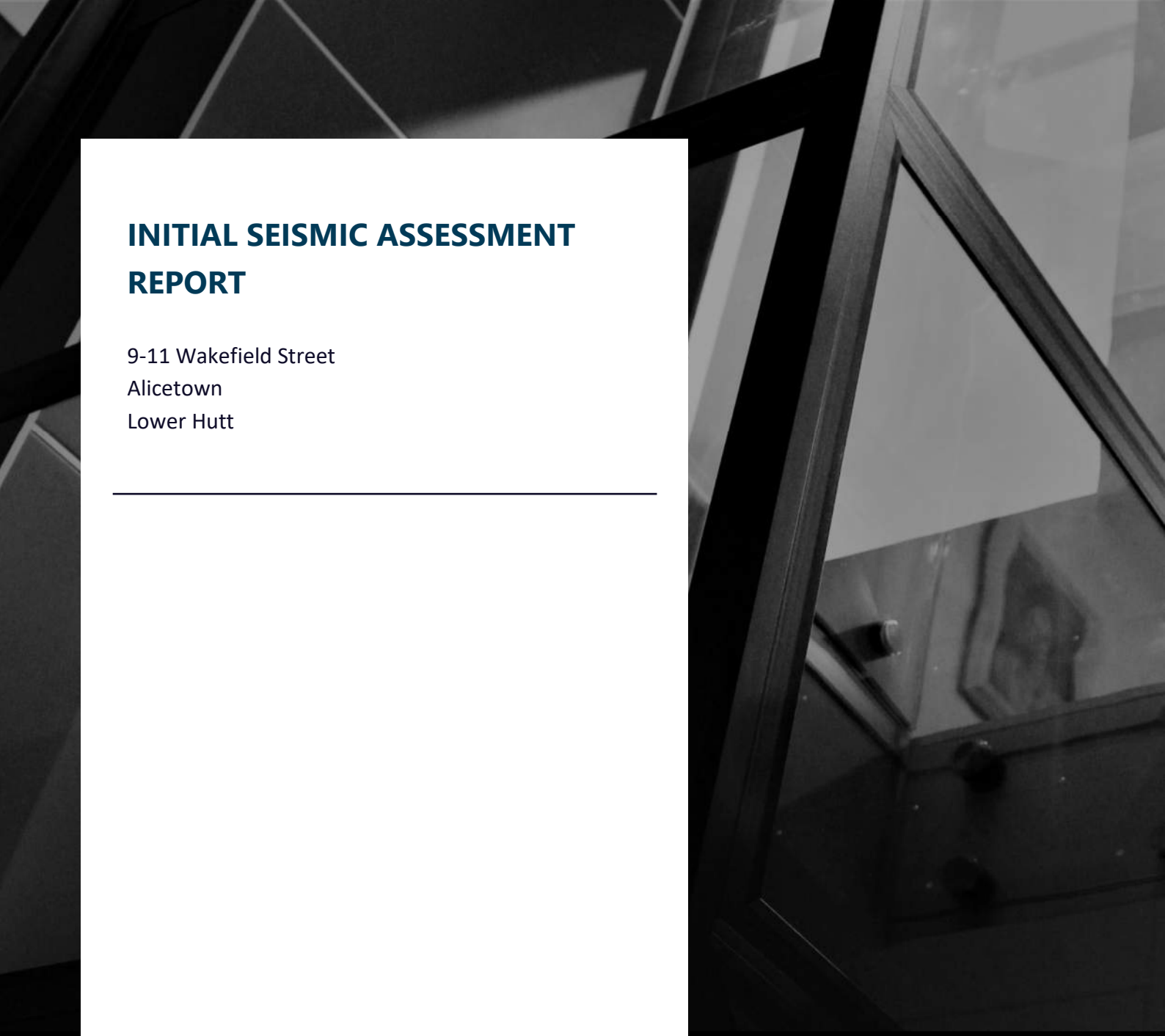


# INITIAL SEISMIC ASSESSMENT REPORT

9-11 Wakefield Street
Alicetown
Lower Hutt

**CLIENT**
HCH Limited – c/o Scott Courtney
9-11 Wakefield Street
Alicetown
Lower Hutt

**PROJECT REF**
P260449

SEISMIC SOLUTIONS

RESIDENTIAL | COMMERCIAL | RETAINING WALLS & FOUNDATIONS | SEISMIC ASSESSMENT | SEISMIC STRENGTHENING | CONSTRUCTION MONITORING

## DOCUMENT CONTROL RECORD

| | |
|---|---|
| **CLIENT:** | HCH Limited c/o Scott Courtney |
| **PROJECT:** | Initial Seismic Assessment of the building located at 9-11 Wakefield Street, Alicetown, Lower Hutt. . |
| **PROJECT NO:** | P260449 |
| **ADDRESS:** | 9-11 Wakefield Street, Alicetown, Lower Hutt |
| **ISSUED ON:** | 15 April 2026 |
| **STATUS:** | (REV 0) Final |
| **ASSESSED BY:** | Mohammad Joya<br>Structural Engineer<br>BSc Civil (UoC) |
| **CHECKED & APPROVED BY:** |  <br>Dr. Najif Ismail<br>Senior Structural Engineer<br>BSc (Hons.) MSc, PhD, CPEng (#1013406) |

| VERSION | DATE | COMMENT | AUTHOR | REVIEWER |
|---|---|---|---|---|
| 1.0 | 4/15/2026 | Final | Mohammad Joya | Dr. Najif Ismail |

## CONTENTS

## EXECUTIVE SUMMARY

We have been engaged by HCH Limited c/o Scott Courtney to undertake an initial seismic assessment (ISA) for the property located at *9-11 Wakefield Street, Alicetown, Lower Hutt* using IEP recommended in the "The Technical Guidelines for Engineering Assessments" – as referred to in Section A8.5 of the Guidelines, which meets the requirements of Section 2.5 of the EPB methodology. It is noted that it is not a detailed seismic assessment.

We have undertaken a review of the building information retrieved from relevant Building Control Authority's (BCA) records and undertaken a site visual inspection of the interior and the exterior of the building on 31 March 2026.

The ISA is considered to provide a relatively quick, high-level and qualitative measure of the building's performance. A more reliable result will be obtained from a Detailed Seismic Assessment (DSA). A DSA could find critical structural weaknesses (CSWs) not identified from the IEP, or that identified CSWs have been addressed in the design of the building.

Based on the BC application documents retrieved from the HCC archives and confirmed by historic imagery, two buildings on the property were originally constructed around 1969. The front building is a single-storey industrial structure measuring approximately 8.5 m by 26.2 m, with timber-framed office spaces partitioned on the south side. The rear building, measuring 12.2 m by 14 m, appears to have been constructed at a later date. According to the HCC archives, no structural strengthening has been carried out since the original construction.

Both buildings are single-storey and feature partially grouted reinforced concrete masonry (RCM) shear walls, steel portals, and reinforced concrete (RC) eave beams, foundation beams, and pads. The roof consists of long-run sheets supported by timber purlins resting on steel portal frames that span the transverse direction. The lateral load-resisting system comprises RC frames infilled with RCM wall panels along the external walls, with two parallel lines of multi-bay RC frames and RCM infill walls providing longitudinal bracing. In the transverse direction, lateral bracing is achieved through steel portal frames with steel columns encased in concrete. Planar roof cross-bracing was observed during the site visit. The foundation system consists of shallow RC pads tied together with RC foundation beams and a concrete slab-on-grade.

The result of our ISA shows that the building's seismic rating is likely to be approximately 35% NBS (IL2), which corresponds to a seismic grade C (Medium Risk) building. This is above the threshold for Earthquake Prone Buildings (34% NBS) but falls below the threshold for Earthquake Risk Buildings (67% NBS). This is legally accepted in regards to seismic performance but improvement is recommended.

