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 CLARA CAPONI 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 **Clara Caponi**. I am employed at Egis NZ Limited where I hold the position of Associate Engineer.

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 relates to site specific heritage engineering matters raised in the submissions seeking changes to the Schedule of Significant Historic Heritage Places (**Schedule**). Specifically, the submissions considered in this evidence are:

   (a) Submission #824 – The Blue Cottage (325 Montreal Street), HID 390;[1]

   (b) Submission #825 – St James' Church (65-69 Riccarton Road, Riccarton), HID 465;

   (c) Submission #1043 – Portstone Cottage (471 Ferry Road, Woolston), HID 194; and

   (d) Submission #1056 – Mitre Hotel (40 Norwich Quay, Lyttelton), HID 1060.

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

   (a) Submission #824: I do not have sufficient information about the Blue Cottage to be able to conclusively provide my opinion on the works necessary to repair the building to a safe and useable condition;

   (b) Submission #825: There are viable engineering options to repair St James' Church to a safe and useable condition;

   (c) Submission #1043: There are viable engineering options to repair Portstone Cottage to a safe and useable condition; and

   (d) Submission # 1056: There are viable engineering options to repair the Mitre Hotel to a safe and useable condition.

[1] HID is the heritage item identification number in the Schedule.

5. Other witnesses will comment on the economic viability of the options to repair and the heritage impacts of those options.

INTRODUCTION

6. My full name is **Clara Caponi** and I am Chartered Professional Engineer. I am employed by Egis NZ Limited where I hold the position of Associate Engineer.

7. I have prepared this statement of evidence on behalf of the Council in respect of matters arising from submissions on PC14.

8. My evidence relates to site specific heritage engineering matters raised in the submissions seeking changes to the Schedule.

9. In preparing this evidence I have:

   (a) read the submissions relating to my area of technical expertise;

   (b) undertaken site visits to the relevant properties, being the Blue Cottage, St James' Church, the Portstone Cottage and the Mitre Hotel; and

   (c) undertaken research regarding new engineering technology and current industry best practice for the strengthening and repairs of heritage structures, where required.

10. The key documents and guidelines I have used, or referred to, in forming my opinion on the matters in this evidence include:

   (a) District Plan Statements of Significance for listed heritage items;

   (b) The International Council on Monuments and Sites (**ICOMOS**) New Zealand Charter for the Conservation of Places of Cultural Heritage Value, 2010;

   (c) Heritage New Zealand Pouhere Taonga, “Statement of General Policy - Management and Use of Historic Places Owned, Controlled or Vested in Heritage New Zealand Pouhere Taonga”, October 2015; and

   (d) Heritage New Zealand Pouhere Taonga Act 2014.

QUALIFICATIONS AND EXPERIENCE

11. I hold a MEng (cum Laude) in Building Engineering from the University of Perugia (Italy) and a Post-Graduate Master Degree in Earthquake

Engineering from the ROSE School and IUSS Institute of University of Pavia (Italy).

12. I am a Chartered Professional Engineer both in in Italy and New Zealand with a special interest in heritage engineering. I am a member of Institution of Professional Engineers New Zealand (**IPENZ**), Structural Engineering Society of New Zealand (**SESOC**) and New Zealand Society for Earthquake Engineering (**NZSEE**). I am also a member of ICOMOS New Zealand as well as ICOMOS New Zealand Joint Scientific Committee on Risk Preparedness (**ANZCORP**). Since 2022, I am also part of the Building Management in Emergencies Technical Working Group established by the Ministry of Business, Innovation and Employment to review and improve government policies and procedures related to a state of post-disaster emergency. I am also a certified member of the Italian Civil Defence Engineering Technical Group operating in post-earthquake emergency response.

13. I have 15 years of experience in seismic engineering. Since the beginning of my career, I have been involved in the design and strengthening of complex structures such as monumental heritage buildings, hospitals and university campuses. These projects have required me to apply the advanced technical knowledge and skills developed during my master studies at the ROSE School.

14. Through the course of my career, I have worked on a diverse portfolio of projects ranging from medieval and renaissance monumental buildings in Italy to early 19th Century heritage buildings in New Zealand. Over my 10 years of heritage experience in New Zealand, I have worked on several projects including Sacred Heart Church in Timaru; Consumer and Applied Science (CApSc) Building (University of Otago) in Dunedin; Immaculate Conception Church in Geraldine; St John the Evangelist Church in Leeston; St Mary's Church in Hokitika; St Joseph's Church in Temuka and the Christchurch Citizen War Memorial. In 2021, one of my projects (the strengthening of Sacred Heart Church, Timaru) won the Canterbury Heritage Award in the seismic category.

CODE OF CONDUCT

15. 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

16. My evidence addresses site-specific heritage structural engineering matters related to the following submissions, which seek to remove certain buildings from the Schedule:

    (a) Submission #824 – The Blue Cottage;

    (b) Submission #825 – St James' Church;

    (c) Submission #1043 – Portstone Cottage; and

    (d) Submission # 1056 – Mitre Hotel.

SUBMISSION #824 – THE BLUE COTTAGE

Introduction

17. This submission relates to a cottage known as “the Blue Cottage” located at 325 Montreal Street (on the corner of Gloucester Street) in the heart of the Christchurch City Centre. The structure and surrounds are scheduled in Appendix 9.3.7.2 of the District Plan as a Significant Heritage Item (Number 390) and Heritage Setting (Number 287).

Building description

18. The Blue Cottage is a single storey timber framed structure with timber bevel-back weatherboards cladding and light-weight metal roofing system (corrugated galvanised steel sheeting) with quadrant profile spouting. The main structure is believed to have been built in c.1885. It was then successively extended at various stages with lean-to additions at the rear (South-West Elevation). The foundation system comprises volcanic stone unit beams installed along most of the perimeter of the original structure (apart from the North-East Elevation in proximity of the current access ramp) and concrete slab on the annexes structures. Two mature trees are located in very close proximity to the building: one near the South-East Elevation and one close to the building North-East corner.

Summary of submission

19. The submission was made by Carter Group Property Limited (**Carter Group**), which is the company that currently owns the building and the associated heritage setting.

20. The submission requests the building and associated heritage setting be removed from the Schedule. This relief is sought for a few reasons, including the following which relate to my area of expertise:

    (a) the building's original architectural features have been removed over time; and

    (b) the building is in a poor state of repair with evident damage to its exterior.

21. I address points (a) and (b) in my evidence below.

Site inspection

22. To gain an understanding of the building's structural system and its current conditions, I attended a site visit with **Ms Amanda Ohs** (Senior Heritage Advisor for the Council) on Wednesday 19 July 2023. Only an external visual inspection was carried out. No 'opening up works', invasive investigations, removal of linings or material testing were undertaken.

Background information

23. In addition to the site inspection, I have also used or referred to the data and information provided in the following key documents:

    (a) "The Caretaker's Cottage, Cramner Centre, Christchurch – A Conservation Plan", Dave Pearson Architects Limited, January 2003;[2]

    (b) Heritage Assessment – Statement of Significance Heritage Item number 390, Christchurch City Council, 3 February 2015;[3]

    (c) Statement of evidence of Gavin Stainley on behalf of Christchurch City Council (Quantity Surveying), 3 December 2015;[4]

[2] Due to the length of the report it has not been appended but can be made available to the Panel on request.
[3] https://districtplan.ccc.govt.nz/Images/DistrictPlanImages/Statement%20of%20Significance/Central%20City/HID%20390.pdf
[4] https://chchplan.ihp.govt.nz/wp-content/uploads/2015/08/3723-CCC-Evidence-of-Gavin-Stanley-9.3-Heritage-3-12-2015.pdf

(d) Statement of evidence of Jacqueline Sarah Hilda Gillies on behalf of Christchurch City Council (Conservation Architecture), 3 December 2015;[5] and

(e) Statement of evidence of Jennifer Susan May on behalf of Christchurch City Council (Conservation Architecture), 3 December 2015.[6]

24. No engineering reports on the building were included with the submission.

Building seismic response and earthquake damage

25. In the evidence provided for the Independent Hearings Panel in 2015, Ms Gillies stated that there was remarkably little evidence of earthquake damage to the building following the Canterbury earthquake sequence. Ms Gilles indicated that the damage was limited to some cracking in the internal lath and plaster walls and ceilings, little damage elsewhere and partial collapse of the rear masonry chimney.

26. During my site inspection, I confirmed that the seismic performance of the building during the Canterbury earthquake sequence should have been reasonably good as the external structures do not show obvious signs of leaning or significant residual displacements. I also observed that the rear masonry chimney has been dismantled at least to roof level with temporary covering of the wall and roof cladding provided in its place.

Building's current condition

27. Currently, the majority of the damage to the existing heritage fabric is due to lack of maintenance. Natural aging and decay of the building materials, inadequate long-term weatherproof details and vandalism represent only secondary causes and contribute just in minor part to the extent of the existing damage.

28. Based on the photographic documentation from the site inspection by Ms Gillies, Ms May and Mr Stanley in 2015, deferred maintenance works have significantly accelerated the deterioration of the building exteriors. The damage has particularly worsened the condition on the South-West Elevation where most of the weatherboards are now beyond salvage due to mould, rot or borer issues. In certain areas, the damage or partial removal of the

[5] https://chchplan.ihp.govt.nz/wp-content/uploads/2015/08/3723-CCC-Evidence-of-Jackie-Gillespie-9.3-Heritage-EIC-3-12-2015.pdf
[6] https://chchplan.ihp.govt.nz/wp-content/uploads/2015/08/3723-CCC-Evidence-of-Jenny-May-9.3-Heritage-EIC-3-12-2015.pdf

cladding system has also exposed the inner timber structure to the natural elements potentially causing the onset of mould and moisture in the building materials.

29. During my site inspection, I also noticed that the mature trees planted in proximity of the South-East Elevation can potentially cause direct and indirect damage to the building. Specifically, the leaves and the small branches fallen over the roof are filling and obstructing the roof valleys, gutters and downpipes impeding a proper rainwater collection and drain. These trees are also leading to the accumulation of organic material (leaves and terrain) on the building's South-East side so that one of the sub-floor vents is now almost completely obstructed and the lower weatherboards are constantly exposed to high-level of dampness potentially causing a premature decay of the building materials.

Structural damage observed

30. During my site inspection, I noticed that the volcanic stone units used for the ring beam foundation on the North-East and North-West Elevations are in advance state of decay and most of them are beyond salvage. The deterioration can be mostly ascribed to natural material exfoliation due to salt attack and freeze-thaw activities. Although natural phenomena, these types of decay have been accelerated by the installation of asphalt pavement along the North-West Elevation and lack of an adequate rainwater drain system at the North-East Elevation.

31. No other obvious structural issues were identified during the site visit (noting this was limited to viewing the exterior surfaces). However, the deferred maintenance works might have also adversely affected the building's structural and non-structural internal components. Leaking issues in the wall external fabric and roof cladding might have allowed penetration of rainwater within the internal structures causing the onset of mould and rot issues. Internal inspections and opening up works would be required to confirm the current conditions of the inner structures and the extent of work effectively required to reinstate the building.

Lead-based paint

32. Site observations suggest the presence of lead-based paint used as original primer on the timber weatherboards. If presence of lead-based paint is confirmed by laboratory testing and building reinstatement is pursued,

adequate treatment of the external cladding should be included in the scope of strengthening and repairs works.

Proposed strengthening and repair works

33. No engineering reports, strengthening scheme concepts or repair methodologies were included with the submission for me to comment on.

Matter raised by the submission: point (a)

34. The submission states that the building's original architectural features have been removed over time and the building should be now considered to have little or no heritage value. I do not agree with this statement.

35. In my opinion, the cottage maintains much of the original fabric and finishes with very few alterations undertaken throughout the course of the years. The alterations are limited to:

    (a) replacement of the original slate roof with corrugated steel sheeting system;

    (b) replacement of a bull-nose roofed verandah originally installed at the North-East Elevation with a modern removable timber ramp with handrails; and

    (c) deconstruction of the original masonry chimneys. The two front chimneys were deconstructed as a result of changes and modifications to the internal fireplaces and the rear chimney was removed as a result of the severe damage sustained after the Canterbury earthquake sequence in 2011-2012.

36. Apart from other minor changes to the exterior such as replacement of the windows' joinery and corner boards, the cottage retains much of the original fabric and finishes.

Matter raised by the submission: point (b)

37. The submission states that the building is in a poor state of repair with evident damage to its exterior. Therefore, in the submitter's opinion, the cottage's heritage status has considerably diminished.

38. As noted above in paragraph 26, the majority of the damage to the existing heritage fabric is due to deferred maintenance. Natural aging and decay of the building materials, construction details not being completely

weatherproof, and vandalism represent only secondary causes and contribute just in minor part to the existing damage. If intrusive investigations prove the damage to the inner structures to be minimal and no trace of lead-based paint is found on the weatherboards, only standard repairs and maintenance works would be required to reinstate the building to a good condition. On the other hand, if the damage to the inner structures is proven to be extensive and traces of lead-based paint are found in the weatherboard coating, substantial repairs and strengthening works would be required to retain the cottage and loss of a significant part of the original heritage fabric should be expected.

Conclusion

39. I disagree that the building has already lost most of its heritage features. Apart from minor changes (most of which could be addressed), the cottage retains much of the original fabric and finishes.

40. Due to the lack of data on the conditions of the internal structural elements, however, it is not possible for me to ascertain the extent of works required to repair the building at the time of writing, nor whether strengthening and repair works would lead to the loss of significant parts of the original heritage.

SUBMISSION #825 – ST JAMES' CHURCH

Introduction

41. This submission relates to an Anglican Church known as St James' Church located at 65 Riccarton Road in the heart of the Upper-Riccarton suburb. The structure and surrounds are listed in Appendix 9.3.7.2 of the District Plan as Heritage Item Number 465 (Category 1, Highly Significant Heritage Structure) and Heritage Setting Number 220.

Building description

42. Built in 1923, St James' Church represents an example of Early English Gothic Revival Style. The Church was designed by Sidney and Alfred Luttrell, a firm of architects and building contractors noted for its contribution to New Zealand architecture both in terms of style and technology.

43. The main body of the Church consists of a nave and a sanctuary located at the nave's East end, to give approximately a rectangular plan form. Although interconnected spaces, the nave and sanctuary are clearly delimited and

separated by an internal chancel arch. Two lateral chapels overlook the sanctuary on the North and South sides. A belfry tower surmounted by a timber spire is located adjacent to the northern chapel. The Church is completed by an entry porch located adjacent to the North-West corner of the nave.

44. From a structural point of view, the building fabric comprises unreinforced masonry perimeter walls and a light-weight timber roof structure supporting slate tiles. The perimeter walls represent the building's main structural system. The walls consist of three different layers: an external layer of hard volcanic stone (bluestone) or limestone, an infill of unreinforced concrete and an internal layer of 2-leaf clay brick in the side walls and 1-leaf clay brick in the gable ends. As reported in the 2011 Aurecon report (reference below):

> "*The interior wall face has plaster finish, and the total wall thickness is around 620mm. The walls have a concrete strip foundation measuring approximately 800mm wide and 600mm deep […]".*
>
> *The church roof is steep with a pitch of about 52°, and the gravity (note from the author) roof load is supported by timber trusses bolted into the side walls*."

45. Buttressing walls have been installed around the entire perimeter of the building to support the side and gable end walls. The buttressing walls are erected in proximity of the roof truss locations on the side walls and on either side of the large stained-glass windows at the building's East and West Elevations (gable end walls). The Church has a timber floor supported on concrete piles.

Summary of the submission

46. The submission has been lodged by the current building owner, the Church Property Trust (**CPT**). In their submission, CPT requests the building and associated heritage setting be removed from the Schedule. This relief is sought for a few reasons, including the following which relate to my area of expertise:

    (a) The building was badly damaged during the Canterbury Earthquakes and was listed as an Earthquake Prone Building (EPB) in 2019 as its NBS rating was less than 20%. Therefore, the structure lacks structural integrity for safe usage.

(b) The heritage status of the Church is diminished considering the current state of disrepair. Therefore, in the owner's opinion, the building no longer meets the criteria for listing.

(c) In light of the above, the CPT believes that the Church is appropriate to be demolished in consideration of the demolition clauses listed in Policy 9.3.2.2.8.

(d) The St James Church is now considered redundant for the Anglican Dioceses of Christchurch as the Riccarton Parish merged with the Spreydon Parish.

47. I address points (a) to (d) in my evidence below.

Site inspection

48. To get an understanding of the building and its current conditions, I viewed the exterior of the building with **Ms Chessa Stevens** (Principal Conservation Architect & National Built Heritage Lead, WSP) on Tuesday 18 July 2023. Only an external visual inspection from the public realm was carried out. No 'opening up works', invasive investigations, removal of linings or material testing were undertaken.

Background information

49. In addition to the site inspection, I have also used or referred to the data and information provided in the following key documents:

(a) Heritage Assessment – Statement of Significance Heritage Item Number 465, St James' Church and Setting – 65,69 Riccarton Road, Christchurch, Christchurch City Council, November 2014;[7]

(b) "St James' Church, Riccarton – Strength and Repair Assessment for Godfrey & Company", Aurecon, August 2011 (**Appendix A**); and

(c) "Consent Documentation for Remediation of St James' Church, Riccarton – Concept Issue", Aurecon, April 2013.[8]

[7] HID 465.pdf (ccc.govt.nz)
[8] Due to the length of the report it has not been appended but can be made available to the Panel on request.

Building seismic response and earthquake damage

50. The Aurecon engineering reports (including Appendix A) indicated only minor to moderate damage, with the majority of the damage concentrated at following locations:

    (a) East and West facades: horizontal cracking developed at eaves level and due to Out-of-Plane rocking motion of the top gable panel wall. However, only degradation of the mortar joints and loosening up of a few stones was reported. No Out-of-Plane displacement of the gable wall top part was observed.

    (b) Internal chancel arch: damage to the internal render and dislodgement of the external capping stone.

    (c) North and South side walls: minor to moderate cracking and localised damage to masonry. Specifically, a vertical cracking was observed in one of the wall panels that forms at the North Elevation. This crack, however, is limited to the portion of the panel wall below window level. A horizontal cracking was also observed on the South Elevation just underneath the roof eave connection.

51. I was able to confirm this information and the extent of earthquake damage to the exterior structures during my site visit (noting this was limited to viewing the building exterior from the public realm).

52. In my opinion, the damage to the North and South side walls has nil to minor effects in terms of overall seismic response of the building. This is due to the limited number of damaged areas and relatively low severity of the damage observed. Therefore, the consequential effect on the structure's capacity to resist future earthquake events is minor.

53. With respect to the building's seismic rating, I consider the rating of "earthquake prone" as appropriate for this building. This is due to the un-repaired damage currently present and the potential for this damage to worsen in any future long-duration or high-intensity earthquakes. Therefore, I agree that no safe usage of the building is possible unless strengthening and repair works are undertaken.

Temporary securing works

54. Following the Canterbury earthquake sequence, temporary securing works have been carried out to reduce the risk of further damage to the building and risk to the public. The temporary works mainly include:

    (a) installation of steel framed structure to prop the East and West gable end walls against Out-of-Plane movements; and

    (b) installation of timber framed structure to prop the internal chancel arch.

Proposed strengthening and repair works

55. In 2013, Aurecon investigated possible seismic strengthening options to improve the seismic response of the building and achieve a capacity of at least 34% NBS or 67% NBS. The investigation outcomes were summarised in their report from April 2013.

56. For each of the overall targeted capacities (34% NBS and 67% NBS), Aurecon provided a selection of possible structural strengthening solutions and commented on the probable advantages or disadvantages of each of them. The project, however, seems to not have proceeded further from these initial high-level structural considerations. A coherent and comprehensive scheme concept identifying the effective structural strengthening solutions proposed for this building was not developed or provided as part of the submission documentation.

Matter raised as part of the submission: Point (a)

57. The submission states that the building was badly damaged during the Canterbury earthquakes and was listed as an Earthquake Prone Building (EPB) in 2019 with its NBS rating being less than 20%. Therefore, they state that the structure lacks structural integrity for safe usage.

58. With respect to the severity of the earthquake damage, Aurecon noted that the Church demonstrated an inherently reasonable level of robustness as it was subject to a significant earthquake event (Canterbury earthquake sequence) and sustained only moderate damage (refer Aurecon report of April 2013). I agree with this observation. In my opinion the structure retains a high-level of structural integrity, although strengthening and repair works are deemed required to remove the building's Earthquake Prone Status and

ensure compliance with the current Building Code and New Zealand Design Standard requirements.

Matter raised as part of the submission: Point (b)

59. The submission states the heritage status of the Church is diminished considering the current state of disrepair. Therefore, in the owner's opinion, the building no longer meets the criteria for listing.

60. With respect to the heritage values, it is my opinion that all of the building's physical values remain very much intact. For more details regarding the current heritage value and significance of the building refer to the evidence of **Ms Ohs**; and for the current architectural values refer to the evidence of **Ms Stevens**.

61. With respect to the condition of the building, it appears that the structure is still in very good condition despite some minor and very limited material degradation of exposed limestones surfaces at a couple of buttressing walls on the South Elevation. Lack of maintenance and care have, however, caused the onset of damage to the heritage fabric. Very basic and economic repairs such us:

    (a) replacement of some roof tiles;

    (b) fixing of the rainwater drain system (gutters, downpipes and gully drains); and

    (c) removal or pruning of infesting vegetation;

    would address most of the issues currently causing deterioration of the building fabric. It is worth noting that these works can be easily undertaken as temporary securing works were installed immediately after the Canterbury earthquake sequence and are still in place, continuing to ensure safe access and work condition on site.

Matter raised as part of the submission: Point (c)

62. The submission states that it would be appropriate for the Church to be demolished in consideration of the demolition clauses listed in Policy 9.3.2.2.8. In light of the matters discussed above, I do not believe this building is meeting the demolition criteria (i), (ii) and (iv) listed in Policy 9.3.2.2.8.

63. In my opinion, modern techniques (such as post-tensioning) and innovative materials (such as Fiber-Reinforced Polymer, FRP) would permit the strengthening and repair of the Church to an acceptable standard, that would be sympathetic to the original structures and allow the building to retain its full heritage value.

64. For the economic feasibility of the strengthening options refer to the evidence of **Ms Ohs**, **Ms Richmond** and **Mr Stanley**.

Matter raised as part of the submission: Point (d)

65. The submission states that St James' Church is now considered redundant for the Anglican Dioceses of Christchurch as the Riccarton Parish has now merged with the Spreydon Parish. Also, changes in demographics are unlikely to justify the use of the building as a Church again in the future.

