STEP ONE: Login and Contributor Information

Contributor*

- Building owner
- Engineering consultant
- Contractor
- City council
- Other (Please specify in the following box)

Name*

Address

Email*

Contact number*

User name*

Password*

Retype password*

STEP TWO: General Information of the Retrofitted Building

A. City where the building is located*

Akaroa	Foxton/Foxton Beach	Mangakino	Otaki	Springs Junction	Waimate
Alexandra	Franz Josef	Marton	Otira	St Arnaud	Wainuiomata
Arrowtown	Geraldine	Masterton	Otorohanga	Stratford	Waiouru
Arthurs Pass	Gisborne	Matamata	Paeroa	Taihape	Waipawa
Ashburton	Gore	Mataura	Pahiatua	Takaka	Waipukurau
Auckland	Greymouth	Milford Sound	Paihia/Russell	Taumarunui	Wairoa
Balclutha	Hamilton	Morrinsville	Palmerston	Taupo	Waitara
Blenheim	Hanmer Springs	Mosgiel	Palmerston North	Tauranga	Waiuku
Bluff	Harihari	Motueka	Paraparaumu	Te Anau	Wanaka
Bulls	Hastings	Mount Maunganui	Patea	Te Aroha	Wanganui
Cambridge	Hawera	Mt Cook	Picton	Te Awamutu	Ward
Cheviot	Hokitika	Murchison	Porirua	Te Kuiti	Warkworth
Christchurch	Huntly	Murupara	Pukekohe	Te Puke	Wellington
Cromwell	Hutt Valley–south of Taita Gorge	Napier	Putaruru	Temuka	Wellington CBD (north of Basin Reserve)
Dannevirke	Inglewood	Nelson	Queenstown	Thames	Westport
Darfield	Invercargill	New Plymouth	Raetihi	Timaru	Whakatane
Dargaville	Kaikohe	Ngaruawahia	Rangiora	Tokoroa	Whangarei
Dunedin	Kaikoura	Oamaru	Reefton	Turangi	Winton
Eastbourne–Point Howard	Kaitaia	Oban	Riverton	Twizel	Woodville
Fairlie	Kawerau	Ohakune	Rotorua	Upper Hutt	
Feilding	Levin	Opotiki	Ruatoria	Waihi	
Fox Glacier	Manakau City	Opunake	Seddon	Waikanae	

B. Has the building be categorized as a Heritage Building*

- Not sure
- No
- Yes

If special consideration was taken for preserving historic features of the building, it might be assumed as a Heritage Building.

C. Approximate year of original design and construction*

- Not sure
- Pre 1935
- 1935-1964
- 1965-1969
- 1970-1975
- 1976-1979
- 1980-1991
- 1992-2003
- 2004 and thereafter

D. Occupancy and social function classification*

- Residential occupancy class includes house and condominium, apartment, mobile home, hotel, motel, dormitory, and convalescent hospital.
- Commercial occupancy class includes retail store, shopping mall, warehouse, service station, shop, office, bank, hospital, medical office, clinic, restaurant, bar, cinema, theatre, and garage.
- Industrial occupancy class includes heavy fabrication and assembly, light fabrication assembly, food and drug processing, chemicals processing, metal and mineral processing, high technology, petroleum, and construction office.
- Religion and non-profit occupancy class includes church, and mosque.
- Governmental occupancy class includes general services office, police station, and fire station.
- Institutional and Educational occupancy class includes school, college, and university.

- Not sure
- Residential
- Commercial
- Industrial
- Religion and non-profit
- Governmental
- Institutional and Educational
- Other (please specify in the following box)

E. Building importance level*

- Not sure
- Importance level 1 (Low)
- Importance level 2 (Ordinary)
- Importance level 3 (High)
- Importance level 4 (Very high)
- Importance level 5 (Exceptional)

Building importance level is based upon five importance categories described in the AS/NZS 1170.0:2002 as follow:

Importance level	Comment
1	Structures presenting a low degree of hazards to life and other property
2	Normal structures and structures not in other importance levels
3	Structures that as a whole may contain people in crowds or contents of high value to the community or pose risks to people in crowds
4	Structures with special post-disaster functions
5	Special structures

F. Estimated building Total Area (m^2)*

Total area includes basements and added spaces areas.