## SCOPE OF OUR ENGAGEMENT

Seismic Solutions Limited was engaged by *HCH Limited c/o Scott Courtney* to undertake an initial seismic assessment (ISA) of the building located at *9-11 Wakefield Street, Alicetown, Lower Hutt* using Initial Evaluation Procedure (IEP) to assign an indicative %NBS rating to the building. Figure 1 shows the location of the building.


**Figure 1.** Location of the building – HCC Webmap

This report has been prepared for the sole benefit of our client, *HCH Limited c/o Scott Courtney*, and the distribution of this report without their consent is prohibited. Please read section 2 of this report and the limitations of the IEP assessment. The scope of our work for this project included the following:

- reviewing the structural drawings available for the building to determine primary structural characteristics, and other information required to undertake the ISA
- New Zealand Geological Society Database, Greater Wellington Regional Council Hazard Maps, Technical literature and our in-house documentation/ geotechnical reports for surrounding buildings.
- undertake a site visual inspection to understand the structural form better, assess building condition, and observe important structural and seismic characteristics
- assess the likely seismic performance of the building using IEP (please read background and limitations in Section 2), and
- report on our findings and recommendations.

## INITIAL EVALUATION PROCEDURE (IEP) AND ITS LIMITATIONS

The Initial Evaluation Procedure (IEP) was developed in 2006 by the New Zealand Society for Earthquake Engineering (NZSEE) and updated in 2013 to reflect experience with its application and as a result of experience in the Canterbury earthquakes. It is a tool to assign a percentage of

New Building Standard (%NBS) score and associated grade to a building as part of an initial seismic assessment of existing buildings. The IEP based assessment enables territorial authorities, building owners and managers to review their building stock as part of an overall risk management process. Characteristics and limitations of the IEP include:

- It tends to be somewhat conservative, identifying some buildings as earthquake prone, or having a lower %NBS score, which subsequent detailed investigation may indicate is less than actual performance. However, there will be exceptions, particularly when critical structural weaknesses (CSWs) are present that have not been recognized from the level of investigation employed.
- It can be undertaken with variable levels of available information, e.g., exterior only inspection, structural drawings available or not, interior inspection, etc. The more information available the more representative the IEP result is likely to be. The IEP records the information that has formed the basis of the assessment and consideration of this is important when determining the likely reliability of the result.
- It is an initial, first-stage review. Building or specific issues which the IEP process flags as being problematic or as potentially critical structural weaknesses, need further detailed investigation and evaluation. A Detailed Seismic Assessment is recommended if the seismic status of a building is critical to any decision making.
- The IEP assumes that the buildings have been designed and built-in accordance with the building standard and good practice current at the time. In some instances, a building may include design features ahead of its time – leading to better than predicted performance. Conversely, some unidentified design or construction issues not picked up by the IEP process may result in the building performing not as well as predicted.
- It is largely qualitative process and should be undertaken or overseen by an experienced engineer. It involves considerable knowledge of the earthquake behaviour of buildings, and judgement as to key attributes and their effect on building performance. Consequently, it is possible that the %NBS derived for a building by independent experienced engineers may differ.
- An IEP may over-penalise some apparently critical features which could have been satisfactorily taken into account in the design.
- An IEP does not consider the seismic performance of non-structural items such as ceiling, plant, services or glazing.

Experience to date is that the IEP is a useful tool to identify potential issues and expected overall performance of a building in an earthquake. However, the process and the associated %NBS and grade should be considered as only indicative of the building's compliance with current code requirements. A detailed investigation and analysis of the building will typically be required to provide a definitive assessment. An IEP score above 67%NBS should be considered sufficient to classify the buildings as not earthquake prone. However, if further information comes available reassessment may be required.

The ISA is considered to provide a relatively quick, high-level and qualitative measure of the building's performance. A more reliable result will be obtained from a Detailed Seismic Assessment (DSA). A DSA could find critical structural weaknesses (CSWs) not identified from

the IEP, or that identified CSWs have been addressed in the design of the building. We recommend a DSA be undertaken to have a more realistic building seismic rating for the building.

## EPB METHODOLOGY AND BUILDING AMENDMENT ACT 2017

Earthquake loading standards have changed overtime in New Zealand and many existing buildings may not meet the seismic resistance requirements of the present day. Therefore, to be used in conjunction with the Building Act 2004, the Ministry of Business Innovation and Employment issued the potentially earthquake prone buildings (EPB) methodology to identify, assess, decide and manage EPBs. More information on EPB methodology can be found from MBIE's website.

The EPB methodology introduced three profile categories to identify potential EPBs i.e. A, B and C. The profile categories proposed in EPB methodology worked to address "worst of the worst" buildings.

- All buildings constructed of brick, block or stone masonry without any reinforcement (URM) built in any year fall under profile category A. Structures of any type of material that has a significant amount of URM present such as masonry facades, bearing wall, gable end wall and brick chimneys are also classified as profile category **A**.
- Profile category **B** are buildings built before 1976 that are taller than 12 m or 3 storey high.
- All buildings built before 1935 not profile category A are classified as profile category **C**.

Territorial building control authorities are required to identify potential earthquake prone buildings and work with owners of identified EPBs to strengthen these buildings in the given timeframes set in the EPB methodology depending upon the seismic risk associated to the location of the buildings. Currently, New Zealand has been divided into three areas i.e. high, moderate, and low seismic risk. Table 1 shows tentative timeframes to strengthen EPBs from the date the first letter is sent to the building owner.

**Table 1.** Timeframes as per EPB methodology to strengthen the buildings

| Seismic Risk Area Category | Timeframes to strengthen | |
|---|---|---|
| | Priority | Others |
| High (Z > 0.3) | 7.5 yrs. | 15 yrs. |
| Medium (0.15 ≤ Z ≤ 0.3) | 12.5 yrs. | 25 yrs. |
| Low (Z < 0.15) | N/A | 35 yrs. |

We believe that the building being assessed herein **does not meet any of the building typologies typically used to identify the potential EPBs**, however a seismic assessment report can be requested by a BCA using 'at any time' pathway. The building is in **Lower Hutt** which has a Z factor of **0.40** and therefore is in a **High** seismic risk area. This ISA report is commissioned voluntarily by the owner of the property and not requested by the BCA.

## BASIS FOR THE ASSESSMENT

Information used in this assessment was obtained from consent documentation/property records held at the council and details obtained during our visual site inspection. The following documentation has been reviewed as part of this assessment.

- Consent documentation retrieved from the BCA's archives
- Geohazard information obtained from HCC map, GWRC website, and NZGD database

Verification of all as-built details was not possible without invasive investigations and therefore where details were not possible to be validated, it was assumed that as-built details are as shown on the available drawings and specifications and typical for the buildings of this form and age. Key parameters used in our IEP assessment are given in Table 2.

**Table 2.** Key parameters used for buildings in our IEP based initial seismic assessment

| Description | Building |
|---|---|
| Year of Construction | Original construction circa 1939 |
| Importance Level | 2 - Normal Consequence |
| Subsoil profile | D – Soft soil |
| Ductility | 2.0 |
| E factor | 1.0 |
| F factor | 1.1 (Trans)<br>1.5 (Long) |

The building at 9-11 Wakefield Street, Alicetown, Lower Hutt is founded on a category **D** subsoil profile, as per numerous nearby borehole and CPT test logs available. The building of interest is located within 200 m towards South-East of the Wellington fault trace, with "**High"** severity of ground shaking (see Figure 3).


**Figure 3.** Ground shaking risk –High (GWRC webmap) and location of active fault (240m)


**Figure 4.** Liquefaction potential – High (GWRC Webmap) and location of active fault (240 m)

The building lies in a location that is deemed to have "High" liquefaction potential and "Low" risk of seismic slope failure (see Figure 4).