66. Considering the inherent resources contained within the existing building, in my opinion, this heritage building has a high potential for adaptive re-use once repair and structural strengthening works required to achieve a Building Code compliant building are undertaken. Although no longer in use as a Church by the Anglican Diocese of Christchurch, the building could readily provide the basis for a wider range of potential future commercial uses while continuing to contribute to the Riccarton streetscape.

Conclusion

67. There are viable engineering options available to repair the building to a safe and useable condition. Therefore, in my opinion there is no engineering reason why the building should be removed from the Schedule.

SUBMISSION #1043 – PORTSTONE COTTAGE

Introduction

68. This submission relates to a cottage known as “Portstone Cottage” located at 471 Ferry Road (on the corner of Smith Street). The structure and setting are scheduled in Appendix 9.3.7.2 of the District Plan as Heritage Item Number 194 (group 3 Heritage Structure) and Heritage Setting Number 396.

Building description

69. Built in the early 1860s, the Portstone Cottage represents one of the few remaining vernacular stone dwellings built in Christchurch during the colonial

period. Design and built by its first owner, the building is a single storey building with a rectangular footprint and a hipped slate roof. The perimeter walls consist of unreinforced masonry built using Port Hills stone cuttings of various sizes and shapes. The external wall structure comprises an inner and outer stone wythe[9] with rubble infill material placed in between. The external and internal wythe are typically built of cut stones, while the rubble infill is made of small stones built up with some silty/clay mortar providing minimal bonding of the rubble. Internally, the structural layout includes timber partition walls and timber studs installed as a support for the timber roof trusses. The internal finishing generally includes a layer of render laid over most part of the perimeter walls, apart from areas where alterations were made and GIB plasterboard linings were installed (West side walls). A modern Pinex (or similar) tiled ceiling had been installed over an existing timber panelling at eaves level.

Summary of submission

70. The submission was lodged by Mr Cameron Parsonson, owner of the section adjacent to the Portstone Cottage.

71. The submission requests the building and associated heritage setting be removed from the Schedule. This relief is sought for a few reasons, including the following which relate to my area of expertise:

    (a) In consideration of the specific construction method adopted to erect the building, in the submitter's opinion repairing and strengthening the building would require disassembling and rebuilding most parts of the existing structures.

    (b) Dismantling and rebuilding the structure would be an expensive exercise and it would likely not be economically feasible.

    (c) There is little community interest in the asset being restored, as it would not be of economic or commercial interest to the owner or community.

72. I address point (a) to (c) in my evidence below.

[9] A wythe is a continuous vertical layer of masonry. Most older masonry structures are comprised of an outer wythe (which constitutes the building exterior façade) and an interior wythe (to which the drywall is attached). A wythe may be independent of, or interlocked with, the adjoining wythe(s). Often cavity or rubble infill materials are installed between the outer and inner wythes.

Site inspection

73. To gain first-hand knowledge of the building structural system and its current conditions, I attended a site visit with Mr Tim Holmes (Heritage Architect, Warren and Mahoney), Mr Gavin Stanley (Quantity Surveyor, Rhodes) and Mr Gareth Wright (Heritage Advisor, Christchurch City Council) on Monday 24 July 2023. Only a visual inspection of the exteriors and interiors of the building was carried out. No 'opening up works', invasive investigations, removal of linings or material testing were undertaken.

Background information

74. In addition to the site investigation, I have also used or referred to the data and information provided in the following key documents:

    (a) Assessment by Don Thomson Consulting Engineers, July 2011 (**Appendix B**);

    (b) "Heritage Engineering Advice Report", Christchurch City Council Heritage Response team, June 2012 (**Appendix C**);

    (c) "Preliminary Strengthening Scheme Concept for Costing", Dunning Thornton Consultant, November 2013 (**Appendix D**);

    (d) "Budget Repair Estimate", Rhodes + Associate, January 2014 (**Appendix E**); and

    (e) Heritage Assessment – Statement of Significance Heritage Item number 194, Christchurch City Council, March 2015.[10]

75. No seismic assessment reports for this building were available.

Building seismic response and earthquake damage

76. The Assessment by Don Thomson Consulting Engineers of July 2011 (Appendix B) and the Heritage Engineering Advice Report compiled by the Council in June 2012 (Appendix C) provide information regarding the damage originally observed after the main events of the Canterbury earthquake sequence. The reports indicate overall that the building suffered moderate damage as a result of the 4 September and 26 December earthquakes in 2010, with damage becoming more extensive due to the 13

[10] https://districtplan.ccc.govt.nz/Images/DistrictPlanImages/Statement%20of%20Significance/Christchurch/HID%20194.pdf

June 2011 event. At that time, the bulk of damage was concentrated at following locations:

(a) Building Exteriors:

(i) Perimeter walls - building corners and adjacent to openings: cracking due to movement;

(ii) Perimeter walls - West Elevation: dislodgment and fall of the stone lintel above the entry door;

(iii) Perimeter walls - South Elevation: façade walls leaning towards the building exterior;

(iv) Perimeter walls - South-East corner: Cracking and damage likely due to pounding between the main building and the ancillary reinforced masonry structure installed close to the building corner.

(b) Building Interiors:

(i) Perimeter walls – East wall: cracking and fall of a portion of the internal render installed at the top South corner. At this location, some stones and rubbles had loosened from the core and fallen away.

(ii) Internal timber studs gravity system – South Elevation: gap between the wall structure and the vertical stud providing gravity support for the roof structure due to façade walls leaning towards the building exterior.

77. I was able to confirm this information during my site inspection on 24 July. Based on my observations, some changes to the extent and severity of the earthquake damage have occurred since 2012. Specifically:

(a) Building Interiors:

(i) Perimeter walls – West walls – Northern panel: pronounced bulging of the GIB plasterboard internal linings. Suspected loosening and falling away of stones from the wall internal wythe with consequent settlement of the rubble towards the lower section of the wall.

(ii) Perimeter walls – West walls – Southern panel: fall of a large portion of the internal render. The damage observed, however, seems to have been caused by an intentional removal of the render finishings to expose the wall internal wythe and assess the severity of the damage sustained by the wall structure.

(iii) Perimeter walls – East walls – Southern panel: increased level of damage to the wall internal wythe. A larger portion of the internal render has fallen, and additional stones and rubbles have loosened from the core and fallen away.

78. As noted in the Council's Heritage Engineering Advice Report of 2012 (Appendix C), however, the structure continues to retain an inherent level of robustness. Although damaged, the walls have resisted a significant number of 5Mw earthquakes from 2010 to present to the present day without collapsing.

Building's current condition

79. The building was considered unsafe to occupy and closed after 4 September 2010. Despite being closed for almost 13 years, the building condition is generally good with only minor and relatively straightforward maintenance works required such as. removal of infesting vegetation and pruning of external trees.

Proposed Strengthening and Repairs Works

80. In 2013, Dunning and Thornton Consultants proposed a strengthening scheme concept to reinstate the building and improve its seismic performance (refer Appendix D). The scope of work proposed include no highly invasive and reversible strengthening works such as:

(a) Installation of a new timber ceiling and related connections to the perimeter wall system at eave level;

(b) Installation of steel ties along the building perimeter at eaves level;

(c) Installation of near surface mounted steel wires (NSM-SWR) anchored to the walls via transverse steel tie-rods;

(d) Reinstatement of the stone lintel above the entry door (West Elevation) through installation of stainless-steel wall pins;

(e) Strengthening of stone lintels through installation of tie rods drilled and epoxied into the stone;

(f) Dismantling and reconstruction of the small ancillary structure in reinforced concrete block work masonry located on the Eastern side of the building.

81. I generally agree with the strengthening approach and solutions proposed by Dunning and Thornton Consultants, although I would recommend in this case also internal grouting of perimeter masonry walls to stabilise the infill rubble. The proposed repair methodology will structurally strengthen the cottage to a standard greater than the minimum requirement of the New Zealand Building Code, minimising the works' invasiveness and retaining the heritage features of the house.

Matter raised as part of the submission (point (a))

82. The submission states that repairing and strengthening the building would require disassembling and rebuilding of most part of the existing structures. As noted above, the strengthening methodology proposed by Dunning and Thornton Consultants would allow the repair and strengthening of the building structures without any disassembling and rebuilding, hence preserving the heritage features of the house.

Matter raised as part of the submission (point (b))

83. The submission states that dismantling and rebuilding the structure would be an expensive exercise and it would likely not be economically feasible. As mentioned above, dismantling and rebuilding of the cottage is not necessarily required to strengthen the structure. The strengthening works proposed by Dunning and Thornton provide a relatively economic methodology for the restoration of an existing facility. The estimated costs of building reinstatement based on the strengthening methodology proposed by Dunning and Thornton are provided in the evidence submitted by **Mr Stanley**; while economic feasibility is considered in the evidence of **Mr Wright** and/or **Ms Richmond**.

Matter raised as part of the submission (point (c))

84. The submission states that there is little community interest in the asset being restored, and it would not be of economic or commercial interest to the owner or community.

85. I note that that if reinstatement is pursued, the repairs and strengthening works can be combined with an adaptive reuse of the building spaces. The potential future uses of the building would then be opened to a wider range of options, including uses not directly associated with the former residential and commercial use.

Conclusion

86. There are viable engineering options to repair the building to a safe and useable condition. The design approach proposed by Dunning and Thornton could provide an effective and heritage-sympathetic way to strengthen the building. Therefore, in my opinion there is no engineering reason why the building should be removed from the Schedule.

SUBMISSION #1056 – MITRE HOTEL

Introduction

87. This submission relates to a heritage hotel known as Mitre Hotel located at 40 Norwich Quay (on the corner of Canterbury Street), Lyttelton. The structure and related setting are scheduled in Appendix 9.3.7.2 of the District Plan as Heritage Item Number 1060 (group 2 Heritage Structure) and Heritage Setting Number 40.

Building description

88. Built in 1926, the Mitre Hotel was designed to resemble the appearance of the previous historic hotel constructed on site in 1878 and lost to fire in March 1926. It represents an early example of monolithic concrete structure with detailing dating from the 1920s.

89. The Mitre Hotel is a two-storey structure with a basement under the central part of the building. The hotel perimeter walls consist of reinforced cast in-situ concrete structures while the basement walls were erected built in clay brick unreinforced masonry over a concrete floor structure. The roof system consists of lightweight steel cladding installed over a layer of timber sarking and purlins directly supported by the roof timber trusses. The roof is multi-pitch, with three equal bays and two valleys that run in the North-South direction.

90. Internally, the structure comprises timber framed walls with the original lath and plaster linings installed on the most parts of the building interiors, apart

from areas where alterations were made and GIB plasterboard linings were installed. The first-floor suspended structure consists of timber flooring installed over timber joist which in turn are supported by timber beams spanning between exterior walls and internal load-bearing partitions. The ceiling system generally consists of the original lath and plaster linings, apart from areas where alterations were made and suspended acoustic ceilings were installed.

91. The foundation system includes concrete footings to the perimeter walls, and clay brick unreinforced masonry footings/retaining wall at the North end of the building.

92. Considering the change in construction technology from 1878, and at the time of construction of the current building, it is probable that all the clay brick unreinforced masonry structures were from the previous building on this site.

Summary of submission

93. The submission was lodged by Mitre Hotel Holdings Limited, the company currently owning the building with associated heritage setting.

94. The submission requests the building and associated heritage setting to be removed from the Schedule. This relief is sought for a few reasons, including the following which are relevant to my area of expertise:

    (a) The building was extensively damaged by the 2010-2012 Canterbury earthquake sequence and has been vandalised thereafter. The submitters have investigated possible repair options and concluded that, in their opinion, the Mitre Hotel is beyond repair.

    (b) In 2013, sewage flowed through the building causing considerable damage to flooring, doors and architraves.

    (c) Rainwater is penetrating the building in recent years due to perished spouting and internal gutters, damaged flashings along the facades, demolished chimneys and roof penetration from large steel tie cables.

95. I address points (a) to (c) below.

Site inspection

96. To gain an understanding of the building structural system and its current conditions, I attended a site visit with Mr Tim Holmes (Heritage Architect,

Warren and Mahoney), Mr Gavin Stainley (Quantity Surveyor, Rhodes) and Ms Amanda Ohs (Senior Heritage Advisor, Christchurch City Council) on Monday 24 July 2023. Only an external visual inspection from the public area around the building was carried out. No 'opening up works', invasive investigations, removal of linings or material testing were undertaken.

Background information

97. In addition to the site investigation, I have also used or referred to the data and information provided in the following key documents:

    (a) "Earthquake damage report", Structex, July 2011;[11]

    (b) Laboratory testing reports by Opus Consultants dated November 2011 which include:[12]

        (i) Concrete compression of core test results;

        (ii) Carbonation determination results;

        (iii) Chloride ion content of concrete results, and assessment of associated corrosion risk for the embedded steel reinforcing;

    (c) "Earthquake Evaluation Report", Kirk Roberts Consulting Engineers Ltd, November 2011;[13]

    (d) "Earthquake Damage to Mitre Hotel Building", R.B.Knowles & Associates Ltd, December 2012;[14]

    (e) "Damage Assessment and Repair Options", Structex, March 2020;[15]

    (f) Cost estimates for reinstatement, partial retention or demolition and rebuild of the building, Wheelers (November 2014) (**Appendix F**) and Prendos (May 2017) (**Appendix G**);

    (g) Insanitary Building Assessment, Christchurch City Council Environmental Health Team, May 2023 (**Appendix H**);

    (h) Report by Christchurch City Council, Engineering Services Team, Building Consenting Unit, June 2023 (**Appendix I**); and

[11] Due to the length of the report it has not been appended but can be made available to the Panel on request.
[12] Due to the length of the report it has not been appended but can be made available to the Panel on request.
[13] Due to the length of the report it has not been appended but can be made available to the Panel on request.
[14] Due to the length of the report it has not been appended but can be made available to the Panel on request.
[15] Due to the length of the report it has not been appended but can be made available to the Panel on request.

(i) Dangerous and Insanitary Building Notice, Christchurch City Council, July 2023 (**Appendix J**).

98. No Detail Seismic Assessment (DSA) reports for this building were included with the submission.

Building seismic response and earthquake damage

99. Information about the damage sustained by the building as a result of the Canterbury earthquake sequence is provided in several engineering reports (refer to the documents (a), (c), (d) and (e) referred to in paragraph 97). Overall, the reports indicate that due to earthquake effects the building suffered minor to significant damage with the bulk of the structural damage concentrated at the following locations:

(a) Perimeter reinforced concrete walls:

(i) cracking and spalling due to In-Plane and Out-of-Plane movements;

(ii) residual Out-of-Plane displacement and deflections;

(iii) rotation of the concrete cantilever balcony installed at 1st floor level of the South Façade (main façade facing Norwich Quay Street);

(b) Internal timber walls:

(i) cracking to lath and plaster linings of internal walls and ceilings throughout the building;

(ii) disconnection between the timber wall return and the perimeter concrete wall due to Out-of-Plane deflection of the South façade;

(c) Timber floors:

(i) timber floor reported as being generally in reasonably condition apart from areas where localised damage due to installation of temporary securing works occurred or isolated elements showing sign of material decay (rot);

(d) Brick chimneys:

(i) Severe damage and partial collapse. All three existing chimneys have been dismantled to below the roof level while their

remaining lower parts show signs of severe cracking and/or partial collapse;

(e) Foundation system:

(i) although not directly inspected, Structex assumed a certain degree of damage at the foundation system due to the movements and residual displacements observed in the upper structure.

100. During my site visit, I was able to confirm the damage to the exterior elements as described by Structex in their Damage Assessment and Repair Options Report (March 2020) noting, however, that my site visit was limited to viewing the exterior of the building from the public realm.

Temporary securing works

101. Following the Canterbury earthquake sequence, temporary securing works have been carried out to reduce the risk of further damage and risk to the public. The temporary works include:

(a) installation of steel framed structures up to eaves level to provide Out-of-Plane support to the perimeter parapets;

(b) installation of steel roof and floor ties as well as steel cables to provide Out-of-Plane support to the West end concrete wall; and

(c) installation of a timber framed structure to prop the front balcony.

Building current conditions and the dangerous and insanitary building notice

102. The building has been unoccupied since 2010 and no repairs or strengthening works have been undertaken. Rainwater has been penetrating the building due to perished spouting and gutter system, damaged flashings along the facades, lack of adequate weatherproof detailing for the roof openings and penetration implemented as part of the temporary securing works. Most of the windows are also broken or missing. As a result, the property is suffering with moisture ingress affecting timber and porous materials such as the lime-based plaster finishings. Based on Council's recent documentation (refer to item 97(g), 97(h) and 97(i)), there is evidence of mould growth on walls. Due to the progressive deterioration of the building, the Council undertook a condition assessment in May 2023 which resulted in a dangerous and insanitary building notice being issued to the

Mitre Hotel building owner. The notice urged the owner to take action and define timeframes to make the building safe and proposed two options:

(a) boarding up all the access points into the property and demolishing the building in full, in accordance with the best practice standards suggested by Worksafe; or

(b) implementing strengthening works and ensuring compliance with the requirements of the Building Code and national design standards.

Proposed strengthening and repair works

103. In the report “Damage Assessment and Repair Options” (March 2020), Structex addressed and scoped three different options to make the building safe. Specifically:

(a) full repair and reinstatement of the existing building;

(b) retention of the South and East Façades with dismantling and rebuilding of the other remaining part of the existing building; and

(c) full demolition of the existing structure and rebuild of the hotel.

104. I agree with Structex that full building reinstatement, partial retention, and complete demolition and rebuild are all possible and viable options to make the property safe.

105. In my opinion, however, Option 103(b) (retention of the South and East Façades with dismantling and rebuilding of the other remaining parts of the existing building) represent the most balanced solution in terms of long-term cost/benefit. Option 103(b) would allow retention of the most significant heritage features of the building as well as preservation of important elements of the heritage Norwich Quay streetscape. This is a particularly relevant aspect considering the high level of heritage loss along Norwich Quay in Lyttelton.

106. Option 103(b) would also limit the scope of strengthening works to the existing structures and permit a degree of flexibility in the design of the new building's internal spaces and structures. This could then allow for a wider range of potential future uses of the building, including uses not directly associated with the former residential and commercial use.

107. The economic feasibility of the strengthening options are considered in the evidence provided by **Ms Ohs**, **Ms Richmond** and **Mr Stanley**.

Matter raised as part of the submission: Point (a)

108. The submission states that the building was extensively damaged by the Canterbury earthquake sequence and has been vandalised thereafter. The submitter has investigated possible repair options and concluded that, in their opinion, the Mitre Hotel is now beyond repair. I do not agree with this statement.

109. In my opinion, the reinstatement of the building is a viable possibility. Strengthening scheme concepts for full and partial reinstatement of the building have already been investigated and scoped by engineer firms in 2020 (refer to Damage Assessment and Repair Options, Structex, March 2020). Also recently, in June 2023, the Council structural engineer appointed to undertake a site inspection and a condition assessment of the building structures, Mr Roland Basobas, considered the strengthening and reinstatement of the building as a possible viable solution (refer Appendix I). This option was therefore included as a possible option in the dangerous and insanitary building notice issued to the owner.

Matter raised as part of the submission: Point (b)

110. The submission states that sewage flowed through the building in 2013, causing considerable damage to flooring, doors and architraves. It is noted that only the exterior fabric of the Mitre Hotel is actually scheduled or protected by Council rules. Therefore, if full reinstatement of the building is pursued, extensive repair or complete replacement works (if more cost-effective) to the flooring, doors and architraves can be included within the scope of the strengthening works, without significant decrease to the heritage value of the scheduled heritage building.

111. For more details regarding the current heritage value and significance of the building refer to the evidence of **Ms Ohs**; while for the architectural values are described in the evidence of **Mr Holmes**.

Matter raised as part of the submission: Point (c)

112. The submission states that rainwater is penetrating the building in recent years due to perished spouting and internal gutters, damaged flashings along

the facades, demolished chimneys and roof penetration from large steel tie cables.

113. Rainwater and moisture ingress can cause significant deterioration of building materials such as timber and lime-based plaster in a relatively short time period. In the Mitre Hotel, however, these materials were mainly adopted for the interior structures and finishings. As mentioned above, the internal timber structures are not currently scheduled or protected by the rules. Therefore, extensive repair or complete replacement works of the interior (if more cost-effective) can be included within the scope of the building reinstatement works.

114. Rainwater and moisture ingress can also have detrimental effects on other building materials such as reinforced concrete. However, the decay timeframe is significantly longer than for untreated natural materials and the damage is usually limited to contained areas or elements.

115. In their laboratory testing reports from 2011, Opus assessed the level of carbonation in the concrete and chloride-induced corrosion in the steel reinforcement. Opus concluded that a full carbonation of the concrete matrix had not occurred and there was a negligible or low risk of chloride-induced corrosion of the embedded steel reinforcing. These tests were undertaken in 2011, almost 90 years after the erection of the building. Although localised corrosion at the crack locations due to water ingress might have occurred in the time since the earthquake, it is very unlikely that the concrete matrix overall condition has deteriorated so drastically to cause an irremediable decay of the material over the last 12 years since the Opus testing was carried out. Therefore, in my opinion, the current material decay of the building's external reinforced concrete fabric is likely to remain minor and limited to a few localised areas. If and where required, specific remediation strategies can be included in the strengthening works to address localised issues identified in the concrete matrix.

116. I also note that damage of this sort is caused mainly by deferred maintenance works, damaged flashings, lack of adequate long-term weatherproof details for the temporary securing works, and vandalism (broken windows). Therefore, the causes of material decay can be easily resolved with relatively little economic investment. The planning of maintenance works should also include safe access to the site to complement the temporary securing works already in place.

CONCLUSION

117. There are viable engineering options to repair the building to a safe and useable condition. Therefore, in my opinion there is no engineering reason why the building should be removed from the Schedule.

Dated: 11 August 2023

Clara Caponi

APPENDIX A: ST JAMES' CHURCH, RICCARTON - STRENGTH AND REPAIR ASSESSMENT FOR GODFREY & COMPANY

St James Church, Riccarton

Strength and Repair Assessment for Godfrey & Company

Report ref:
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aurecon

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Contents

1. Introduction

At the invitation of Godfrey and Company structural engineers from Aurecon first inspected St James Church shortly after the 4 September 2010 Canterbury earthquake. Further inspections have been carried out after subsequent aftershocks and after the latest 13 June earthquakes.

