waterproofing and Underfloor Heating	3.8m2					m2	3.80	$ 435.00	$ 1,653.00		$ 1,653.00		
F01-22	Waste	Waste - Floor and Shower. Supply and Install New	Two	$ 684.00							$ -		$ 684.00		
F01-23	Shower Glass	Shower Glass - Including Door. Supply and Install New		$ 1,900.00							$ -		$ 1,900.00		
F01-24	Wall Covering	Wall Covering - Tan Tile to All Walls Supply and Instal	19.5m2					m2	19.50	$ 200.00	$ 3,900.00		$ 3,900.00		
F01-25	Wall Covering	Wall Covering - Supply and Install Gib, Stopping and Paint	19.5m2					m2	19.50	$ 75.00	$ 1,462.50		$ 1,462.50		
F01-26	Vanity	Vanity - Wall Hung Colonial. Reinstall Vanity and Replace Taps	500W x 400D	$ 550.00							$ -		$ 550.00		
F01-27	Mirror Cabinet	Mirror Cabinet - Detailed Colonial, Painted. Reinstate, Prep and Paint	650W x 1300H x 150D	$ 144.00	hr	3	$ 50.00				$ 150.00	$20.00	$ 314.00		
F01-28	Accessories	Accessories - 10 Bar Towel Rail. Reinstall	One					no	1	$ 75.00	$ 75.00		$ 75.00		
F01-29	Toilet	Toilet - Freestanding Colonial. Supply and Install New	One	$ 1,100.00							$ -		$ 1,100.00		
F01-30	Shower Mixer	Shower Mixer - Supply and Instal	One	$ 160.00							$ -	$390.00	$ 550.00		
F01-31	Shower Slide	Shower Slide - Supply and Instal	One	$ 160.00							$ -	$390.00	$ 550.00		
F01-32	Basin Taps	Basin Taps - Supply and Insta	One	$ 160.00							$ -	$390.00	$ 550.00		
F01-33	Exterior Door	Exterior Door - Rimu, Leadlight, 2 Pane, Painted. Prep and Paint	500W x 2100H	$ 290.00							$ -		$ 290.00		
F01-34	Ceiling	Ceiling - Supply and Install Gib, Stopping and Paint	3.8m2					m2	3.80	$ 75.00	$ 285.00		$ 285.00		
F01 Sub-Total															$ 31,707.10
F02-1	Floor	Floor - Red Wool Carpet Supply and Install	17m2					m2	17	$ 115.00	$ 1,955.00		$ 1,955.00		
F02-2	Skirting	Skirting - Painted Mdf 230H Supply and Install	16m					m	16	$ 45.00	$ 720.00		$ 720.00		
F02-3	Exterior Door	Exterior Door - Leadlight, Rimu, 3 Pane, Painted. Prep and Paint	670W x 2100H	$ 290.00							$ -		$ 290.00		
F02-4	Window	Window - Leadlight, 4 Pane. Prep and Paint	1400W x 1700H	$ 385.00							$ -		$ 385.00		
F02-5	Feature Joinery	Feature Joinery - Rimu, 2x Posts, 2x Corbells. Reinstall, Prep and Pain	2700W x 2600H	$ 216.00	hr	8	$ 50.00				$ 400.00	$80.00	$ 696.00		
F02-6	Interior Door	Interior Door - Rimu, 1/2 Painted and 1/2 Varnish. Prep and Varnish/Pain	860W x 2100H	$ 290.00							$ -		$ 290.00		
F02-7	Wall Covering	Wall Covering - Supply and Install Gib, Stopping and Painting	44m2					m2	44	$ 75.00	$ 3,300.00		$ 3,300.00		
F02-8	Ceiling	Ceiling - Supply and Install Gib, Stopping and Paint	17m2					m2	17	$ 75.00	$ 1,275.00		$ 1,275.00		
F02-9	Shower Glass	Shower Glass - Including Door. Supply and Install New	1150W x 1920H	$ 1,900.00							$ -		$ 1,900.00		

F02-10	Floor	Floor - Black Stone Tile. Supply and Install including Tile Underla	2.1m2						m2	2	$ 305.00	$ 640.50		$ 640.50	Shower Room	
F02-11	Waste	Waste - Floor & Shower. Supply and Install	Two	$ 684.00								$ -		$ 684.00		
F02-12	Vanity	Vanity - Corner Wall Hung with Taps. Reinstall Vanity and Replace Taps	350 x 350	$ 550.00								$ -		$ 550.00		
F02-13	Wall Covering	Wall Covering - Black Stone Tile. Supply and Instal	15m2						m2	15	$ 250.00	$ 3,750.00		$ 3,750.00		
F02-14	Wall Covering	Wall Covering - Supply and Install Gib, Stopping and Painting	15m2						m2	15	$ 75.00	$ 1,125.00		$ 1,125.00		
F02-15	Ceiling	Ceiling - Supply and Install Gib, Stopping and Paint	2m2						m2	2	$ 75.00	$ 150.00		$ 150.00		
F02-16	Shower Mixer	Shower Mixer - Supply and Instal	One	$ 160.00								$ -	$390.00	$ 550.00		
F02-17	Shower Slide	Shower Slide - Supply and Instal	One	$ 160.00								$ -	$390.00	$ 550.00		
F02 Sub-Total																$ 18,810.50
F03-1	Floor	Floor - Tiled with Mosaic Detail. Supply and Install Winkleman including Tile Underlay, Waterproofing and Underfloor Heating	8m2						m2	8	$ 505.00	$ 4,040.00		$ 4,040.00		
F03-2	Wall Covering	Wall Covering - Tiled with Mosaic Detail. Supply and Install Winkleman	17m2 1400H						m2	17	$ 395.00	$ 6,715.00		$ 6,715.00		
F03-3	Wall Covering	Wall Covering - Supply and Install Gib, Stopping and Paint	32m2						m2	32	$ 75.00	$ 2,400.00		$ 2,400.00		
F03-4	Interior Door	Interior Door. Supply and Install, Prep and Paint	810W x 2100H	$ 290.00	hr	4	$ 50.00					$ 200.00	$1,250.00	$ 1,740.00	Door Missing	
F03-5	Bidet	Bidet - Antique Marble. Reinstal	One	$ 390.00								$ -		$ 390.00		
F03-6	Bath & Shower	Bath & Shower - Antique Shower Over 'Twyfords' Freestanding Bath, Popup Waste. Reinstall	One	$ 390.00	hr	2	$ 50.00					$ 100.00		$ 490.00		
F03-7	Window	Window - Leadlight. Prep and Pain	1100W x 1500H	$ 267.00								$ -		$ 267.00		
F03-8	Ceiling	Ceiling - Supply and Install Gib, Stopping and Paint	8m2						m2	8	$ 75.00	$ 600.00		$ 600.00		
F03-9	Light Fitting	Light Fitting - Marble/Stone Wal	Five 350W									$ -		$ -	See Electrical Below	
F03-10	Hand Rail	Hand Rail - Reinstal	950W		hr	2	$ 50.00					$ 100.00	$25.00	$ 125.00		
F03 Sub-Total																$ 16,767.00
F04-1	Floor	Floor - Black Tiles with Marble Border. Supply and Install New Tiles including Tile Backing, Waterproofing and Underfloor Heating	8.6m2						m2	9	$ 435.00	$ 3,741.00		$ 3,741.00		
F04-2	Vanity	Vanity - With Four Mirrors, Wall Panelling and Joinery on top of Vanity, Black Stone Top. Reinstate Vanity and Install New Taps	Vanity 2300L x 530D Joinery 4200L x 1500H	$ 300.00	hr	12	$ 50.00					$ 600.00	$600.00	$ 1,500.00		
F04-3	Bath	Bath - Built-in 'Clearlite' Spa. Reinstate	One	$ 450.00	hr	2	$ 50.00					$ 100.00	$100.00	$ 650.00		
F04-4	Bath Surround	Bath Surround - Built-in Stone Edge, Painted Detail to Base, Stone Step. Reinstate, Prep and Pain	1300W x 630H x 2000L	$ 250.00	hr	14	$ 50.00					$ 700.00	$200.00	$ 1,150.00		
F04-5	Accessories	Accessories - 10 Bar Towel Rail. Supply and Install New	One		hr	4	$ 50.00					$ 200.00	$380.00	$ 580.00	Rusted	
F04-6	Toilet	Toilet - Heritage Style Freestanding. Supply and Install New	One	$ 1,100.00								$ -		$ 1,100.00		
F04-7	Shower Glass	Shower Glass - Two Sided Enclosure. Supply and Install New	1100W x 1150W x 2000H	$ 1,900.00								$ -		$ 1,900.00		
F04-8	Wall Covering	Wall Covering - Tan Tile to Ceiling. Supply and Instal	26m2						m2	26	$ 200.00	$ 5,200.00		$ 5,200.00		
F04-9	Wall Covering	Wall Covering - Hardies Villaboard	31.2m2						m2	31.20	$ 75.00	$ 2,340.00		$ 2,340.00		
F04-10	Ceiling	Ceiling - Supply and Install Gib, Stopping and Paint	11.7m2						m2	11.70	$ 75.00	$ 877.50		$ 877.50		
F04-11	Bath Mixer	Bath Mixer	One	$ 160.00								$ -	$390.00	$ 550.00		
F04-12	Waste	Floor & Shower Waste - Supply & Install	Two	$ 684.00								$ -		$ 684.00		
F04-13	Shower Mixer	Shower Mixer	One	$ 160.00								$ -	$390.00	$ 550.00		
F04-14	Shower Slide	Shower Slide	One	$ 160.00								$ -	$390.00	$ 550.00		
F04-15	Interior Door	Interior Door - Prep and Pain	One	$ 390.00								$ -		$ 390.00		
F04 Sub-Total																$ 21,762.50
F05-1	Floor	Floor - Red Wool Carpet Supply and Install	18.3m2						m2	18.30	$ 115.00	$ 2,104.50		$ 2,104.50		
F05-2	Skirting	Skirting - Painted Mdf 230H Supply and Instal	25.5m						m	25.50	$ 45.00	$ 1,147.50		$ 1,147.50		
F05-3	Interior Door	Interior Door - Rimu Panelled 1/2 Paint and 1/2 Varnish (x2) Replace Missing Door, Prep and Varnish/Paint	810W x 2100H	$ 580.00	hr	4	$ 50.00					$ 200.00	$1,250.00	$ 2,030.00	One Door Missing	
F05-4														$ -		
F05-5														$ -		
F05-6														$ -		
F05-7														$ -		
F05-8	Wall Covering	Wall Covering - Supply and Install Gib, Stopping and Paint	61.8m2						m2	61.80	$ 75.00	$ 4,635.00		$ 4,635.00		
F05-9	Window	Window - Curved Leadlight Bay Window with Two Cushions. Prep, Paint and Replace Upholstery	1700W x 1700H x 550D	$ 468.00								$ -	$1,300.00	$ 1,768.00		
F05-10	Window	Window - Leadlight, 2 Sashes. Prep and Paint	1200W x 1300H	$ 252.00								$ -		$ 252.00		
F05-11	Ceiling	Ceiling - Gib over Lath & Plaster Supply and Install Gib, Stopping and Paint	18.3m2						m2	18.30	$ 75.00	$ 1,372.50		$ 1,372.50		
F05-12	Shelving	Shelving - Built-in Corner Wardrobe, Painted, 5 Shelf. Reinstall, Prep and Paint	1000W x 1000W	$ 162.00	hr	8	$ 50.00					$ 400.00	$200.00	$ 762.00		
F05-13	Boards	Boards - First Floor Main Switchboard and Cbus Cabine										$ -		$ -	See Electrical Below	
F05-14	Light Fitting	Light Fitting	Three									$ -		$ -	Missing. See Electrical Below	
F05 Sub-Total																$ 14,071.50
F06-1	Floor	Floor - Black Tiles with Marble Border. Supply and Install New Tiles including Tile Backing, Waterproofing and Underfloor Heating	9m2						m2	9	$ 435.00	$ 3,915.00		$ 3,915.00		
F06-2	Waste	Waste - 1x Floor and 1x Shower. Supply and Install New	Two	$ 760.00								$ -		$ 760.00		
F06-3	Vanity	Vanity - Over-head Detailed Mirror and Black Stone Top. Reinstall Vanity and Replace Taps	1500W x 500D	$ 270.00	hr	12	$ 50.00					$ 600.00	$780.00	$ 1,650.00		
F06-4	Accessories	Accessories - 10 Bar Towel Rail. Reinstate	One						no	1	$ 75.00	$ 75.00		$ 75.00		
F06-5	Toilet	Toilet - Colonial Style. Supply and Install New	One	$ 1,100.00								$ -		$ 1,100.00		
F06-6	Shower Glass	Shower Glass - Two Sided, Sloped to Ceiling. Supply and Instal	1080W x 1300W x 2539H	$ 1,900.00								$ -		$ 1,900.00		
F06-7	Shower Mixer	Shower Mixer - Supply and Instal	One	$ 160.00								$ -	$390.00	$ 550.00		
F06-8	Shower Slide	Shower Slide - Supply and Instal	One	$ 160.00								$ -	$390.00	$ 550.00		
F06-9	Interior Door	Interior Door - Rimu Panelled, Painted. Prep and Paint	810W x 2100H	$ 290.00								$ -		$ 290.00		
F06-10	Wall Covering	Wall Covering - Tan Tile to All Walls Supply and Instal	38m2						m2	38	$ 200.00	$ 7,600.00		$ 7,600.00		
F06-11	Wall Covering	Wall Covering - Hardies Villaboard	38m2						m2	38	$ 75.00	$ 2,850.00		$ 2,850.00		
F06-12	Window	Window - Leadlight, 2 Pane. Prep and Paint	1200W x 1300H	$ 252.00								$ -		$ 252.00		
F06-13	Ceiling	Ceiling - Supply and Install Gib, Stopping and Paint	11.5m2						m2	11.50	$ 75.00	$ 862.50		$ 862.50		
F06-14	Light Fitting	Light Fitting	Four									$ -		$ -	See Electrical Below	
F06 Sub-Total																$ 22,354.50
F07-1	Floor	Floor - Red Wool Carpet Supply and Install	32m2						m2	32	$ 115.00	$ 3,680.00		$ 3,680.00		
F07-2	Skirting	Skirting - Painted Mdf 230H Supply and Instal	29m						m	29	$ 45.00	$ 1,305.00		$ 1,305.00		