## BUILDING DESCRIPTION

Based on the BC application documents retrieved from the HCC archives and confirmed by historic imagery, two buildings on the property were originally constructed around 1969. The front building is a single-storey industrial structure measuring approximately 8.5 m by 26.2 m, with timber-framed office spaces partitioned on the south side. The rear building, measuring 12.2 m by 14 m, appears to have been constructed at a later date. According to the HCC archives, no structural strengthening has been carried out since the original construction.

Both buildings are single-storey and feature partially grouted reinforced concrete masonry (RCM) shear walls, steel portals, and reinforced concrete (RC) eave beams, foundation beams, and pads. The roof consists of long-run sheets supported by timber purlins resting on steel portal frames that span the transverse direction. The lateral load-resisting system comprises RC frames infilled with RCM wall panels along the external walls, with two parallel lines of multi-bay RC frames and RCM infill walls providing longitudinal bracing. In the transverse direction, lateral bracing is achieved through steel portal frames with steel columns encased in concrete. Planar roof cross-bracing was observed during the site visit. The foundation system consists of shallow RC pads tied together with RC foundation beams and a concrete slab-on-grade.

## ISA GRADES AND RELATIVE RISK

Table 3 Taken from the NZSEE Guidelines provides the basis of a proposed grading system for existing buildings, as one way of interpreting the %NBS building score. As shown, occupants in Earthquake Prone buildings (less than 34%NBS) are exposed to more than 10 times the risk that

they would be in a similar new building. For buildings that are potentially Earthquake Risk (less than 67%NBS), but not Earthquake Prone, the risk is at least 5 times greater than that of an equivalent new building.

The New Zealand Society for Earthquake Engineering (which provides authoritative advice to the legislation makers and should be considered to represent the consensus view of New Zealand structural engineers) classifies a building achieving greater than 67%NBS as "Low Risk Building" and having "Acceptable" building structural performance. Meanwhile a building achieving less than 33%NBS is classified as "Very High-Risk Building" and having "Unacceptable" building structural performance. However, it is noted that this score must be read in conjunction with the limitations noted in section 4. Broad descriptions of the life-safety risk can be assigned to the building grades as shown in Table 3.

**Table 3.** NZSEE Recommended Seismic Grades and Relative Earthquake Risk

| Building Grade | Percentage of New Building Strength (%NBS) | Approx. Risk Relative to a New Building | Life-safety Risk Description |
|---|---|---|---|
| A+ | >100 | <1 | Low risk |
| A | 80 to 100 | 1 to 2 times | Low risk |
| B | 67 to 79 | 2 to 5 times | Low or medium risk |
| C | 34 to 66 | 5 to 10 times | Medium risk |
| D | 20 to 33 | 10 to 25 times | High risk |
| E | <20 | More than 25 times | Very high risk |

## SEISMIC RESTRAINT OF NON-STRUCTURAL ITEMS

During an earthquake, the safety of people can be put at risk due to non-structural items falling on them. These items should be adequately seismically restrained, where possible, to the NZS4219:2009 "The Seismic Performance of Engineering Systems in Buildings". All suspended ceilings would be designed to the AS/NZS 2785 "Suspended ceilings – design and installation". The following items are defined as life safety risks (NZS4219 Part Categories P.2 and P.3) and require seismic restraint:

- Any suspended item that can fall greater than 3m
- Any suspended item that weighs more than 7.5kg
- Any item, regardless of height and weight, which if it failed due to loss of lateral would release a hazardous substance
- Any wall-mounted item that weighs more than 25kg
- Any item support at floor level that weighs more than 50kg

The types of building elements and situations that are most likely to pose a significant life safety hazard and need to be included in seismic assessments are given in Table A4.1 of the assessment guidelines and this refers to five classes of floor spaces that are defined in Table A4.2 of the assessment guidelines.

Seismic restraints of shelving, storage racks, and contents are not considered as part of an ISA. A thorough compliance report for contents and non-structural elements was not undertaken because it is outside the scope of an ISA engagement.

## CONCLUSIONS

The building located at *9-11 Wakefield Street, Alicetown, Lower Hutt* achieves **35% NBS (IL2)** in the transverse (E-W) direction and **50% NBS (IL2)** in the longitudinal (N-S) direction. The assessment of this building therefore indicates an overall score of **35% NBS (IL2)**, corresponding to a Grade **C (Medium Risk)** building as defined by the New Zealand Society for Earthquake Engineering (NZSEE) building grading scheme. This is **above** the threshold for earthquake prone buildings (34% NBS) as mandated in the earthquake prone building policy and therefore no seismic strengthening is legally required. However, seismic strengthening to 67 % NBS (IL2) is recommended.

## LIMITATIONS

This report summarizes the results of an initial seismic assessment of the building located at **9-11 Wakefield Street, Alicetown, Lower Hutt** based on Initial Evaluation Procedure. The purpose of this report is to determine an indicative seismic rating of the building. It shall not be relied upon for any other purpose by any other party and may not contain sufficient information for their use.

Opinions and judgments expressed herein are based on our understanding and interpretation of current regulatory standards and should not be construed as legal opinions. Where opinions or judgments are to be relied on, they should be independently verified with appropriate legal advice. Any recommendations, opinions, or guidance provided in this report are limited to technical engineering requirements and are not made under the Financial Advisers Act 2008.

We have reviewed Building Consent documentation held by the relevant BCA and we have inspected the building. However, it is not possible to inspect every aspect of the building structure, so we have had to assume at some instances that the building was constructed in accordance with the drawings on property files.

We perform the services in accordance with the standard agreement for consulting services and current professional standards. No guarantees are either expressed or implied or liability is accepted by this company or any employee or sub-consultant of this company with respect to its use by any other person. The findings of this report may be subject to revision pending the discovery of more detailed information. If you have any questions, please do not hesitate to contact the undersigned.

The assessment of the building undertaken herein is limited to consideration of the B1-Structures provision of the New Zealand Building Code (NZBC), and no assessment of the compliance requirements of other sections of the NZBC has been undertaken. No comment is made of secondary building elements including cladding or other similar items.

## ANNEX A: ENGINEERING ASSESSMENT SUMMARY REPORT

The following table provides the Assessment Summary Report for seismic assessments undertaken using The Technical Guidelines for Engineering Assessments – as referred to in Section A8.5 of the Guidelines, which meets the requirements of Section 2.5 of the EPB methodology.

| **1. Building Information** | |
|---|---|
| Building Name/ Description | - |
| Street Address | 9-11 Wakefield Street, Alicetown, Lower Hutt |
| Territorial Authority | Hutt City Council |
| No. of Storeys | Single storey |
| Area of Typical Floor (approx.) | 400 $m^2$ |
| Year of Design (approx.) | 1970 |
| NZ Standards designed to | - |
| Structural System including Foundations | In main body of the report. |
| Does the building comprise a shared structural form or shares structural elements with any other adjacent titles? | N/A |
| Key features of ground profile and identified geohazards | The underlying soil is subsoil profile category D with “High” liquefaction potential |
| Previous strengthening and/ or significant alteration | Minor alterations and addition. |
| Heritage Issues/ Status | N/A |

| **2. Assessment Information** | |
|---|---|
| Consulting Practice | Seismic Solutions Limited |
| CPEng Responsible, including:<br>• Name<br>• CPEng number<br>• A statement of suitable skills and experience in | Dr. Najif Ismail<br>CPEng # 1013406<br><br>PhD (2012), MSc, and BSc (Hons) in Civil engineering. 20+ years of professional experience in structural earthquake engineering. CPEng in |