Our scope of work became:

- Site inspections to review the damage to the church, to understand its construction and to assess the extent of repairs required;
- Temporary propping of the end gables and the chancel arch to secure the church against further damage; and
- Detailed structural analysis of the building to determine its strength and to determine whether or not it is earthquake prone and therefore requires strengthening;
- Concept strengthening design if the building proves to be earthquake prone.

2. Description of Church

The church is an unreinforced masonry building with composite stone-concrete-brick walls. The exterior wall skin is stone, with the thickness varying from 150 to 330 mm around the building. The interior layer is 2-leaf brick in the side walls and 1-leaf brick for the end gables. Between the interior and the exterior wall skins is an unreinforced concrete layer of good quality construction. The interior wall face has plaster finish, and the total wall thickness is around 620mm. The walls have a concrete strip foundation measuring approximately 800mm wide and 600mm deep constructed on a 2400mm wide concrete slab.

The church roof is steep with a pitch of about 52^{o}, and the roof load is supported by timber trusses bolted into the side walls. There is a masonry buttress supporting the side wall at each truss location. The trusses are positioned roughly 3400 mm apart.

3. Damage to Church

Much of the damage observed in the church building during our inspections originated from the 4 September 2010 earthquake, but the damage became slightly worse with subsequent earthquakes. The observed damage is summarised below:

- Both the east and west main gables have cracked at eaves level and the walls rocked out-of-plane around the cracked joint causing degradation of masonry at the joints. Mortar pointing at the cracked bed-joints have fallen on the ground and a few stones have become loose;
- The top part of the chancel arch gable has displaced out of plane;
- The chancel arch was damaged and was subsequently propped after the 22 February earthquake;
- A horizontal crack has occurred on the side walls below the roof connections;
- Vertical cracks have appeared at the lower sections of the side walls below windows; and
- Mortar pointing between Oamaru stones in the buttresses and in the window frames has deteriorated.

4. Strength Assessment

4.1 New Building Standard (NBS)

This is the earthquake standard that would apply to a new building of similar type and use if the building was designed to meet the latest design Codes of Practice. If the strength of a building is less than this level, then its strength is expressed as a percentage of NBS.

4.2 Earthquake Prone Buildings

A building can be considered to be earthquake prone if its strength is less than one third of the strength to which an equivalent new building would be designed, that is, less than 33%NBS. If the strength of a building exceeds 33%NBS then it does not need to be strengthened.

4.3 Christchurch City Council Earthquake Prone Building Policy 2010

The Christchurch City Council (CCC) already had in place an Earthquake Prone Building Policy (EPB Policy) requiring all earthquake prone buildings to be strengthened within a timeframe varying from 15 to 30 years. The level to which the buildings were required to be strengthened was 33%NBS.

As a result of the 4 September 2010 Canterbury earthquake the CCC raised the level that a building was required to be strengthened from 33% to 67% NBS but qualified this as a target level and noted that the actual strengthening level for each building will be determined in conjunction with the owners on a building-by-building basis. Factors that will be taken into account by the Council in determining the strengthening level include the cost of strengthening, the use to which the building is put, the level of danger posed by the building, and the extent of damage and repair required.

Irrespective of strengthening level, the threshold level that triggers a requirement to strengthen is if the existing strength of the building is less than 33%NBS.

4.4 Strength of Church Building

We established the church geometry by three-dimensional scanning of the church, and we analysed the church walls, the tower, and the roof diaphragm structures. We modelled walls as unreinforced concrete frames having a thickness equal to the measured thickness of concrete, and we assumed the remainder of wall thickness as added mass having no structural strength. We used the response spectrum method to carry out the related wall analyses, and we also analysed the church roof between the west gable and the chancel arch as a shear beam consistent with the seismic behaviour of timber diaphragms.

We checked the strength of the concrete walls for their capacity to resist in-plane forces (forces parallel to the wall).The minimum capacity of the west end gable wall was found to be 132% and 115%NBS, respectively for shear and for bending. The minimum capacity of the east gable end walls was obtained as 124% and 80%NBS, respectively for shear and for bending. The minimum capacity of the side walls was obtained as 234%NBS for bending and 157%NBS for shear.

We calculated the %NBS for the tower as being greater than 100% for both shear and bending actions. The %NBS was obtained as 74% and 53%, respectively for shear and bending in the main pillars below the chancel arch. The chancel arch itself is subject to pounding forces from roofs on both sides, and the %NBS is likely to be zero as the wall construction is likely to be unreinforced masonry at roof level. As a failure in the chancel arch poses serious life hazards, the post-cracking capacity of masonry that is conventionally utilised for regular wall piers and spandrels should be ignored.

The minimum capacity of the church side walls to remain stable when subjected to out-of-plane forces (forces perpendicular to the wall) is 75%NBS. We have made conservative assumptions that included ignoring the thickness of interior brick walls when evaluating the church walls for out-of-plane stability. We calculated the %NBS value for out-of-plane behaviour of east and west gable walls as 25% and

58%, respectively. The very low %NBS calculated for the east gable wall is due to the recess in the wall in the central area. We have assumed that the walls have positive connections to the roof as this assumption can be ascertained and connections added with relative ease during the church repair.

The roof diaphragm was assessed to have minimum deformation and strength capacities of 55%NBS and 72%NBS, respectively. We have ignored the increase in the diaphragm capacity due to the roof truss stiffness and strength.

In summary the strength of the church building is limited to 0 %NBS and 25 %NBS respectively by the chancel arch and by the out-of-plane stability of the east end gable wall. Because these values are less than 33%NBS the church is earthquake prone.

4.5 Strengthening of the church

Because the strength of the main building is less than 33%NBS the building must be strengthened to achieve a target level of 67% and the church repair should be done along with strengthening.

The work that would be required is as follows:

- Strengthen the pillars below the chancel arch for flexure by drilling from the eaves level and grouting reinforcing bars into the walls or post-tensioning the walls. This is a commonly used technique that has no impact on the heritage values of the building, is totally concealed and fire rated by the surrounding bricks, and which is cost effective because it makes maximum use of the existing materials (bricks) to carry the seismic loads as opposed to introducing new elements.
- Re-instate the integrity of the chancel arch by grout injecting and using twisted steel bars to reinforce the wall. Apply 30mm engineered cementitious composites (ECC) on the wall face to add strength against pounding forces from the roof.
- Strengthen and stiffen the timber roof diaphragm in the longitudinal direction by adding end chord elements parallel to the gable end walls. These elements are one or more continuous timber joists with steel straps nailed to the roof trusses and rafters at the diaphragms ends.
- Grout injecting and binding the wall skins together in the end gable walls to increase the effective wall thickness so that full rocking capacity of the end gables are utilised. Anchor the gable end walls back to roof.
- Pin top gable Oamaru stones and loose end gable Oamaru stones back to the church walls.
- The damage caused by the earthquake would need to be repaired.

We have scoped the work required to repair and strengthen the church in our drawings, copies of which are appended.

5. Heritage Issues

The church is Category 1 protected buildings under the Christchurch City Council (CCC) Plan, but is not under the Historic Places Trust Register. Consultation with CCC will be required prior to any work being undertaken.

5.1 Permitted Activity

Any restoration or repair of the buildings following earthquake damage will be assessed as a Permitted Activity, and therefore will not require Resource Consent provided the works undertaken will be “carried out in manner and design and with similar materials to those originally used and which does not detract from those features for which the item has been listed”. The nature of such works is

somewhat subjective, and would need to be discussed with the Council in order to confirm the Permitted Activity Status of the same.

5.2 Restricted Discretionary Activity

Repair/restoration works that do not otherwise qualify as a Permitted Activity will require consent as a Restricted Discretionary Activity where Council's discretion is limited to:

- Form, features and fabric of building and additions to building.
- Cladding of building.
- External colour of building.
- Location and size of buildings and structures on a site.

For all resource consent applications involving heritage buildings the following information is required:

- An explanation of the nature of the heritage resources affected, i.e. heritage building/place/site/waahi tapu;
- The specific location of the heritage resource, (preferably a map showing the location of the resource and area of impact the proposal has on the resource;
- A statement as to whether the activity will affect the whole/part of the heritage resource;
- An indication as to how adverse effects on heritage values will be mitigated;
- Where it is likely a significant adverse effect will result, a description of any possible alternative location or methods of undertaking the activity;
- What consultation (if any) has occurred with the New Zealand Historic Places Trust.

5.3 Strengthening

Strengthening of the buildings will be a Restricted Discretionary Activity.

Strengthening methods that do not mitigate any adverse impact on the heritage values of the buildings are unlikely to find favour from either the Council or the New Zealand Historic Places Trust.

6. Conclusions

Our conclusions are as follows:

- The church is earthquake prone as its current seismic capacity is less than 33%NBS
- There is a legal requirement for the church to be strengthened
- The CCC requires earthquake prone buildings to be strengthened to a target level of 67%NBS. We recommend strengthening be undertaken so that the target level of 67% is achieved as far as is practicable which also respecting the heritage aspects of the building.
- The church has suffered moderate damage during the earthquake which can be repaired.

7. Recommendations

We recommend that the work described in our report and on the drawings be costed in order for the church to decide whether to proceed with the work.

Should the church decide to proceed, detailed structural calculations, drawings, and specifications will need to be prepared for building consent. The services of a heritage architect will be needed to advise on heritage aspects of the work.

8. Limitations

Our site inspections have been limited in scope to visual inspections. No detailed testing of materials has been carried out apart from drilling some of the walls to determine their construction. We have not been able to inspect the structure where hidden by wall or ceiling linings. We have assumed that the structural elements we have inspected are typical.

Appendix A
Design Codes and Importance Level

A1. Design Codes

Our strength assessment of the building has been based on the following documents.

AS/NZS 1170 is the joint Australian / New Zealand code that provides design loadings for buildings. NZS 1170.5 2004 is part of this code and provides earthquake design loads for New Zealand.

NZS 4230:2004 has been used for calculation of unreinforced concrete strength properties.

There is no code that explicitly covers the strengthening of unreinforced masonry buildings. The New Zealand Society for Earthquake Engineering has filled this void with the Recommendations of a NZSEE Study Group on Earthquake Risk Buildings entitled “Assessment and Improvement of the Structural Performance of Buildings in Earthquakes”. While not a code as such, it is recognised by Territorial Authorities including the CCC which states in its 2010 EPB Policy that it is the “preferred basis for defining technical requirements and criteria”.

We have also used overseas codes and research papers to augment the above documents. In particular we have made extensive use of the latest research from Auckland University titled “Assessment and Improvement of Unreinforced Masonry Buildings for Earthquake Resistance” edited by Professor Jason Ingham and issued as a Draft Supplement to the NZSEE Study Group Recommendations.

A2. Importance Level

AS/NZS 1170 assigns five importance levels to the design of buildings which reflect the consequences of failure in terms of human life as well as economic, social and environmental consequences.

Normal buildings fall into importance level 2. Importance level 3 includes buildings that may contain people in crowds or contents that have a high value to the community. Buildings that are designed to importance level 3 are designed to seismic forces that are 30% higher than a similar building in importance level 2.

The church building is classified as importance level 2 in terms of AS/NZS 1170 as the church has a capacity of approximately 160 people.

The NZSEE Study Group Recommendations state that “Historical buildings of significant cultural significance should be assigned importance level 3 unless this classification would result in significant disruption to the historical fabric”. However this is not a legal requirement whereas AS/NZS 1170 is a mandatory legal requirement.

A3. Application of Importance Level to St James Church

An earthquake prone building is defined in legislation as a building having a strength of less than one third of that of an equivalent new building. The legislation does not require either the church to be considered as anything other than a normal building and therefore we have based our assessment as to whether it is earthquake prone on the church being classified as importance level 2. The fact that the NZSEE Study Group Recommendations state that such buildings should have a classification of importance level 3 relates to the strengthening of the buildings and has no relevance to the assessment as to whether the church is earthquake prone.

Therefore we have classified the church building as importance level 2 in determining whether it is earthquake prone.

Appendix B
Assumptions and References

B1 Assumptions

We have based our strength assessment on the following:

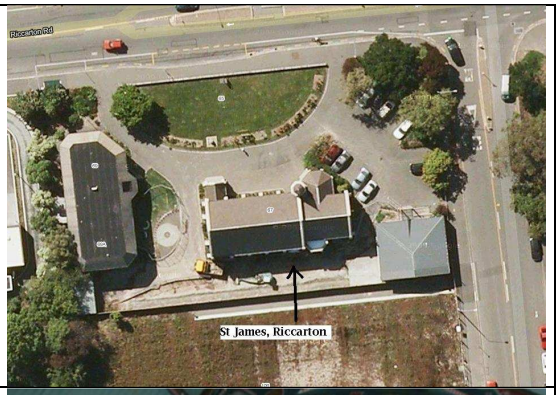
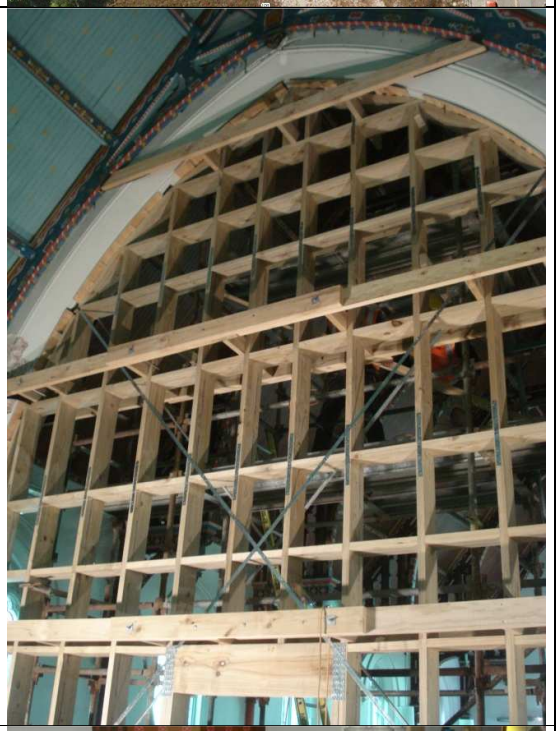
- Design loading to NZS 1170.5 2004
- Building classified as importance level 2
- Hazard factor Z = 0.3, soil class D, return period factor R = 1.0, near fault factor N(T,D) = 1.0
- Structural performance factor S = 1.0 for unreinforced masonry and concrete and S = 0.7 for timber diaphragms
- Ductility factor = 1.0 for unreinforced masonry and concrete and ductility factor = 2.0 for timber floor diaphragms
- The strength capacity of unreinforced concrete has been based on the NZS 4230.
- In accordance with NZSEE 2006 Study Group Recommendations we have reduced the in-plane forces on the walls by 35% when using 5% damping to provide the same level of force as would have been obtained using 15% damping.
- When considering the walls out-of-plane we have used 5% damping and we have used 5% damping for the timber floor diaphragms.
- The walls of the building have been modelled as frames consisting of piers and spandrels in accordance with the NZSEE 2006 Study Group Recommendations as most of the weight of the structure is concentrated in the walls. The walls have been analysed using response spectrum analysis.
- The NZSEE 2006 Study Group Recommendations and the University of Auckland Draft Supplement have been used, respectively, to calculate the in-plane and out-of-plane capacity of the walls.
- Masonry and timber diaphragm material properties have been assumed as the lesser values recommended by the NZSEE 2006 Study Group Recommendations and the University of Auckland Draft Supplement.
- We have assumed that the walls have positive connections to the roof. At the time of earthquake repair, the existence of such connections will need to be ascertained and connection anchors added if necessary.

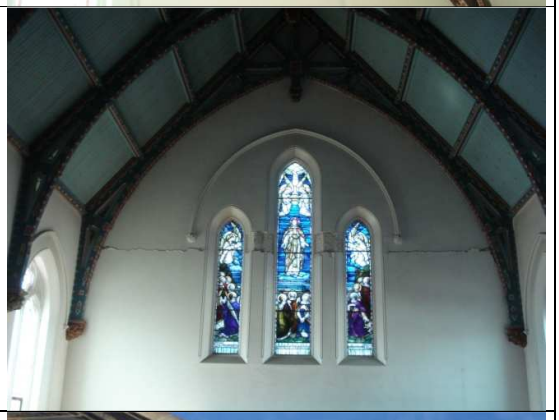
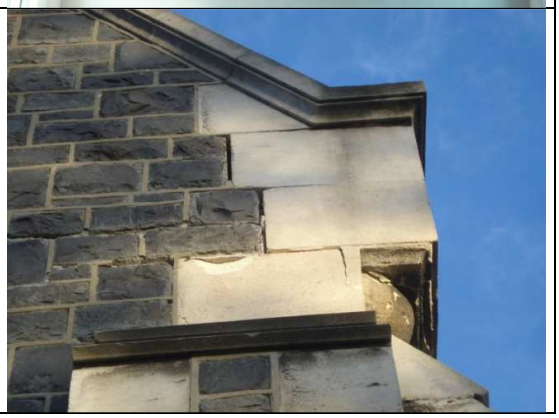
B2.Reference Documents

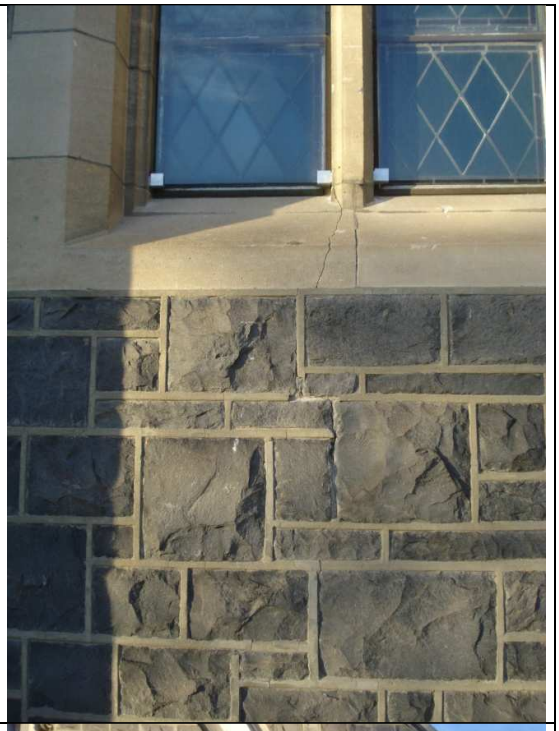
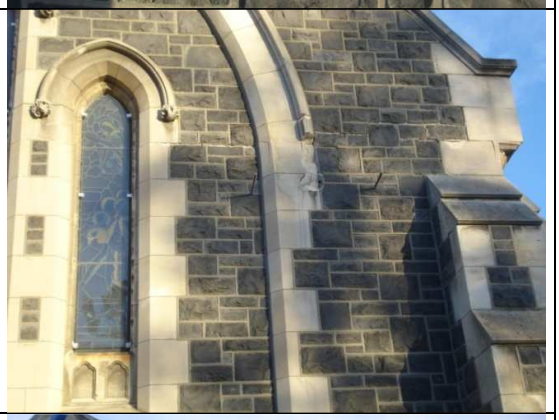
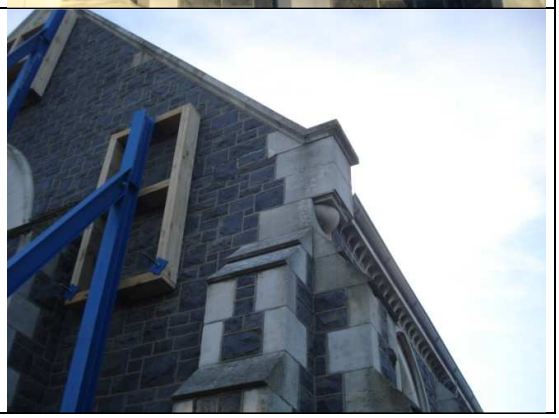
We have used the following reference documents:

- AS/NZS 1170.0,1, 5 and commentaries
- NZS 4230:2004.
- New Zealand Society for Earthquake Engineering 2006 Study Group Recommendations “Assessment and Improvement of the Structural Performance of Buildings in Earthquakes”
- Draft Supplement to the NZSEE 2006 Study Group Recommendations published by the University of Auckland “Assessment and Improvement of Unreinforced Masonry Buildings for Earthquake Resistance” and commentary.

Appendix C
Site Plan and Photographs

Site plan	
The chancel arch which was propped after February earthquake.	
Plaster has fallen off the propped chancel arch during the 13 June earthquake.	

Damage to top of north wall.	
Damage to interior brick skin of the west gable end wall	
Horizontal crack at eaves level in the east gable end wall; similar crack appeared in the west end gable wall.	
Displaced stonework at east gable wall.	

Vertical cracks below window on the north wall.	
The horizontal crack at east gable.	
The propped west gable.	

Slight chipping at the base of the north gable.	

APPENDIX B: ASSESSMENT BY DON THOMSON CONSULTING ENGINEERS

DON THOMSON
consulting engineers

81 Harbour View Road
Northland
Wellington 6012

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fax 04 475–8414
www.donthomson.co.nz

MWH Mainzeal Joint Venture Ltd

Christchurch Earthquake Commercial Claims

Address:	471 Ferry Road, Woolston, Christchurch
Building Name:	Dizzy Lizzy's Restaurant
Claim Number:	3878268
Contact:	Elizabeth Thompson
Assessment date:	04-07-2011
Assessed by:	Alasdair Sinclair
Assessment level:	1
DTCE Project No.	211409

Introduction / Scope

Don Thomson Consulting Engineers Ltd (DTCE) were requested by MWH Mainzeal Joint Venture Ltd (MWHM) to undertake a visual inspection of the property located at 471 Ferry Road, Christchurch. The building suffered damage from the first earthquake in September 2010, and further damage resulted from aftershocks on 22 February 2011 and 13 June 2011.

The scope of works includes:

- external inspection of exposed structure
- check wall verticality with spirit level/similar
- record structural and non-structural defects
- review any available engineering reports
- determine potential outcome of building
- scope basic 'make safe' requirements, if needed

Deliverables:

- complete level 1 rapid assessment form (if not already done)
- Level 1 report including recommended building outcome
- any recommendations for further investigation (any further structural assessment, geotechnical, survey, services etc.)
- sketch any make safe requirements, if needed

Description of Property

The building is a one storey house originally constructed c. 1863 and is listed as a heritage site. Prior to the September earthquake it was used as a restaurant. The external walls are stone masonry and the internal walls are made from timber. The slate tile roof is supported by internal timber columns and beams which appear to be independent of the masonry walls. There is a concrete floor in the kitchen area but the rest of the floor is suspected to be timber.

It is unlikely that the stone walls have any foundation at all.

