



Worksheet 2A

Commercial

Damage and Repair Time

Overall rating

**

Damage

Overall rating

Repair Time

Notes

(Replace with building-specific notes)

Vulnerability Assessment Method

Building Name	Tower Block 7/5 Richter Street, Quaketown					Damage rating	**	Building only	***	Damage Score is estimated mean damage in 500-year shaking as % of Replacement Value (RV)																																									
Assessor	ABC Consulting Engineers					Damage Score	40	Building + Ext Serv	***																																										
Reviewer	DEF Structural																																																		
Item	Sub-item	User input		Look-up value	Calculation	Sub-item	User input	Look-up value	Damage Ratio is value corresponding to Damage Vulnerability Code entered according to the Look-up table. Values in Look-up table may be changed to suit building type.																																										
		Proportion of whole building RV (%)	Damage Vulnerability Code	Damage ratio	Damage		Time Code	Repair Time																																											
Site	Part of site supporting building	5	1	80%	4.0	Site	3	Months	<p>1. Damage Rating: Enter values for: Proportion of RV (optional) and Damage Vulnerability Code for each line item. Worksheet determines green values based on entries. The MDR values entered should be reasonable estimates of damage for each element, taking account of the variation throughout the building.</p> <p>2. Repair Time Rating: Enter Time Code for each line item. Worksheet fills in Repair Time</p>																																										
Foundations	Piles, pads, retaining walls, anchors	5	2	40%	2.0	Foundations	1	Days																																											
Structure	Primary structure: columns, walls, beams	10	3	10%	1.0	Primary structure	1	Days																																											
	Floors	10	1	80%	8.0	Floors	1	Days																																											
	Stairs	2	2	40%	0.8	Stairs	1	Days																																											
	Roof	3	3	10%	0.3	Roof	1	Days																																											
Non-structural elements	Cladding / walls	15	1	80%	12.0	Cladding / walls	1	Days																																											
	Glazing	15	3	10%	1.5	Glazing	1	Days																																											
	Ceilings	5	1	80%	4.0	Ceilings	1	Days																																											
	Partitions	5	2	40%	2.0	Partitions	1	Days																																											
Building Services	Lifts, plant, distribution networks	25	3	10%	2.5	Building services	3	Months																																											
Other (Describe)	Add description(s) as needed	0	1	80%	0.0	Other	1	Days																																											
		Check total = 100 here ==>		100		Total	40	Building only	3	Months	These values are the highest in column above (Building) and below (External Services)																																								
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Vulnerability to MDR Look-up Table			<table border="1"> <thead> <tr> <th colspan="2">Repair Time Code Key</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Days</td> </tr> <tr> <td>2</td> <td>Weeks</td> </tr> <tr> <td>3</td> <td>Months</td> </tr> <tr> <td>4</td> <td>> 6 months</td> </tr> <tr> <td>5</td> <td>> 1 year</td> </tr> </tbody> </table>			Repair Time Code Key		1	Days	2	Weeks	3	Months	4	> 6 months	5	> 1 year	<table border="1"> <thead> <tr> <th>Vulnerability</th> <th>Code</th> <th>Mean Damage Ratio (DR)</th> </tr> </thead> <tbody> <tr> <td>High</td> <td>1</td> <td>80%</td> </tr> <tr> <td>Moderate</td> <td>2</td> <td>40%</td> </tr> <tr> <td>Low</td> <td>3</td> <td>10%</td> </tr> </tbody> </table>			Vulnerability	Code	Mean Damage Ratio (DR)	High	1	80%	Moderate	2	40%	Low	3	10%	<table border="1"> <tbody> <tr> <td>Power</td> <td>3</td> <td>Months</td> </tr> <tr> <td>Water</td> <td>3</td> <td>Months</td> </tr> <tr> <td>Telecoms / Internet</td> <td>3</td> <td>Months</td> </tr> <tr> <td>Sewerage</td> <td>3</td> <td>Months</td> </tr> <tr> <td>Access roads</td> <td>2</td> <td>Weeks</td> </tr> </tbody> </table>			Power	3	Months	Water	3	Months	Telecoms / Internet	3	Months	Sewerage	3	Months	Access roads	2	Weeks	Enter Time Code for each line item. Worksheet fills in Repair Time
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Users may change Mean Damage Ratios for this Look-up table.																																																			

User Input: Items in red type require or allow user input. Items in green type are calculated or determined by Worksheet.