| | |
|---|---|
| the seismic assessment of existing buildings | New Zealand and Australia. Regularly undertakes ISA/DSA/strengthening projects and attends seminars/conferences/CPD courses. Works as peer reviewer and consultant with BCAs. Registered Tier 2 RBA assessor with MBIE. Author of more than 65 technical publications and a book on this topic. Recipient of the 2013 Best PhD thesis award by TMS, and the 2020 EQC/NZSEE Ivan Skinner Award. |
| Documentation reviewed, including:<br>• date/ version of drawings/ calculations<br>• previous seismic assessments | Consent documentation retrieved from the BCA's archives<br>Geohazard information obtained from the HCC hazard map, GWRC website, and NZGD database |
| Geotechnical Report(s) | None building specific.<br>But undertaken a review of online hazard maps, existing building consent documentation, and NZG database. |
| Date(s) Building Inspected and extent of inspection | Building exterior and interior visual inspections on 31 March 2026 |
| Description of any structural testing undertaken and results summary | N/A |
| Previous Assessment Reports | N/A |
| Other Relevant Information | N/A |

| **3. Summary of Engineering Assessment Methodology and Key Parameters Used** | |
|---|---|
| Occupancy Type(s) and Importance Level | Importance Level 2 |
| Site Subsoil Class | D |
| Summary of how Part B was applied, including:<br>Key parameters such as $\mu$, Sp and F factors | $\mu$ = 2.0 , F =1.10 (Trans)<br>$\mu$ = 2.0 , F =1.50 (Long) |
| Other Relevant Information | N/A |

| **4. Assessment Outcomes** | |
|---|---|
| Assessment Status (Draft or Final) | Final |
| Assessed *%NBS* Rating | 35% NBS (IL2) |
| Seismic Grade and Relative Risk (from Table A3.1) | C (Medium Risk) |

| | | |
|---|---|---|
| Describe the Potential Critical Structural Weaknesses | N/A | |
| Does the result reflect the building's expected behaviour, or is more information/ analysis required? | Yes | |
| If the results of this ISA are being used for earthquake prone decision purposes, and elements rating <34%*NBS* have been identified: | **Engineering Statement of Structural Weaknesses and Location** | ***Mode of Failure and Physical Consequence* Statement(s)** |
| Recommendations (*Optional for EPB purposes*) | Assessment of seismic restraints for non-structural elements is not part of this assessment and can be focus of a detailed follow up assessment. | |

## ANNEX B: IEP CALCULATION SHEETS

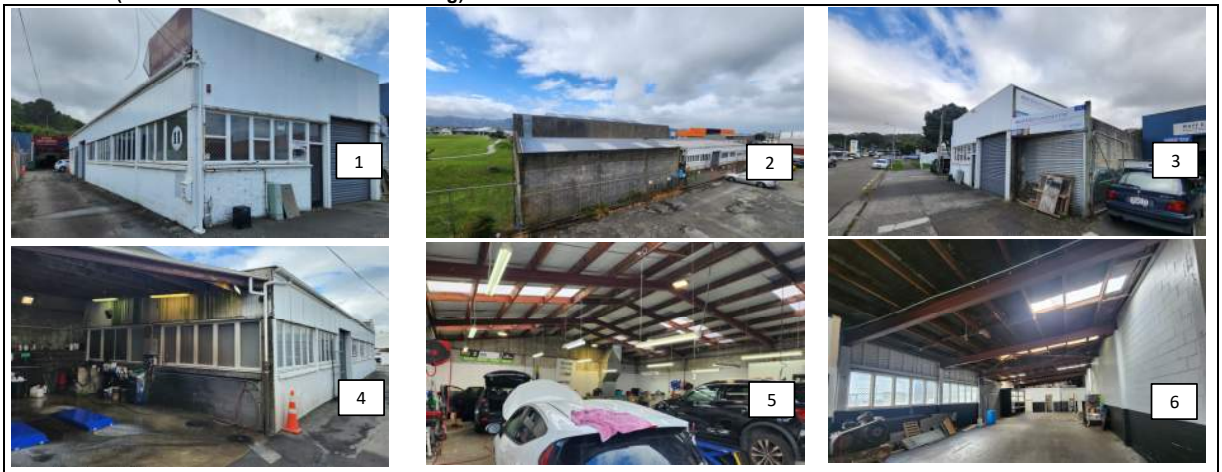
**WARNING!!** *This initial evaluation has been carried out solely as an initial seismic assessment of the building following the procedure set out in the "The Seismic Assessment of Existing Buildings" Technical Guidelines for Engineering Assessments, July 2017. This spreadsheet must be read in conjunction with the limitations set out in the accompanying report, and should not be relied on by any party for any other purpose. Detailed inspections and engineering calculations, or engineering judgements based on them, have not been undertaken, and these may lead to a different result or seismic grade.*

| | | | |
|---|---|---|---|
| **Street Number & Name:** | **9-11 Wakefield Street** | **Job No.:** | **P260449** |
| **AKA:** | | **By:** | **NI** |
| **Name of building:** | | **Date:** | **15/04/2026** |
| **City:** | **Lower Hutt** | **Revision No.:** | |

## Table IEP-1 Initial Evaluation Procedure Step 1

### Step 1 - General Information

**1.1 Photos (attach sufficient to describe building)**




NOTE: THERE ARE MORE PHOTOS ON PAGE 1a ATTACHED

**1.2 Sketches (plans etc, show items of interest)**


NOTE: THERE ARE MORE SKETCHES ON PAGE 1a ATTACHED

**1.3 List relevant features (Note: only 10 lines of text will print in this box. If further text required use Page 1a)**

Buildings built circa 1970 mainly single storey industrial structure. Steel portals in transverse direction and RCm boundary walls. In longitudinal directions infilled RC frame with ifnfill being partially grouted RCM walls. Building is founded on subsoil type D and has a close proximity (app 300m) to the Wellington fault line. The foundation system is shallow footings with RC slab intergal to foundations.

**1.4 Note information sources** Tick as appropriate

| | | | |
|---|---|---|---|
| **Visual Inspection of Exterior** | ☑ | **Specifications** | ☐ |
| **Visual Inspection of Interior** | ☑ | **Geotechnical Reports** | ☐ |
| **Drawings (note type)** | ☑ | **Other (list)** | ☐ |

Historical drawing from 1939

| | | | |
|---|---|---|---|
| **Street Number & Name:** | **9-11 Wakefield Street** | **Job No.:** | **P260449** |
| **AKA:** | | **By:** | **NI** |
| **Name of building:** | | **Date:** | **15/04/2026** |
| **City:** | **Lower Hutt** | **Revision No.:** | |

## Table IEP-2 Initial Evaluation Procedure Step 2

### Step 2 - Determination of *(%NBS)*$_b$

(Baseline *(%NBS)* for particular building - refer Section B5 )