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The building has gone through several iterations of expansion and alteration which can be seen by the different quality and style of stonework and pointing in the external walls. At the street frontage it appears that the original monolithic stonework has been covered by a thinner stone façade.

A small reinforced masonry structure was built c. 1977 against the stone wall on the eastern side of the house and was used to store gas cylinders. At present it is not being used for any purpose. Two free standing timber structures have been built out the front of the property of which one is used as toilet facilities and the other as a cool store.

No placard has been placed on the building but the owner has vacated the premises under recommendation from a friend, Jon Donovan, who is a structural engineer.

Condition of Property

Access to the interior of the building was not possible due to the doors being jammed shut by movement in the stone walls from seismic activity. We therefore conducted an assessment of the buildings exterior only. Please refer to the attached marked-up drawing of the structure indicating the areas of damage. For reference, we were supplied site notes and descriptions of the interior condition by Andrew Russell of MWH Mainzeal from his inspection on 1/02/11, before the second earthquake of 22/02/11.

The stone walls around the perimeter of the building show a large amount of cracking due to in-plane shear stresses, and in places stones have fallen away. In particular, the most severe damage appears to be concentrated in the corners. At the North-West corner of the house there is diagonal cracks about 20mm wide through the mortar. The inherent stability of these walls is likely to be marginal at best.

The stone lintel over the door on the western side of the house shows signs of incipient collapse as it has moved away from the adjacent wall. It appears that this lintel is a facing stone approximately 100mm to 150mm thick, as this is the thickness of the stone veneer. There is a greater chance of the lintel toppling in this case as there is less bearing area providing support. There are a number of 1 – 2mm cracks around the other stone lintels on the southern external wall but these are not at risk of collapsing.

The external wall on the southern side of the building has tilted and the veneer is showing some signs of separating from the original wall. There is a 25mm gap between the stone veneer and timber doorway. This doorway was measured using a digital level and found to be 1.3° out of plumb. According to Jon Donovan there is a 50mm gap between the main stone wall and the ceiling, which he saw when inspecting the interior before the June seismic event. Windows and doorways around the rest of the house are still plumb.

Pounding has occurred between the reinforced masonry wall and the external stone wall on the eastern side of the house. Stones have fallen out of the wall into the interior of the house causing damage to the plasterboard lining. Mortar between the stones has broken away within a 45 degree failure plane to the top of the stone wall from the corner of the masonry wall.

The timber framing supporting the roof shows no sign of damage as viewed from outside the building.

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Conclusions

Damage to the corners of the building need to be repaired. The surface cracking could be re-pointed, however, it is likely that the mortar binding the corners has been compromised for the full depth of the wall. It may be possible to inject a high-strength grout resin in the least damaged area. Where blocks have been lost from the wall this could leave uncertainty that all the voids were filled adequately and it may not be possible to simply push the lost or moved blocks back into place. It is likely that the corners of the building will need to be demolished and rebuilt around a reinforced concrete core.

The stone lintels should be propped, and will likely all require replacement.

To realign the southern external wall, it will need to be demolished and then rebuilt on engineered foundations and a reinforced concrete core.

The masonry adjunct building remains a hazard to the stone building due to an insufficient construction gap. Rebuilding which does not address the seismic gap invites future damage from pounding. Given the relative importance of the two structures, the masonry adjunct building could be demolished and rebuilt with an appropriate gap. Alternatively, the repaired external stone wall could be connected to the adjunct to prevent relative movement.

Further Investigations

The following works are required in assessing this structure:

1. The outside of the house must be well shored in order to access the interior of the house.
2. Once propped inside and out, the internal plaster lining on the external walls should be removed.
3. Carry out careful demolition on the stone walls at the corners of the house from top down to assess the depth of cracking through the stone work.

Disclaimer

In preparing this report, Don Thomson Consulting Engineers Ltd (DTCE) has undertaken a limited visual inspection only of the property at 471 Ferry Road, Christchurch. The recommendations of this report are intended to address damaged structural elements and are not intended to improve the building's structural performance. DTCE's views are based on the presence of visible physical damage only as at the time of inspection. DTCE makes no representation or warranty, express or implied that the structures are intrinsically safe or without latent or hidden defects, damage or deficiency other than those which are visibly apparent at the time of inspection.

This report has been prepared at the specific instructions of MWHM for the purpose stated in the report scope.

Only MWH Mainzeal Joint Venture Ltd and Vero Insurance New Zealand Ltd are entitled to rely upon this report, and then only for the purpose stated above. Don Thomson Consulting Engineers Ltd accept no liability to anyone other than MWH Mainzeal Joint Venture Ltd and Vero Insurance New Zealand Ltd in any way in relation to this report and the content of it and

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Prepared by:	Reviewed by:	Approved by:
Robyn Murray Structural Engineer	**Alasdair Sinclair** Senior Engineer	**Don Thomson** Director

Don Thomson
Consulting Engineers

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WELLINGTON 6005
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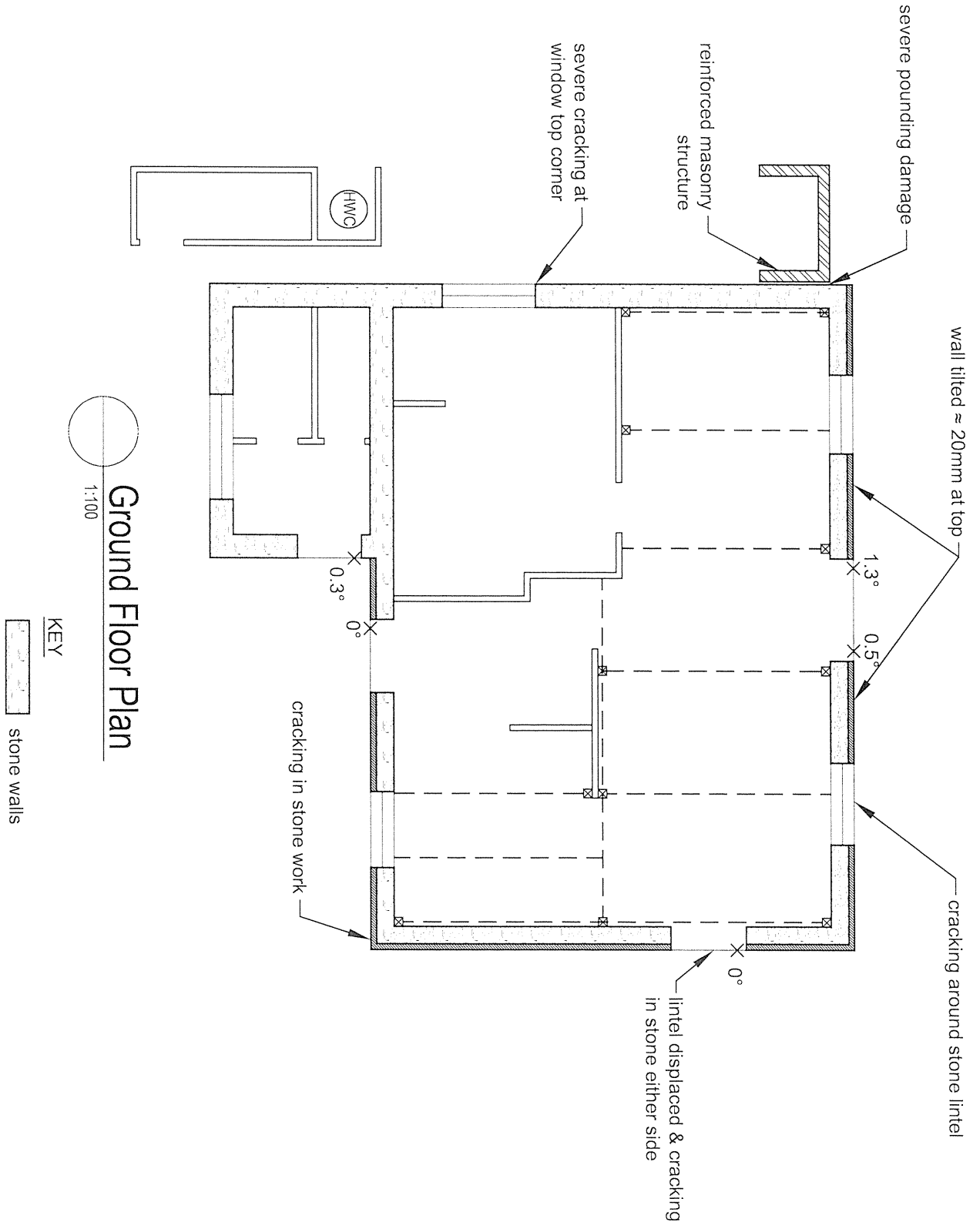
ACENZ
safety in numbers

sketch sheet	sketch: 1
job name: 471 Ferry Road	
drawn: ERY	job no: 211409
checked: RLM	date: 25-07-11



Christchurch Eq RAPID Assessment Form - LEVEL 2

Inspector Initials: ALS
Territorial Authority: Christchurch City
Date: 7/7/11
Time: 1430
Final Posting (e.g. UNSAFE): R2

Building Name: Dizzy Lizzy's
Short Name: Restaurant
Address: 471 Ferry Rd, Woolston 8023
GPS Co-ordinates: S° 43° 32' 40 E° 172° 40'
Contact Name: Lizzie
Contact Phone: 027-647-8215

Storeys at and above ground level: 1
Below ground level: 0
Total gross floor area (m^2): 108
Year built: 1863
No of residential Units: /

Photo Taken: (Yes) / No

Type of Construction
- ☐ Timber frame
- ☐ Steel frame
- ☐ Tilt-up concrete
- ☐ Concrete frame
- ☐ RC frame with masonry infill
- ☐ Concrete shear wall
- ☑ Unreinforced masonry
- ☐ Reinforced masonry
- ☐ Confined masonry
- ☐ Other:

Primary Occupancy
- ☐ Dwelling
- ☐ Other residential
- ☐ Public assembly
- ☐ School
- ☐ Religious
- ☑ Commercial/ Offices
- ☐ Industrial
- ☐ Government
- ☑ Heritage Listed
- ☐ Other

Investigate the building for the conditions listed on page 1 and 2, and check the appropriate column. A sketch may be added on page 3

Overall Hazards / Damage	Minor/None	Moderate	Severe	Comments
Collapse, partial collapse, off foundation	☐	☐	☑	
Building or storey leaning	☐	☑	☐	stone veneer on South side leanin
Wall or other structural damage	☐	☑	☐	cracking of mortar
Overhead falling hazard	☐	☐	☑	stone lintel falling out.
Ground movement, settlement, slips	☑	☐	☐	
Neighbouring building hazard	☑	☐	☐	
Electrical, gas, sewerage, water, hazmats	☐	☐	☐	

Record any existing placard on this building:

Existing Placard Type (e.g. UNSAFE): None

Choose a new posting based on the new evaluation and team judgement. Severe conditions affecting the whole building are grounds for an UNSAFE posting. Localised Severe and overall Moderate conditions may require a RESTRICTED USE. Place INSPECTED placard at main entrance. Post all other placards at every significant entrance. Transfer the chosen posting to the top of this page.

INSPECTED			RESTRICTED USE		UNSAFE		
GREEN	G1	G2	YELLOW	Y1	Y2	RED	R1	(R2)	R3

Record any restriction on use or entry:

Further Action Recommended:

Tick the boxes below only if further actions are recommended

- ☐ Barricades are needed (state location):
- ☐ Detailed engineering evaluation recommended
  - ☑ Structural ☐ Geotechnical ☐ Other:
- ☐ Other recommendations: Put shoring up to support external walls

Estimated Overall Building Damage (Exclude Contents)

None	☐		
0-1 %	☐	31-60 %	☑
2-10 %	☐	61-99 %	☐
11-30 %	☐	100 %	☐

Sign here on completion

Date & Time
ID

Inspection ID: _____ (Office Use Only)

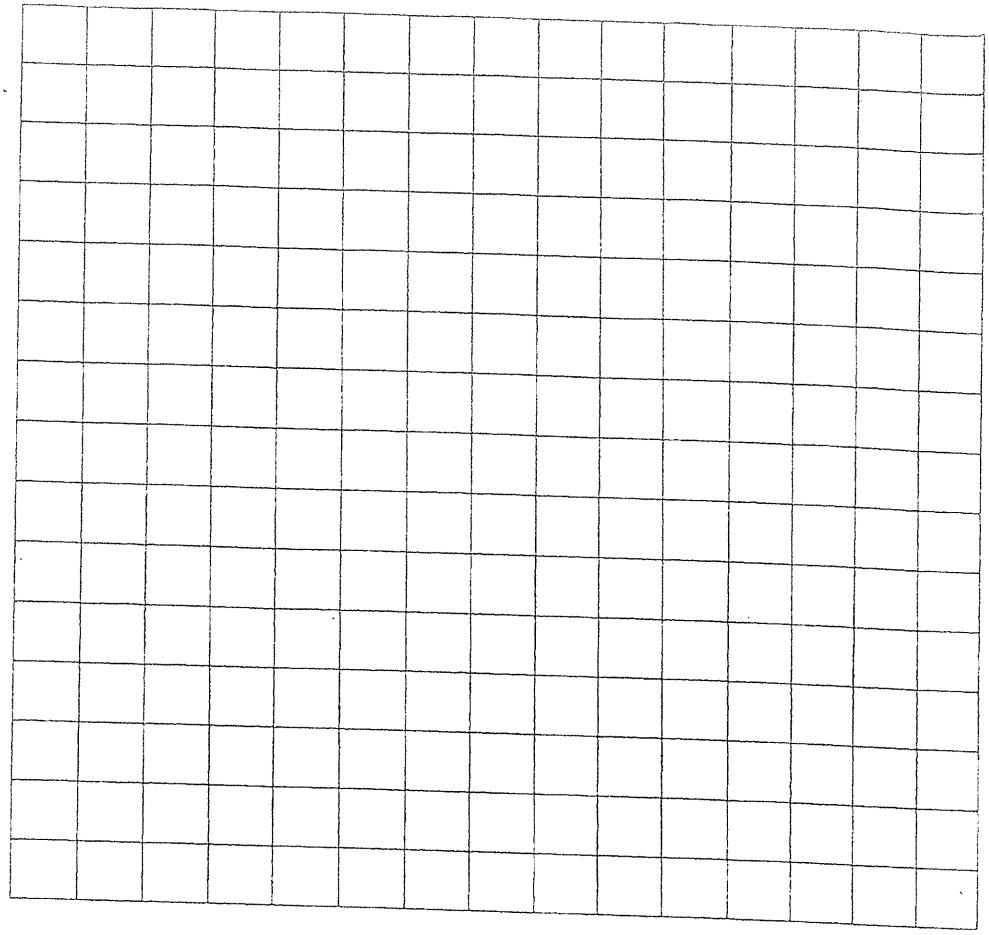
Structural Hazards/ Damage	Minor/None	Moderate	Severe	Comments
Foundations	☑	☐	☐	
Roofs, floors (vertical load)	☑	☐	☐	
Columns, pilasters, corbels	☑	☐	☐	
Diaphragms, horizontal bracing	☑	☐	☐	
Pre-cast connections	☐	☐	☐	
Beam	☑	☐	☐	
Non-structural Hazards / Damage				
Parapets, ornamentation	☑	☐	☐	
Cladding, glazing	☐	☑	☐	Veneer Tilt
Ceilings, light fixtures	☑	☐	☐	
Interior walls, partitions	☑	☐	☐	
Elevators	☐	☐	☐	
Stairs/ Exits	☐	☐	☐	
Utilities (eg. gas, electricity, water)	☐	☐	☐	
Other	☐	☐	☐	
Geotechnical Hazards / Damage				
Slope failure, debris	☑	☐	☐	
Ground movement, fissures	☑	☐	☐	
Soil bulging, liquefaction	☐	☐	☐	

General Comment Severe cracking in external stone walls

Usability Category

Damage Intensity	Posting	Usability Category	Remarks
Light damage *Low risk*	Inspected (Green)	G1. Occupiable, no immediate further investigation required	
		G2. Occupiable, repairs required	
Medium damage *Medium risk*	Restricted Use (Yellow)	Y1. Short term entry	
		Y2. No entry to parts until repaired or demolished	
Heavy damage *High risk*	Unsafe (Red)	R1. Significant damage: repairs, strengthening possible	
		R2. Severe damage: demolition likely	
		R3. At risk from adjacent premises or from ground failure	

Sketch (optional)
Provide a sketch of the entire building or damage points. Indicate damage points.



Recommendations for Repair and Reconstruction or Demolition (Optional)

APPENDIX C: HERITAGE ENGINEERING ADVICE REPORT

HERITAGE RESPONSE TEAM - HERITAGE ENGINEERING ADVICE Post Site Visit (Non Resource Consent)

Date	15 June 2012
Address:	471 Ferry Road, Linwood
Attendance on Site	Mrs E Thompson(Owner), Gareth Wright (CCC) and Andrew Marriott (CCC CPEng)
City/Banks Plan Listing	Group 3

1. Damaged Suffered in earthquakes

The building at 471 Ferry Road, known as "Portstone" suffered moderate damage in the 4th September 2010 and 26th December 2010 earthquakes and aftershocks. This assessment is written following the 22nd February 2011 M6.3 and 13th June 2011 M6.3 earthquakes when additional major to moderate damage occurred. The building is a group 3 listed building under the Christchurch City Council District Plan and is registered as category II with the New Zealand Historic Places Trust.

2. Building Description

The building is single storey with a slate roof, rubble stone external walls and timber internal walls. The floor of the building appeared to be a concrete slab on grade. The roof is supported on timber trusses and a modern tiled ceiling has been installed. The building is believed to date from 1863 and is one of the last stone workers cottages remaining in Christchurch.

An inspection was undertaken of the interior and exterior by Andrew Marriott CPEng on 19th January 2012. The inspection of the building was limited to a visual inspection of those areas accessible at the time and did not include removal of linings and testing of structural elements or building services. No detailed calculation or design work has been undertaken.

3. Level of Damage Observed

The building has suffered from shaking damage from the earthquake swarm beginning on 4th September 2010. This is evidenced by movement cracking to the external walls principally at the corners and adjacent to openings. Inside the building the plaster and some of the stone rubble has loosened and in some places fallen as shown in the photo below.

Externally the most severe damage has occurred above the entry door on the western side of the building, where the stone lintel has dislodged and fallen. The photo below shows the area where the stone lintel was and the variable nature of the stone used in the wall with the inner and outer faces being large and worked and the rubble infill being small and un-worked with some mortar bonding the rubble.

The external stone face on the South wall has tilted towards the exterior resulting in a 50mm gap between the stone and the door frame on this elevation. It would appear that the stone face has separated from the rubble infill and the whole wall is leaning as well as shown in the photo below.

We have not checked the house for level, but believe that it has not been subjected to settlement.

The chimney and fireplace in the restaurant area appeared to be a modern addition and undamaged. This should be checked by a chimney specialist prior to being used.

4. Review of Engineering reports

An Engineering report by Robyn Murray of Don Thomson Consulting Engineers, dated 4th July 2011 was provided to us on 20th January 2012. The report is based on an external inspection only and its recommendations and my comments are as below:-

"Access to the interior of the building was not possible due to the doors being jammed shut by movement in the stone walls from seismic activity. We therefore conducted an assessment of the buildings exterior only. Please refer to the attached marked-up drawing of the structure indicating the areas of damage. For reference, we were supplied site notes and descriptions of the interior condition by Andrew Russell of MWH Mainzeal from his inspection on 1/02/11, before the second earthquake of 22/02/11.

The stone walls around the perimeter of the building show a large amount of cracking due to in-plane shear stresses, and in places stones have fallen away. In particular, the most severe damage appears to be concentrated in the corners. At the North-West corner of the house there is diagonal cracks about 20mm wide through the mortar. The inherent stability of these walls is likely to be marginal at best." I agree that the damage is as per the report, the stability of the walls is better than marginal as they have remained standing throughout the forty 5Mw or greater earthquakes in the 4th September 2010 to present earthquake swarm.

"The stone lintel over the door on the western side of the house shows signs of incipient collapse as it has moved away from the adjacent wall. It appears that this lintel is a facing stone approximately 100mm to 150mm thick, as this is the thickness of the stone veneer. There is a greater chance of the lintel toppling in this case as there is less bearing area providing support. There are a number of 1 – 2mm cracks around the other stone lintels on the southern external wall but these are not at risk of collapsing." At the time of our inspection the stone lintel had collapsed along with some of the rubble infill, as the photo on page 2 above shows. The lintel appeared to be intact

and it can be refitted with ties installed across the width of the wall from the inside to 50mm from the outer face. The tying should be undertaken to the remaining windows and doors to secure the lintels.

"The external wall on the southern side of the building has tilted and the veneer is showing some signs of separating from the original wall. There is a 25mm gap between the stone veneer and timber doorway. This doorway was measured using a digital level and found to be 1.3° out of plumb. According to Jon Donovan there is a 50mm gap between the main stone wall and the ceiling, which he saw when inspecting the interior before the June seismic event. Windows and doorways around the rest of the house are still plumb." It is likely that the wall can be plumbed, if necessary, using horizontal walers connected to turfors tied through the width of the building and carefully tensioned to move the wall back into position. The wall should then be permanently tied to the roof structure to prevent it moving out again. The inner and outer stone whytes should then be tied together with Helifix Dryfix ties at 400mm horizontally and vertically. The ties should be installed from the inside once the plaster has been removed from the face of the wall.

"Pounding has occurred between the reinforced masonry wall and the external stone wall on the eastern side of the house. Stones have fallen out of the wall into the interior of the house causing damage to the plasterboard lining. Mortar between the stones has broken away within a 45 degree failure plane to the top of the stone wall from the corner of the masonry wall." The masonry wall should be removed in order to protect the older stone building. If it necessary to rebuild the masonry, it should be positioned at least 200mm away from the stonework. The stonework should then be reinstated incorporating ties between the inner and outer whytes.

In general, the inner and outer stone whytes throughout the building should then be tied together with Helifix Dryfix ties at 400mm horizontally and vertically. The ties should be installed from the inside once the plaster has been removed from the face of the wall. The walls should then be repointed where necessary to protect the walls from water ingress and frost damage. A low pressure cementious grout should then be used to fill any remaining voids in the core of the walls. The internal face of the wall should then be plastered to match the existing.

"The timber framing supporting the roof shows no sign of damage as viewed from outside the building." Agreed.

