



CAPABILITY PROFILE

SEISMIC ASSESSMENT PROCEDURES

INTRODUCTION

Currently in New Zealand buildings are being assessed in accordance with The Building Act 2004 and an Initial Evaluation Procedure as set out in the New Zealand Society Earthquake Engineering report of 2006.

The Initial Evaluation Procedure (IEP) is a qualitative method based upon the dates when the building was constructed and therefore the structural building codes at the time, together with the type of structure, the materials used, and its positioning within New Zealand and proximity to seismic fault lines. Unfortunately, the procedure is not definitive enough to be relied upon, and often scores buildings above or below their true performance rating, and is therefore indicative only.

The IEP measures performance of an existing structure's resistance to earthquakes by comparing it in percentage terms to the resistance required if a new building of a similar structure were to be built on the same site. This is known as %NBS or New Building Standard. The New Zealand Society for Earthquake Engineering's report of 2006 sets benchmark levels of performance for existing structures of 33% and 67%. Below 33% the building is considered as Earthquake Prone, between 33% and 67% it is considered an Earthquake Risk, and above 67% is deemed acceptable and does not require any further action legally.

If the structure falls below either level the local authority has the right under the Building Act to instruct the owner to prove the building is not Earthquake Prone, strengthen the building, or demolish the building. If the building is to be strengthened it is the local authority's right to set the level required for compliance, either >33% or >67%.

An IEP does not require a detailed analysis and hence the conclusions of the IEP may be incorrect, and the building may subsequently be proven not to be Earthquake Prone or an Earthquake Risk.

Dependent upon the findings of the IEP, a Detailed Seismic Assessment (DSE) may be required to more accurately determine the building's % NBS.

Dependent upon the building's original construction, we often find the % NBS score to be quite inaccurate when carrying out Detailed Seismic Assessments.

The Building Act 2004 – Legislative Basis for the Earthquake Prone Building Policy

The sections of the Building Act that refer to earthquake-prone buildings (EPBs) are in subpart 6 of Part 2 of the Act. Section 122 and its associated regulations define an EPB.

Sections 124 to 130 provide power for Territorial Authorities to act on EPBs and set out how this action is to be taken.

Sections 131 and 132 require TAs to establish EPB policies and specify how the policies are to be established, what they are to include and when they are to be reviewed.

CAPABILITY

Structural Engineers NZ Ltd's expertise in this field is as follows:

- We have an experienced Chartered Professional Engineer (CPEng) who is able to carry out both IEP & DSE assessment of buildings, commercial & industrial, accurately and objectively.
- We have experience of analysing structures using the most current and sophisticated analysis techniques.
- Our reports are written clearly and concisely, and contain an initial Executive Summary which will describe the building's performance in plain English despite the remainder of the report often being highly technical.
- We are experienced in peer-reviewing documentation provided by other engineers, Territorial Authorities, and if necessary, we can provide a CPEng engineer experienced in attending Court as an Expert Witness.

RANGE OF SERVICES

Initial Evaluation Procedures

Our reports are presented in a clear and concise manner:

| | | | | | |
|--|---|----------------|---------------------|-----------------|-------------------|
|  Structural Engineers NZ Ltd (+64) 98899350 / (+64) 21540531 <small>E. Dowdall B. Jones C. King M. H. Wilson C. P. King G. J. Simpson J. Dowdall</small> | Project SEISMIC ASSESSMENT OF 26A MIRO STREET, TAUPO | | Job Ref. 123456 | | |
| | Section INITIAL EVALUATION PROCEDURE | | Sheet no./rev. 1 | | |
| Calc. by EHD | Date SEPT 2012 | CHK'd by MD | Date SEPT 2012 | App'd by EHD | Date SEPT 2012 |

SEISMIC ASSESSMENT OF 26A MIRO STREET, TAUPO INITIAL EVALUATION PROCEDURE



1 Introduction

Currently in New Zealand buildings are being assessed in accordance with The Building Act 2004 and an Initial Evaluation Procedure as set out in the New Zealand Society Earthquake Engineering report of 2006.