**2.1 Determine nominal *(%NBS)* = *(%NBS)*$_{nom}$**

| | Longitudinal | Transverse |
|---|---|---|
| **a) Building Strengthening Data** | | |
| Tick if building is known to have been strengthened in this direction | ☐ | ☐ |
| If strengthened, enter percentage of code the building has been strengthened to | N/A | N/A |
| **b) Year of Design/Strengthening, Building Type and Seismic Zone** | | |
| Pre 1935 | ○ | ○ |
| 1935-1965 | ○ | ○ |
| 1965-1976 | ● | ● |
| 1976-1984 | ○ | ○ |
| 1984-1992 | ○ | ○ |
| 1992-2004 | ○ | ○ |
| 2004-2011 | ○ | ○ |
| Post Aug 2011 | ○ | ○ |
| **Building Type:** | Others | Others |
| **Seismic Zone:** | Zone A | Zone A |
| **c) Soil Type** | | |
| **From NZS1170.5:2004, Cl 3.1.3 :** | D Soft Soil | D Soft Soil |
| **From NZS4203:1992, Cl 4.6.2.2 : (for 1992 to 2004 and only if known)** | **Not applicable** | **Not applicable** |
| **d) Estimate Period, *T*** | | |
| *Comment:* | $h_n$ = 5.425 | 5.425 m |
| Steel portals in trans and infill RC frame in long | $A_c$ = 4.31 | 1.00 m$^2$ |
| Moment Resisting Concrete Frames: $T = \max\{0.09h_n^{0.75}, 0.4\}$ | ○ | ○ |
| Moment Resisting Steel Frames: $T = \max\{0.14h_n^{0.75}, 0.4\}$ | ○ | ○ |
| Eccentrically Braced Steel Frames: $T = \max\{0.08h_n^{0.75}, 0.4\}$ | ○ | ○ |
| All Other Frame Structures: $T = \max\{0.06h_n^{0.75}, 0.4\}$ | ● | ● |
| Concrete Shear Walls $T = \max\{0.09h_n^{0.75}/A_c^{0.5}, 0.4\}$ | ○ | ○ |
| Masonry Shear Walls: $T \leq 0.4$sec | ○ | ○ |
| User Defined (input Period): | ○ | ○ |
| *Where $h_n$ = height in metres from the base of the structure to the uppermost seismic weight or mass.* | **T:** 0.40 | 0.40 |
| **e) Factor A:** Strengthening factor determined using result from (a) above (set to 1.0 if not strengthened) | **Factor A:** 1.00 | 1.00 |
| **f) Factor B:** Determined from NZSEE Guidelines Figure 3A.1 using results (a) to (e) above | **Factor B:** 0.06 | 0.06 |
| **g) Factor C:** For reinforced concrete buildings designed between 1976-84 Factor C = 1.2, otherwise take as 1.0. | **Factor C:** 1.00 | 1.00 |
| **h) Factor D:** For buildings designed prior to 1935 Factor D = 0.8 except for Wellington and Napier (1931-1935) where Factor D may be taken as 1.0, otherwise take as 1.0. | **Factor D:** 1.00 | 1.00 |
| ***(%NBS)*$_{nom}$ = AxBxCxD** | ***(%NBS)*$_{nom}$** 6% | 6% |

**WARNING!!** *This initial evaluation has been carried out solely as an initial seismic assessment of the building following the procedure set out in "The Seismic Assessment of Existing Buildings" Technical Guidelines for Engineering Assessments, July 2017. This spreadsheet must be read in conjunction with the limitations set out in the accompanying report, and should not be relied on by any party for any other purpose. Detailed inspections and engineering calculations, or engineering judgements based on them, have not been undertaken, and these may lead to a different result or seismic grade.*

| | | | |
|---|---|---|---|
| Street Number & Name: | 9-11 Wakefield Street | Job No.: | P260449 |
| AKA: | | By: | NI |
| Name of building: | | Date: | 15/04/2026 |
| City: | Lower Hutt | Revision No.: | |

## Table IEP-2 Initial Evaluation Procedure Step 2 continued

### 2.2 Near Fault Scaling Factor, Factor E

If $T \leq 1.5$sec, Factor E = 1

| | | Longitudinal | Transverse |
|---|---|---|---|
| a) Near Fault Factor, *N(T,D)* (from NZS1170.5:2004, Cl 3.1.6) | N(T,D): | 1 | 1 |
| b) Factor E = 1/N(T,D) | Factor E: | 1.00 | 1.00 |

### 2.3 Hazard Scaling Factor, Factor F

a) Hazard Factor, *Z*, for site

Location: Hutt Valley-south of Taita Gorge ▼ Refer right for user-defined locations

| | | |
|---|---|---|
| $Z$ = | 0.4 | (from NZS1170.5:2004, Table 3.3) |
| $Z_{1992}$ = | 1.2 | (NZS4203:1992 Zone Factor from accompanying Figure 3.5(b)) |
| $Z_{2004}$ = | 0.4 | (from NZS1170.5:2004, Table 3.3) |

b) Factor F

| | | |
|---|---|---|
| For pre 1992 | = | $1/Z$ |
| For 1992-2011 | = | $Z_{1992}/Z$ |
| For post 2011 | = | $Z_{2004}/Z$ |

| | Longitudinal | Transverse |
|---|---|---|
| Factor F: | 2.50 | 2.50 |

### 2.4 Return Period Scaling Factor, Factor G

a) Design Importance Level, I

(Set to 1 if not known. For buildings designed prior to 1965 and known to be designed as a public building set to 1.25. For buildings designed 1965-1976 and known to be designed as a public building set to 1.33 for Zone A or 1.2 for Zone B. For 1976-1984 set I value.)

| | Longitudinal | Transverse |
|---|---|---|
| I = | 1 | 1 |

b) Design Risk Factor, $R_o$ (set to 1.0 if other than 1976-2004, or not known)

| | Longitudinal | Transverse |
|---|---|---|
| $R_o$ = | 1 | 1 |

c) Return Period Factor, R (from NZS1170.0:2004 Building Importance Level)

Choose Importance Level: ○ 1 ● 2 ○ 3 ○ 4 (Longitudinal) ○ 1 ● 2 ○ 3 ○ 4 (Transverse)

| | Longitudinal | Transverse |
|---|---|---|
| R = | 1.0 | 1.0 |

d) Factor G = $IR_o/R$

| | Longitudinal | Transverse |
|---|---|---|
| Factor G: | 1.00 | 1.00 |

### 2.5 Ductility Scaling Factor, Factor H

a) Available Displacement Ductility Within Existing Structure

*Comment:*

| | Longitudinal | Transverse |
|---|---|---|
| $\mu$ = | 2.00 | 2.00 |

b) Factor H

| | | $k_\mu$ (Longitudinal) | $k_\mu$ (Transverse) |
|---|---|---|---|
| For pre 1976 (maximum of 2) | = | 1.57 | 1.57 |
| For 1976 onwards | = | 1 | 1 |
| Factor H: | | 1.57 | 1.57 |

(where $k_\mu$ is NZS1170.5:2004 Inelastic Spectrum Scaling Factor, from accompanying Table 3.3)

### 2.6 Structural Performance Scaling Factor, Factor I

a) Structural Performance Factor, $S_p$ (from accompanying Figure 3.4)

Tick if light timber-framed construction in this direction ☐ (Longitudinal) ☐ (Transverse)

| | Longitudinal | Transverse |
|---|---|---|
| $S_p$ = | 0.70 | 0.70 |

b) Structural Performance Scaling Factor = $1/S_p$

| | Longitudinal | Transverse |
|---|---|---|
| Factor I: | 1.43 | 1.43 |

Note Factor B values for 1992 to 2004 have been multiplied by 0.67 to account for Sp in this period

### 2.7 Baseline *%NBS* for Building, $(\%NBS)_b$

(equals $(\%NBS)_{nom}$ x E x F x G x H x I )

| | Longitudinal | Transverse |
|---|---|---|
| | 34% | 34% |

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|---|---|---|---|
| Street Number & Name: | 9-11 Wakefield Street | Job No.: | P260449 |
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| Name of building: | | Date: | 15/04/2026 |
| City: | Lower Hutt | Revision No.: | |

## Table IEP-3 Initial Evaluation Procedure Step 3

**Step 3 - Assessment of Performance Achievement Ratio (PAR)**
*(Refer Appendix B - Section B3.2)*

### a) Longitudinal Direction

**potential CSWs** — **Effect on Structural Performance** (Choose a value - Do not interpolate) — **Factors**

**3.1 Plan Irregularity**

*Effect on Structural Performance* ○ *Severe* ○ *Significant* ● *Insignificant* — **Factor A** 1.0

Building assessed is rectangular in shape and no critical planar regularity was observed

**3.2 Vertical Irregularity**

*Effect on Structural Performance* ○ *Severe* ○ *Significant* ● *Insignificant* — **Factor B** 1.0

Single storey building with no vertical irregularity that might affect the assessment outcome.