F07-3	Interior Door	Interior Door - Supply and Install New Door, Prep and Paint	810W x 2100H	$ 290.00	hr	4	$ 50.00				$ 200.00	$1,250.00	$ 1,740.00	Door Missing	
F07-4	Interior Door	Interior Door - Rimu French Doors to Wardrobe, Painted. Prep and Paint	1250W x 2000H	$ 580.00							$ -		$ 580.00		
F07-5	Window	Window - Leadlight, 4 Pane. Prep and Paint	2550W x 1270H	$ 523.00							$ -		$ 523.00		
F07-6	Window	Window - Leadlight, 2 Pane. Prep and Paint	700W x 1800H	$ 203.00							$ -		$ 203.00		
F07-7	Wall Covering	Wall Covering - Supply and Install Gib, Stopping and Paint	62m2					m2	62	$ 75.00	$ 4,650.00		$ 4,650.00		
F07-8	Ceiling	Ceiling - Supply and Install Gib, Stopping and Paint	32m2					m2	32	$ 75.00	$ 2,400.00		$ 2,400.00		
F07-9	Fire Hose Reel	Fire Hose Reel	One								$ -		$ -	See Fire Below	
F07 Sub-Total															$ 15,081.00
F08-1	Floor	Floor - Red Wool Carpet Supply and Install	30.2m2					m2	30.20	$ 115.00	$ 3,473.00		$ 3,473.00		
F08-2	Skirting	Skirting - Painted Mdf 230H Supply and Install	25m					m	25	$ 45.00	$ 1,125.00		$ 1,125.00		
F08-3	Window	Window - Leadlight, 1 Pane. Prep and Paint	750W x 600H	$ 81.00							$ -		$ 81.00		
F08-4	Window	Window - Leadlight, 3 Pane. Prep and Paint	1600W x 1100H	$ 284.00							$ -		$ 284.00		
F08-5	Window	Window - Leadlight, 4 Pane. Prep and Paint	1500W x 1750H	$ 424.00							$ -		$ 424.00		
F08-6													$ -		
F08-7													$ -		
F08-8													$ -		
F08-9													$ -		
F08-10	Wall Covering	Wall Covering - Supply and Install Gib, Stopping and Paint	61.5m2					m2	61.50	$ 75.00	$ 4,612.50		$ 4,612.50		
F08-11	Interior Door	Interior Door - Rimu Panelled 1/2 Paint and 1/2 Varnish (x2), Brass Vent to Base. Prep and Varnish/Paint		$ 290.00							$ -		$ 290.00		
F08-12	Ceiling	Ceiling - Supply and Install Gib, Stopping and Paint	30.2m2					m2	30.20	$ 75.00	$ 2,265.00		$ 2,265.00		
F08-13	Light Fitting	Light Fitting	Six								$ -		$ -	See Electrical Below	
F08 Sub-Total															$ 12,554.50
F09-1	Floor	Floor - Red Wool Carpet Supply and Install	52m2					m2	52	$ 115.00	$ 5,980.00		$ 5,980.00		
F09-2	Skirting	Skirting - Painted Mdf 230H Supply and Install	45m					m	45	$ 45.00	$ 2,025.00		$ 2,025.00		
F09-3													$ -	Note: Brick, Covered under Team Brick	
F09-4													$ -		
F09-5													$ -	See Team Brick	
F09-6													$ -		
F09-7	Window	Window - Leadlight, 2 Pane. Prep and Paint	700W x 1600H	$ 180.00							$ -		$ 180.00		
F09-8	Window	Window - Leadlight, 2 Pane. Prep and Paint	700W x 1600H	$ 180.00							$ -		$ 180.00		
F09-9	Window	Window - Leadlight, 2 Sashes. Prep and Paint	1200W x 1050H	$ 204.00							$ -		$ 204.00		
F09-10	Window	Window - Leadlight, 2 Sashes. Prep and Paint	1400W x 1400H	$ 316.00							$ -		$ 316.00		
F09-11	Window	Window - Curved Bay Window, 8 Pane, Mullions. Prep, Paint, Replace Upholstery Cushions	2700W x 1600H x 600D	$ 699.00							$ -	$1,500.00	$ 2,199.00	Not Leadlight	
F09-12	Shelving	Shelving - Simple L Shape, Painted with Rail. Reinstall, Prep and Pain	2000W x 1500W x 400D	$ 72.00	hr	4	$ 50.00				$ 200.00	$100.00	$ 372.00		
F09-13	Wall Covering	Wall Covering - Supply and Install Gib, Stopping and Paint	90m2					m2	90	$ 75.00	$ 6,750.00		$ 6,750.00		
F09-14	Interior Door	Interior Door - Rimu Panelled, 1/2 Paint and 1/2 Varnish, Brass Bottom Vent. Prep and Varnish/Pain	870W x 2100H	$ 290.00							$ -		$ 290.00		
F09-15	Ceiling	Ceiling - Supply and Install Gib, Stopping and Paint	52m2					m2	52	$ 75.00	$ 3,900.00		$ 3,900.00		
F09-16	Light Fitting	Light Fitting	Ten								$ -		$ -	See Electrical Below	
F09 Sub-Total															$ 22,396.00
F10-1	Floor	Floor - Black Tiles with Marble Border. Supply and Install New Tiles including Tile Backing, Waterproofing and Underfloor Heating	8m2					m2	8	$ 435.00	$ 3,480.00		$ 3,480.00		
F10-2	Floor	Floor - Tiled Shower Base and Waste. Supply and Instal	3m2	$ 630.00							$ -		$ 630.00		
F10-3	Vanity	Vanity - Double with Wall Unit. Reinstall Vanity and Replace Tap	1700W x 2300H	$ 300.00	hr	12	$ 50.00				$ 600.00	$780.00	$ 1,680.00		
F10-4	Bath	Bath - Double Spa. Reinstal	1100W x 1800L	$ 450.00	hr	2	$ 50.00				$ 100.00	$120.00	$ 670.00		
F10-5	Bath Surround	Bath Surround - Stone, Painted Joinery to Ceiling, 4 Inset Mirrors, 6 Inset Lights, Painted Panels. Reinstall, Prep and Paint	2700W x 2300H x 1400D	$ 250.00	hr	18	$ 50.00				$ 900.00	$850.00	$ 2,000.00		
F10-6	Shower Glass	Shower Glass - L Shape Glass Partition and Glass Door. Supply and Instal	Partition 1300W Door 860W x 2300H	$ 1,900.00	hr	2	$ 50.00				$ 100.00		$ 2,000.00		
F10-7	Accessories	Accessories - 10 Bar Towel Rail. Reinstall	One					no	1	$ 75.00	$ 75.00		$ 75.00		
F10-8	Interior Door	Interior Door - Rimu Panelled, Painted. Prep and Paint	860W x 2100H	$ 290.00							$ -		$ 290.00		
F10-9	Walls & Ceiling	Walls & Ceiling - Tan Tiles to Shower Area	34m2					m2	34	$ 200.00	$ 6,800.00		$ 6,800.00		
F10-10	Wall Covering	Wall Covering - Hardies Villaboard	32m2					m2	32	$ 75.00	$ 2,400.00		$ 2,400.00		
F10-11	Toilet	Toilet - Heritage Freestanding. Supply and Instal	One	$ 1,100.00							$ -		$ 1,100.00		
F10-12	Shower Mixer	Shower Mixer	Two	$ 320.00							$ -	$780.00	$ 1,100.00		
F10-13	Shower Slide	Shower Slide	One	$ 160.00							$ -	$390.00	$ 550.00		
F10-14	Shower O/Head Rose	Shower O/Head Rose	One	$ 160.00							$ -	$390.00	$ 550.00		
F10-15	Extraction Fan	Extraction Fan	One								$ -		$ -	See Electrical Below	
F10-16	Light Fitting	Light Fitting	One								$ -		$ -	See Electrical Below	
F10-17	Ceiling	Ceiling - Supply and Install Gib, Stopping and Paint	11m2					m2	11	$ 75.00	$ 825.00		$ 825.00		
F10 Sub-Total															$ 24,150.00
F11-1	Floor	Floor - Red Wool Carpet Supply and Install	22m2					m2	22	$ 115.00	$ 2,530.00		$ 2,530.00		
F11-2	Wall Covering	Wall Covering - Rimu Wall Panelling Reinstall and Polyurethane	13.5m2 900H	$ 593.00	hr	53	$ 50.00				$ 2,650.00	$648.00	$ 3,891.00		
F11-3	Wall Covering	Wall Covering - Supply and Install Gib, Stopping and Painting	50m2					m2	50	$ 75.00	$ 3,750.00		$ 3,750.00	Includes Cupboard	
F11-4	Interior Door	Interior Door - Rimu Door to Cupboard, 1/2 Paint and 1/2 Varnish. Prep and Varnish/Pain	520W x 1850H	$ 290.00							$ -		$ 290.00		
F11-5	Shelving	Shelving - L Shaped to Cupboard, Painted. Reinstall, Prep and Pain	1300W x 900W x300D	$ 198.00	hr	8	$ 50.00				$ 400.00	$120.00	$ 718.00		
F11-6	Ceiling	Ceiling - Supply and Install Gib, Stopping and Paint	22m2					m2	22	$ 75.00	$ 1,650.00		$ 1,650.00		
F11-7	Ceiling	Ceiling - Rimu Detailed Moulding. Reinstall and Polyurethane	56m					m	56	$ 50.00	$ 2,800.00		$ 2,800.00		
F11-8	Light Fitting	Light Fitting	One								$ -		$ -	See Electrical Below	
F11 Sub-Total															$ 15,629.00
F12-1	Floor	Floor - Red Wool Carpet Supply and Install	15.5m2					m2	15.50	$ 115.00	$ 1,782.50		$ 1,782.50		
F12-2	Wall Covering	Wall Covering - Rimu Wall Panelling Reinstall and Polyurethane	20m2 900H	$ 880.00	hr	80	$ 50.00				$ 4,000.00	$960.00	$ 5,840.00		
F12-3	Wall Covering	Wall Covering - Supply and Install Gib, Stopping and Paint	65m2					m2	65	$ 75.00	$ 4,875.00		$ 4,875.00		
F12-4	Feature Joinery	Feature Joinery - Rimu Opening with 2x Corbells. Reinstall and Polyurethane	1200W x 2700H	$ 144.00	hr	8	$ 50.00				$ 400.00	$80.00	$ 624.00		
F12-5	Ceiling	Ceiling - Supply and Install Gib, Stopping and Paint	15.5m2					m2	15.50	$ 75.00	$ 1,162.50		$ 1,162.50		
F12-6	Light Fitting	Light Fitting	Three								$ -		$ -	See Electrical Below	