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The IEP measures performance of an existing structure's resistance to earthquakes by comparing it in percentage terms to the resistance required if a new building of a similar structure were to be built on the same site. This is known as %NBS or New Building Standard. The New Zealand Society for Earthquake Engineering's report of 2006 sets benchmark levels of performance for existing structures of 33% and 67%. Below 33% the building is considered as Earthquake Prone, between 33% and 67% it is considered an Earthquake Risk, and above 67% it is deemed acceptable and does not require any further action legally.

They will contain all of the information required by the local Council (Territorial Authority).

They will give clear & concise advice on what to do next. This advice will take into account the owner's legal responsibility, and will break down costings for our services, often in a staged approach to ensure that these costs are kept to a minimum.

Generally, the cost of preparing such a report would be between \$1000 – \$2000, depending upon the size & complexity, and location, of the building.

We cover the entire Central North Island, although we can travel to anywhere in New Zealand at your request.

KEY BENEFITS

We strongly believe in the strength of client liaison & relationships.

We strive to achieve objective reports (which are legal documents) which provide clear, no-nonsense guidelines, and at each step of the process we will discuss our findings with our clients in an open and transparent manner.

Client confidentiality is paramount to us.

Detailed Seismic Assessments

Our reports are presented in a clear and concise manner:

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|---|--|----------------|---------------------|-----------------|-------------------|
|  Structural Engineers NZ Ltd (+64) 98899350 / (+64) 21540531 <small>E. Dowdall B. Jones C. King M. H. Wilson C. P. King G. J. Simpson J. Dowdall</small> | Project BARRONS BUILDING, 44 MANUKA STREET, TAUPO | | Job Ref. 123456 | | |
| | Section STRUCTURAL CALCULATIONS / DESIGN REPORT | | Sheet no./rev. 1 | | |
| Calc. by EHD | Date SEPT 2012 | CHK'd by MD | Date SEPT 2012 | App'd by EHD | Date SEPT 2012 |

1 Introduction

1.1 Outline

D&C have been requested by St John's Area Committee to investigate the feasibility of their occupying the above building, with the intention that it be used to provide medical facilities. Such buildings are required to be classified as Importance Level IV i.e. they are to retain post-disaster capabilities, in accordance with AS/NZS 1170.0:2002.

In accordance with the document entitled St John National Earthquake Assessment for Detailed Engineering Evaluations (DEE) the building is to be evaluated on the basis of its %NBS rating, i.e. the % by which the building fails to meet the requirements of a new building designed to current New Zealand codes and standards. Further explanation of this is given under Section 2 – Executive Summary.

1.2 Initial Information

We have obtained such information that exists on the Taupo District Council's property file – a series of eight drawings entitled Fulton Hogan Refurbishments To Existing Building 44 Manuka Street Taupo, and numbered sheets 1 - 8. These drawings contain very little detail regarding the construction of the original building.

D&C have undertaken several surveys of the existing building, which have included taking photographs, site dimensions, and the inspection of existing steel members. Of these surveys, one was partly invasive, sufficient to ascertain the main steelwork member sizes. A level survey the interior of the building was undertaken. Full access to all areas was not available, and these structural calculations and report are based on certain assumptions. These assumptions are based on engineering judgement, and may not be entirely correct. Where the ramifications of these assumptions have significance, is outlined in the following report.

These calculations focus upon the main part of the building, which is a steel portal-frame, constructed circa 1974.



LOCATION

Again, they will contain all of the information required by the local Council (Territorial Authority).

Dependent upon the building owner's instructions, they can contain details of strengthening procedures and indicative costs, to bring the building up to a certain %NBS. This can be 70%, 80% or even 100% NBS.

We use sophisticated analysis software combined with over 40 year's experience in structural engineering design of all types of commercial & residential buildings. Our clients can be assured of the best possible service, which is both technically and legally correct, and cost-effective.

We can arrange to visit you to discuss your requirements, program, costings etc. We have carried out work for all types of buildings, be they steel-framed, reinforced masonry, reinforced concrete, or timber. Often buildings are of hybrid construction (one or more of the above) and we specialise in these types of analyses.

For further information regarding SENZ's capabilities, and how we can help you, please contact Ted Dowdall at ted@structural-engs.co.nz or tel: 09 88 99 350.