"Conclusions

Damage to the corners of the building need to be repaired. The surface cracking could be repointed, however, it is likely that the mortar binding the corners has been compromised for the full depth of the wall. It may be possible to inject a high-strength grout resin in the least damaged area. Where blocks have been lost from the wall this could leave uncertainty that all the voids were filled adequately and it may not be possible to simply push the lost or moved blocks back into place. It is likely that the corners of the building will need to be demolished and rebuilt around a reinforced concrete core." Refer above for my recommended approach to repair of the walls. If the repair approach is followed it is unlikely that any reinforced concrete cores will be necessary. This will however need further clarification by detailed calculations that should be undertaken by a Chartered Structural Engineer familiar with design of unreinforced masonry structures.

"The stone lintels should be propped, and will likely all require replacement." Refer above for treatment of the existing lintels, which I believe can be saved and reincorporated into the walls.

"To realign the southern external wall, it will need to be demolished and then rebuilt on engineered foundations and a reinforced concrete core." My recommendations above detail the Relevelling and strengthening of the wall, which I believe can be undertaken insitu.

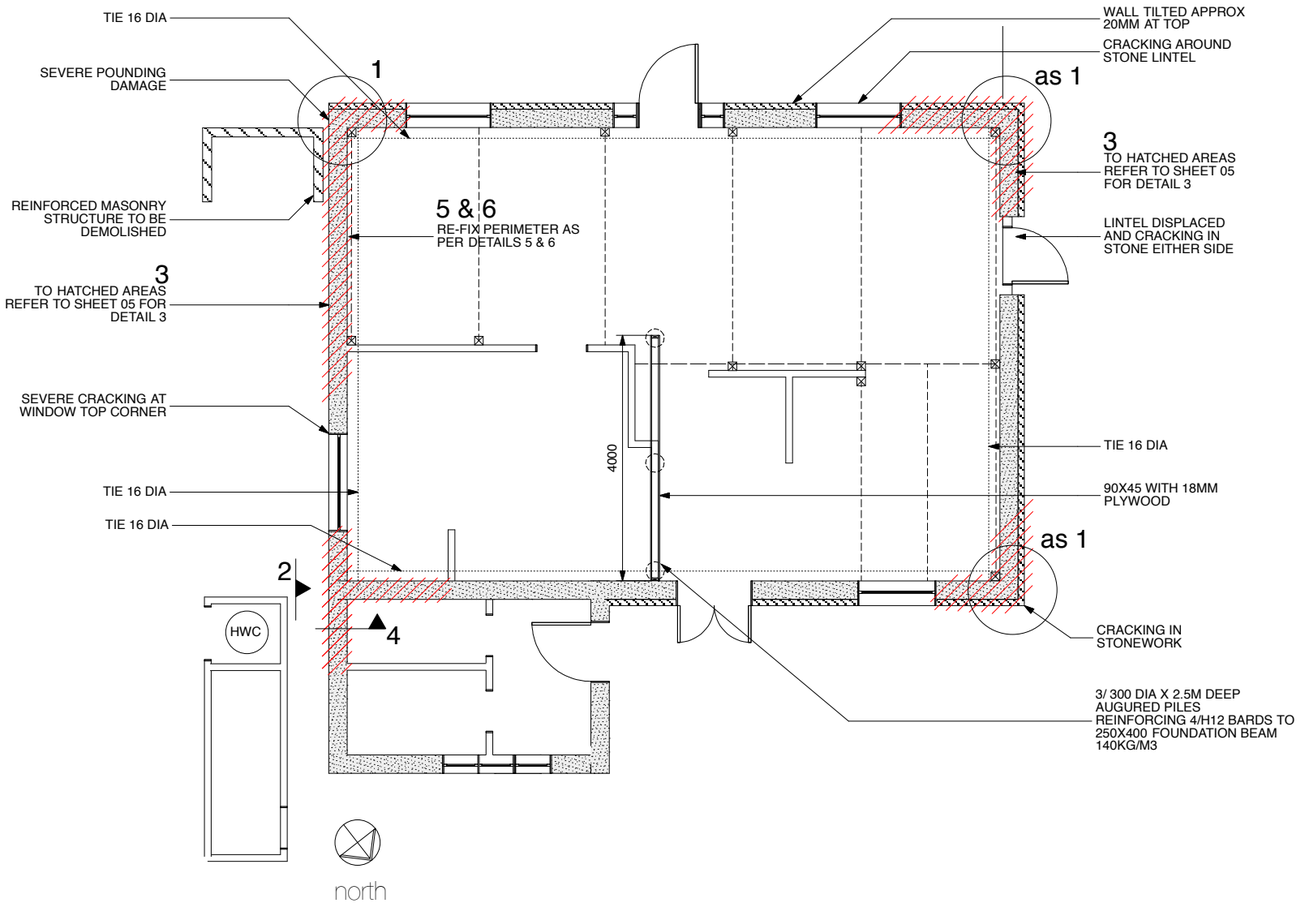
"The masonry adjunct building remains a hazard to the stone building due to an insufficient construction gap. Rebuilding which does not address the seismic gap invites future damage from pounding. Given the relative importance of the two structures, the masonry adjunct building could be demolished and rebuilt with an appropriate gap. Alternatively, the repaired external stone wall could be connected to the adjunct to prevent relative movement." I agree that the modern masonry structure be demolished and rebuilt with a 200mm seismic gap.

5. Engineering recommendations

The building is of significant heritage value as it is one of the last remaining stone cottages in Christchurch dating back to 1863. I recommend that the building be repaired using the techniques noted above.

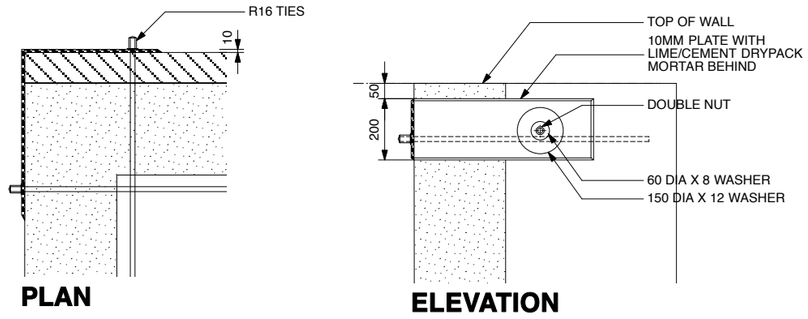
The above advice is of a preliminary nature and should be confirmed with a more detailed assessment of the building by the owners Engineers.

APPENDIX D: PRELIMINARY STRENGTHENING SCHEME CONCEPT FOR COSTING BY DUNNING THORNTON CONSULTANTS



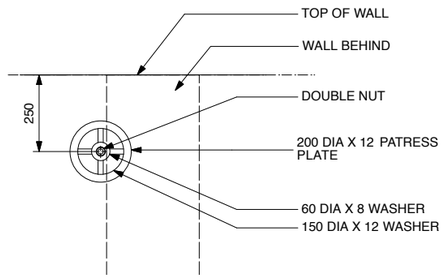
PLAN 1:50

1. TYPICAL CORNER TIE DETAIL 1:10



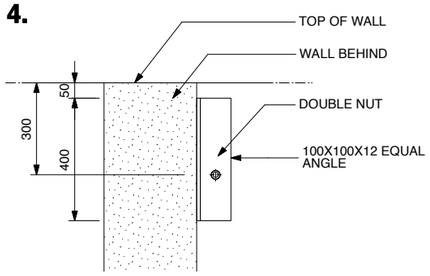
PLAN **ELEVATION**

2. ISOLATED PATTRESS PLATE

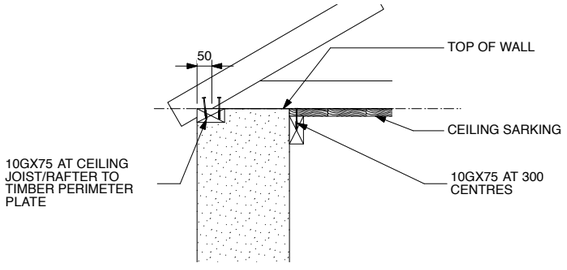


ELEVATION 1:10

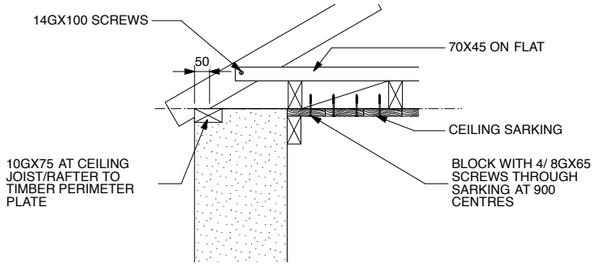
4.



5. PERIMETER FIXING DETAIL (FRONT & BACK)



6. PERIMETER FIXING DETAIL (SIDES)



Original Size A1

Original Scale

Original Size A1

100 50 0 10

PORTSTONE
471 FERRY ROAD

GROUND FLOOR PLAN

REVISIONS	
FOR PRICING	27.11.13
PRELIMINARY DESIGN	04.03.13

Scales
A3 Scales 1: 50, 1:10, 1:5
Designed
Drawn SO
CAD Reference

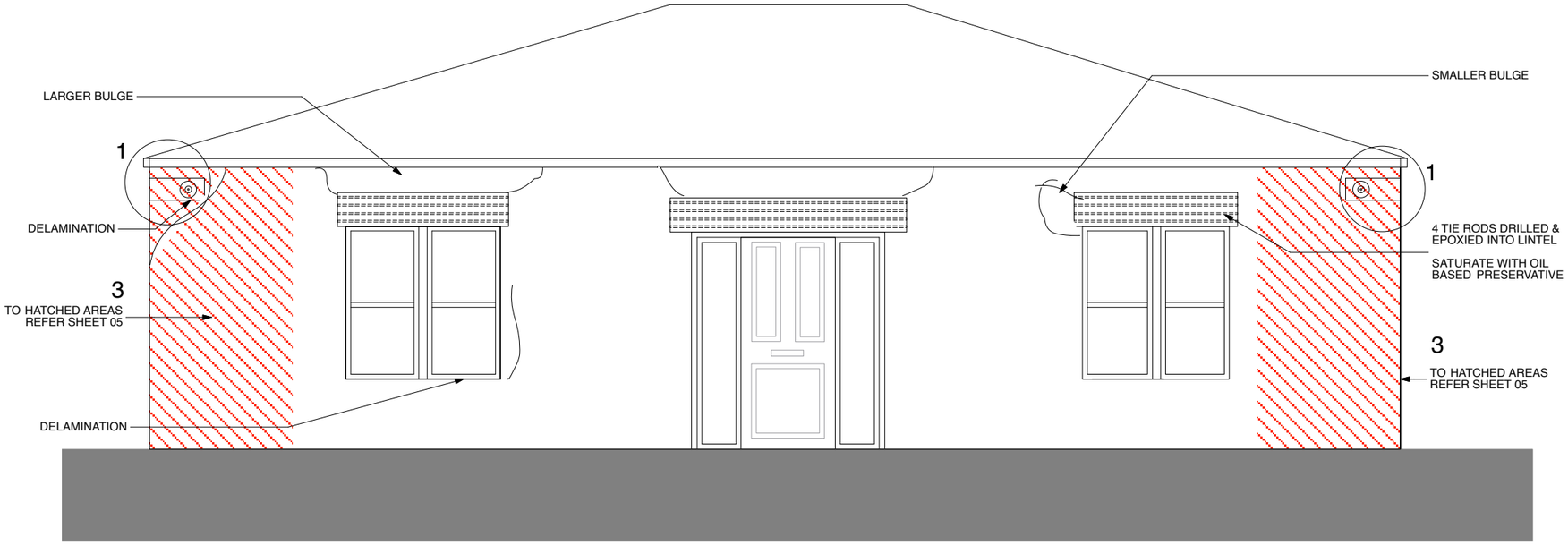
Job Number 7296
Drawing Number 00
Rev A

Dunning Thornton consultants
p: 385 0019 f: 385 0312 e: dtcwgtn@dunningthornton.co.nz P.O. Box 27-153 Wellington

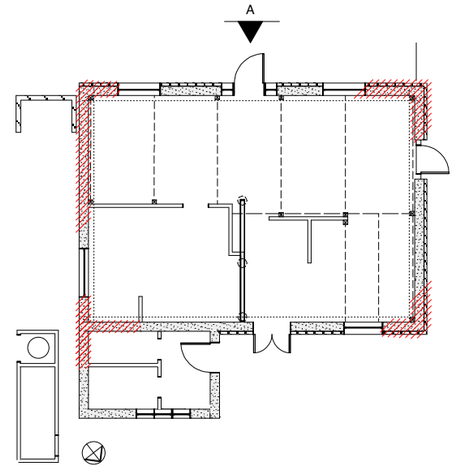
IF IN DOUBT ASK

DO NOT SCALE

Original Size A1



ELEVATION A 1:50



PLAN 1:200

Original Scale

Original Size A1

100 50 0 10

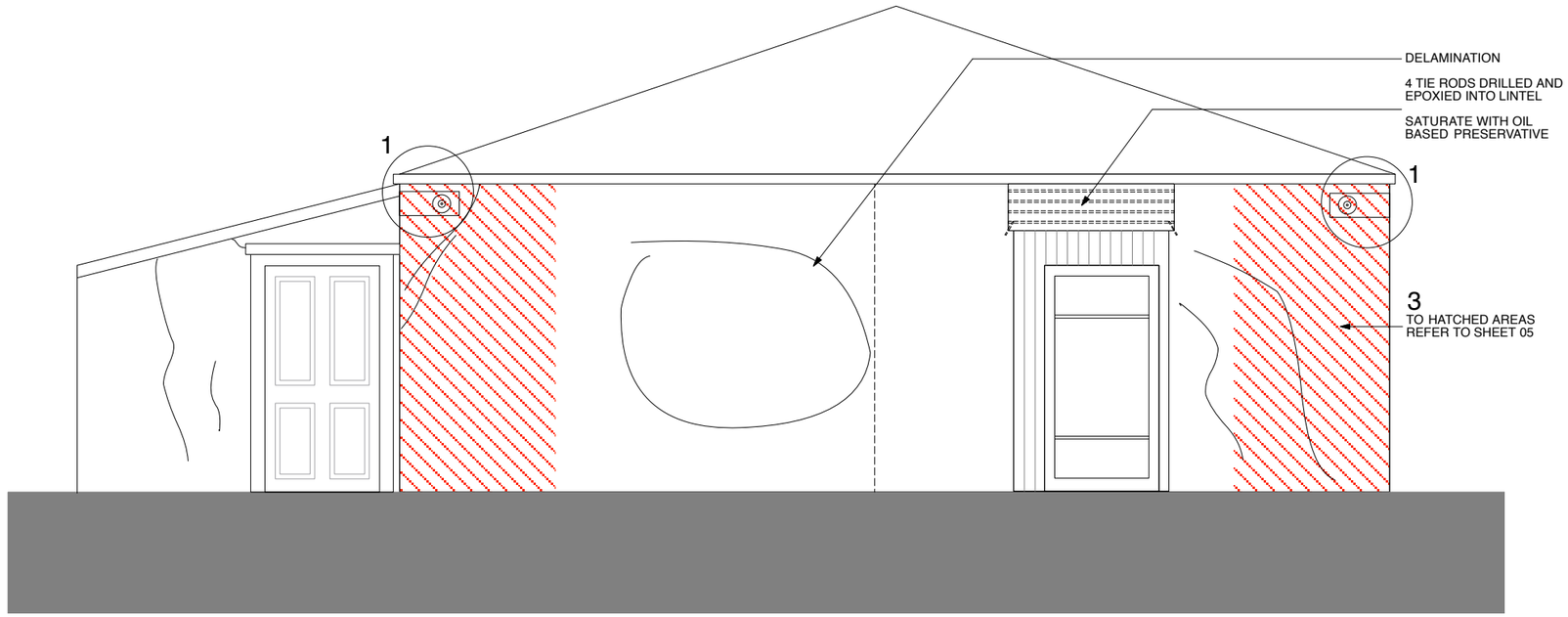
	PORTSTONE 471 FERRY ROAD	**ELEVATION A**	REVISIONS FOR PRICING 27.11.13 PRELIMINARY DESIGN 04.03.13	Scales A3 Scales 1: 50, 1:200 Designed Drawn SO CAD Reference	Job Number 7296 Drawing Number 01 Rev A	Dunning Thornton consultants

IF IN DOUBT ASK

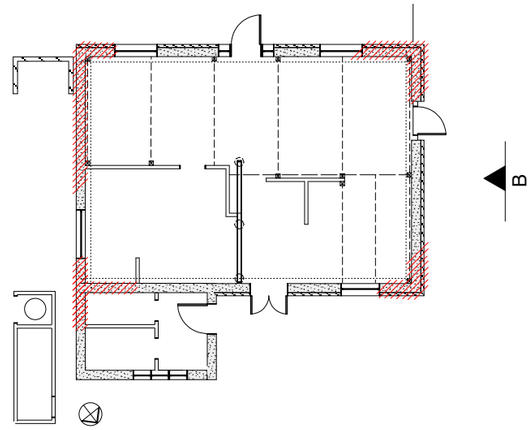
DO NOT SCALE

p: 385 0019 f: 385 0312 e: dtcowgtn@dunningthornton.co.nz P.O. Box 27-153 Wellington

Original Size A1



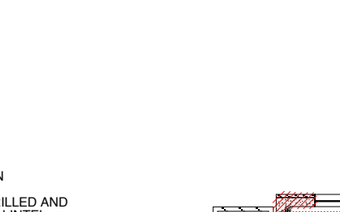
ELEVATION B 1:50



PLAN 1:200

a

b



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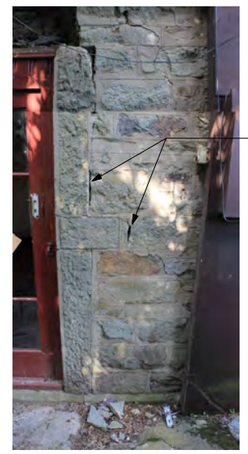


d

Original Scale

Original Size A1

100 50 0 10

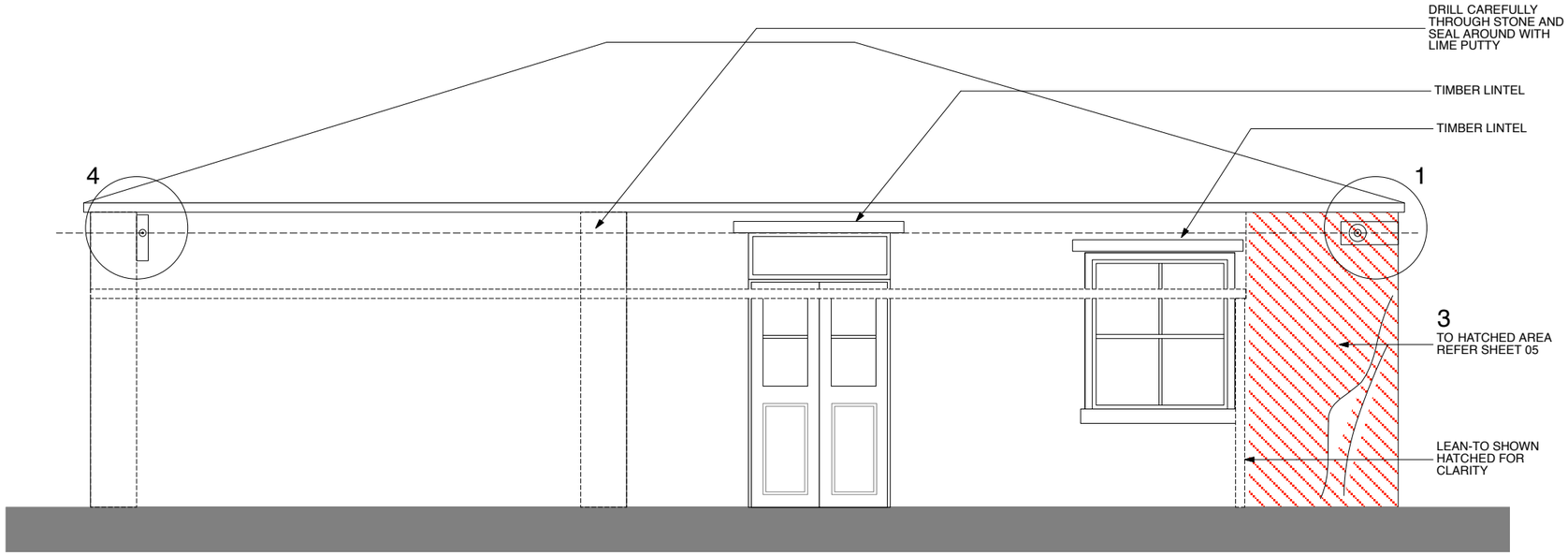
	PORTSTONE 471 FERRY ROAD	**ELEVATION B**	REVISIONS FOR PRICING 27.11.13 PRELIMINARY DESIGN 04.03.13	Scales A3 Scales 1: 50, 1:200 Designed Drawn SO CAD Reference	Job Number 7296 Drawing Number 02 Rev A	Dunning Thornton consultants

IF IN DOUBT ASK

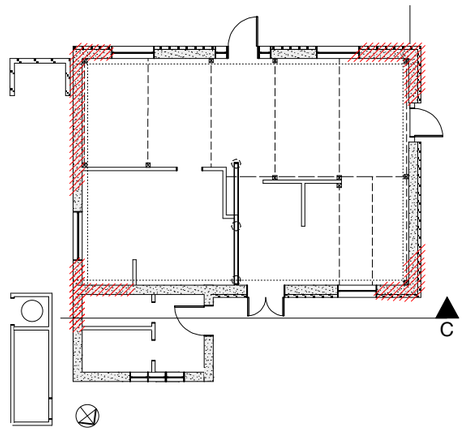
DO NOT SCALE

p: 385 0019 f: 385 0312 e: dtcwgtn@dunningthornton.co.nz P.O. Box 27-153 Wellington