F12 Sub-Total																$ 14,284.00
F13-1	Floor	Floor - Red Wool Carpet Supply and Install	13m2						m2	13	$ 115.00	$ 1,495.00		$ 1,495.00	Stairs Ground to FF	
F13-2	Wall Covering	Wall Covering - Rimu Wall Panelling Replace Rotten, Reinstall and Polyurethane	12m2 900H	$ 528.00	hr	48	$ 50.00				$ 2,400.00	$748.00	$ 3,676.00	One Third Rotten	
F13-3	Hand Rail	Hand Rail - Rimu. Reinstall and Polyurethane	10m	$ 270.00	hr	14	$ 50.00				$ 700.00	$400.00	$ 1,370.00		
F13-4	Wall Covering	Wall Covering - Supply and Install Textured Lining Paper, Painted to Walls including Gib	28m2						m2	28	$ 117.00	$ 3,276.00		$ 3,276.00		
F13-5	Window Seat	Window Seat - Rimu with Squab and Curved Skirting. Reinstall, Prep, Paint and Replace Upholstery	1000W x 500H x 550D	$ 162.00	hr	10	$ 50.00				$ 500.00	$990.00	$ 1,652.00		
F13-6	Wall Covering	Wall Covering - Supply and Install Gib, Stopping and Paint	40m2						m2	40	$ 75.00	$ 3,000.00		$ 3,000.00		
F13-7	Window	Window - Rimu Angled with Exterior Door. Prep and Polyurethane	Window 680W x 1700H Door 600W x 2000H	$ 550.00								$ -		$ 550.00	Not Leadlight	
F13-8	Window	Window - 4 Pane. Prep and Polyurethane	1350W x 2000H	$ 437.00								$ -		$ 437.00	Not Leadlight	
F13-9	Feature Joinery	Feature Joinery - Rimu Arches, 10x Posts, 10x Corbells. Reinstall, Prep and Polyurethane		$ 990.00	hr	54	$ 50.00				$ 2,700.00	$405.00	$ 4,095.00		
F13-10	Light Fitting	Light Fitting - Brass Wall, Fish Shaped	1x Double 1x Single 1x Ceiling									$ -		$ -	See Electrical Below	
F13-11	Ceiling	Ceiling - T&G Detailed. Supply and Install New T&G, Prep and Polyurethane	13m2	$ 572.00	hr	52	$ 50.00				$ 2,600.00	$624.00	$ 3,796.00	Water Damaged	
F13-12	Stairs	Stairs - 16 Step with 2x Landing. Reinstall Steps, Replace Landings			hr	36	$ 50.00				$ 1,800.00	$630.00	$ 2,430.00		
F13-13	Window	Window - Leadlight, 2 Pane. Prep and Polyurethane	1300W x 600H	$ 126.00								$ -		$ 126.00		
F13 Sub-Total																$ 25,903.00
S01-1	Floor	Floor - Red Wool Carpet Supply and Install	50m2						m2	50	$ 115.00	$ 5,750.00		$ 5,750.00	Water Damaged	
S01-2	Cupboard	Cupboard - Painted with Stone Bench Top. Reinstall, Prep and Paint	2400L x 900H x 600D	$ 324.00	hr	9	$ 50.00				$ 450.00	$180.00	$ 954.00		
S01-3	Wall Covering	Wall Covering - Fabric Panelling. Reinstall	Fifty Four		hr	50	$ 50.00				$ 2,500.00	$100.00	$ 2,600.00		
S01-4	Feature Joinery	Feature Joinery - Mdf Pillars, Painted x2. Reinstall, Prep and Paint	2500W x 2300H	$ 150.00	hr	6	$ 50.00				$ 300.00	$100.00	$ 550.00		
S01-5	Interior Door	Interior Door - Rimu Panelled, 1/2 Paint and 1/2 Varnish. Prep and Varnish/Paint	810W x 2100H	$ 351.00								$ -		$ 351.00		
S01-6	Window	Window - Leadlight, 4 Pane. Prep and Paint	2100W x 1050H	$ 351.00								$ -		$ 351.00		
S01-7	Window	Window - Leadlight, 2 Pane. Prep and Paint	1400W x 1200H	$ 270.00								$ -		$ 270.00		
S01-8	Window Seat	Window Seat - Rimu with Two Squabs. Reinstall, Prep, Paint and Replace Upholstery	2600W x 500H x 500D	$ 90.00	hr	6	$ 50.00				$ 300.00	$1,200.00	$ 1,590.00		
S01-9	Wall Covering	Wall Covering - Supply and Install Gib, Stopping and Paint	93m2						m2	93	$ 75.00	$ 6,975.00		$ 6,975.00		
S01-10	Ceiling	Ceiling - Supply and Install Gib, Stopping and Paint	18m2						m2	18	$ 75.00	$ 1,350.00		$ 1,350.00	Water Damaged	
S01-11	Light Fitting	Light Fitting	Twelve									$ -		$ -	See Electrical Below	
S01-12	Seating Platform	Seating Platform - Two Step Up	16m2		hr		$ 50.00					$ -		$ -	No Work Required	
S01-13	Media Cabinet	Media Cabinet	One									$ -		$ -	See Electrical Below	
S01 Sub-Total																$ 20,741.00
S02-1	Floor	Floor - Red Wool Carpet Supply and Install	65m2						m2	65	$ 115.00	$ 7,475.00		$ 7,475.00		
S02-2	Skirting	Skirting - Painted Mdf 230H Supply and Install	44m						m	44	$ 45.00	$ 1,980.00		$ 1,980.00		
S02-3	Interior Door	Interior Door - Rimu Panelled, 1/2 Paint and 1/2 Varnish. Prep and Varnish/Paint	860W x 2100H	$ 290.00								$ -		$ 290.00		
S02-4	Interior Door	Interior Door - Rimu Double Wardrobe Doors (x2) Painted. Prep and Paint	1250W x 2000H	$ 580.00								$ -		$ 580.00		
S02-5	Shelving	Shelving - Wardrobe Rails and Divisions. Reinstall, Prep and Paint		$ 120.00	hr	4	$ 50.00				$ 200.00	$50.00	$ 370.00		
S02-6	Fire Hose Reel	Fire Hose Reel	One									$ -		$ -	See Fire Below	
S02-7	Window	Window - Leadlight, 4 Pane. Prep and Paint	2600W x 1200H	$ 504.00								$ -		$ 504.00	Middle Two Panes 45 Degree V	
S02-8	Window	Window - Leadlight, 3 Pane. Prep and Paint	1900W x 1200H	$ 369.00								$ -		$ 369.00		
S02-9	Interior Door	Interior Door - T&G Attic Door. Prep and Paint	640W x 1230H	$ 140.00								$ -		$ 140.00		
S02-10														$ -		
S02-11														$ -	Rusty	
S02-12														$ -		
S02-13														$ -		
S02-14	Window Seat	Window Seat - Rimu. Reinstall, Prep, Paint and Upholstery	4300W x 600H x 600D	$ 81.00	hr	6	$ 50.00				$ 300.00	$1,200.00	$ 1,581.00		
S02-15	Wall Covering	Wall Covering - Supply and Install Gib, Stopping and Paint	110m2						m2	110	$ 75.00	$ 8,250.00		$ 8,250.00		
S02-16	Ceiling	Ceiling - Supply and Install Gib, Stopping and Paint	46m2						m2	42	$ 75.00	$ 3,150.00		$ 3,150.00		
S02-17	Window	Window - Frosted Roof. Prep and Paint	1800W x 300H	$ 97.00								$ -		$ 97.00		
S02-18	Floor	Floor - Black Tiles with Marble Border. Supply and Install New Tiles including Tile Backing, Waterproofing and Underfloor Heating	5.7m2						m2	6	$ 435.00	$ 2,479.50		$ 2,479.50	Bathroom	
S02-19	Waste	Waste - Floor and Shower. Supply and Install New	Two	$ 684.00								$ -		$ 684.00		
S02-20	Shower Glass	Shower Glass. Supply and Instal	1000W x 2300H	$ 1,900.00								$ -		$ 1,900.00		
S02-21	Vanity	Vanity - Detailed, Stone Top, Mirror Surround and Painted Pelmet. Reinstall Vanity and Replace Taps, Prep and Paint Pelmet	1200W x 2350H	$ 300.00	hr	12	$ 50.00				$ 600.00	$600.00	$ 1,500.00		
S02-22	Accessories	Accessories - 10 Bar Towel Rail. Reinstate	One						no	1	$ 75.00	$ 75.00		$ 75.00		
S02-23	Toilet	Toilet - In Wall. Supply and Install New	One	$ 1,100.00								$ -		$ 1,100.00		
S02-24	Interior Door	Interior Door - Rimu Panelled, Painted. Reinstall, Prep and Pain	860W x 2100H	$ 290.00								$ -		$ 290.00		
S02-25	Shower Mixer	Shower Mixer	Two	$ 320.00								$ -	$780.00	$ 1,100.00		
S02-26	Shower Slide	Shower Slide	One	$ 160.00								$ -	$390.00	$ 550.00		
S02-27	Shower Ceiling Rose	Shower Ceiling Rose	One	$ 160.00								$ -	$390.00	$ 550.00		
S02-28	Wall Covering	Wall Covering - Tiled. Supply and Install	31m2						m2	31	$ 200.00	$ 6,200.00		$ 6,200.00		
S02-29	Wall Covering	Wall Covering - Hardies Villaboard	31m2						m2	31	$ 75.00	$ 2,325.00		$ 2,325.00		
S02-30	Ceiling	Ceiling - Supply and Install Gib, Stopping and Paint	5.7m2						m2	6	$ 75.00	$ 427.50		$ 427.50		
S02-31	Light Fitting	Light Fitting	Three									$ -		$ -	See Electrical Below	
S02-32	Extraction Fan	Extraction Fan	One									$ -		$ -	See Electrical Below	
S02 Sub-Total																$ 43,967.00
S03-1	Floor	Floor - Red Wool Carpet Supply and Install	42m2						m2	42	$ 115.00	$ 4,830.00		$ 4,830.00		
S03-2	Skirting	Skirting - Painted Mdf 230H Supply and Install	34m						m	34	$ 45.00	$ 1,530.00		$ 1,530.00		
S03-3	Wall Covering	Wall Covering - Supply and Install Gib, Stopping and Paint	74m2						m2	74	$ 75.00	$ 5,550.00		$ 5,550.00	Including Sloping Section	
S03-4	Interior Door	Interior Door - Rimu Panelled, 1/2 Paint and 1/2 Varnish. Prep and Varnish/Paint	860W x 2100H	$ 290.00								$ -		$ 290.00		
S03-5	Window	Window - Leadlight, 4 Pane. Prep and Paint	2800W x 1400H x 800H	$ 634.00								$ -		$ 634.00	Two Middle Panes Higher than Outside Panes	