G. Estimated building total height (m)*

Total height is the height of building from the ground level.

- 3 m
- 4 m
- 5 m
- .....
- 120 m

H. Building model type before rehabilitation*

☐ With ☐ diaphragm, and ☐ foundation

- **Not sure**
- **Wood**
  - Wood light frame
  - Multi story, multi-unit residential wood frame
  - Commercial and industrial wood frame
- **Steel**
  - Steel moment-resisting frame
  - Steel moment-resisting frame with concrete shear walls
  - Steel concentrically braced frame
  - Steel eccentrically braced frame
  - Steel frame with concrete shear walls
  - Steel frame with infill reinforced masonry shear walls
  - Steel frame with infill unreinforced masonry shear walls
  - Steel light frame
- **Concrete**
  - Concrete moment-resisting frame
  - Concrete moment-resisting frame with concrete shear wall
  - Concrete shear wall without moment-resisting frame
  - Concrete frame with infill reinforced masonry shear walls
  - Concrete frame with infill unreinforced masonry shear walls
  - Precast/Tilt-up concrete shear wall building
  - Precast concrete frame with concrete shear walls
  - Precast concrete frame without shear walls
- **Reinforced masonry bearing wall building (RM)**
- **Unreinforced masonry bearing wall building (URM)**

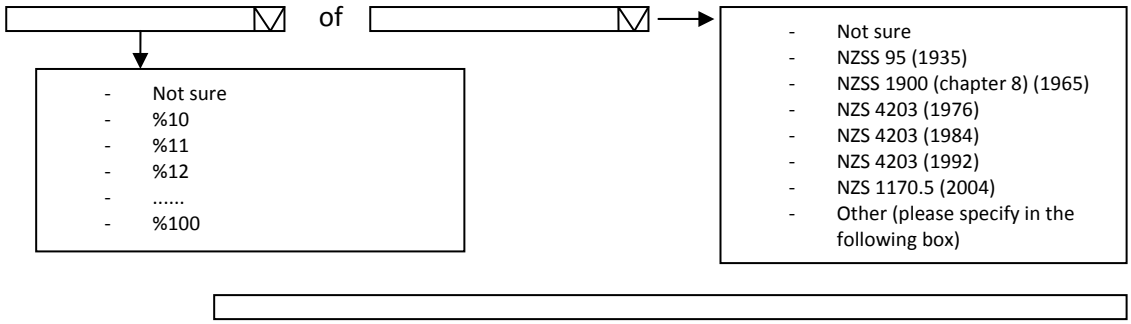
- Not sure
- Stiff/Rigid
- Flexible

- Not sure
- Complete
- Partial
- No

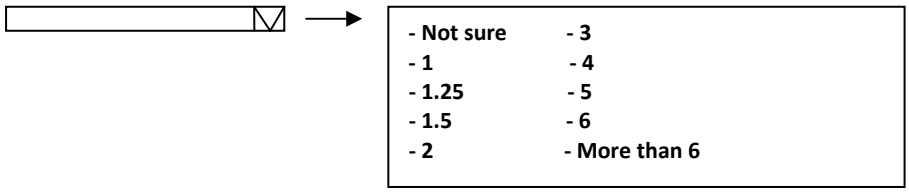
This question applies to the original building, not the structural system used for rehabilitation.