Original Size A1

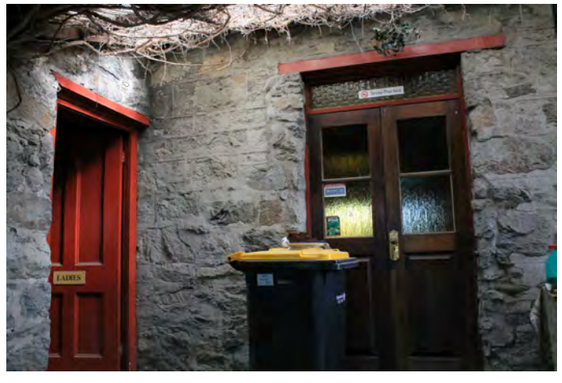


ELEVATION C 1:50



PLAN 1:200

ELEVATION C2 1:50



Original Size A1 Original Scale

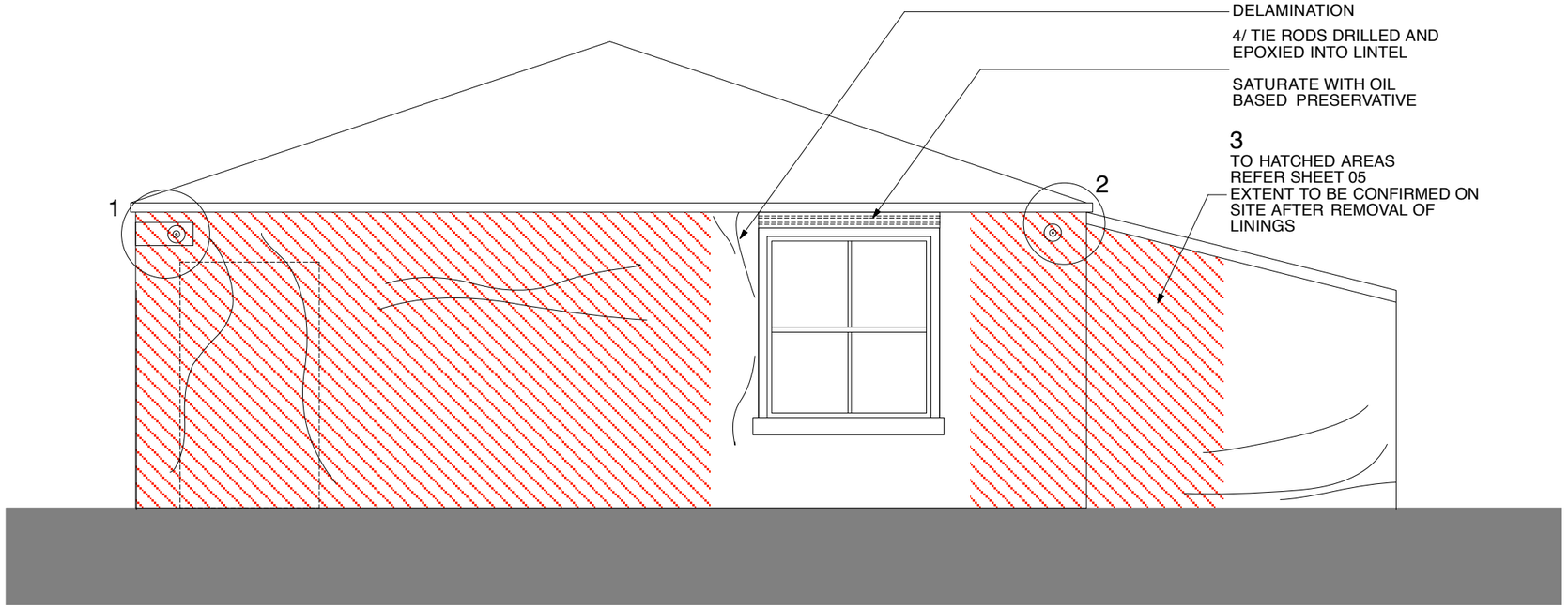
100 50 0 10

	PORTSTONE 471 FERRY ROAD	**ELEVATION C**	REVISIONS FOR PRICING 27.11.13 PRELIMINARY DESIGN 04.03.13	Scales A3 Scales 1: 50, 1:200 Designed Drawn SO CAD Reference	Job Number 7296 Drawing Number 03 Rev A	Dunning Thornton consultants

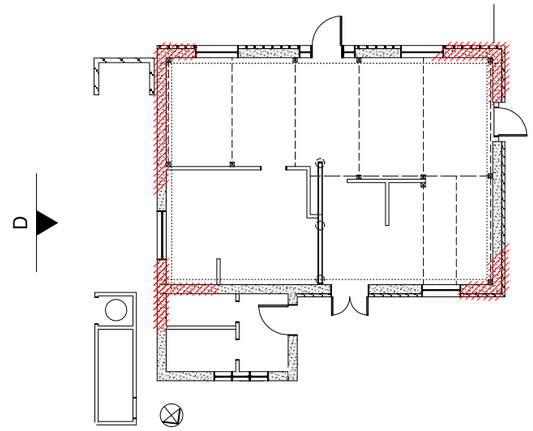
IF IN DOUBT ASK

DO NOT SCALE

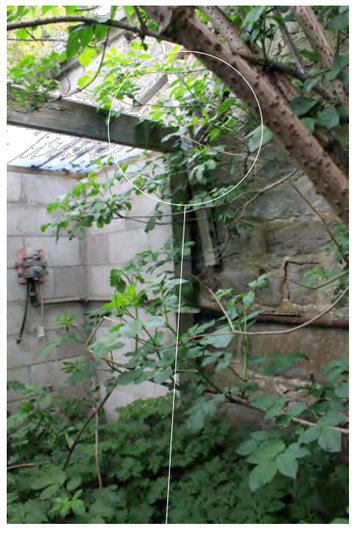
p: 385 0019 f: 385 0312 e: dtcwgtn@dunningthornton.co.nz P.O. Box 27-153 Wellington



ELEVATION D 1:50



PLAN 1:200



PORTSTONE
471 FERRY ROAD

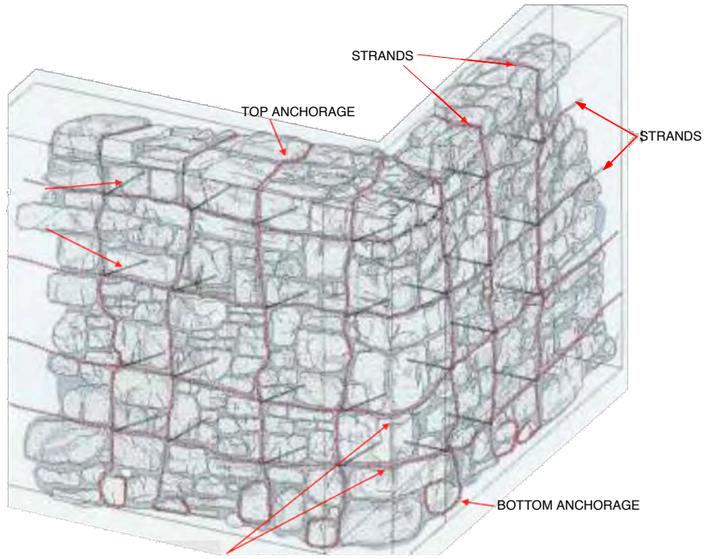
ELEVATION D

REVISIONS	
FOR PRICING	27.11.13
PRELIMINARY DESIGN	04.03.13

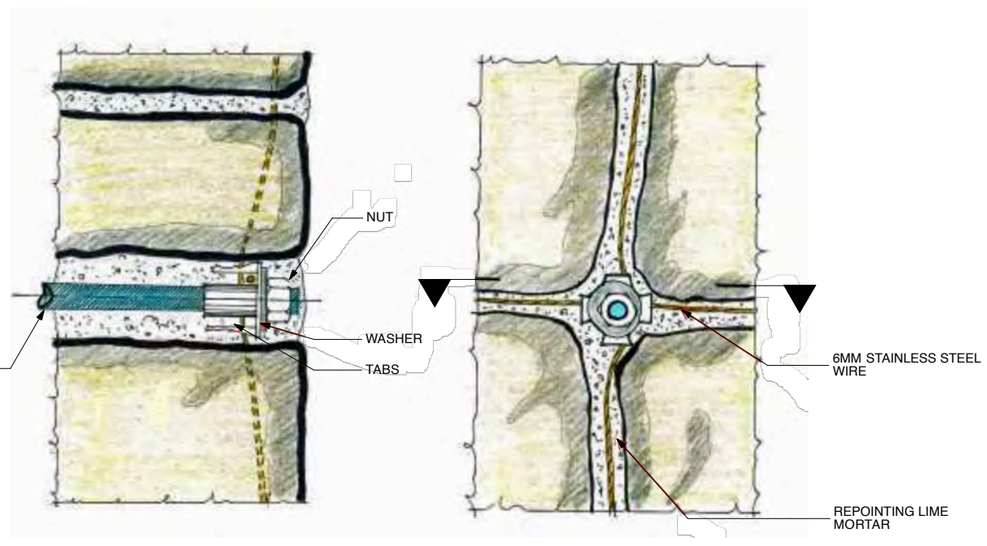
Scales
A3 Scales 1: 50, 1:200
Designed
Drawn SO
CAD Reference

Job Number 7296
Drawing Number 04
Rev A

Dunning Thornton consultants
p: 385 0019 f: 385 0312 e: dtcwgtn@dunningthornton.co.nz P.O. Box 27-153 Wellington



DETAIL 3 NTS
CONTINUOUS MESH SYSTEM



DETAIL 3 NTS
MINI INVASIVE AND REVERSIBLE SYSTEM

PORTSTONE
471 FERRY ROAD

DETAIL 3

REVISIONS	
FOR PRICING	27.11.13
PRELIMINARY DESIGN	04.03.13

Scales
A3 Scales 1: 50
Designed
Drawn SO
CAD Reference

Job Number 7296
Drawing Number 05
Rev A

Dunning Thornton consultants
p: 385 0019 f: 385 0312 e: dtcwgtn@dunningthornton.co.nz P.O. Box 27-153 Wellington

APPENDIX E: BUDGET REPAIR ESTIMATE

RHODES
+ASSOCIATES
QUANTITY SURVEYORS • COST CONSULTANTS

22 January 2014

Gareth Wright
Heritage Response Team – Strategy and Planning Group
53 Hereford Street
CHRISTCHURCH

Dear Gareth

PORTSTONE,471 FERRY ROAD, WOOLSTON,CHRISTCHURCH

Please find enclosed our Budget Repair Estimate for the anticipated Repairs to the above for a total amount of **$577,000.00** (Five Hundred and Seventy Seven Thousand Dollars) excluding GST, as per the clarifications and exclusions included within the document. Please refer to enclosed report which provides further detail on the assumptions made.

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

Portstone, 471 Ferry Road, Woolston, Christchurch

Budget Repair Estimate

January 2014

EXECUTIVE SUMMARY

Rhodes & Associates Limited have been appointed by Gareth Wright of The Christchurch City Council to provide a Budget Repair Estimate for the repair works to Portstone, 471 Ferry Road, Woolston, Christchurch. The estimate has been based on documentation provided by Dunning Thornton Consultants, site visits and photographs.

As this is a Budget Repair Estimate Rhodes & Associates Limited have made certain assumptions on the services and the extent of repairs taking into account their experience on these types of works. This could however change should there be additional works discovered once the construction has commenced.

Budget Repair Estimate

Construction Cost	418,471.00
Off Site Overheads & Margins	41,848.00
Total Construction Cost	**460,319.00**
Design & Construction Contingency	46,032.00
Total Anticipated Construction Cost	**506,351.00**
Professional Fees	70,890.00
Total Budget Repair Estimate	**577,241.00**

Excluding GST

CLARIFICATIONS & EXCLUSIONS

Procurement

- The works are to be negotiated
- Estimated contract period – 6 months

Construction Clarifications

- No allowance has been made for works or associated costs carried out to date, Rhodes and Associates Limited's Budget Repair Estimate only covers the remaining works required to complete the repairs from the documentation supplied
- Allowances have been made where delamination and bulging has occurred, no allowance has been made to correct the 20mm out of plane tilt which occurs on the front elevation
- It has been assumed that the floor construction throughout is timber on piles and is to be levelled
- The roof is only stripped to permit access to the work areas only
- 6mm Stainless steel flexible wire has been allowed to walls (see drawing 7296-05-A)

Exclusions

- Removal and reinstatement of Tenant fit out
- Works to existing foundations
- Works to existing electrical distribution board
- Waterproofing membranes to walls
- Grouting stabilisation to external walls
- Works to existing gas fire
- Replacement of sanitary wear
- Services up-grade
- External works unless specifically mentioned
- Asbestos
- Escalation
- Fireproofing

DOCUMENTATION

Dunning Thornton Consultants, drawings

7296-00-A Ground Floor Plan
7296-01-A Elevation A
7296-02-A Elevation B
7296-03-A Elevation C
7296-04-A Elevation D
7296-05-A Detail

Elemental Estimate Summary

Project: Christchurch City Council
Building: Portstone, 471 Ferry Road
Details: Main Building

No.	Description	Quantity	Unit	Total
1	Site Preparation			10,440.00
2	Substructure			55,036.00
3	Structural Walls			3,990.00
4	Roof			10,065.00
5	External Walls and Exterior Finish			112,490.00
6	Windows and External Doors			13,350.00
7	Interior Walls			40,580.00
8	Interior Doors			3,000.00
9	Floor Finishes			8,550.00
10	Ceiling Finishes			12,112.00
11	Sanitary Plumbing			1,500.00
12	Electrical Services			8,900.00
13	External Works			2,000.00
14	Preliminary & General			136,458.00
	Subtotal			**418,471.00**
15	Off Site Overheads & Margins	10	%	41,848.00
	Total Construction Costs			**460,319.00**
16	Design & Construction Contingencies	10	%	46,032.00
	Total Anticipated Construction Cost			**506,351.00**
17	Professional Fees	14	%	70,890.00
	Total Budget Repair Estimate			**577,241.00**

Elemental Estimate

Project: Christchurch City Council
Building: Portstone, 471 Ferry Road
Details: Main Building

Ref	Description	Qty	Unit	Rate	Total
1	**Site Preparation**				
1.1	Allow for the removal of vegetation to allow for sufficient access to the works	1	Item	1,400.00	1,400.00
1.2	Allow for an arborist to trim back trees to allow access to the works	1	Item	2,000.00	2,000.00
1.3	Allow for the demolition of a small reinforced block gas bottle store and the disposal of material off site	1	Item	500.00	500.00
1.4	Allow for the removal of the existing timber structure abutting the building	1	Item	1,200.00	1,200.00
1.5	Allow for the careful removal of the existing floor coverings dispose off site	89	m2	60.00	5,340.00
					10,440.00
2	**Substructure**				
2.1	300dia x 2500mm deep augured piles (McMillan Drilling Group - Screw pile allowed)	1	Item	15,000.00	15,000.00
2.2	250 x 400dp tie foundation including all necessary excavation, reinforcement @ 140kg/m3, formwork	4	m	130.00	520.00
2.3	Carefully take up existing timber flooring, de-nail, clean, identify and label, place to one side for re-use, reinstate upon completion of new foundation and re-level. Allowing for minor repairs and nominal pads as required (Assumed same construction in toilet area)	89	m2	444.00	39,516.00
					55,036.00
3	**Structural Walls**				
3.1	Supply and install 200x600x600mm steel corner ties 10mm thick along bed on lime/cement dry-pack mortar bed with 2no 150mm diameter, 12mm thick steel wall tie pattress plates along with 60mm diameter, 8mm washer and double nuts for R16 tie bar	3	No	415.00	1,245.00
3.2	Supply and install 200mm diameter, 12mm steel pattress plate complete with 1no 150 diameter, 12mm thick washer and 60mm diameter, 8mm washer and double nuts for R16 tie bar	1	No	350.00	350.00
3.3	Supply and install 100x100x12 ea steel plate including double nuts for R16 tie bar	1	No	250.00	250.00
3.4	Supply and install steel tie bars 16 dia	39	m	55.00	2,145.00
					3,990.00

Elemental Estimate

Project: Christchurch City Council
Building: Portstone, 471 Ferry Road
Details: Main Building

Ref	Description	Qty	Unit	Rate	Total
4	**Roof**				*(Continued)*
4.1	Allow for the careful removal, cleaning and placing to one side for reuse of existing slate tiles to allow access to remedial works, reinstate tiling upon completion (Measured Flat)	40	m2	95.00	3,800.00
4.2	Allowance for replacement tiles	1	Item	1,000.00	1,000.00
4.3	Allow for the installation of timber support 70x45 fixed to joists with 14Gx100 screws. In addition allow the installation of blocking between joists with 4/8Gx65 screws through sarking at 900 ctrs.	20	m	117.00	2,340.00
4.4	Allow for nailing 10Gx75 at ceiling joist/rafter to timber perimeter plate, also allow for 10Gx75 at 300 centres through timber sarking to existing beam	30	m	30.00	900.00
4.5	Allow for the removal of the existing rainwater goods to allow access to the works and re-instate upon completion	45	m	45.00	2,025.00
					10,065.00
5	**External Walls and Exterior Finish**				
5.1	Allow for carefully raking out existing cement mortar joints internally and externally to stone wall to a depth of 30mm, clean joint and insert 6mm stainless steel wires. Drill and epoxy in place M10 stainless rods with retaining tabs, nuts and washers at regular intersections to retain wire. Upon completion re-point walls disturbed to match existing. (Allowance for 6mm flexible stainless steel wires)	48	m2	1,000.00	48,000.00
5.2	Allow for temporary propping above stone lintels to allow for safe removal	1	Item	1,000.00	1,000.00
5.3	Carefully take out stone lintels, remove excess mortar. Carefully chase back of lintel and allow for the supply and installation of steel tie rods saturated with an oil based preservative and epoxy in place (4 rods per lintel) (5 no lintels)	9	m	960.00	8,640.00
5.4	Carefully drill stone mullions and insert 2 M10 S/S pins in 12mm dia dry-fit holes and attach to stone lintel	10	No	260.00	2,600.00
5.5	Allow for deconstruction, stabilization of stonework which has been displaced, make allowance for the reconstruction of the internal core where required, re-point upon completion to match existing (Provisional Quantity)	41	m2	1,250.00	51,250.00

Elemental Estimate

Project: Christchurch City Council
Building: Portstone, 471 Ferry Road
Details: Main Building

Ref	Description	Qty	Unit	Rate	Total
5	**External Walls and Exterior Finish**				*(Continued)*
5.6	Allowance for replacement of damaged stone as required (Provisional Sum)	1	Item	1,000.00	1,000.00
					112,490.00
6	**Windows and External Doors**				
6.1	Allow provision for making good existing glazing as required	1	Item	500.00	500.00
6.2	Allow for removing existing single doors, sanding down and refitting, including making good hardware and timber frame, redecorate and reinstate upon completion	2	No	1,250.00	2,500.00
6.3	Allow for removing existing double doors, sanding down and refitting, including making good hardware and timber frame, redecorate and reinstate upon completion	1	No	1,750.00	1,750.00
6.4	Allow for removing existing entrance door and surrounding frame to allow access by piling rig. Allow for re-instatement upon completion, including making good and redecoration	1	No	2,100.00	2,100.00
6.5	Provision for replacement hardware as required	1	Item	1,000.00	1,000.00
6.6	Allow for preservative treatment to timber lintels to external walls (Provisional Sum)	1	Item	500.00	500.00
6.7	Allow for easing and adjusting existing windows, make good frames where necessary and redecorate upon completion (Provisional Sum)	1	Item	5,000.00	5,000.00
					13,350.00
7	**Interior Walls**				
7.1	Allow for the removal of solid plaster to the external wall, clean down and prepare. New solid plaster to walls. Allow for decoration on completion. (No allowance made for waterproofing membranes)	120	m2	215.00	25,800.00
7.2	Allow for the complete removal of partition wall to allow access for the Piling rig and re-levelling of floor, replacement on completion	49	m2	60.00	2,940.00
7.3	Allow for the replacement of previously demolished partition walls, timber frame, insulated, gib and decoration	43	m2	205.00	8,815.00
7.4	Allow for the installation of new partition faced with 18mm plywood	11	m2	275.00	3,025.00
					40,580.00

Elemental Estimate

Project: Christchurch City Council
Building: Portstone, 471 Ferry Road
Details: Main Building

Ref	Description	Qty	Unit	Rate	Total
8	**Interior Doors**				*(Continued)*
8.1	Allow for removing existing doors and frames, make good, redecorate and reinstate upon completion	3	No	1,000.00	3,000.00
					3,000.00
9	**Floor Finishes**				
9.1	Allow for the careful removal of existing timber skirtings, allow for temporary storage and repair where necessary and re-instate upon completion and redecorate	95	m	90.00	8,550.00
					8,550.00
10	**Ceiling Finishes**				
10.1	Allow to strip out existing ceiling and replace with new Gib, make allowance for timber supports where required. Allow for decoration on completion	89	m2	108.00	9,612.00
10.2	Allow for minor repairs, redecorate upon completion (Provisional Sum)	1	Item	2,500.00	2,500.00
					12,112.00
11	**Sanitary Plumbing**				
11.1	Allow for disconnecting, removal and storage of existing sanitary wear. Allow for reinstallation upon completion	1	Item	1,500.00	1,500.00
					1,500.00
12	**Electrical Services**				
12.1	Allow for the removal of all existing wiring and light fittings to facilitate the remedial works	89	m2	20.00	1,780.00
12.2	Allow for new electrical reticulation and commercial lighting allowance for base build only. Allowance for working around heritage material	89	m2	80.00	7,120.00
					8,900.00
13	**External Works**				
13.1	Allowance for making good paving	1	Item	2,000.00	2,000.00
					2,000.00
14	**Preliminary & General**				
14.1	Main Contractors on site preliminaries and general - 6 Month Contract	6	Mnt	20,000.00	120,000.00
14.2	External scaffolding - erect and dismantle	113	m2	14.00	1,582.00

Elemental Estimate

Project: Christchurch City Council
Building: Portstone, 471 Ferry Road
Details: Main Building

Ref	Description	Qty	Unit	Rate	Total
14	**Preliminary & General**				*(Continued)*
14.3	External scaffolding - rental for 6 months	113	m2	52.00	5,876.00
14.4	Internal mobile scaffolds	1	Item	2,000.00	2,000.00
14.5	Temporary protection to existing structure	1	Item	5,000.00	5,000.00
14.6	Temporary propping (Provisional Sum)	1	Item	2,000.00	2,000.00
					136,458.00
					418,471.00

APPENDIX F: COST ESTIMATES FOR REINSTATEMENT, PARTIAL RETENTION OR DEMOLITION AND REBUILD OF THE BUILDING – WHEELERS

wheelers
construction / renovations / maintenance

Wheelers Limited
2/473 Brougham St Waltham
PO Box 30015 Barrington
Christchurch
Ph: 0508 6677101
Email: info@wheelersltd.co.nz
Website: www.wheelersltd.co.nz

Thursday 20th November 2014

Tony Ward
Address

Property: **Mitre Hotel, Lyttelton, Canterbury**

Dear Mr Ward,

Please find attached an estimate for the rebuild of the above structure following the severe damage caused by the September 2010, the February 2011 and the June 2011 earthquake events.