S03-6	Interior Door	Interior Door - T&G Attic Door, Grooved, Painted. Prep and Paint	810W x 1500H	$ 196.00							$ -		$ 196.00		
S03-7	Window	Window - Leadlight, 2 Sashes. Prep and Paint	1300W x 1300H	$ 273.00							$ -		$ 273.00		
S03-8													$ -		
S03-9													$ -		
S03-10													$ -	See Team Brick	
S03-11													$ -		
S03-12	Ceiling	Ceiling - Supply and Install Gib, Stopping and Paint	33m2					m2	33	$ 75.00	$ 2,475.00		$ 2,475.00	Including Boxed in Beam	
S03-13	Light Fitting	Light Fitting	Eight								$ -		$ -	See Electrical Below	
S03 Sub-Total															$ 15,778.00
S04-1	Floor	Floor - Red Wool Carpet Supply and Install	17m2					m2	17	$ 115.00	$ 1,955.00		$ 1,955.00		
S04-2	Wall Covering	Wall Covering - Rimu Wall Panelling Reinstall and Polyurethane	11.9m2 900H	$ 523.00	hr	48	$ 50.00				$ 2,400.00	$571.00	$ 3,494.00		
S04-3	Interior Door	Interior Door - Rimu, Grooved under Stairs. Prep and Polyurethane	600W x 1600H	$ 290.00							$ -		$ 290.00		
S04-4	Feature Joinery	Feature Joinery - Rimu Arch Opening. Reinstall and Polyurethane	965W x 2000H	$ 135.00	hr	6	$ 50.00				$ 300.00	$100.00	$ 535.00		
S04-5	Stairs	Stairs - 16 Step to Roof. Reinstall Stairs			hr	36	$ 50.00				$ 1,800.00	$250.00	$ 2,050.00		
S04-6	Wall Covering	Wall Covering - Supply and Install Gib, Stopping and Paint	53m2					m2	53	$ 75.00	$ 3,975.00		$ 3,975.00	Including Stairwell	
S04-7	Skylight	Skylight - Painted Obsure Glass, 8 Pane, 4 Sashes. Prep and Paint	850W x 850L	$ 135.00							$ -		$ 135.00		
S04-8	Ceiling	Ceiling - Supply and Install Gib, Stopping and Paint	17m2					m2	17	$ 75.00	$ 1,275.00		$ 1,275.00		
S04-9	Light Fitting	Light Fitting	Fourteen								$ -		$ -	See Electrical Below	
S04-10	Boards	Boards - Second Floor Switchboard and Cbus Cabinet									$ -		$ -	See Electrical Below Located in Cupboard under Stairs	
S04-11	Shelving	Shelving - 4x Shelves, Painted. Reinstall, Prep and Paint	700W x 600D	$ 135.00	hr	6	$ 50.00				$ 300.00	$80.00	$ 515.00	Located in Cupboard under Stairs	
S04-12	Skirting	Skirting - Painted Mdf 230H Supply and Install	4m					m	4	$ 45.00	$ 180.00		$ 180.00	Located in Cupboard under Stairs	
S04-13	Stringers	Stringers - To Stairs. Reinstate, Prep and Painted	9.6m					m	9.60	$ 30.00	$ 288.00		$ 288.00		
S04-14	Window	Window - Obscure Glass, 2 Pane, 1 Sash. Prep and Paint	950W x 550H	$ 95.00							$ -		$ 95.00	On Staircase	
S04-15	Exterior Door	Exterior Door - Rimu Panel, Painted to Roof. Prep and Paint	700W x 1400H	$ 290.00							$ -		$ 290.00		
S04 Sub-Total															$ 15,077.00
S05-1	Floor	Floor - Red Wool Carpet Supply and Install	16m2					m2	16	$ 75.00	$ 1,200.00		$ 1,200.00	FF to SF Stairs	
S05-2	Stairs	Stairs - 17 Step with 2x Landing. Reinstall Stairs, Replace Two Landings	9.95m2		hr	40	$ 50.00				$ 2,000.00	$700.00	$ 2,700.00		
S05-3	Wall Covering	Wall Covering - Rimu Wall Panelling Reinstall and Polyurethane	19.36m2 900H	$ 851.00	hr	76	$ 50.00				$ 3,800.00	$928.00	$ 5,579.00		
S05-4	Balustrading	Balustrading - Rimu including Newell and 3x Posts. Reinstall and Polyurethane	4.2m x 900H	$ 680.00	hr	20	$ 50.00				$ 1,000.00	$250.00	$ 1,930.00		
S05-5	Feature Joinery	Feature Joinery - Rimu Arch, 2x Posts and 2x Corbells. Reinstall, Prep and Polyurethane	1300W x 2100H	$ 198.00	hr	8	$ 50.00				$ 400.00	$150.00	$ 748.00		
S05-6	Window	Window - Stained Glass, 1 Pane. Supply and Install New, Prep and Paint	700W x 1100H	$ 124.00	hr	2	$ 50.00				$ 100.00	$1,458.00	$ 1,682.00	Rotten	
S05-7	Window	Window - Leadlight, 1 Sash. Prep and Paint	750W x 1200H	$ 145.00							$ -		$ 145.00		
S05-8	Wall Covering	Wall Covering - Supply and Install Gib, Stopping and Paint	45.68m2					m2	45.68	$ 75.00	$ 3,426.00		$ 3,426.00		
S05-9	Ceiling	Ceiling - Supply and Install Gib, Stopping and Paint	14m2					m2	14	$ 75.00	$ 1,050.00		$ 1,050.00		
S05 Sub-Total															$ 18,460.00
Contents	Curtains	Curtains - Supply and Install		$ 72,913.00							$ -		$ 72,913.00		
Contents	Appliances	Appliances - Supply and Install Freestanding Oven & Stove, Dishwasher		$ 10,000.00							$ -		$ 10,000.00		
Contents Sub-Total															$ 82,913.00
S/Plumbing & Gas	Plumbing	Plumbing - Supply and Fit Pipework, Wastes, Disconnections and Reconnections		$ 53,784.00							$ -		$ 53,784.00		
S/Plumbing & Gas	Gas Fitter	Gas Fitter - RePipe Gas Lines and Fit Gas Appliances		$ 23,000.00							$ -		$ 23,000.00		
Sanitary Plumbing & Gas Sub-Total															$ 76,784.00
Mechanical	HVAC	HVAC - Supply and Install Ducted Cental Heating System		$ 42,355.00							$ -		$ 42,355.00		
Mechanical Services Sub-Total															$ 42,355.00
Fire	Fire System	Fire System - Supply and Install		$ 65,000.00							$ -		$ 65,000.00		
Fire Services Sub-Total															$ 65,000.00
Electrical	Electrical/Power	Electrical/Power - Mains Connection including Disconnect/Reconnect, Temporary Power to Existing Cbus System		$ 69,230.00							$ -		$ 69,230.00		
Electrical	Lighting	Lighting - Supply and Replace PC Sum		$ 45,000.00							$ -		$ 45,000.00	Majority of Lights have been Removed	
Electrical Services Sub-Total															$ 114,230.00
Drainage	Sewer	Sewage - Remove and Replace Existing Terracotta Sewer						m	105	$ 110.00	$ 11,550.00		$ 11,550.00		
Drainage	Stormwater	Stormwater - Remove and Replace						m	155	$ 110.00	$ 17,050.00		$ 17,050.00		
Drainage Sub-Total															$ 28,600.00
Exterior	Brick Paving	Brick Paving - Supply and Install Border with Paved Brick Infill including New Concrete Base where Required	329.6 m2					m2	300.00	$ 200.00	$ 60,000.00		$ 60,000.00		
Exterior	Deck	Deck - Supply and Install Hardwood with Perimeter Foundation and Detailed Moulded Board	25 m2					m2	25	$ 340.00	$ 8,500.00		$ 8,500.00		
Exterior	Driveway	Driveway - Resurface Asphalt	1046 m2					m2	1046	$ 35.00	$ 36,610.00		$ 36,610.00		
Exterior	Driveway	Driveway - Reset Tile Paver Boarder to Asphalt Driveway where required	180m					m	180	$ 20.00	$ 3,600.00		$ 3,600.00		
Exterior	Floor	Floor - Remove, Dispose, Supply and Install Front Porch Tiles, Detailed Winklemann on Concrete Base	6.1 m2					m2	6.10	$ 1,090.00	$ 6,649.00		$ 6,649.00		
Exterior	Fountain	Fountain - Requires Repair						no	1	$ 2,500.00	$ 2,500.00		$ 2,500.00		
Exterior	Porch Structure	Porch Structure - To Entrance, Rebuild, Prep and Paint	3600W x 3000H	$ 1,305.00	hr	100	$ 50.00				$ 5,000.00	$700.00	$ 7,005.00	EG-31	
Exterior	Porch Panelling	Porch Panelling - Prep and Pain	4.5 m2	$ 247.00							$ -		$ 247.00		
Exterior	Balcony Structure	Balcony Structure - Reinstall including Balustrade and Floor, Prep and Paint		$ 972.00	hr	60	$ 50.00				$ 3,000.00	$850.00	$ 4,822.00	EF-17	
Exterior	Verandah Structure	Verandah Structure - Refit Post, Beam, Arch Structure including Roof Framing, Prep and Paint	40m2	$ 3,780.00	hr	144	$ 50.00				$ 7,200.00	$2,520.00	$ 13,500.00	NG-14	
Exterior	Balcony Structure	Balcony Structure - Refit Deck and Balustrade, Prep and Paint	2000W x 3000H x 1000D	$ 972.00	hr	60	$ 50.00				$ 3,000.00	$850.00	$ 4,822.00	NF-10	
Exterior	Verandah Structure	Verandah Structure - Supply and Install 4 Posts, Waterproofed, Dummy Rafters, Mouldings, T&G Soffit, Membrane Roof and Balustrading, Prep and Paint	2700W x 6000L 23m2	$ 4,968.00	hr	170	$ 50.00				$ 8,500.00	$6,679.00	$ 20,147.00	WG-24	
Exterior Sub-Total															$ 168,402.00
Allowances	Insurance	Insurance - Contract Works		$ 45,000.00							$ -		$ 45,000.00		
Allowances	Scaffolding	Mobile Scaffolding - Hire for Stairwells and Interior						no	1	$ 5,000.00	$ 5,000.00		$ 5,000.00		
Allowances	Environmental	Environmental - Control report including Monitoring						no	1	$ 5,000.00	$ 5,000.00		$ 5,000.00		
Allowances	Scaffolding	Scaffolding for Duration of Works		$ 126,556.00							$ -		$ 126,556.00		
Allowances	Locksmith	Locksmith - ReKey Cellar Door and Courtyard Key Pad		$ 120.87							$ -		$ 120.87		
Allowances	Asbestos	Asbestos - Specialist Testing		$ 4,000.00							$ -		$ 4,000.00		

Alllowances Sub-Total														$ 185,676.87

Hours Total 13717

Appendix C

NZS 3910:2013 - Cost Fluctuation Adjustment By Indexations

NZS 3910:2003

APPENDIX A – COST FLUCTUATION ADJUSTMENT BY INDEXATION

A1
The provisions of this Appendix shall apply unless otherwise specifically provided in the Special Conditions.

A2
The amounts payable by the Principal to the Contractor under the contract shall be adjusted up or down by amounts calculated in accordance with the following formula:

where

$$C=V\left[\frac{0.4(L-L')}{L'}+\frac{0.6(M-M')}{M'}\right]$$

C = Cost fluctuation adjustment for the quarter under consideration,

V = Valuation of work shown as payable in any Payment Schedule in respect of work having been completed during the quarter under consideration subject to A3, but without deduction of retentions and excluding the Cost fluctuation adjustment,

L = Labour Cost Index; Private Sector: Industry Group – Construction: All Salary and Wage Rates: published by Statistics New Zealand, for the quarter under consideration,

L' = Index as defined under L but applying for the quarter during which tenders close,

M = Producers Price Index; Inputs: Industry Group – Construction, published by Statistics New Zealand applying for the quarter under consideration,

M ' = Index as defined under M but applying for the quarter during which tenders close.

A3
For the purpose of calculating the Cost fluctuation adjustment, any Daywork, Prime Cost Sums, Variations and other payment items which are based on actual Cost or current prices and any advances shall be excluded from the Engineer's valuation.

A4
No other Cost fluctuation adjustment will be made by reason of any inaccuracy in the proportions of labour and Material Costs assumed in the above formula.

A5
The Contractor shall not be entitled to claim or have deducted any Cost fluctuation adjustment for any further changes in indices which occur after the Due Date for Completion of the contract.

A6
The indices to be used in the calculation of fluctuation shall be those first published by Statistics New Zealand for the appropriate quarter.

A7

Where indices for the quarter have not yet been published, interim payments will be made on the basis of the indices for the most recent quarter for which indices are available.

A8
If at any time either of the indices referred to in A2 are no longer published by Statistics New Zealand, or if the basis of either index is materially changed, the adjustment shall thereafter be calculated by using such other index, or in such other manner, as will fairly reflect the changes as previously measured by that index.