STEP THREE: Seismic Assessment and Rehabilitation Information

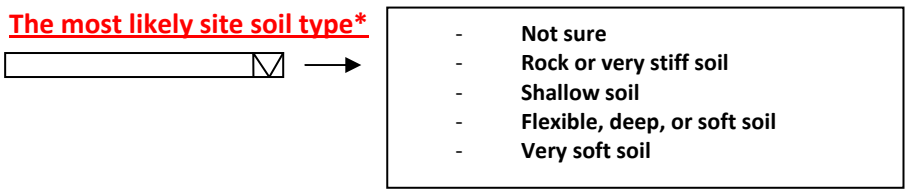
A. The most likely seismic load level to which the building was retrofitted*



B. The most likely ductility of existing structure before rehabilitation*



C. The most likely site soil type*



D. Rehabilitation methods considered for the building*
(Please select as many methods as having applied to the structure or are to be considered for rehabilitation)

- ● Add shear walls
- ● Add braced frames
- ● Add moment frames
- ● Add dampers (e.g. friction dampers, fluid viscous dampers)
- ● Add base isolation system
- ● Add external seismic resisting cores and tie these to the existing building
- ● Linking existing adjacent buildings in order to make a regular one
- ● Non-structural components and equipment mitigation such as Architectural, Mechanical, Plumbing, Electrical, Furnishing, and interim equipment
- ● Modify or upgrade existing walls
- ● Providing adequate wall-to-diaphragm and/or wall-to-foundation tie
- ● Modify or upgrade existing frame (e.g. columns, beams, shear walls, connections)
- ● Modify or upgrade existing diaphragm
- ● Modify or upgrade existing foundation
- ● Removing or strengthening hazards such as parapets, chimneys, towers, gables, long walls, and unsafe high stories
- ● Reducing unnecessary seismic mass possibly by part demolition of upper stories, etc
- ● Removing causes that make a building fall into irregular configuration such as soft-story, etc
- ● Linking existing adjacent buildings in order to make a regular one
- ● Other

STEP FOUR: Construction Cost Information

A. Approximate base year for cost*

Base year for cost is the bid date for construction or the year used for the cost estimate in the study.
If the exact year is not known, please approximate.

- 2015
- 2014
- 2013
- 2012
- 2011
- .....
- 1900

B. Construction cost details*

Estimated Total Construction Cost (1) (NZ$)

Estimated Structural Cost (2) (% of Total Construction Cost)

Please mark the most likely items included in the estimated "Structural Cost"

- ○ Increasing structural lateral resisting system
- ○ Diaphragm mitigation
- ○ Foundation mitigation
- ○ Repair of damage and restoration (5)
- ○ Other

- Not sure
- %1
- %2
- .....
- %100

Estimated Non-structural Cost (3) (% of Total Construction Cost)

Please mark the most likely items included in the estimated "Non-

- ○ Non-structural components mitigation (6)
- ○ Exterior falling hazards mitigation (7)
- ○ Demolition and restoration (cover-up cost) (8)
- ○ Geologic hazard mitigation
- ○ Other

Estimated Non-seismic Cost (4) (% of Total Construction Cost)

Please mark the most likely items included in the estimated "Non-seismic Cost"

- ○ Fire and life safety (9)
- ○ Disabled access improvements (10)
- ○ Hazardous material removal (asbestos, lead-based paint, contaminated soil, etc)
- ○ Additional non-structural and system improvements (11)
- ○ Other

- Not considered in retrofit project
- Not sure
- %1
- %2
- .....
- %100

1

Construction cost

=

Seismic Cost

Cost associated with the construction works that directly enhance the seismic performance of the structure against earthquake.

+

Non-seismic Cost

Cost associated with the construction works that do not directly enhance the seismic performance of structure, however, when a building undergoes seismic rehabilitation, they should be done to comply with the local code requirements. Non-seismic construction works can also be considered by owners to improve building functionality, appearance, and so on.