This cost is an estimate only due to unknown factors yet to be considered. For example, Detailed Engineers reports, Geotechnical reports, Council Consents, Architectural Drawings etc.

Yours sincerely,

Anthony Wheeler
Managing Director
Wheelers Limited

Wheelers Limited
2/473 Brougham St Waltham
PO Box 30015 Barrington
Christchurch
Ph: 0508 6677101
Email: info@wheelersltd.co.nz
Website: www.wheelersltd.co.nz

wheelers
construction / renovations / maintenance

Thursday 20th November 2014

Tony Ward
Address

Property: **Mitre Hotel, Lyttelton, Canterbury**

Dear Mr Ward,

Please find attached an estimate for the repair of the cosmetic and chimney damage sustained in the September 2010 earthquake.

These estimated repair costs have been prepared based on the Scope of Works received by The Earthquake Commission on the 31st January 2011 only.

Yours sincerely,

Anthony Wheeler
Managing Director
Wheelers Limited

1st Scope
EQC only covered 1st floor
There was ground floor
damage in the pub as well.
see supporting photos. IAC assess
3 full cap claims.
EQC assessed Sept Damage > 200k + GST $100k +GST
Clearly they accessed both floors. Building
with up to 50% residential are treated as
residential under the EQC act

Job:	MITRE1
Name:	Tony Ward
Address:	40 Norwich Quay - September event Lyttelton

Element: Repair

18000 **INTERNAL AREA**

Item	Description	Qty	Unit
	Repair EQ damage repair to September event	1	SUM

INTERNAL AREA	**$92,715.77**
Element: Repair - Sub Total	**$92,715.77**
GST @ 15.00%	**$13,907.37**
Tony Ward / 40 Norwich Quay - September eventLyttelton - TOTAL	**$106,623.14**

Wheelers Limited
2/473 Brougham St Waltham
PO Box 30015 Barrington
Christchurch
Ph: 0508 6677101
Email: info@wheelersltd.co.nz
Website: www.wheelersltd.co.nz

wheelers
construction / renovations / maintenance

Thursday 20th November 2014

Tony Ward
Address

Property: **Mitre Hotel, Lyttelton, Canterbury**

Dear Mr Ward,

Please find attached an estimate for the repair of the damage sustained in the February 2011 earthquake.

Due to the severe structural damage sustained as a result of this earthquake, the building was deemed unsafe to enter to categorise the nature of the damage at the time.

Therefore the estimated costs of the repairs to be done as a result of this earthquake have been estimated from the Scope of Works received by the Earthquake Commission 18 months further on, on the 18th June 2012. These costs also include only a basic Engineers report, suggesting a more detailed Engineers report will be required before repairs begin.

As this Scope of Works was not done until this late stage, the original overall estimated repair costs have been split to allow for the further damage done by the June 2011 earthquake event.

Yours sincerely,

Anthony Wheeler
Managing Director
Wheelers Limited

Job:	MITRE2
Name:	Tony Ward
Address:	40 Norwich Quay - February event Lyttelton

Element: Repair

18000 **INTERNAL AREA**

Item	Description	Qty	Unit
	Repair EQ damage repair to February event	1	SUM

INTERNAL AREA	**$2,653,158.97**
Element: Repair - Sub Total	**$2,653,158.97**
GST @ 15.00%	**$397,973.85**
Tony Ward / 40 Norwich Quay - February eventLyttelton - TOTAL	**$3,051,132.82**

wheelers
construction / renovations / maintenance

Wheelers Limited
2/473 Brougham St Waltham
PO Box 30015 Barrington
Christchurch
Ph: 0508 6677101
Email: info@wheelersltd.co.nz
Website: www.wheelersltd.co.nz

Thursday 20th November 2014

Tony Ward
Address

Property: **Mitre Hotel, Lyttelton, Canterbury**

Dear Mr Ward,

Please find attached an estimate for the repair of the damage sustained in the June 2011 earthquake.

Due to the severe structural damage sustained as a result of the February 2011 earthquake, the building was deemed unsafe to enter to categorise the nature of the further damage caused by this event.

Therefore the estimated costs of the repairs to be done as a result of this earthquake have been estimated from the Scope of Works received by the Earthquake Commission 18 months further on, on the 18th June 2012. These costs also include only a basic Engineers report, suggesting a more detailed Engineers report will be required before repairs begin.

As this Scope of Works was not done until this late stage, the original overall estimated costs have been split to allow for the further damage created from this event.

Yours sincerely,

Anthony Wheeler
Managing Director
Wheelers Limited

Job:	MITRE3
Name:	Tony Ward
Address:	40 Norwich Quay - June event Lyttelton

Element: Repair

18000 **INTERNAL AREA**

Item	Description	Qty	Unit
	Repair EQ damage repair to June event	1	SUM

INTERNAL AREA	**$279,925.27**
Element: Repair - Sub Total	**$279,925.27**
GST @ 15.00%	**$41,988.79**
Tony Ward / 40 Norwich Quay - June eventLyttelton - TOTAL	**$321,914.06**

Job:	MITRE
Name:	Tony Ward
Address:	40 Norwich Quay - Functional replacement Lyttelton

Element: New Build

49000 **NEW BUILD**

Item	Description	Qty	Unit
	Build	1	SUM

NEW BUILD	**$2,883,860.00**
Element: New Build - Sub Total	**$2,883,860.00**
GST @ 15.00%	**$432,579.00**
Tony Ward / 40 Norwich Quay - Functional replacementLyttelton - TOTAL	**$3,316,439.00**

APPENDIX G: COST ESTIMATES FOR REINSTATEMENT, PARTIAL RETENTION OR DEMOLITION AND REBUILD OF THE BUILDING – PRENDOS

PRENDOS

9 May 2017

023303001

De Zwart Properties Ltd
PO Box 19818
CHRISTCHURCH

Attention: Tony Ward

Dear Tony,

RE: MITRE HOTEL - 40 NORWICH QUAY, LYTTELTON - REBUILD ESTIMATE

As requested, we are pleased to enclose herewith the proposed Rebuild Estimate in connection with the above property for your retention.

We trust the foregoing will meet your present requirements. Please do not hesitate to contact us if you need further information / clarification.

Yours faithfully,
Prendos New Zealand Limited

Prepared by:

Sabina Jereb, NZIQS (Affil.)

QUANTITY SURVEYOR

Reviewed by:

Rory Crosbie
BSc (Hons) FRICS MNZIBS
CHARTERED AND REGISTERED BUILDING SURVEYOR

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General information

GENERAL INFORMATION

1.0 Brief description of works

This rebuild estimate is for the Mitre Hotel, historic heritage property at 40 Norwich Quay, Lyttelton.

To the south and east the building borders the public street pavement, to the west the neighbour's courtyard and to the north the enclosed back yard area with simple garage and woodshed. An elevated timber deck is attached at the first floor level. The moderately steep site is sloping south.

The building has three stories, basement, ground and first floor. The basement does not extend over the full footprint of the building. On the ground floor is the restaurant and bar area. The first floor contains the motel bedrooms and the proprietor's apartment.

The current building has a concrete floor and concrete external walls. The cladding is coloured plaster finish. Front entrance, first floor balcony and many ornamental features are dominating the south elevation. Multi-pitched metal clad roof is generally raking north. The joinery is mostly timber throughout. Nicely carved staircases, timber panelling in the first floor hallway and fireplaces are typical of the period.

2.0 Scope of services

Our estimate is prepared as per clients instructions, which is to estimate the value of rebuilding the Motel to match the existing, built as per current standards and regulations. Included in our rebuild estimate are allowances for demolition of existing structures and external works. Allowances for services and fire protection are estimated to comply with current regulations.

3.0 Basis of estimate

The following has been reviewed and considered when preparing this estimate:

- Basic concept issue drawings of current construction (floor plans only) prepared by AE Architects Ltd, dated 6/7/2011
- Historic EQC notes provided by the client
- Photos taken by a former employee of Prendos, Andrew Pollock
- Some of the reports, listed on the attached schedule of documents, and previous estimates, all provided by the client

At this stage no detailed design has been prepared. We have therefore based our estimate on the above mentioned drawings, reports and photos. As the provided documentation only provides an outline of the building, this estimate is to be considered as a high level desktop estimate only. We prepared the estimate based on our professional experience from similar projects.

The following assumptions have been made:

- Slab-on-grade, perimeter foundation and thickenings under the load bearing walls to the basement and ground floor (GF)
- Concrete slab above the basement
- Concrete floor above GF including the extension and the balcony
- Concrete block external walls to the basement, GF and first floor (FF)
- Concrete beams and columns to the GF
- Trusses to the roof
- Ply diaphragm in the FF
- Block load-bering internal walls to the GF
- Timber non load-bearing internal walls to the GF and all internal walls to the FF
- Multi-pitched metal roofing with butynol lined internal gutters to the main part and butynol roofing to the extension and the balcony
- Timber stairs to the basement and to the extension
- External and internal timber joinery throughout
- Plaster finish cladding to mirror current features as per heritage requirements
- Plasterboard to all internal walls
- Suspended ceilings to the GF, plasterboard ceiling to the FF
- Strapping with EPS insulation to inside of block walls
- Insulation to roofs
- Acoustic insulation between the GF and FF
- Provisions for fire protection and accessibilty as per current regulations
- External walkway and ladders would not be required any more (subject to heritage requirements)
- Three fireplaces and chimnyes are considered (exact number TBC)
- Allowance for coolroom is considered (TBC)
- No ground imrpovements have been considered as no geotechnical reports provided

All external areas to the north are considered to be replaced. Assumptions in our estimate and the allowances outlined above may require further adjusting during the claim settlement process.

We have further included allowances for:

- Preliminary and General items of 7%,
- Profit and attendance on subcontractors of 7%,
- Design and construction contingency allowance of 5%,
- A sum for professional fees of 8%,
- A sum for statutory fees.

4.0 Value

We have estimated the works described under items 2.0 and 3.0 to be:

- **$ 3,188,456** excl. GST

Please find the rebuild estimate in Appendix A. We draw your attention to page 2 of the estimate for standard and special exclusions.

5.0 Limitations

This estimate has been produced for the strict and sole use of and benefit of the addressee and their legal advisor(s). It is not to be duplicated, disseminated or in any other way replicated without the express approval of the writer. This estimate has been produced in accordance with our letter of engagement incorporating all terms and conditions stated herein.

The author(s) of this estimate where they use the singular phrase "I" or the plural "we" or similar phraseology, are referring to their role acting on behalf of Prendos New Zealand Ltd, not as individuals.

APPENDIX A: Proposed Rebuild Estimate

PRENDOS

MAIN SUMMARY

Job Ref: 023303001
Date: 22/03/2017

Mitre Hotel - Rebuild Estimate

Code	Description	Quantity	Unit	Total
	Mitre Hotel Lyttelton			
	Rebuild Estimate			
	Demolition and Traffic management			205,725
	Site preparation			42,274
	Substructure			114,055
	Structure			400,119
	Carpentry			252,022
	External Joinery			122,465
	Joinery			221,750
	Cladding			107,200
	Roof			79,495
	Coolroom			26,825
	Plumbing and fittings			113,605
	Drainage			31,285
	Heating, ventilation and A/C			141,580
	Fire Protection			105,500
	Electrical services and fittings			126,200
	Plasterboard linings			105,029
	Floor Coverings			20,586
	Painting and specialist finishes			96,865
	Scaffold and edge protection			74,060
	External works			57,558
	Total			
	Preliminary and General	7	%	171,094
	Margin (attendance on subcontractors)	7	%	183,070
	Construction Contingency	5	%	130,765
	Professional fees	8	%	234,330
	Building Consent Fees			25,000

Mitre Hotel - Rebuild Estimate

Code	Description	Quantity	Unit	Total
	Total EQR Estimate (exclusive of GST):			3,188,456
	GST	15	%	478,268
	Total EQR Estimate (inclusive of GST):			3,666,725

STANDARD EXCLUSIONS

Price escalation & Demand surge.

Finance costs.

Holding costs including rates, taxes and related outgoings.

Land and legal costs.

Prendos NZ ltd fees to date.

Negotiation with Insurer.

Depreciation.

Temporary accommodation.

Relocation, temporary storage and disruption costs for the duration of the construction period.

Ground strengthening and land remediation works, other than noted.

Development costs, general costs and capitalised interest calculations

Statutory authority charges including all utility providers other than noted.

After hours works.

Staging.

Consequential loss.

Betterment.

New furnishing and fittings other than noted.

Contracts work insurance.

SPECIAL EXCLUSIONS

Handling asbestos.

Ground water and temporary dewatering.

Contamination of soil.

Ground strengthening.

Cooperation with neighbours on access.

Code	Description	Quantity	Unit	Total
	Internal signage.			
	Audio system.			
	Carpets (contents insurance).			
	Curtains, blinds, fixtures other than noted.			
	Special locking (master keys, etc).			
	Any lift to FF.			
	NOTES			
	External walkway and ladders would not be required any more (subject to heritage requirements).			
	Three fireplaces and chimneys are considered (exact number TBC).			
	Allowance for coolroom is considered (TBC).			
	To be read in conjunction with the attached cover letter, especially in regard to exclusions.			

PRENDOS

Job Ref:023303001
Date:22/03/2017

Mitre Hotel - Rebuild Estimate

Description	Quantity	Unit	Rate	Amount	Comments
DEMOLITION					
Disconnect services to allow demolition and groundworks to be undertaken. Incl. making safe as required	1.00	P/S	2,900.00	2,900.00	
Careful demolition of heavy-weight 2-storey commercial property incl. basement and ancillary structures. Restricted access, hilly site. Including external areas	807.00	m2	155.00	125,085.00	Public and neighbouring property to 3 sides and small yard at the back.
E/o for temporary supports	1.00	P/S	7,500.00	7,500.00	
Protect/maintain/temporary relocate services and street lighting	1.00	P/S	10,000.00	10,000.00	
Make good neighbouring properties	1.00	P/S	5,000.00	5,000.00	No allowance for negotiation
Break as necessary and reinstate public footpath	120.00	m2	127.00	15,240.00	Including kerbs
Traffic Management					
E/o for Traffic management during demolition and construction works	1.00	P/S	35,000.00	35,000.00	Including TM plan, statuary fees, hoardings
E/o for elevated site safe measures	1.00	P/S	5,000.00	5,000.00	Close proximity street and neighbours
SITE PREPARATION					
Sediment control	1.00	P/S	5,000.00	5,000.00	
Site clearance - prepare to receive new foundation	390.00	m2	0.00	0.00	Not considered as new hard-fill considered below
Extra excavation for new basement and retaining walls, including cart away	122.00	m3	52.15	6,362.30	
E/o for temporary retaining of soils	1.00	P/S	7,500.00	7,500.00	Retaining walls, for basement considered extra excavation
Engineered compacted hard-fill including excavation for basement and GF	116.60	m3	111.85	13,041.49	Subject to geotechnical engineer's recommendations. 300mm considered
Backfill behind basement and retaining walls and compact	122.00	m3	85.00	10,370.00	Including drainage fill where necessary
SUBSTRUCTURE					
Concrete slab on ground 150mm incl.sand blinding, construction joints, etc; to GF and basement	388.65	m2	130.00	50,524.89	No allowance for enhanced foundation. Subject to engineers recommendations
E/o for slab thickenings, pads	1.00	P/S	16,000.00	16,000.00	

Mitre Hotel - Rebuild Estimate

Description	Quantity	Unit	Rate	Amount	Comments
Perimeter foundation to GF and basement (Continued)	113.00	m	362.39	40,949.96	
Drainage & plumbing in the slab	388.65	m2	15.00	5,829.80	
E/o for delivery ramp	1.00	Item	750.00	750.00	
STRUCTURE					
Concrete works					All subject to engineer's design
Suspended concrete slab above basement	53.86	m2	300.00	16,158.00	In-situ considered
Suspended concrete slab above GF, including cantilevered balcony	377.00	m2	220.00	82,940.00	Precast
Suspended concrete slab to rear extension	12.13	m2	280.00	3,396.40	In-situ considered
Allowance for Concrete columns	105.00	m	360.00	37,800.00	In-situ considered
Allowance for Concrete beams	77.53	m	400.00	31,012.00	In-situ considered
Precast concrete arches to front	4.00	Item	2,200.00	8,800.00	
Precast concrete balustrade to balcony	9.62	m	900.00	8,658.00	
E/o for connections and other structural elements designed by structural engineer	1.00	P/S	25,000.00	25,000.00	Including any structural steel, bracing
E/o for penetrations/drilling holes to concrete	1.00	P/S	3,500.00	3,500.00	
Blockwork					
200 Block work - full filed & rebar - external walls to GF and FF, basement walls	549.00	m2	230.00	126,270.00	Including framing for openings
E/o for special facade features	1.00	Sum	10,000.00	10,000.00	Other considered under the cladding
200 Block work - full filed & rebar - internal load-bearing walls to GF	179.00	m2	220.00	39,380.00	Estimate
Tanking to block walls - basement and GF	131.00	m2	55.00	7,205.00	
CARPENTRY					
Wall framing					
Wall framing 90x45 H1.2 (incl fixings, bracing)	745.00	m2	65.00	48,425.00	Timber framing assumed
Allowance for sundry timbers	1.00	Sum	4,000.00	4,000.00	
Roof Framing					
Timber roof trusses incl. fixings, bracing, etc	373.80	m2	85.00	31,773.00	Complex roof
Framing to balcony ceiling	12.33	m2	35.00	431.38	
E/o for loose timber / 70x45 purlins	441.08	m2	25.00	11,027.00	
Platform for HWC	1.00	Item	450.00	450.00	Incl bracing
Allowance for sundry timbers	1.00	Sum	4,000.00	4,000.00	
Timber fillet along balustrade walls/roof parapets to achieve 5 degree fall	60.00	m	25.00	1,500.00	

Mitre Hotel - Rebuild Estimate

Description	Quantity	Unit	Rate	Amount	Comments
Ceiling ply diaphragm to FF (Continued)	348.12	m2	75.00	26,109	Bracing
Ceiling framing					
Timber ceiling framing to FF	348.12	m2	25.00	8,703.00	
Insulation to timber walls/ceilings					
R3.6 insulation to ceilings	372.12	m2	21.02	7,821.96	
E/o for acoustic insulation internal walls 75/100mm	1.00	P/S	5,000.00	5,000.00	Estimate
E/o for acoustic insulation between floors	372.12	m2	20.00	7,442.40	
Strapping to block walls including insulation (like 40mm EPS)	399.00	m2	60.00	23,940.00	
Internal wall linings					
Waterproofing to walls in wet areas	70.00	m2	75.00	5,250.00	Estimate
Aqua-panel to wall	6.00	m2	140.00	840.00	Bathroom with bath
Winscot timber paneling - painted	35.00	m2	300.00	10,500.00	
T&G timber paneling - varnished	65.00	m2	280.00	18,200.00	
Trims					
Dado trim/Picture Rail	250.00	m	32.00	8,000.00	Rimu considered
Timber skirting (different ones)	500.00	m	35.00	17,500	Estimate, average rate
Floor					
Final coating to balcony floor - waterproof system	24.28	m2	300.00	7,284.00	Estimate
Waterproofing to floor	51.00	m2	75.00	3,825.00	Kitchens, bathrooms, toilets, bars
EXTERNAL JOINERY					
All including hardware, installation, paint finish, glazing if not stated otherwise					
Timber Joinery					*Assumed all ext. joinery would be uniform timber for the purpose of this estimate*
Timber double glazed windows	59.00	m2	1,435.00	84,665.00	With hardware, installation, tapes, painted, architraves
E/o for obscure glazing	1.00	Sum	1,000.00	1,000.00	Estimate
Timber entry door main door and glazing above	1.00	Item	6,000.00	6,000.00	
Timber entry double door	1.00	Item	3,700.00	3,700.00	Entry to main bar
Timber entry double door	1.00	Item	3,700.00	3,700.00	Delivery entrance
Timber exterior single side doors	3.00	Item	2,200.00	6,600.00	
Sliding door FF	1.00	Item	3,800.00	3,800.00	

Mitre Hotel - Rebuild Estimate

Description	Quantity	Unit	Rate	Amount	Comments
Timber double door FF (Continued)	2.00	Item	3,500.00	7,000.00	Balcony
Timber double door FF	1.00	Item	3,500.00	3,500.00	
Sundry hardware	1.00	P/S	2,500.00	2,500.00	
JOINERY					
Timber Doors (Internal)					
All incl hardware, installation, architraves					
Main entry paneled doors	1.00	Item	4,000.00	4,000.00	Average
Single solid door, painted or veneer, incl. architrave	33.00	Item	1,850.00	61,050.00	
Sliding door to restaurant	1.00	Item	3,000.00	3,000.00	
Sliding door to master bedroom	1.00	Item	2,000.00	2,000.00	
Sliding door to dining FF	1.00	Item	2,000.00	2,000.00	
Single sliding doors	2.00	Item	1,900.00	3,800.00	
Double solid doors, veneer	1.00	Item	2,800.00	2,800.00	
Internal window, single glazed	1.00	Item	900.00	900.00	
E/o for glazing to internal doors	1.00	Sum	4,000.00	4,000.00	Estimate
Sundry hardware	1.00	Sum	2,500.00	2,500.00	
Other joinery					
MDF wooden stairs to basement	1.00	Item	1,800.00	1,800.00	
Rimu timber staircase incl timber balustrade, handrails - main stairwell	1.00	Item	15,000.00	15,000.00	Main stairwell from GF
Rimu timber staircase incl timber balustrade, handrails - mezzanine	1.00	Item	4,000.00	4,000.00	Stairwell to mezzanine
Rimu timber staircase incl timber balustrade, handrails - side stairwell	1.00	Item	6,000.00	6,000.00	Side stairs
Timber handrail to basement stairs	8.00	m	50.00	400.00	With brackets, finished, 65x42mm
Storage to bay window seating	1.00	Item	1,000.00	1,000.00	Main bar
General wardrobes and shelving throughout	1.00	Sum	15,000.00	15,000.00	Estimate
General fixings allowance	1.00	Sum	5,000.00	5,000.00	
Rimu archways and similar joinery features	1.00	Sum	2,500.00	2,500.00	
Office joinery	1.00	Sum	5,000.00	5,000.00	
TAB joinery units and fittings	1.00	P/S	15,000.00	15,000.00	
Main bar joinery and fittings	1.00	P/S	30,000.00	30,000.00	
Bar kitchen joinery and appliances	1.00	P/S	20,000.00	20,000.00	
FF kitchen joinery and appliances	1.00	P/S	15,000.00	15,000.00	
CLADDING					
Plastering					