For Statistics New Zealand Producers price index information goto T:\RACL - Information Point\Cost Information\Business Price Indexes

Appendix D

Cost Fluctuation Adjustment Calculations By Indexations

HIN 185 - Dwelling, Daresbury And Setting - 9 Daresbury Lane, 67 And 67B Fendalton Road Christchurch

Cost Fluctuation Adjustment Calculations By Indexation

MILNE CONSTRUCTION

Option 1 Daresbury House - Reduced Repair Quotation (03 July 2019)
Option 2 Rhodes + Associates Adjusted Option 1 (Changes To Calculations %'s of Margins, Contingencies, Professional Fees, P&G)
Option 3 Rhodes + Associates Adjusted Option 2 (Changes To Value Of %'s of Margins, Contingencies, Professional Fees, P&G)

$$C=V\left[\frac{0.4(L-L')}{L'}+\frac{0.6(M-M')}{M'}\right]$$

		Period	Year/Quarter	Option 1 Daresbury House - Reduced Repair Quotation (03 July 2019)	Option 2 Rhodes + Associates Adjusted Option 1 (Changes To Calculations %'s of Margins, Contingencies, Professional Fees, P&G)	Difference Between Option 1 and 2	Option 3 Rhodes + Associates Adjusted Option 2 (Changes To Value Of %'s of Margins, Contingencies, Professional Fees, P&G)	Difference Between Option 1 and 3
C	Cost fluctuation adjustment for the quarter under consideration, *(rounded up to the nearest $)*			**$ 1,069,005.00**	**$ 1,096,964.00**	**$ 27,959.00**	**$ 1,132,876.00**	**$ 63,871.00**
V	Valuation of work shown as payable in any Payment Schedule in respect of work having been completed during the quarter under consideration subject to A3, but without deduction of retentions			$ 5,419,124.00	$ 5,560,854.00	$ 141,730.00	$ 5,742,905.00	$ 323,781.00
L	Labour Cost Index; Private Sector: Industry Group – Construction: All Salary and Wage Rates: published	July to September 2023	2023 Q3	1377	1377		1377	
L'	Index as defined under L but applying for the quarter during which tenders close,	July to September 2019	2019 Q3	1227	1227		1227	
M	Producers Price Index; Inputs: Industry Group – Construction, published by Statistics New Zealand applying for the quarter under consideration,	July to September 2023	2023 Q3	1488	1488		1488	
M'	Index as defined under M but applying for the quarter during which tenders close.	July to September 2019	2019 Q3	1193	1193		1193	
	Adjusted value (Rounded to nearest $)			**$ 6,488,129.00**	**$ 6,657,818.00**	**$ 169,689.00**	**$ 6,875,781.00**	**$ 387,652.00**
	Adjusted value per m2, based on 1,643 m2 (Rounded to nearest $)			*$ 3,949.00*	*$ 4,052.00*	*$ 103.00*	*$ 4,185.00*	*$ 236.00*

Appendix E

Statistics New Zealand - Labour Cost/Producers Price Index's

Labour Cost Index - LCI - L and L[1] - Jan 2011 to Dec 2020

Work Income And Spending | Labour Cost Index

Private Sector and Industry Group (ANZSIC06)(Base: June 2009 qtr (=1000)) (Qrtly-Mar/Jun/Sep/Dec)

	All Salary and Wage Rates Construction	Movement In Index
2019Q3	1227	5
2019Q4	1236	9
2020Q1	1242	6
2020Q2	1235	-7
2020Q3	1246	11
2020Q4	1253	7
2021Q1	1264	11
2021Q2	1273	9
2021Q3	1284	11
2021Q4	1294	10
2022Q1	1305	11
2022Q2	1326	21
2022Q3	1336	10
2022Q4	1353	17
2023Q1	1361	8
2023Q2*	1369	8
2023Q3*	1377	8

Last updated by Statistics New Zealand 03 May 2023 at 10:45am

Producers Price Index - PPI - M and M[1] - Jan 2011 to Dec 2020

Economic Indicators | Producers Price Index - PPI

Inputs (ANZSIC06) - NZSIOC level 1, Base: Dec. 2010 quarter (=1000) (Qrtly-Mar/Jun/Sep/Dec)

	Construction	Movement In Index
2019Q3	1193	9
2019Q4	1199	6
2020Q1	1202	3
2020Q2	1198	-4
2020Q3	1207	9
2020Q4	1211	4
2021Q1	1223	12
2021Q2	1246	23
2021Q3	1277	31
2021Q4	1304	27
2022Q1	1353	49
2022Q2	1409	56
2022Q3	1445	36
2022Q4	1467	22
2023Q1	1474	7
2023Q2*	1481	7
2023Q3*	1488	7

Last updated by Statistics New Zealand 18 May 2023 at 10:45am

* Denotes estimated indicies taken as movement in last confirmed quarter

Appendix F

Adjustments to Milne Construction Quotation

MILNE CONSTRUCTION

Option 1 Daresbury House - Reduced Repair Quotation (03 July 2019)
Option 2 Rhodes + Associates Adjusted Option 1 (Changes To Calculations %'s of Margins, Contingencies, Professional Fees, P&G)
Option 3 Rhodes + Associates Adjusted Option 2 (Changes To Value Of %'s of Margins, Contingencies, Professional Fees, P&G)

DESCRIPTION	OPTION 1 Daresbury House - Reduced Repair Quotation (03 July 2019) %	OPTION 1 VALUE		OPTION 2 Rhodes + Associates Adjusted Option 1 (Changes To Calculations %'s of Margins, Contingencies, Professional Fees, P&G) %	OPTION 2 VALUE		OPTION 3 Rhodes + Associates Adjusted Option 2 (Changes To Value Of %'s of Margins, Contingencies, Professional Fees, P&G) %	OPTION 3 VALUE	
Milne Construction - Sub Total Excluding GST		**$4,179,704.89**			**$4,179,704.89**			**$4,179,704.89**	
Omit as included within P&G									
Establishment - Storage Containers								-$ 50,000.00	
Establishment - Site Office								-$ 6,000.00	
Insurance - Contract Works								-$ 45,000.00	
Mobile Scaffolding - Hire for Stairwells and Interior								-$ 5,000.00	
Environmental - Control report including Monitoring								-$ 5,000.00	
Scaffolding for Duration of Works								-$ 126,556.00	
Locksmith - ReKey Cellar Door and Courtyard Key Pad								-$ 120.87	
Sub Total Excluding GST		**$4,179,704.89**	A		**$4,179,704.89**	A		**$3,942,028.02**	A
Margins	7.50%	$ 313,477.87	B = 7.5% of A						
Contingencies	10.00%	$ 417,970.49	C = 7.5% of A						
Professional Fees	5.00%	$ 208,985.24	D = 7.5% of A						
Project Management		$ 90,000.00	E						
P&G	5.00%	$ 208,985.24	F = 7.5% of A						
Preliminaries				5.00%	$ 208,985.24	B = 5% of A	12.00%	$ 473,043.36	B = 12% of A
Project Management					$ 90,000.00	C			C
Margins				7.50%	$ 335,901.76	D = 7.5% of (A+B+C)	7.50%	$ 331,130.35	D = 7.5% of (A+B+C)
Contract Contingencies				10.00%	$ 481,459.19	E = 10% of (A+B+C+D)	10.00%	$ 474,620.17	E = 10% of (A+B+C+D)
Other Development Costs (Prodfessional Fees)				5.00%	$ 264,802.55	F = 5% of (A+B+C+D+E)	10.00%	$ 522,082.19	F = 10% of (A+B+C+D+E)
Sub Total Excluding GST Including Margins, Contingencies and P&G (Rounded to nearest $)		**$5,419,124.00**	G = (A+B+C+D+E+F)		**$5,560,854.00**	G = A+B+C+D+E+F		**$5,742,905.00**	G = A+B+C+D+E+F

APPENDIX I - LEWIS AND BARROW LTD, STRENGTHENING OPTIONS FOR BUILDINGS AT 265 RICCARTON ROAD, CHRISTCHURCH, 26 JANUARY 2013

LEWIS & BARROW LTD
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Strengthening Options for Buildings at

265 Riccarton Road, Christchurch

File: 21303

Date: 26th January 2013

Contents

1. LIMITATIONS OF THIS REPORT

- This report has been prepared for the benefit of Wellstar Co. Limited as our client with respect to the brief. The reliance by any other parties including CERA and the general public, on the information or opinions contained in the report shall, without prior review and agreement in writing be at such other party's sole risk.

- This report is based on inspections as detailed in the report of those areas that are readily accessible. No destructive or invasive tests were carried out unless specifically mentioned.

- Latent or hidden defects may be present on this property. Hence anything unusual that is apparent in future on this property will require investigation and a further report.

- The term '%NBS' refers to earthquake strength only and has been determined in accordance with AS/NZS 1170.5.

- Those portions of the property unsighted or not reported on in this report, cannot be relied upon to be sound or suitable for purpose.

- If the original building plans have been observed, this will be detailed in the report.

- Our inspection and report has not determined whether the building was built in accordance with the relevant standards at the time of construction.

2. INTRODUCTION

Lewis and Barrow have been engaged by Wellstar Co. Limited to undertake a preliminary assessment of the buildings at 265 Riccartion Road to establish what options are available for each building giving recommendations on what buildings require demolition and elementary indications of what strengthening work would be required to each building.

This report shall be read in conjunction with the limitations on page 3 as well as the attachments as specified at the end of this report.

3. PROPERTY HISTORY

There are multiple buildings located at 265 Riccarton Road. Over the properties history there have been several extensions. Following is an abbreviated history of the property.

1904-1909	Original House Constructed
1949	Extension to Original House
1960	Extension to House
1961	Chapel Addition
1961	East Wing Addition
2002	Alterations to East Wing

In addition to the above, the property has had undocumented internal alterations undertaken over the years.

4. SEISMIC CONSIDERATIONS

Peak ground accelerations (PGA) have been assessed for this site. Accelerations for this ground were well below the areas that did liquefy. For comparison the table below compares acceleration for this site compared to the central city and Bexley.

Table 1 – Condition Peak Ground Accelerations in g's

Earthquake	Date	265 Riccarton Rd	Cathedral Square	Bexley
M6.2	22 February 2011	0.32	0.44	0.55
M6.0	13 June 2011	0.17	0.24	0.29
M5.9	23 December 2011	0.16	0.20	0.38

5. FOUNDATIONS

The foundations of these buildings have performed very well. This is not because the ground is immune from liquefaction, it is due to the fact that none of these recent earthquakes shook this ground hard enough to liquefy it.

6. ORIGINAL HOUSE - 1904

6.1. DESCRIPTION

Floor

The ground and first floors are T&G timber on large Rimu timber joists.

Walls

The original house was constructed as triple brick. The ground floor has a double brick inner structural skin and a weathering single skin on the outside for all external walls. Internal walls are similar in a few places but mainly they are double brick on the ground floors.

The first floor external walls are single brick structural inner skin and single external weather skin. All external walls have a cavity between the inner and outer skins. The gables have partially collapsed. The mortar in the bricks is soft and appears to be simple lime mortar.

25% of the internal walls are of 9" brick construction. 75% of internal walls are timber framed. Wall linings are Gypsum Plastered and heavy.

There are no connections between the floors and the walls other than gravity and friction. 12' floor to floor, 10' floor to top of ceiling.

Roof

The roof is slate on timber battens on large timbers roof framing or trusses. Ceilings are Gypsum Plastered and heavy.

6.2. PERCENTAGE NEW BUILDING STRENGTH

A summary of the %NBS of the structural building elements of this building has been summarized below:

Table 2 – Original House – Summary of %NBS of Building Elements

Building Element	Current %NBS
Top Floor Face Loads	12%
Roof/Wall Connection	12%
Floor/Wall Connection	23%
First Floor Diaphragm	23%

6.3. STRENGTHENING RECOMMENDATIONS

Considering the age of this building, the damage it has sustained and the weakness of the mortar, it is believed to be uneconomic to repair. Therefore, it is recommended that this building be rebuilt.

7. EXTENSION TO ORIGINAL HOUSE – 1949

7.1. DESCRIPTION

Floor

The ground and first floors are T&G timber on timber joists. First floor joists are spanning between either reinforced concrete beams or RSJ steel beams.

Walls

The ground floor has a double brick inner structural skin and a weathering single skin on the outside for all external walls.

The first floor external walls are single brick structural inner skin and single external weather skin. All external walls have a cavity between the inner and outer skins.

The majority of internal walls are of 9" brick construction. Wall linings are Gypsum Plastered and heavy.

There are no connections between the floors and the walls other than gravity and friction. 12' floor to floor, 10' floor to top of ceiling.

Roof

The roof is slate on timber battens on large timber trusses. Ceilings and walls are Gypsum Plastered and heavy.

General

Calculations are just as applicable to this building as for the original building for connections of walls to floors and roofs. Mortar is better, and there is a reinforced concrete bond beam under the first floor and under the roof with 4-3/4" rods and 6mm stirrups at 600mm crs.