**3.3 Short Columns**

*Effect on Structural Performance* ○ *Severe* ○ *Significant* ● *Insignificant* — **Factor C** 1.0

Although there are openings found in the longitudinal direction, flanged column will provide in-plane shear resistance to avoid short column effect.

**3.4 Pounding Potential**

***(Estimate D1 and D2 and set D = the lower of the two, or 1.0 if no potential for pounding, or consequences are considered to be minimal)***

**a) Factor D1: - Pounding Effect**

***Note:***
***Values given assume the building has a frame structure. For stiff buildings (eg shear walls), the effect of pounding may be reduced by taking the coefficient to the right of the value applicable to frame buildings.***

**Factor D1 For Longitudinal Direction:** 1.0

| *Table for Selection of Factor D1* | Severe | Significant | Insignificant |
|---|---|---|---|
| *Separation* | 0<Sep<.005H | .005<Sep<.01H | Sep>.01H |
| *Alignment of Floors within 20% of Storey Height* | ○ 1 | ○ 1 | ● 1 |
| *Alignment of Floors not within 20% of Storey Height* | ○ 0.4 | ○ 0.7 | ○ 0.8 |

No possible pounding effect expected due to variation in storey heights.

**b) Factor D2: - Height Difference Effect**

**Factor D2 For Longitudinal Direction:** 1.0

| *Table for Selection of Factor D2* | Severe | Significant | Insignificant |
|---|---|---|---|
| | 0<Sep<.005H | .005<Sep<.01H | Sep>.01H |
| *Height Difference > 4 Storeys* | ○ 0.4 | ○ 0.7 | ○ 1 |
| *Height Difference 2 to 4 Storeys* | ○ 0.7 | ○ 0.9 | ○ 1 |
| *Height Difference < 2 Storeys* | ○ 1 | ○ 1 | ● 1 |

The front office space is double storeyed but there is not much possibility for a pounding effect due to that.

**Factor D** 1.0

**3.5 Site Characteristics -** *Stability, landslide threat, liquefaction etc as it affects the structural performance from a life-safety perspective*

*Effect on Structural Performance* ○ *Severe* ○ *Significant* ● *Insignificant* — **Factor E** 1.0

Building located at a high liqefaction risk zone as per GWRC liquefaction potential map but structural impact on the building is unlikley.

**3.6 Other Factors -** *for allowance of all other relevant characterstics of the building* — **Factor F** 1.5

**For ≤ 3 storeys - Maximum value 2.5**
**otherwise - Maximum value 1.5.**
**No minimum.**

**Record rationale for choice of Factor F:**

plenty of wall length and single storey

**3.7 Performance Achievement Ratio (PAR)**
(equals **A x B x C x D x E x F** )

**PAR**

**Longitudinal** **1.50**

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## Table IEP-3 Initial Evaluation Procedure Step 3

**Step 3 - Assessment of Performance Achievement Ratio (PAR)**
*(Refer Appendix B - Section B3.2)*

**b) Transverse Direction**

**potential CSWs** — **Effect on Structural Performance** (Choose a value - Do not interpolate) — **Factors**

**3.1 Plan Irregularity**

*Effect on Structural Performance* ○ Severe ○ Significant ● Insignificant — **Factor A** 1.0

There is a slight planar irregularity. However, looking at the orientation and placing of concrete infill walls, there is not much difference in the point of centre of rigidity and centre of mass. Hence considered insignificant.

**3.2 Vertical Irregularity**

*Effect on Structural Performance* ○ Severe ○ Significant ● Insignificant — **Factor B** 1.0

Single storey building that do not have any critical vertical irregularity to affect the structural perfromance.

**3.3 Short Columns**

*Effect on Structural Performance* ○ Severe ○ Significant ● Insignificant — **Factor C** 1.0

Some of the opening were infilled with concrete masonry. No possible short column effect observed because of the presence of openings.

**3.4 Pounding Potential**

***(Estimate D1 and D2 and set D = the lower of the two, or 1.0 if no potential for pounding, or consequences are considered to be minimal)***

**a) Factor D1: - Pounding Effect**

***Note:***
***Values given assume the building has a frame structure. For stiff buildings (eg shear walls), the effect of pounding may be reduced by taking the coefficient to the right of the value applicable to frame buildings.***

**Factor D1 For Transverse Direction:** 1.0

| *Table for Selection of Factor D1* | Severe | Significant | Insignificant |
|---|---|---|---|
| *Separation* | 0<Sep<.005H | .005<Sep<.01H | Sep>.01H |
| *Alignment of Floors within 20% of Storey Height* | ○ 1 | ○ 1 | ● 1 |
| *Alignment of Floors not within 20% of Storey Height* | ○ 0.4 | ○ 0.7 | ○ 0.8 |

Building shares structural elements with adjacent property but no pounding effect expected.

**b) Factor D2: - Height Difference Effect**

**Factor D2 For Transverse Direction:** 1.0

| *Table for Selection of Factor D2* | Severe | Significant | Insignificant |
|---|---|---|---|
| | 0<Sep<.005H | .005<Sep<.01H | Sep>.01H |
| *Height Difference > 4 Storeys* | ○ 0.4 | ○ 0.7 | ○ 1 |
| *Height Difference 2 to 4 Storeys* | ○ 0.7 | ○ 0.9 | ○ 1 |
| *Height Difference < 2 Storeys* | ○ 1 | ○ 1 | ● 1 |

Adjacent property is of same height and shares structural elements with assessed building but no pounding effect expected.

**Factor D** 1.0

**3.5 Site Characteristics -** *Stability, landslide threat, liquefaction etc as it affects the structural performance from a life-safety perspective*

*Effect on Structural Performance* ○ Severe ○ Significant ● Insignificant — **Factor E** 1.0

Same as longitudinal.

**3.6 Other Factors -** *for allowance of all other relevant characterstics of the building*

**For ≤ 3 storeys - Maximum value 2.5**
**otherwise - Maximum value 1.5.**
**No minimum.**

**Factor F** 1.10

**Record rationale for choice of Factor F:**

In transverse direction steel portals with concrete encased columns. At some locations the steel corrosion was substantial.

**3.7 Performance Achievement Ratio (PAR)**
(equals **A x B x C x D x E x F** )

**PAR**

**Transverse** **1.10**

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## Table IEP-4 Initial Evaluation Procedure Steps 4, 5, 6 and 7

### Step 4 - Percentage of New Building Standard *(%NBS)*

| | | Longitudinal | Transverse |
|---|---|---|---|
| 4.1 | **Assessed Baseline *%NBS* *(%NBS)*$_b$** (from Table IEP - 1) | 34% | 34% |
| 4.2 | **Performance Achievement Ratio (PAR)** (from Table IEP - 2) | 1.50 | 1.10 |
| 4.3 | **PAR x Baseline *(%NBS)*$_b$** | 50% | 35% |
| 4.4 | **Percentage New Building Standard *(%NBS)* - Seismic Rating** ( Use lower of two values from Step 4.3) | | 35% |

**Step 5 - Is *%NBS* < 34?** NO

**Step 6 - Potentially Earthquake Risk (is *%NBS* < 67)?** YES

**Step 7 - Provisional Grading for Seismic Risk based on IEP**

**Seismic Grade** C

**Additional Comments (items of note affecting IEP based seismic rating)**

Although no signs fo apparent damage was found to the structure, following points were noted.
As the IEP indicates the building as an EPB, a detailed seismic assessment is recommended to identify and address critical structural weaknesses of the building. The assessment shall also consider the effect of shared structural system with the adjacent title.
The building does not have a diaphragm to transfer lateral loads to LLRS and hence a truss diaphragm is advised to be added to ensure lateral loads are safely transferred to the LLRS.
It has been observed that part of the concrete beam in south elevation is likley discontinous and it is advised to ensure LRS continuity.
Some openings were infilled as part of the alterations done and reinrocement in walls and block infills to be confirmed prior to strengthening.