Total construction cost should be paid to contractor and includes contractor's overhead, profit, and contingency costs. Also include change orders during construction work. ***If the exact amount is not known, please approximate.***

2

Structural cost

It is the cost of enhancing seismic performance of elements which form building lateral resisting system. Structural cost is one part of seismic cost which associated with the construction works that directly enhance the seismic performance of the structure against earthquake. ***If the exact amount is not known, please approximate based on your past experiences and engineering judgement.***

3

Non-structural cost

It is the cost of seismic mitigation of non-structural components and other elements interacting with structural system. It also includes the costs associated with demolition and remodelling of architectural features necessitated by applying retrofit measures to building. Non-structural cost forms the other part of seismic cost. *If the* ***exact amount is not known, please approximate based on your past experiences and engineering judgement.***

4

Non-seismic cost

Cost associated with the construction works that do not directly enhance the seismic performance of structure, however, when a building undergoes seismic rehabilitation, they should be done to comply with the local code requirements. Non-seismic construction works can also be considered by owners to improve building functionality, appearance, and so on. ***If Non-seismic work was considered in the retrofit program but its amount is not exactly known, please approximate based on your past experiences and engineering judgement.***

5

The cost associated with repairing any of existing lateral and gravity force resisting elements that have been damaged because of previous earthquake, ground settlement or deterioration.

6

This item Includes only the cost associated with compliance to minimum local code (or the code or guideline used for rehabilitation) requirements.

7

Exterior falling hazards include appendages (parapets, cornices, canopies), enclosure (exterior non-bearing precast or masonry walls, exterior infill walls), and masonry chimney.

8

The cost associated with removing and replacing various finishes that are affected by structural work.

9

The cost associated with providing facilities to enable the people who use a building can escape from the building if it is on fire (means of escape from fire) and providing protection devices to limit the extend and effects of the spread of fire.

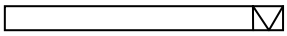
10

The cost associated with access facilities for persons with disabilities such as elevators, restrooms and automatic doors.

11

The cost associated with additional remodelling, modifying, improving or changing non-structural components done voluntarily on owner willingness in conjunction with seismic rehabilitation retrofit.

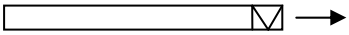
C. Construction cost in terms of % of "Building Replacement Value" *



- Not sure
- %1
- %2
- %3
- .....
- %100
- More than %100

Building replacement value is the cost of demolition and replacement of the building, i.e. constructing a new building of equivalent strength, instead of getting it rehabilitated at the time when rehabilitation was done.
It actually represents the typical structural cost of demolishing the old structure and erecting a new one with nearly similar characteristics, e.g. occupancy and social function classification, height, and area, but probably with different materials and techniques being likely much in use and prevalent at the time of rehabilitation.
If the exact amount is not known, please approximate based on your past experiences and engineering judgement.