7.2. PERCENTAGE NEW BUILDING STRENGTH

A summary of the %NBS of the structural building elements of this building has been summarized below:

Table 3 – Extension to Original House – Summary of %NBS of Building Elements

Building Element	Current %NBS
Top Floor Face Loads	15%
Roof/Wall Connection	12%
Floor/Wall Connection	23%
First Floor Diaphragm	23%

7.3. STRENGTHENING RECOMMENDATIONS

Option 1

Strengthen the walls by providing a reinforced concrete core within brick cavities. It will be very difficult to grout rods into concrete bond beams and foundations. Therefore, outer bricks will probably have to be removed to do this work. If this option was adopted, it would remove a cavity weathering system from the wall.

Option 2

Remove inner Wythe and replace with poured in place reinforced concrete wall.

Percentage New Building Strength

If strengthening was to be undertaken without altering the existing foundations the building would achieve 35%NBS.

If strengthening work was to be undertaken incorporating new foundations, the building would achieve 100%NBS. However, this would require all new floor/wall and roof/wall connections and a plywood diaphragm at first floor level and at top ceiling level.

Strengthening Cost Estimates

The cost of strengthening the building would exceed the rebuild cost.
Estimate of strengthening: $5,000,000.00

In our opinion the house extension is uneconomical to repair and should be demolished.

8. EXTENSION TO HOUSE – 1960

8.1. DESCRIPTION

This extension is of the same construction as the 1949 house extension.

Floor

The ground and first floors are T&G timber on timber joists. First floor joists are spanning between either reinforced concrete beams or RSJ steel beams.

Walls

The ground floor has a double brick inner structural skin and a weathering single skin on the outside for all external walls.

The first floor external walls are single brick structural inner skin and single external weather skin. All external walls have a cavity between the inner and outer skins.

The majority of internal walls are of 9” brick construction. Wall linings are Gypsum Plastered and heavy.

There are no connections between the floors and the walls other than gravity and friction. 12’ floor to floor, 10’ floor to top of ceiling.

Roof

The roof is slate on timber battens on steel trusses. Ceilings and walls are Gypsum Plastered and heavy.

General

This extension has 3 reinforced concrete frames for big spans and where an existing wall of the previous house was removed. Roof trusses are a hybrid steel and timber, are coved and not designed to provide diaphragm action. Dormitory is a big open space.

8.2. PERCENTAGE NEW BUILDING STRENGTH

A summary of the %NBS of the structural building elements of this building has been summarized below:

Table 4 – Extension to Original House – Summary of %NBS of Building Elements

Building Element	Current %NBS
Top Floor Face Loads	15%
Roof/Wall Connection	12%
Floor/Wall Connection	23%
First Floor Diaphragm	23%

8.3. STRENGTHENING RECOMMENDATIONS

Option 1

Strengthen the walls by providing a reinforced concrete core within brick cavities. It will be very difficult to grout rods into concrete bond beams and foundations. Therefore, outer bricks will probably have to be removed to do this work. If this option was adopted, it would remove a cavity weathering system from the wall.

Option 2

Remove inner Wythe and replace with poured in place reinforced concrete wall.

General

Strengthening would also involve improving the roof trusses and concrete frames.

In our opinion the house extension is uneconomical to repair and should be demolished.

9. CHAPEL ADDITION - 1961

9.1. DESCRIPTION

Floor

Reinforced concrete slab on 7” or 14” thick foundation walls bearing on 900mm or 1500mm wide concrete bases.

Walls

6” reinforced concrete walls with single brick external veneer and 50mm internal stone lining. There is a cavity between the external veneer and reinforced concrete wall.

Roof

The roof is slate on timber battens on timber purlins on steel portals. Portals at 13' crs.

9.2. PERCENTAGE NEW BUILDING STRENGTH

A summary of the %NBS of the structural building elements of this building has been summarized below:

Table 5 – Extension to Original House – Summary of %NBS of Building Elements

Building Element	Current %NBS
Portals	8.5%
Walls	15%

A NZ standard Initial Evaluation Procedure (IEP) rated this building as having 15%NBS.

9.3. STRENGTHENING RECOMMENDATIONS

- Place much bigger portals alongside existing portals
- Cross brace East & West Walls
- Install a large portal at the South end of Chapel
- Detach from other buildings

In our opinion this Chapel is uneconomical to repair and should be demolished.

10. EAST WING ADDITION – 1961

10.1. DESCRIPTION

Floor

Ground floor is a suspended concrete slab on 7" foundation walls bearing on concrete bases. The first floor is a concrete slab bearing onto a concrete bond beam.

Walls

The ground floor has a single brick inner structural skin and a weathering single skin on the outside for all external walls.

The first floor external walls are single brick structural inner skin and single external weather skin. All external walls have a cavity between the inner and outer skins.

There are no connections between the floors and the walls other than gravity and friction. 12' floor to floor, 10' floor to top of ceiling.

Roof

The roof is slate on timber battens on timber trusses.

10.2. 2002 ALTERATIONS

The alterations undertaken in 2002 involved the following:

1. Removal of brickwork under windows along West elevation
2. Removal of top floor concrete tiltslab walls in East-West direction
3. Installing non-ductile columns within bricks along West elevation
4. New balcony to the first floor along the West side of building with an external access stair down to the ground floor
5. Stairs tied in at top and bottom

These alterations did not improve the building much. They didn't weaken it either. The building has the usual problems of face loaded walls. The concrete floor is shown on one detail not bound to external wall on the East wing section but is shown bound in on the central block adjacent.

10.3. PERCENTAGE NEW BUILDING STRENGTH

A summary of the %NBS of the structural building elements of this building has been summarized below:

Table 6 – Extension to Original House – Summary of %NBS of Building Elements

Building Element	Current %NBS
Brick Top Floor Face Loads	18%
Brick Bottom Floor Shear Loads	20%
Brick Bottom Face Loads	28%
Roof Diaphragm	23%

The calculations provided with the plans show that shear action in line with the brick walls and the face loads on brick walls were not considered in the design. The calculations show that the seismic coefficients used would only provide 18%NBS.

A NZ standard Initial Evaluation Procedure (IEP) rated this building as having 15%NBS.

10.4. STRENGTHENING RECOMMENDATIONS

- Brace roof
- Check floor diaphragm
- Replace brick with reinforced concrete block
- Strengthen top floor East and West walls
- Lots of details to improve

Could get the building to 100%NBS but it would cost as much or more than a new building and the owner would be left with a 53 year old building that is difficult to maintain.

In our opinion the East Wing building is uneconomical to repair and should be demolished.

APPENDIX A
IEP FORMS FOR CHAPEL AND EAST WING

Detailed Engineering Evaluation Summary Data V1.14

Location

Building Name:	Chapel		Reviewer:	W. L. Lewis	
	Unit	No: Street	CPEng No:	33543	
Building Address:			Company:		
Legal Description:			Company project number:		
			Company phone number:		
	Degrees	Min Sec			
GPS south:			Date of submission:		
GPS east:			Inspection Date:		
			Revision:		
Building Unique Identifier (CCC):			Is there a full report with this summary?		

Site

Site slope:	flat	Max retaining height (m):	
Soil type:	silt	Soil Profile (if available):	
Site Class (to NZS1170.5):	D		
Proximity to waterway (m, if <100m):		If Ground improvement on site, describe:	
Proximity to clifftop (m, if < 100m):			
Proximity to cliff base (m,if <100m):		Approx site elevation (m):	13.00

Building

No. of storeys above ground:	1	single storey = 1	Ground floor elevation (Absolute) (m):	
Ground floor split?	no		Ground floor elevation above ground (m):	
Storeys below ground	0			
Foundation type:	strip footings		if Foundation type is other, describe:	
Building height (m):	6.80	height from ground to level of uppermost seismic mass (for IEP only) (m):		
Floor footprint area (approx):	200			
Age of Building (years):	53		Date of design:	1935-1965
Strengthening present?	no		If so, when (year)?	
			And what load level (%g)?	
Use (ground floor):	other (specify)		Brief strengthening description:	
Use (upper floors):				
Use notes (if required):	Church			
Importance level (to NZS1170.5):	IL2			

Gravity Structure

Gravity System:	frame system		
Roof:	steel framed	rafter type, purlin type and cladding	
Floors:	concrete flat slab	slab thickness (mm)	100
Beams:	steel non-composite	beam and connector type	
Columns:	structural steel	typical dimensions (mm x mm)	
Walls:	load bearing concrete	#N/A	

Lateral load resisting structure

Lateral system along:	concrete shear wall	**Note: Define along and across in**	enter wall data in "IEP period calcs"	
Ductility assumed, μ:	1.00	**detailed report!**	worksheet for period calculation.	
Period along:	0.40	#### enter height above at H31	estimate or calculation?	estimated
Total deflection (ULS) (mm):	20		estimate or calculation?	estimated
maximum interstorey deflection (ULS) (mm):	20		estimate or calculation?	estimated
Lateral system across:	welded and bolted steel moment frame		note typical bay length (m)	
Ductility assumed, μ:	1.00			
Period across:	0.60	0.00	estimate or calculation?	estimated
Total deflection (ULS) (mm):	100		estimate or calculation?	estimated
maximum interstorey deflection (ULS) (mm):	100		estimate or calculation?	estimated

Separations:

north (mm):		leave blank if not relevant
east (mm):		
south (mm):	0	
west (mm):		

Non-structural elements

Stairs:			
Wall cladding:	other heavy	describe	
Roof Cladding:	Heavy tiles	describe	
Glazing:	steel frames		
Ceilings:	fibrous plaster, fixed		
Services(list):	Usual		

Available documentation

Architectural	full	original designer name/date	
Structural	full	original designer name/date	
Mechanical	none	original designer name/date	
Electrical	none	original designer name/date	
Geotech report	none	original designer name/date	

Damage

Site:	Site performance:	good	Describe damage:
(refer DEE Table 4-2)			
	Settlement:	none observed	notes (if applicable):
	Differential settlement:	none observed	notes (if applicable):
	Liquefaction:	none apparent	notes (if applicable):
	Lateral Spread:	none apparent	notes (if applicable):
	Differential lateral spread:	none apparent	notes (if applicable):
	Ground cracks:	none apparent	notes (if applicable):
	Damage to area:	none apparent	notes (if applicable):

Building:

	Current Placard Status:	yellow	
Along	Damage ratio:		Describe how damage ratio arrived at:
	Describe (summary):		
Across	Damage ratio:		
	Describe (summary):		
Diaphragms	Damage?:	no	Describe:
CSWs:	Damage?:	yes	Describe:
Pounding:	Damage?:	no	Describe:
Non-structural:	Damage?:	yes	Describe:

$$Damage\_Ratio = \frac{(\%NBS(before) - \%NBS(after))}{\%NBS(before)}$$

Recommendations

	Level of repair/strengthening required:	significant structural and strengthening	Describe:	
	Building Consent required:	yes	Describe:	
	Interim occupancy recommendations:	do not occupy	Describe:	
Along	Assessed %NBS before e'quakes:		15% %NBS from IEP below	If IEP not used, please detail assessment methodology:
	Assessed %NBS after e'quakes:			
Across	Assessed %NBS before e'quakes:		15% %NBS from IEP below	
	Assessed %NBS after e'quakes:			

IEP **Use of this method is not mandatory - more detailed analysis may give a different answer, which would take precedence. Do not fill in fields if not using IEP.**

Period of design of building (from above): 1935-1965 h_N from above: m

Seismic Zone, if designed between 1965 and 1992: not required for this age of building

not required for this age of building

	along	across
Period (from above):	0.4	0.6
(%NBS)nom from Fig 3.3:	3.0%	3.0%

Note:1 for specifically design public buildings, to the code of the day: pre-1965 = 1.25; 1965-1976, Zone A =1.33; 1965-1976, Zone B = 1.2; all else 1.0 — 1.00

Note 2: for RC buildings designed between 1976-1984, use 1.2 — 1.0

Note 3: for buildings designed prior to 1935 use 0.8, except in Wellington (1.0) — 1.0

	along	across
Final (%NBS)nom:	**3%**	**3%**

2.2 Near Fault Scaling Factor

Near Fault scaling factor, from NZS1170.5, cl 3.1.6: 1.00

	along	across
Near Fault scaling factor (1/N(T,D), **Factor A**:	1	1

2.3 Hazard Scaling Factor

Hazard factor Z for site from AS1170.5, Table 3.3: 0.30

Z_{1992}, from NZS4203:1992: 0.8

Hazard scaling factor, **Factor B:** 3.333333333

2.4 Return Period Scaling Factor

Building Importance level (from above): 2

Return Period Scaling factor from Table 3.1, **Factor C**: 1.00

2.5 Ductility Scaling Factor

	along	across
Assessed ductility (less than max in Table 3.2)	1.00	1.00
Ductility scaling factor: =1 from 1976 onwards; or =k_μ, if pre-1976, fromTable 3.3:	1.00	1.00
Ductility Scaling Factor, **Factor D**:	1.00	1.00