### Relationship between Grade and *%NBS*:

| Grade: | A+ | A | B | C | D | E |
|---|---|---|---|---|---|---|
| *%NBS*: | > 100 | 100 to 80 | 79 to 67 | 66 to 34 | < 34 to 20 | < 20 |

| | | | |
|---|---|---|---|
| Street Number & Name: | 9-11 Wakefield Street | Job No.: | P260449 |
| AKA: | | By: | NI |
| Name of building: | | Date: | 15/04/2026 |
| City: | Lower Hutt | Revision No.: | |

## Table IEP-5 Initial Evaluation Procedure Step 8

**Step 8 - Identification of potential Severe Structural Weaknesses (SSWs) that could result in significant risk to a significant number of occupants**

| | | |
|---|---|---|
| 8.1 | Number of storeys above ground level | 1 |
| 8.2 | Presence of heavy concrete floors and/or concrete roof? (Y/N) | N |

### Potential Severe Structural Weaknesses (SSWs):

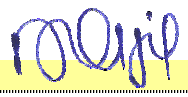
Note: Options that are greyed out are not applicable and need not be considered.

**Occupancy not considered to be significant - no further consideration required**

**Risk not considered to be significant - no further consideration required**

The following potential Severe Structural Weaknesses (SSWs) have been identified in the building that could result in significant risk to a significant number of occupants:

1. None identified
2. Weak or soft storey (except top storey)
3. Brittle columns and/or beam-column joints the deformations of which are not constrained by other structural elements
4. Flat slab buildings with lateral capacity reliant on low ductility slab-to-column connections
5. No identifiable connection between primary structure and diaphragms
6. Ledge and gap stairs

**IEP Assessment Confirmed by**  **Signature**

**Najif Ismail** **Name**

**1013406** **CPEng. No**

| | | | |
|---|---|---|---|
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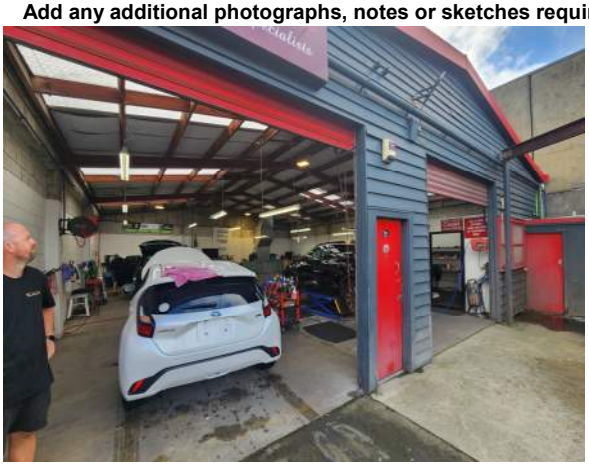
| City: | Lower Hutt | Revision No.: | |