Mitre Hotel - Rebuild Estimate

Description	Quantity	Unit	Rate	Amount	Comments
Plaster finish to external block walls (Continued)	438.00	m2	120.00	52,560.00	
Plaster finish to self-standing columns	7.20	m2	150.00	1,080.00	
Plaster finish to ceiling above the main entrance (under the balcony)	12.00	m2	130.00	1,560.00	
Plaster finish to balcony balustrade	1.00	Sum	2,000.00	2,000.00	
E/o for details to plaster incl. windows, surrounds, overhangs, lettering. etc. polystyrene substrate, plaster finish	1.00	P/S	50,000.00	50,000.00	High level estimate
ROOF					
Roofing					
Corrugated sheet roofing, wire netting, underlay	441.08	m2	60.00	26,465.04	Endura 0.55 pre-finished
E/o for flashings (apron, parapet) and cut chase; per m2 of roof	441.08	m2	30.00	13,232.52	Including rear extension
Roof penetrations	1.00	Sum	2,000.00	2,000.00	Estimate. Other than chimneys
Butynol roof to rear extension	12.23	m2	275.00	3,361.88	
Fascia/Barge					
Timber fascia/barge board	20.00	m	35.00	700.00	
Soffit					
T&G soffit, painted, above FF balcony	12.33	m2	170.00	2,095.25	
Gutters/DPs					
Colorsteel gutter	20.00	m	66.00	1,320.00	125mm half round
Gutters (butyl, ply, framing)	80.00	m	200.00	16,000.00	
Colorsteel downpipes	28.00	m	90.00	2,520.00	63mm round
Rain-heads	4.00	No	450.00	1,800.00	
Other					
Skylight to mezzanine room, including framing, flashings	1.00	No	10,000.00	10,000.00	Estimate
COOLROOM					
Insulating panel system to coolroom walls and ceiling, incl.door	79.00	m2	115.00	9,085.00	Assumed 8 x 3 x 2.5m box with 75mm panels
Frames and girts	79.00	m2	60.00	4,740.00	
E/o for shelving	1.00	Sum	3,000.00	3,000.00	
E/o for services	1.00	P/S	10,000.00	10,000	
PLUMBING and FITTINGS					
Plumbing - including fittings - medium qual	751.00	m2	60.00	45,060.00	
Toilet pan, waste and fresh water connection	5.00	No	950.00	4,750.00	With seat

Mitre Hotel - Rebuild Estimate

Description	Quantity	Unit	Rate	Amount	Comments
SS urinals incl. flushing (Continued)	1.00	Sum	7,000.00	7,000.00	
Std pre-formed acrylic shower - square	2.00	No	2,360.00	4,720.00	Without fittings
Acrylic bath, framed cradle	1.00	Item	1,850.00	1,850.00	
WHB	8.00	Item	500.00	4,000.00	Including one in each bedroom
Vanity - single basin	3.00	Item	750.00	2,250.00	Without fittings
Laundry tub	1.00	Item	1,200.00	1,200.00	Without fittings
Misc. bathroom fittings - towel rail, mirror, heater, extraction fans, hand dryers, etc	5.00	P/S	1,500.00	7,500.00	Average
Accessible toilet provisions	1.00	P/S	1,000.00	1,000.00	
Water					
Water supply connection	1.00	P/S	3,500.00	3,500.00	
Cold water reticulation	751.00	m2	10.00	7,510.00	per GFA
Hot water reticulation	751.00	m2	15.00	11,265.00	per GFA
Hot water source	1.00	P/S	6,000.00	6,000.00	Commercial
Gas					
Gas installation for kitchens	1.00	P/S	6,000.00	6,000.00	
DRAINAGE					
Storm-water and sewer drains incl. all fittings and GT. Including external areas. Provisional Sum	751.00	m2	35.00	26,285.00	
Storm-water connection	1.00	P/S	2,500.00	2,500.00	
Sewer connection	1.00	P/S	2,500.00	2,500.00	
HVAC					
Heating					
Log-burner and flue	2.00	P/S	8,000.00	16,000.00	
Gas-burner and flue	1.00	P/S	7,000.00	7,000.00	
Light weight chimney complete	3.00	P/S	12,000.00	36,000.00	Average
Fireplace surround & mantles & hearth	3.00	P/S	3,500.00	10,500.00	Average
Heat-pump	2.00	P/S	6,000.00	12,000.00	Commercial type, estimate
Air					
Ducted ventilation system. Provisional sum	751.00	m2	80.00	60,080.00	
FIRE PROTECTION					
Allowance for detection/Fire alarm	1.00	P/S	45,000.00	45,000.00	
E/o allowance for fire and smoke-stop doors	1.00	P/S	7,500.00	7,500.00	
Allowance for signage and emergency lightning	1.00	P/S	12,000.00	12,000.00	
Allowance for sprinkler system	1.00	P/S	25,000.00	25,000.00	

Mitre Hotel - Rebuild Estimate

Description	Quantity	Unit	Rate	Amount	Comments
Allowance for fire penetrations (Continued)	1.00	P/S	5,000.00	5,000.00	
Allowance for fire walls	1.00	P/S	3,000.00	3,000.00	
Allowance for fire protection between floors	1.00	P/S	5,000.00	5,000.00	
Allowance for extinguishers, hose reel and similar if needed	1.00	P/S	3,000.00	3,000.00	
Considered fire ladders and escape walkway omitted					
ELECTRICAL SERVICES and FITTINGS					
Electrical services: new mains cable, DB, outlets, lights, sockets, circuits, connections, extracts. Provisional sum	807.00	m2	100.00	80,700.00	Including basement, externals, connections to fire protection systems and security systems
Mains cable	1.00	P/S	3,500.00	3,500.00	
Phone/Data	1.00	P/S	5,000.00	5,000.00	
Wall mounted heaters	1.00	P/S	5,000.00	5,000.00	
Main kitchen extract	1.00	P/S	2,000.00	2,000.00	
Security					
Security/CCTV system	1.00	P/S	30,000.00	30,000.00	
PLASTERBOARD LININGS					
Internal Wall Linings					
10mm Plasterboard to walls/ Stopping level 4	1,961.00	m2	33.00	64,713.00	
E/o for 10mm Aqualine (wall)	95.00	m2	12.00	1,140.00	
Internal ceiling linings					
13mm Plasterboard to ceiling/ Stopping level 4	348.12	m2	28.00	9,747.36	FF
Suspended ceiling to GF	344.37	m2	50.00	17,218.50	
E/o for cascades and similar	1.00	Sum	6,000.00	6,000.00	Including framing
E/o for vaulted ceiling in mezzanine	1.00	Sum	3,000.00	3,000.00	
E/o for 13mm Aqualine	14.00	m2	15.00	210.00	
Roof access hatch (simple)	4.00	Item	500.00	2,000.00	
E/o for ceiling lining around skylight	1.00	Sum	1,000.00	1,000.00	
FLOOR COVERINGS					
Vinyl (sheets)					
Supply and lay Vinyl, incl preparation	196.06	m2	105.00	20,586.30	
Carpet					
Carpet with underlay (excluded)	0.00	m2	0.00	0.00	
PAINTING					

Mitre Hotel - Rebuild Estimate

Description	Quantity	Unit	Rate	Amount	Comments
Internal (Continued)					
Paint walls	1,443.00	m2	23.00	33,189.00	
Paint ceilings	369.00	m2	24.00	8,856.00	
E/o for any other special ceiling finishes	1.00	Sum	2,000.00	2,000.00	
Paint skirtings	500.000	m	10.00	5,000.00	
Decorative wall paper	400.00	m2	50.00	20,000.00	
Paint dado rail	250.00	m	10.00	2,500.00	
External					
Paint fascia/barge	20.000	m	15.00	300.00	
Paint plaster finish	478.00	m2	40.00	19,120.00	Including all features to the cladding
Paint balcony balustrade	1.00	Sum	900.00	900.00	
Exterior signage	1.00	P/S	5,000.00	5,000.00	
SCAFFOLD and EDGE PROTECTION					
Scaffolding					
Scaffolding to externals including roof edge protection	678.00	m2	85.00	57,630.00	24 weeks allowed
E/o for pedestrian walkways and council consent	1.00	Sum	10,000.00	10,000.00	Estimate
Allowance to wrap the scaffold to three sides	493.00	m2	10.00	4,930.00	
Allowance for internal scaffold	1.00	Sum	1,500.00	1,500.00	Stairwell
EXTERNAL WORKS					TBC what forms part of the claim
New elevated timber deck with timber balustrade and stairwell access to the rear	8.00	m2	1,155.00	9,240.00	
Balustrade to rear extension	11.00	m	150.00	1,650.00	Simple
Stairwell to rear extension	1.00	Item	1,800.00	1,800.00	Simple
Concrete patio at the back for the bar	100.00	m2	100.00	10,000.00	Estimate
Brick wall	10.00	m	250.00	2,500.00	
Brick retaining wall towards the garage, street	27.00	m	400.00	10,800.00	1m high
Concrete steps	1.00	Item	1,200.00	1,200.00	
Stone aggregate driveway (garage access)	25.60	m2	30.00	768.00	EQC
Simple garage	1.00	Item	10,000.00	10,000.00	Simple
Woodshed	1.00	Item	1,500.00	1,500.00	Simple
Allowance for replacing fences	35.00	m	160.00	5,600.00	Including gates
Allowance for vegetation, soft landscaping	1.00	P/S	2,500.00	2,500.00	

APPENDIX H: INSANITARY BUILDING ASSESSMENT

Environmental Health Team

Christchurch City Council

Insanitary Building Assessment

HYB#820411

Address:	40Norwich Quay Lyttelton, Christchurch
Date and time notified:	26/05/23
Date and time on site:	26/05/2023 1300
Nature of complaint:	☐ Damp ☐ Mould ☒ Insanitary ☐ Overcrowding ☐ Other:
Source of notification:	☐ Resident (owner) ☐ Resident (tenant) ☐ Landlord ☒ Other: At request of Ty Greene, CCC Team Leader Compliance & Investigations
Complaint details:	Insanitary building assessment requested. Desktop review of photos to assist the request. Due to the current state of the building I have been advised that entry is prohibited. Photos taken during a recent site visit.
Property manager:	Name: Mitre Hotel Holdings Limited Contact details: 178 Bridle Path Road Christchurch 8022
Dwelling description:	Multi-storey commercial building. Building has been unoccupied and left in a continued state of disrepair following the Canterbury Earthquake sequences in 2010 and 2011. There is temporary fencing outside part of the building running along the southern and eastern boundary. The fencing extends about 3 metres to 0 metres from the edge of the building. There is recent evidence of an heavy impact to the north eastern part of the building. Resulting from the impact the fence has separated allowing pedestrian access into the cordoned areas leading into the open door and eventually inside of the building. The building is known to the Council. Historic and current photos of the abandoned building show a sequence of decaying and dilapidation to the building. The building is located in close proximity to Lyttelton harbour and the southern part of the building is exposed to the prevailing southerly weather.
Notes:	1. Status – unoccupied. Access into the building is easy through an insecure front door and un-boarded exposed windows scattered around the building. 2. Vandalised building from occupation and the weather events . 3. Most widows are broken or missing and the property is suffering with moisture ingress affecting wooden, absorbent and organic materials. There is evidence of mould growth on walls. 4. Due to the openness of the building and the vulnerability of being exposed to the elements the photos illustrate water penetration with mould and moisture present.
Legislation:	**s123 Building Act 2004 Insanitary building means a building that:** a) is offensive or likely to be injurious to health because— (i) of how it is situated or constructed; or (ii) it is in a state of disrepair; or b) has insufficient or defective provisions against moisture penetration so as to cause dampness in the building or in any adjoining building; or c) does not have a supply of potable water that is adequate for its intended use; or d) does not have sanitary facilities that are adequate for its intended use.

Overall Comments:	In my opinion, the multi-storey building is in an insanitary state; and it is also likely to be injurious to health meeting the threshold of being an insanitary building as per the definition set out in Section 123 of the Building Act 2004. There is also insufficient or defective provisions against moisture penetration so as to cause dampness in the building. Missing or defective protection also add to the current insanitary nature of the dwelling.
Officer:	Tony Dowson Christchurch City Council Environmental Health Officer
Date and Time:	26 May 2023 1.30
TRIM:	

Photos:

Missing window

Vandalism – damage to walls

Mould growth on walls

Water/weather penetration /Damaged ceilings

Broken & damaged fireplace 	Damaged ceilings 
Damaged ceilings, walls/ mould /moisture and weather penetration damage 	Damaged ceilings, walls/ mould /moisture and weather penetration damage 

Damaged ceilings, walls/ mould /moisture and weather penetration damage 	

APPENDIX I: REPORT BY CHRISTCHURCH CITY COUNCIL, ENGINEERING SERVICES TEAM, BUILDING CONSENTING UNIT

Christchurch City Council
Engineering Services Team, Building Consenting Unit

(Engineering Request Input)

Date: 19 June 2023

To: Ty Green, Team Leader, Compliance & Investigation Team B, Regulatory Compliance

From: Roland Basobas, Structural Engineer (Building Control), Engineering Services

Reviewer: Vincent Wong, Senior Engineer (Building Control), Engineering Services

Re: 40 Norwich Quay, Lyttelton

Summary

A structural re-inspection was carried out at 40 Norwich Quay, Lyttelton, Christchurch

Considering all the factors as set out below, I consider that the building is dangerous* in its current state as per section 121 of the Building Act 2004 (the Act)

Accordingly. I recommend:

- A dangerous building notice is issued as per Section 124 of the Act; is recommended to the property due to the seriousness of this matter including the risk presented by the building in its current state to the neighboring properties.

1.0 Introduction

On the 15/05/2023, the Engineering Service team received a request from yourself, Ty Green, Team leader of the Compliance and Investigation Team B, Christchurch City Council.

You and I subsequently carried out an onsite inspection for this property on 18 May 2023, between 9:30 as to 10:30am. The weather at time of inspection was cloudy. The owner was not present at the time of the inspection.

The re-inspection was to carry out a visual inspection of the condition of the building and present a further internal determination to whether the building is deemed dangerous in present time (Note: A previous assessment report dated March 2020 (TRIM Ref: 20/309866) had determined the building as dangerous and the photos in that report was used as source of reference. Note: This report does not intend to supersede that report.

Attention will also be given to neighbouring properties and if necessary, deemed them as affected building(s) as defined in section 121 of the Building Act 2004 (BA2004)

2.0 Assessment

Field investigation via walk by inspections only were carried out on 18th May 2023. External visual inspection of the building was undertaken with photos taken where possible. Photos from this field investigation are included as part of this report (Section 4.0). The building is in such state of disrepair that no level readings, verticality checks nor physical tests were conducted during the visit.

3.0 Building inspection / Discussion

The following pointers were noted following the inspection:

3.1. New cracks were observed at the East wall (refer to photos 6 & 7) of the building. At time of this writing, I was informed by yourself that a car (vehicle type unknown) crashed on this wall. The columns and adjacent walls appeared to be badly damaged by this crash, with visibly shear cracks showing. It is somewhat unusual to see such significant cracks from a car crash. A probable explanation is that there could be some undetected shear cracks from previous events on this location (such as earthquake shakes) and this crash somehow compounded those cracks. This also inferred that there could be other damages elsewhere in the building which may have gone unnoticed.

3.2. For the Western wall (photos 2, 8 & 9), it would appear there are further spalling and cracking of concrete to the exterior when compared to the photos in the previous 2020 report (section 1). Some of these cracks may have existed previously, being hard-to-notice type micro cracks. Possible reasons for continuing progression of the cracks included on-going vibration from heavy port vehicles using Norwich Quay and continuing aftershocks in the Canterbury region (refer Geonet for events sequences from past 12 months). Progression of cracking indicated this being an overall deteriorating structure, and its ability to stand up will continue to be undermined with each unfavorable event. The building is beside the harbour area so the corrosion risk of the wall reinforcement (now possibly exposed due to the cracks) will increase.

3.3 Interior wise, water damages (photo 12) to wall and ceiling framings were observed. These are clear signs of moisture penetrations, which would imply possible defects in the roof structure atop. It is likely that the building has not been maintained/repaired, therefore allowing water ingress into the structure. Water ingress if untreated, can lead to a host of damp related problems.

3.4 Adverse weather events, including snowy/rainy days or storm force winds are not uncommon. These occurrences can further target any weaknesses in this building. Coupled with the recent weather events that had occurred in New Zealand, I would expect weather related damages to exacerbate over time, resulting in further damage to the already compromised structural cladding system. These events could increase the risk of parts of the roof system collapsing fully or partially, and therefore likely causing injury or death. An experienced structural engineer, if required, can be requested to verify the above.

3.5 There is also indication that someone from the outside have assessed the building (broken windows from photo 1, internal graffiti from photo 11 etc.). The timing of entrance is unknown to us. Regardless, I am concerned that these individuals may have been unaware of the hazard in a dilapidated structure and the imminent danger they had put themselves in.

Dangerous building (as per S121 of NZ BA2004)

*(1) A building is **dangerous** for the purposes of this Act if,—*

(a)in the ordinary course of events (excluding the occurrence of an earthquake), the building is likely to cause—

(i)injury or death (whether by collapse or otherwise) to any persons in it or to persons on other property; or

(ii)damage to other property; or

(b)in the event of fire, injury or death to any persons in the building or to persons on other property is likely.

(2) For the purpose of determining whether a building is dangerous in terms of subsection (1)(b), a territorial authority—

(a)may seek advice from employees, volunteers, and contractors of Fire and Emergency New Zealand who have been notified to the territorial authority by the board of Fire and Emergency New Zealand as being competent to give advice; and

(b)if the advice is sought, must have due regard to the advice.

4.0 Photos

Photo 1 –View from the front (South)

Photo 2 – View from West side wall

Photo 3 – View from East side wall

Photo 4 –View from Rear (North)

Photo 5–View from Rear Side (North)

Photo 6 – View from East wall with new cracks.

Photo 7 – View of new cracks at East wall

Photo 8 – View of concrete spalling at West wall (in close proximity to the neighbor driveway)

Photo 9 – View of concrete spalling at West wall (in close proximity to the neighbor driveway)

Photo 10 - Access to the rear part of the building

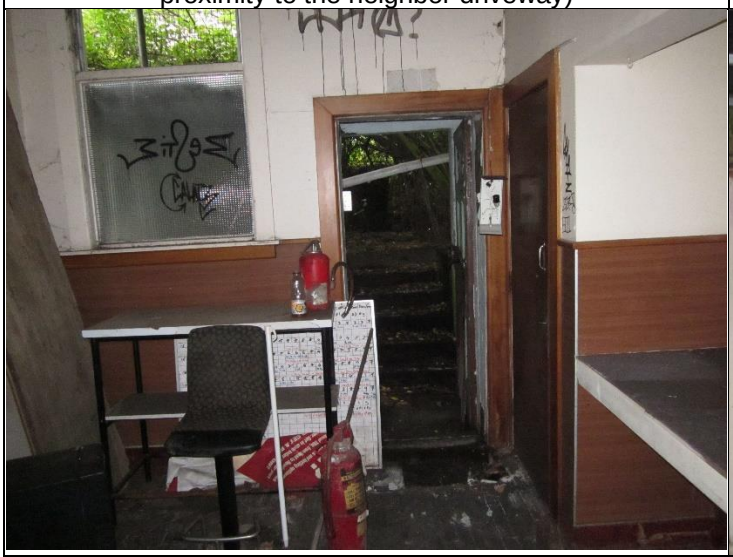

Photo 11 – View from interior. Another access to rear part of the building. It would appear the building had been assessed by others.

Photo 12 – View form interior – Visible water damaged on the roof and wall

5.0 Conclusion/Recommendations:

It is my professional opinion that the deteriorating state of the building, meant there is presence of imminent danger to the safety of pedestrians using the pathway and to the adjacent property. The building in its current state and its proximity to a neighboring property should be considered dangerous, i.e., in the ordinary course of events, the building is likely to cause injury or death to persons or property.

The followings are therefore recommended:

- Section 124 notice is to be issued immediately by CCC for this property.
- A letter/instruction from the building compliance team or similar enforcement unit is provided to the property owner(s) requesting that this property be fenced/barricaded to prevent trespassers from unlawfully occupying the structure.
- Immediate options (remediation/make building safe or demolition & lockups to prevent assess) should be considered to mitigate the risks on this location.

Yours sincerely,

Roland Basobas
Structural Engineer (Building Control)
Engineering Services Team
Engineering Services Team, Building Consenting Unit

Report reviewed by:

Vincent Wong
Senior Engineer (Building Control)
Engineering Services Team
Engineering Services Team, Building Consenting Unit

APPENDIX J DANGEROUS AND INSANITARY BUILDING NOTICE

CHRISTCHURCH CITY COUNCIL
NOTICE
UNDER SECTION 124(2)(c) BUILDING ACT 2004

TO:	
Mitre Hotel Holdings Limited C/- Tony Ward 18 Evergreen Place, Sunshine Bay, Queenstown 9300 Email: ph3844104@me.com	

THE BUILDING

Street Address; 40 Norwich Quay, Lyttelton, Christchurch 8082

Legal Description: Part Town Section 9 Town of Lyttelton

PARTICULARS

The Council is satisfied the building, is Insanitary under section 123(a)(ii)(b)(c)&(d) of the Building Act 2004. See the attached report.

123 Meaning of insanitary building

A building is insanitary for the purposes of this Act if the building—

(a) is offensive or likely to be injurious to health because—

(i) of how it is situated or constructed; or

(ii) it is in a state of disrepair; or

(b) has insufficient or defective provisions against moisture penetration so as to cause dampness in the building or in any adjoining building; or

(c) does not have a supply of potable water that is adequate for its intended use; or

(d) does not have sanitary facilities that are adequate for its intended use.

TO REDUCE OR REMOVE THE DANGER YOU MUST COMPLY WITH EITHER POINT ONE OR TWO BY THURSDAY 20 JULY 2023, AND POINT THREE BY 10 JANUARY 2024

1. Arrange for adequate temporary fencing to be placed around the whole building,
   Or
2. Arrange for materials to provide full coverage of the windows and doors restricting entry into the property;
   And
3. Have taken steps to make the building sanitary.

If you do not comply with this notice you commit an offence under section 128A of the Building Act 2004 and may be liable to a fine of up to $200,000, or you can be issued with an infringement notice and an instant fine of $1000.

Signed for & on behalf of the Christchurch City Council:

Name: Tracey Weston

Position: Head of Regulatory Compliance

Date of issue: 07 July 2023

[NOTE: This notice must be fixed to the building concerned and a copy of the notice given to all relevant people listed in s125(2) of the Building Act 2004]