2.6 Structural Performance Scaling Factor:

Sp:	1.000	1.000
Structural Performance Scaling Factor **Factor E**:	1	1

2.7 Baseline %NBS, (NBS%)b = (%NBS)nom x A x B x C x D x E

%NBSb:	**10%**	**10%**

Global Critical Structural Weaknesses: (refer to NZSEE IEP Table 3.4)

3.1. Plan Irregularity, factor A: insignificant 1

3.2. Vertical irregularity, Factor B: insignificant 1

3.3. Short columns, Factor C: insignificant 1

3.4. Pounding potential

Pounding effect D1, from Table to right 1.0

Height Difference effect D2, from Table to right 1.0

Therefore, Factor D: 1

3.5. Site Characteristics insignificant 1

Table for selection of D1

Separation	Severe 0<sep<.005H	Significant .005<sep<.01H	Insignificant/none Sep>.01H
Alignment of floors within 20% of H	**0.7**	**0.8**	**1**
Alignment of floors not within 20% of H	**0.4**	**0.7**	**0.8**

Table for Selection of D2

Separation	Severe 0<sep<.005H	Significant .005<sep<.01H	Insignificant/none Sep>.01H
Height difference > 4 storeys	0.4	0.7	1
Height difference 2 to 4 storeys	0.7	0.9	1
Height difference < 2 storeys	1	1	1

3.6. Other factors, Factor F For ≤ 3 storeys, max value =2.5, otherwise max value =1.5, no minimum

	Along	Across
	1.5	1.5
Rationale for choice of F factor, if not 1	Quality Build and Maitenance	Quality Build and Maintenance

Detail Critical Structural Weaknesses: (refer to DEE Procedure section 6)

List any: Brick Veneer Refer also section 6.3.1 of DEE for discussion of F factor modification for other critical structural weaknesses

3.7. Overall Performance Achievement ratio (PAR)	**1.50**	**1.50**
4.3 PAR x (%NBS)b: PAR x Baseline %NBS:	**15%**	**15%**
4.4 Percentage New Building Standard (%NBS), (before)		**15%**

Detailed Engineering Evaluation Summary Data V1.14

Location

Building Name:	Dormitory		Reviewer:	W. L. Lewis	
	Unit	No: Street	CPEng No:		33543
Building Address:		265 Riccarton	Company:		
Legal Description:			Company project number:		
	Degrees	Min Sec	Company phone number:		
GPS south:			Date of submission:		
GPS east:			Inspection Date:		
			Revision:		
Building Unique Identifier (CCC):			Is there a full report with this summary?		

Site

Site slope:	flat	Max retaining height (m):	
Soil type:	sandy silt	Soil Profile (if available):	
Site Class (to NZS1170.5):	D		
Proximity to waterway (m, if <100m):		If Ground improvement on site, describe:	
Proximity to clifftop (m, if < 100m):			
Proximity to cliff base (m,if <100m):		Approx site elevation (m):	

Building

No. of storeys above ground:	1	single storey = 1	Ground floor elevation (Absolute) (m):	
Ground floor split?	no		Ground floor elevation above ground (m):	
Storeys below ground	0			
Foundation type:	strip footings		if Foundation type is other, describe:	
Building height (m):	8.10	height from ground to level of uppermost seismic mass (for IEP only) (m):		
Floor footprint area (approx):	560			
Age of Building (years):	53		Date of design:	
Strengthening present?	yes		If so, when (year)?	2002
			And what load level (%g)?	
Use (ground floor):	multi-unit residential		Brief strengthening description:	not completed
Use (upper floors):	multi-unit residential			
Use notes (if required):				
Importance level (to NZS1170.5):	IL2			

Gravity Structure

Gravity System:	load bearing walls		
Roof:	concrete	slab thickness (mm):	
Floors:	concrete flat slab	slab thickness (mm):	
Beams:	cast-insitu concrete	overall depth x width (mm x mm):	
Columns:	load bearing walls	typical dimensions (mm x mm):	
Walls:	load bearing brick	#N/A	

Lateral load resisting structure

Lateral system along:	unreinforced masonry bearing wall - brick	**Note: Define along and across in**	note wall thickness and cavity:	
Ductility assumed, μ:	1.00	**detailed report!**		
Period along:	0.40	0.40 from parameters in sheet	estimate or calculation?	estimated
Total deflection (ULS) (mm):	20		estimate or calculation?	estimated
maximum interstorey deflection (ULS) (mm):	20		estimate or calculation?	estimated
Lateral system across:	multi-level tilt panel		note total length of wall at ground (m):	
Ductility assumed, μ:	1.00			
Period across:	0.50	#### enter height above at H31	estimate or calculation?	estimated
Total deflection (ULS) (mm):	30		estimate or calculation?	estimated
maximum interstorey deflection (ULS) (mm):	30		estimate or calculation?	estimated

Separations:

north (mm):		leave blank if not relevant
east (mm):		
south (mm):		
west (mm):	0	

Non-structural elements

Stairs:	cast insitu	notes:	
Wall cladding:	brick or tile	describe (note cavity if exists):	
Roof Cladding:	Heavy tiles	describe:	
Glazing:	steel frames		
Ceilings:	fibrous plaster, fixed		
Services(list):	usual		

Available documentation

Architectural	full	original designer name/date	
Structural	none	original designer name/date	
Mechanical	none	original designer name/date	
Electrical	none	original designer name/date	
Geotech report	none	original designer name/date	

Damage

Site:	Site performance:	Good	Describe damage:
(refer DEE Table 4-2)			
	Settlement:	none observed	notes (if applicable):
	Differential settlement:	none observed	notes (if applicable):
	Liquefaction:	none apparent	notes (if applicable):
	Lateral Spread:	none apparent	notes (if applicable):
	Differential lateral spread:	none apparent	notes (if applicable):
	Ground cracks:	none apparent	notes (if applicable):
	Damage to area:	none apparent	notes (if applicable):

Building:

	Current Placard Status:	yellow	
Along	Damage ratio:		Describe how damage ratio arrived at:
	Describe (summary):		
Across	Damage ratio:		
	Describe (summary):		
Diaphragms	Damage?:	no	Describe:
CSWs:	Damage?:	no	Describe:
Pounding:	Damage?:	no	Describe:
Non-structural:	Damage?:	yes	Describe:

$$Damage\_Ratio = \frac{(\%NBS(before) - \%NBS(after))}{\%NBS(before)}$$

Recommendations

	Level of repair/strengthening required:	significant structural and strengthening	Describe:	
	Building Consent required:	yes	Describe:	
	Interim occupancy recommendations:	do not occupy	Describe:	
Along	Assessed %NBS before e'quakes:		15% %NBS from IEP below	If IEP not used, please detail assessment methodology:
	Assessed %NBS after e'quakes:			
Across	Assessed %NBS before e'quakes:		15% %NBS from IEP below	
	Assessed %NBS after e'quakes:			

IEP **Use of this method is not mandatory - more detailed analysis may give a different answer, which would take precedence. Do not fill in fields if not using IEP.**

Period of design of building (from above): 0 h_N from above: m

Seismic Zone, if designed between 1965 and 1992: not required for this age of building

not required for this age of building

	along	across
Period (from above):	0.4	0.5
(%NBS)nom from Fig 3.3:	3.0%	3.0%
Note:1 for specifically design public buildings, to the code of the day: pre-1965 = 1.25; 1965-1976, Zone A =1.33; 1965-1976, Zone B = 1.2; all else 1.0		1.00
Note 2: for RC buildings designed between 1976-1984, use 1.2		1.0
Note 3: for buildings designed prior to 1935 use 0.8, except in Wellington (1.0)		1.0
Final (%NBS)nom:	**3%**	**3%**

2.2 Near Fault Scaling Factor

Near Fault scaling factor, from NZS1170.5, cl 3.1.6: 1.00

	along	across
Near Fault scaling factor (1/N(T,D), **Factor A**:	1	1

2.3 Hazard Scaling Factor

Hazard factor Z for site from AS1170.5, Table 3.3: 0.30

Z_{1992}, from NZS4203:1992: 0.8

Hazard scaling factor, **Factor B:** 3.333333333

2.4 Return Period Scaling Factor

Building Importance level (from above): 2

Return Period Scaling factor from Table 3.1, **Factor C**: 1.00

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	along	across
Assessed ductility (less than max in Table 3.2)	1.00	1.00
Ductility scaling factor: =1 from 1976 onwards; or =k_μ, if pre-1976, fromTable 3.3:	1.00	1.00
Ductility Scaling Factor, **Factor D**:	1.00	1.00

2.6 Structural Performance Scaling Factor:

Sp:	1.000	1.000
Structural Performance Scaling Factor **Factor E**:	1	1

2.7 Baseline %NBS, (NBS%)b = (%NBS)nom x A x B x C x D x E

%NBSb:	**10%**	**10%**

Global Critical Structural Weaknesses: (refer to NZSEE IEP Table 3.4)

3.1. Plan Irregularity, factor A: insignificant 1

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Pounding effect D1, from Table to right 1.0

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Table for Selection of D2

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3.6. Other factors, Factor F For ≤ 3 storeys, max value =2.5, otherwise max value =1.5, no minimum

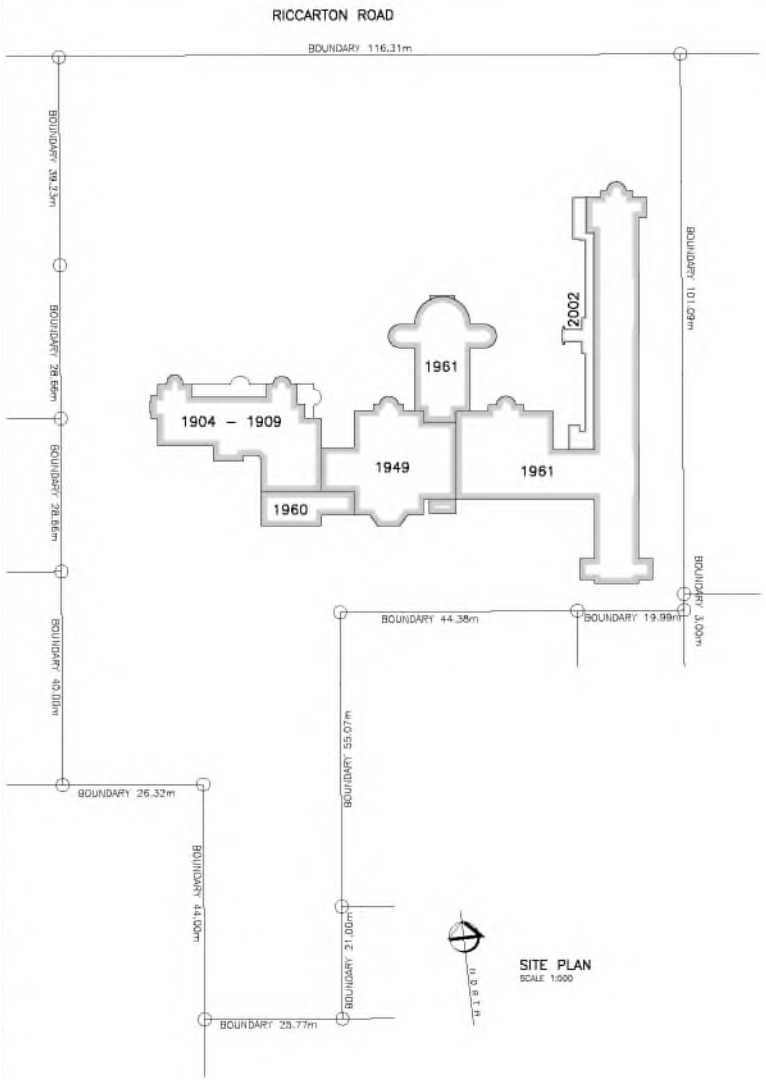
	Along	Across
	1.5	1.5
Rationale for choice of F factor, if not 1	Quality Built and Maintenance	Quality Built and Maintained

Detail Critical Structural Weaknesses: (refer to DEE Procedure section 6)