D. Duration of construction work (months)

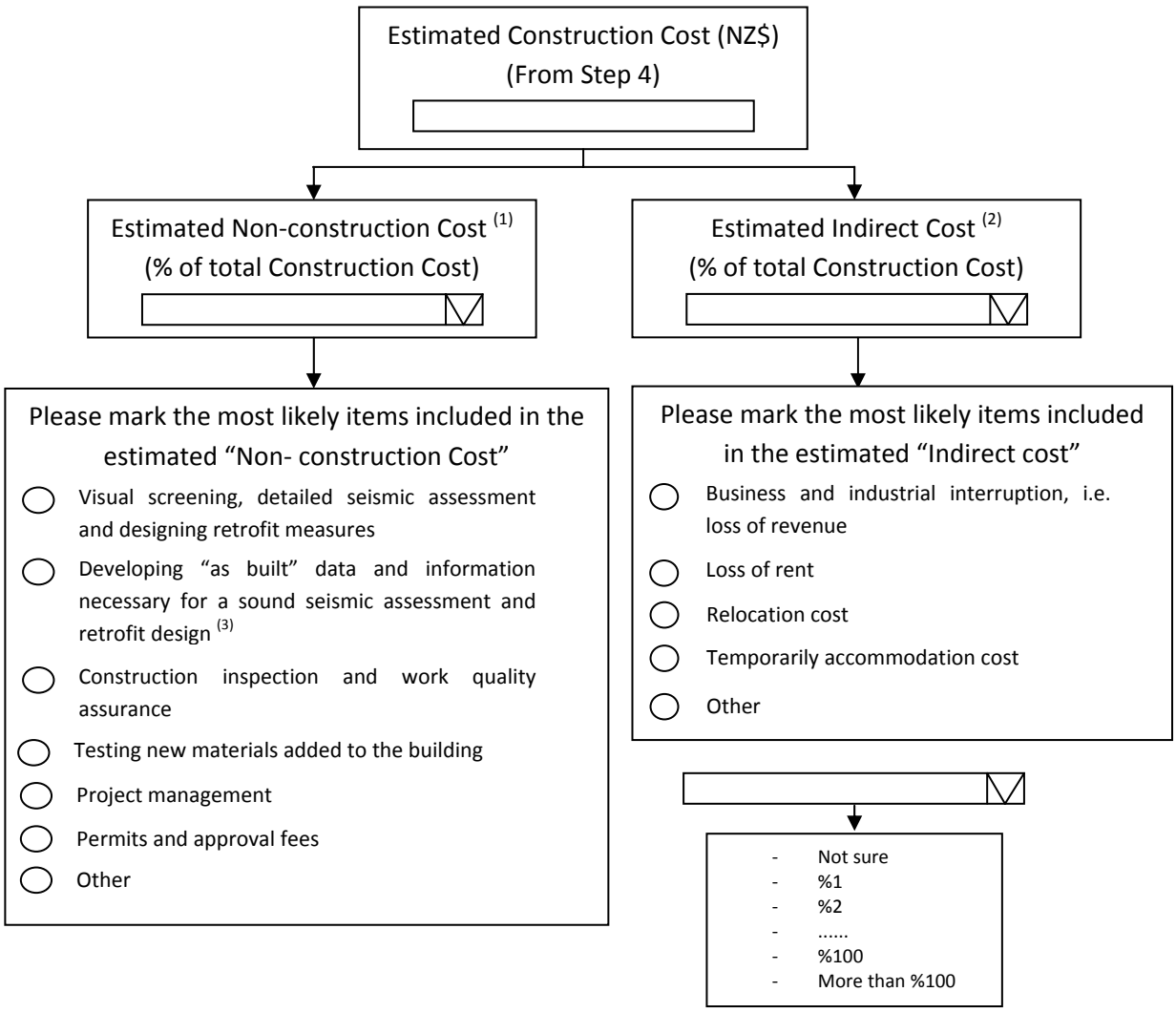


- **Not sure**
- **1**
- **2**
- **.....**
- **60**

If it is not known exactly, please approximate based on your past experiences and engineering judgement.

STEP FIVE: Complementary Cost Information

A. Non-construction and Indirect Cost details*



1 **Non-construction cost**

Cost of prerequisite activities that should be conducted before construction phase. It also includes the costs of all works confirming that construction work was done properly and, therefore, increase the reliability of rehabilitation. ***If the exact amount is not known, please approximate based on your past experiences and engineering judgement.***

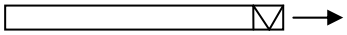
2 **Indirect cost**

Cost comes about as a result of the rehabilitation work and affects the owner/s, the tenants, the community, or other related groups. ***If the exact amount is not known, please approximate based on your past experiences and engineering judgement.***

3

This item may include costs associated with providing architectural and structural drawings of existing building, geotechnical report, site specific seismicity report, test report of existing building materials and so on.

B. Condition of occupancy during construction work*

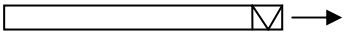


- **Not sure**
- **Occupants-in-place**
- **Occupants temporarily removed**
- **Vacant**

Condition of occupancy is the location of the occupants during construction work.

- **Occupants-in-place**: Work was scheduled around normal hours of occupancy without necessitating occupants leaving their place.
- **Occupants temporarily removed**: Occupants were moved to another place inside or outside the building during construction.
- **Vacant**: The building was completely vacated during rehabilitation construction

C. Costs are associated with



- Not sure
- Rehabilitation after an earthquake
- Planned rehabilitation
- Owner willingness
- Other (please describe in the following box)

- Rehabilitation after an earthquake refers to ones performed as a direct response to observed structural damage after an earthquake
- Planned rehabilitation refers to ones done in accordance with the Building Act of the time