## Table IEP-1a Additional Photos and Sketches

**Add any additional photographs, notes or sketches required below:**



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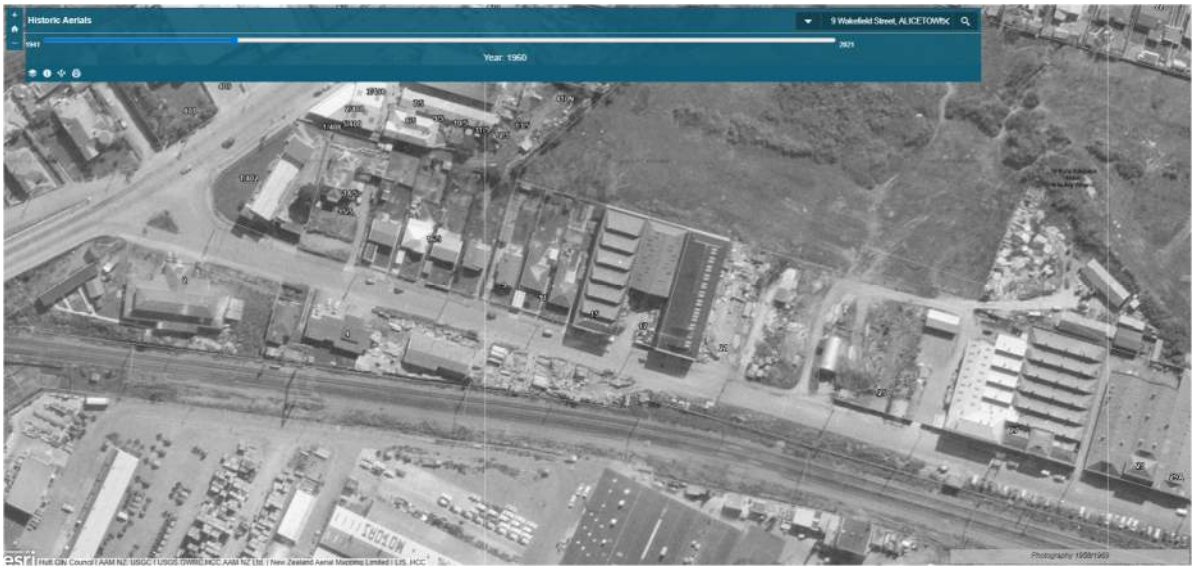
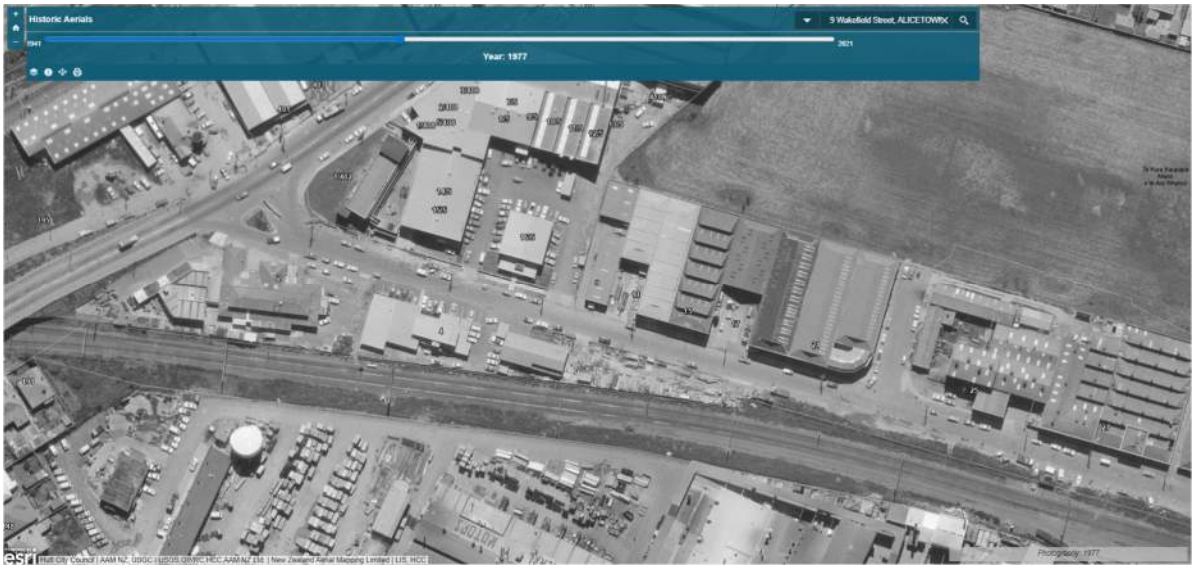
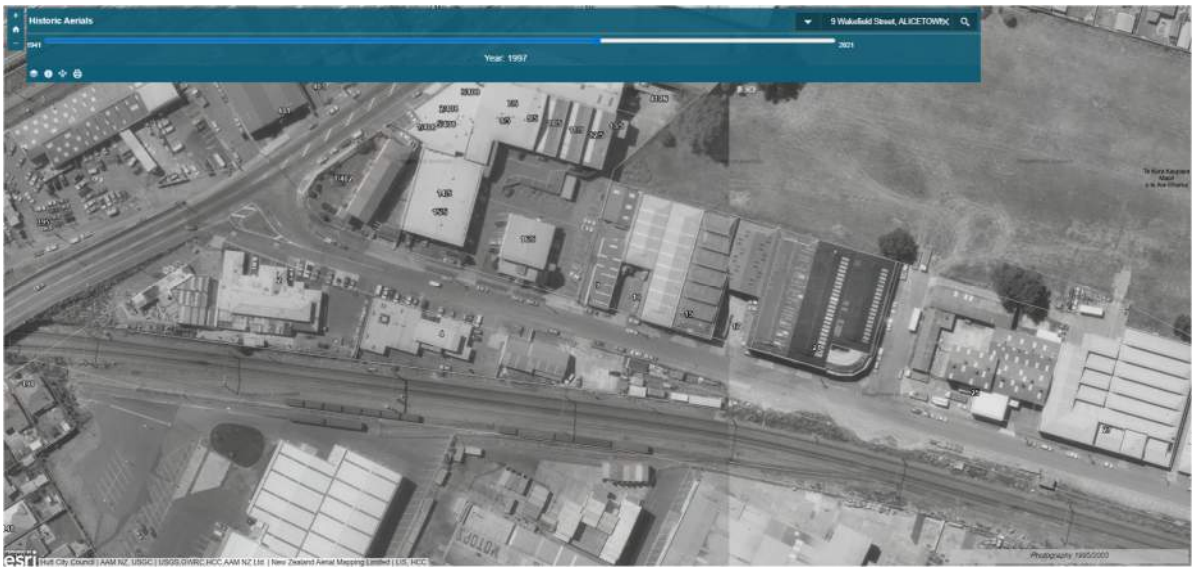
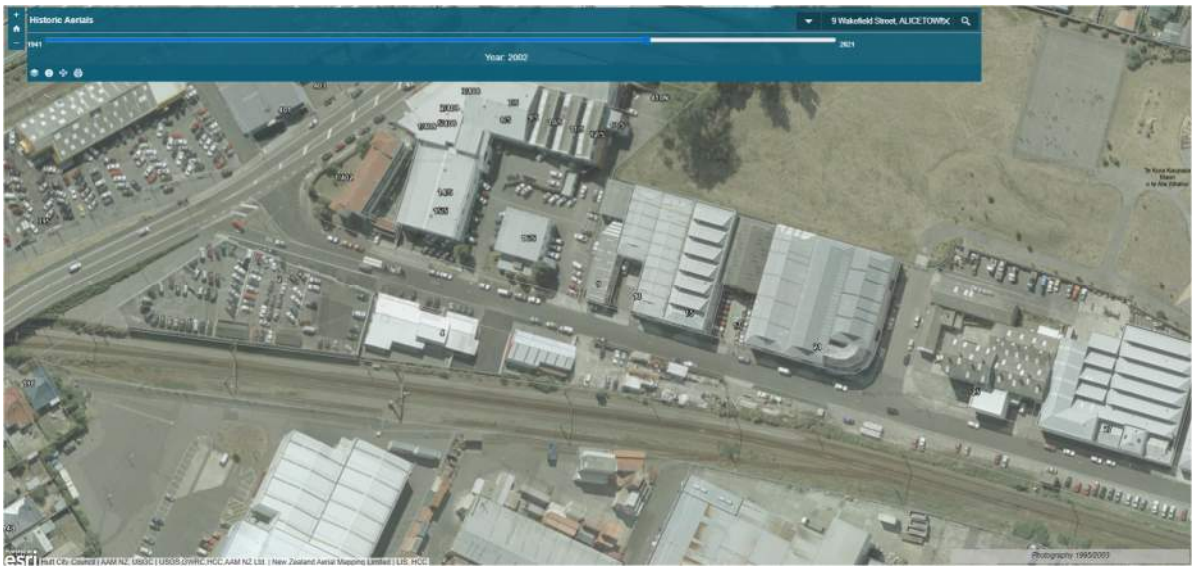
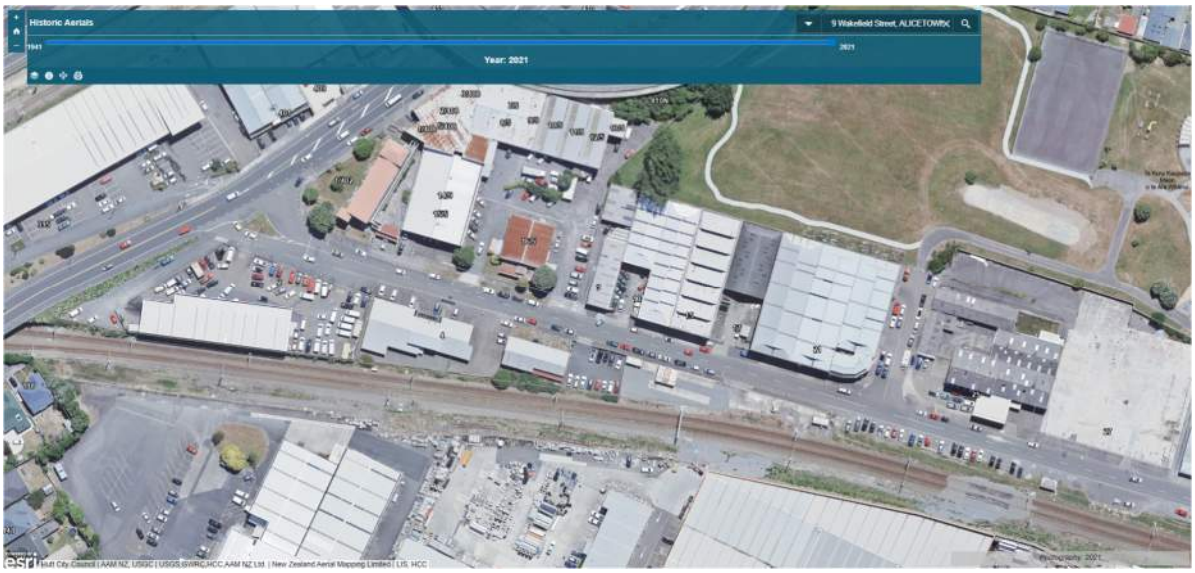
Historic Aerials
9 Wakefield Street, ALICETOWN
1941
2021
Year: 1941
Hutt City Council | AAM NZ, USGC | USGS,GWRC,HCC,AAM NZ Ltd. | New Zealand Aerial Mapping Limited | LIS, HCC
Photography: 1941


Historic Aerials
9 Wakefield Street, ALICETOWN
1941
2021
Year: 1960
Photography 1958/1969


Historic Aerials
9 Wakefield Street, ALICETOWN
1941
2021
Year: 1977
Photography: 1977


Historic Aerials
9 Wakefield Street, ALICETOWN
1941
2021
Year: 1997
Hutt City Council | AAM NZ, USGC | USGS,GWRC,HCC,AAM NZ Ltd | New Zealand Aerial Mapping Limited | LIS, HCC
Photography 1995/2003


Historic Aerials
9 Wakefield Street, ALICETOWN
1941
2021
Year: 2002
Hutt City Council | AAM NZ, USGC | USGS,GWRC,HCC,AAM NZ Ltd | New Zealand Aerial Mapping Limited | LIS, HCC
Photography 1995/2003


Historic Aerials
9 Wakefield Street, ALICETOWN
1941
2021
Year: 2021
Hutt City Council | AAM NZ, USGC | USGS,GWRC,HCC,AAM NZ Ltd | New Zealand Aerial Mapping Limited | LIS, HCC

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