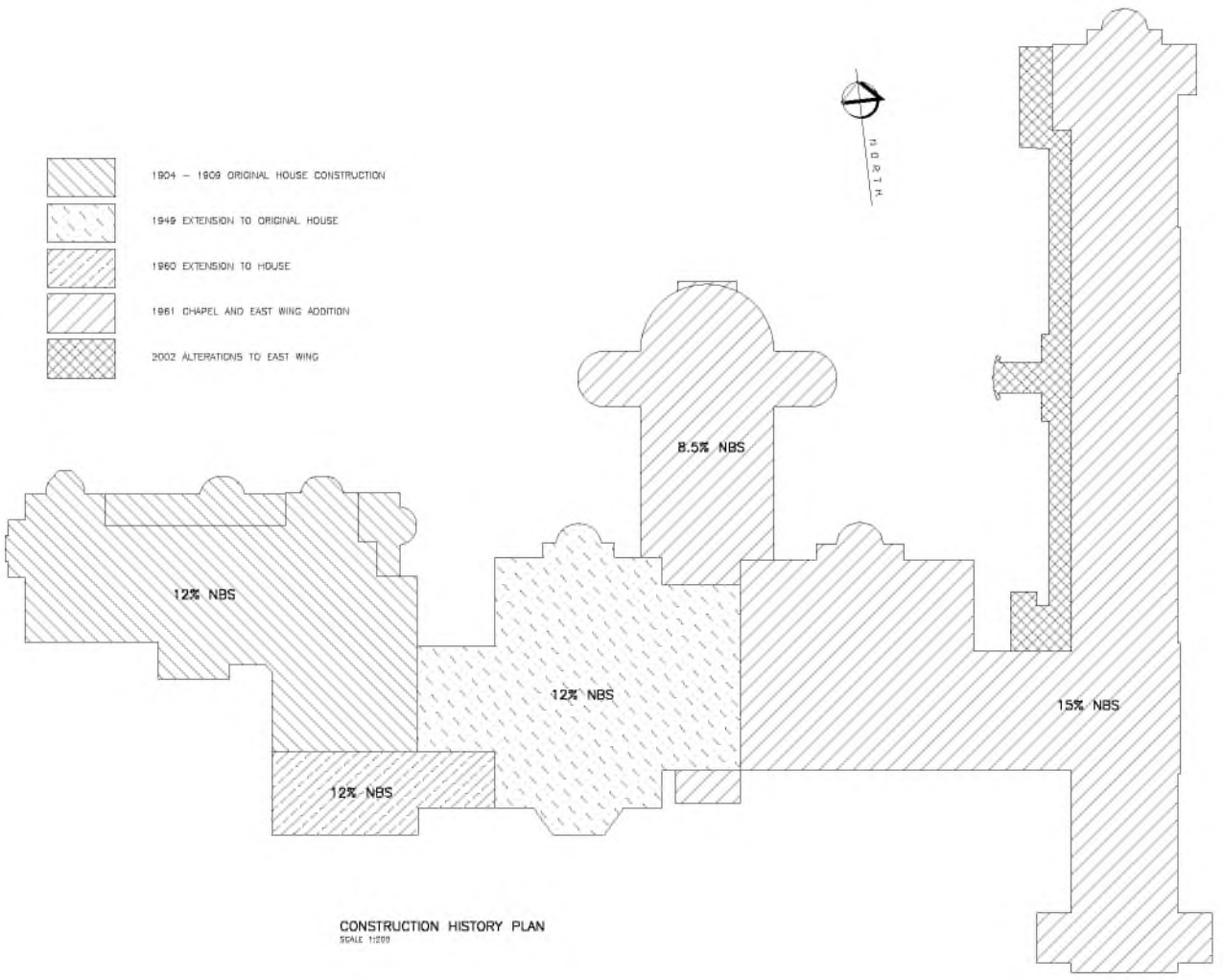
List any: Refer also section 6.3.1 of DEE for discussion of F factor modification for other critical structural weaknesses

3.7. Overall Performance Achievement ratio (PAR)	**1.50**	**1.50**
4.3 PAR x (%NBS)b: PAR x Baseline %NBS:	**15%**	**15%**
4.4 Percentage New Building Standard (%NBS), (before)		**15%**

APPENDIX B
SITE PLAN & CONSTRUCTION HISTORY PLAN



SITE PLAN
SCALE 1:500



CONSTRUCTION HISTORY PLAN
SCALE 1:200

DIMENSIONS ARE IN MILLIMETRES UNLESS STATED OTHERWISE. CONTRACTOR SHALL VERIFY ALL DIMENSIONS BEFORE STARTING WORK

LEWIS & BARROW LTD
Consulting Civil And Structural Engineers
Unit B, 357 Madras Street – Christchurch – New Zealand
Ph: (03) 366-4320 – www.lewisandbarrow.co.nz

BUILDINGS AT 265 RICCARTON ROAD

ENG DSN	SCALE AT A1	FILE	DRAWING
DRN	1:200	21303	1
ENG CKD	1:500		
DRN CKD NB			OF 1
APP			
DATE 28.01.14			

APPENDIX J - MIYAMOTO ENGINEERS, LETTER – 65 RICCARTON ROAD – ANTONIO HALL BUILDING – POST-FIRE STRUCTURAL INSPECTION, 22 DECEMBER 2021

22 December 2021

Murray Withers
RataGroup
Email: murray@ratagroup.co.nz

Subject: 265 Riccarton Road – Antonio Hall building – Post-fire structural inspection
Project Number: **210611**

Dear Murray,

Miyamoto were engaged to inspect the building at 265 Riccarton Road, Christchurch also known as Antonio Hall building to determine the extent of structural damage caused by a recent fire that occurred in the west wing of the building. Alejandro Amaris Associate Structural Engineer of Miyamoto carried out an inspection of the building on Tuesday 21 December 2021.

The building has three sections and was built in three stages: The west wing is the original building and was used at that time as homestead which was built circa 1910; the middle section was built circa 1950 which contain a wedding chapel and the east wing post 1960s. In 1996 the building was registered as a Category II historic place by the New Zealand Historic Places Trust.

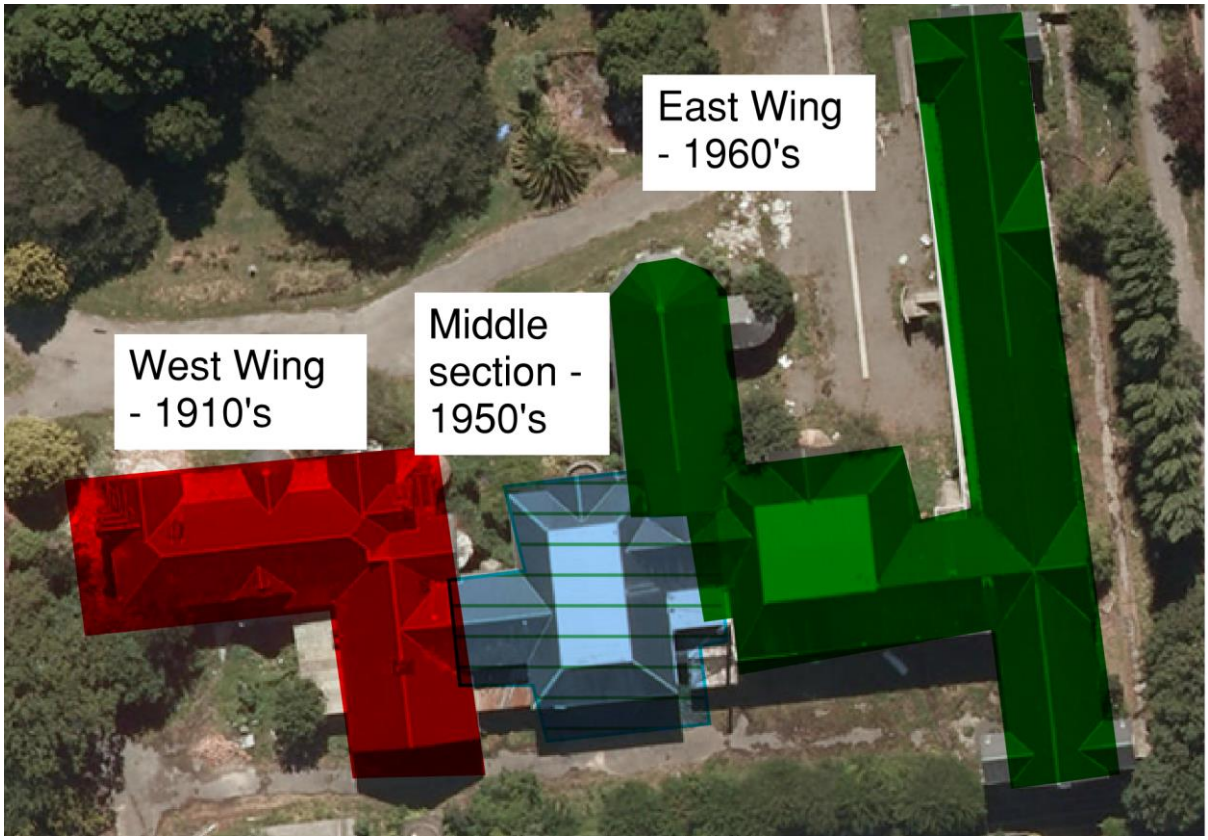


Figure 1- Aerial photo at 265 Riccarton Rd

Miyamoto understands that there was damage in an earlier fire back in 2019 which affected the middle section with a wedding chapel and part of the east wing (see Figure 2).

Figure 2- Aerial photo at 265 Riccarton Rd

Our scope of works is limited to assessment of the original west wing, for which we have been requested to comment on the structural stability of the building follow a recent (second) fire event in November 2021.

The west wing building consists of a two-storey building, L-shape in plan, with the primary structure being double skin brick cavity walls. From the site inspection it is evident that the fire has affected the following elements:

- The fire has burnt through the roof rafters and metal sheeting causing collapse, leaving no roof structure.
- The timber floor joists and flooring of the first floor has been burnt through causing collapse, leaving no first floor.
- The ground floor structure and subfloor was covered in debris from the fire and could not be assessed.

Miyamoto observed the following items that pose an immediate risk to the public and/or to any person in the building in particularly if someone is to access the fire affected areas:

1. The majority of wooden structure (roof and first floor flooring) had been significantly damaged and has collapsed as a result of the most recent fire. The existing unreinforced brick walls are currently cantilevered from ground level, with very low out-of-plane capacity under seismic or wind loading. Out of plane collapse presents a risk to anyone within 8m of the building footprint during an earthquake or a moderate wind event.
2. Loose roof linings and building services (ducting) are compromised and at risk of falling or becoming airborne in a moderate wind event.

3. Debris on the ground which poses a trip hazard, with timber and exposed nails that present a risk of injury to anyone that accesses the area of debris.
4. Remaining burnt out timber elements risk collapse if disturbed.
5. The damage to the ground floor structure is unknown and may also present a risk of collapse and entrapment.
6. The remaining brick walls have the following damage:
    - Partial collapse of brickwork from loss of lateral support due to collapse of roof and first floor.
    - Spalling to several areas of brickwork from heat effects of the fire
    - Substantial cracking from earthquake in 'hourglass' formation consistent with in-plane shear failure.

Miyamoto recommend the following be carried out as soon as practicable for the west wing (old homestead) of the complex:

1. Prevent access to the damaged area of the building by installation of suitable hoarding and/or fencing at least 8m away from the perimeter of the building.
2. Remove loose roof linings, building services, etc, where safe to do so.
3. Demolish the fire affected internal partition walls and clean up debris from the ground floor.

The following has been considered in relation to the remaining brickwork elements of the west wing:

1. The combination of fire and earthquake damage has resulted in widescale damage that would at least require a substantial proportion of replacement and there are limited areas of the brickwork that are now salvageable.
2. The condition of the brick ties within the cavity of the double brick walls are unknown, but it is likely that there is at least some deterioration to the ties that has compromised the structure of these walls.
3. The instability of the brickwork from the lack of lateral support and the damage noted above would present a significant hazard to any workers that access the site. Hence the safe installation of temporary bracing or strong-backs used to retain the brick walls is unlikely to be practicable.

For the reasons noted above, it is recommended that the remaining elements of the west wing is demolished and the materials that are at risk of becoming airborne (e.g. sheet roofing or lightweight fibres) be secured or disposed of.

Should any further information be required, or any additional damage is identified, please contact the undersigned.

Yours sincerely,

Alejandro Amaris
Associate Structural Engineer
021 356 761
Alejandro.amaris@miyamoto.nz

Reviewed by:

Ivo de Vocht
Associate Structural Engineer
027 537 9490
Ivo.deVocht@miyamoto.nz

SITE VISIT PHOTOS