The Vulnerability Assessment Method requires assessment of vulnerability to damage of each item into High, Moderate or Low. Pre-assigned MDRs are used to calculate a Damage Score as the estimated % of overall damage



Worksheet 2B

Commercial

Damage and Repair Time

Overall rating

**

Damage

Overall rating

Repair Time

Notes

(Replace with building-specific notes)

Mean Damage Ratio Method

Building Name	Tower Block 7/5 Richter Street, Quaketown		Damage rating **		Building only ***			Damage Score is estimated mean damage in 500-year shaking as % of Replacement Value (RV)														
Assessor	ABC Consulting Engineers		Damage Score 35		Building + Ext Serv ***																	
Reviewer	DEF Structural																					
Item	Sub-item	User input	Look-up value	Calculation		User input	Look-up value															
		Proportion of whole building RV (%)	Damage ratio <i>DR500 (%)</i>	Damage <i>%Bldg RV</i>	Sub-item	Time Code	Repair Time															
Site	Part of site supporting building	5	20%	1.0	Site	3	Months	<p>1. Damage Rating: Enter values for: Proportion of RV (optional) and Mean Damage Ratio for each line item. Worksheet determines green values based on entries. The MDR values entered should be reasonable estimates of damage for each element, taking account of the variation throughout the building.</p> <p>2. Repair Time Rating: Enter Time Code for each line item. Worksheet fills in Repair Time</p>														
Foundations	Piles, pads, retaining walls, anchors	5	30%	1.5	Foundations	1	Days															
Structure	Primary structure: columns, walls, beams	10	50%	5.0	Primary structure	1	Days															
	Floors	10	40%	4.0	Floors	1	Days															
	Stairs	2	60%	1.2	Stairs	1	Days															
	Roof	3	5%	0.2	Roof	1	Days															
Non-structural elements	Cladding / walls	15	30%	4.5	Cladding / walls	1	Days															
	Glazing	15	8%	1.2	Glazing	1	Days															
	Ceilings	5	20%	1.0	Ceilings	1	Days															
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Building Services	Lifts, plant, distribution networks	25	50%	12.5	Building services	3	Months															
Other (Describe)	Add description(s) as needed	0	0%	0.0	Other	1	Days															
		Check total = 100 here ==>	100	Total	35	Building only	3	Months	These values are the highest in column above (Building) and below (External Services)													
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User Input: Items in red type require or allow user input. Items in green type are calculated or determined by Worksheet.

The Mean Damage Ratio Method allows users to determine Mean Damage Ratios by any recognised means and enter the values directly. These MDRs are used to calculate a Damage Score as the estimated % of overall damage



Worksheet 3

Issues of potential concern identified

Adjacent Buildings: Impact on Rating

Safety

Damage

Repair

Commercial

External Factor Record

4



Building Name

Tower Block 7/5 Richter Street, Quaketown

Assessor

ABC Consulting Engineers

Reviewer

DEF Structural

Note: If the potential impact of adjacent buildings (or other external factors) is significant, assess the impact on the star-rating of the building and record the number of stars by which the rating would be reduced. The star-rating for the building will remain as shown on Worksheets 1 and 2 but the potential impact of the External Factors will be represented by hollow stars rather than fully shaded ones.

Enter Score and then comment on evidence / lack of evidence of any issues beyond the subject site that could have significant influence on Safety, Damage or Repair / Down time. Qualitative comment only needed - enough to alert owner / prospective purchaser of potential concern.

External Factor

Score

Comment

Notes

Adjacent buildings / sites

1

Building to North is URM. Collapse of parts could well occur in 500-year shaking and pose a safety risk, cause damage and increase repair time.

Earthquake Fault Movement

1

Site remote from known faults. No issues.

Landslip / Boulder Roll

0

Site not shown to be subject to risk on Council maps. No issues.

Liquefaction / Lateral spreading

1

Potential for minor liquefaction / lateral spreading movement on adjacent sites. Unlikely to be a safety or damage concern but repair time could be affected.

Utilities

0

No evidence of special measures to protect incoming utilities from expected differential movement. No safety or damage issues but repair / reinstatement of operations could be delayed.

Site access

1

Liquefaction potential and landslip risk to major roads essential to building function. Could affect time to reinstate function but no safety or damage issues.

Tsunami / Flooding

0

Site not shown to be subject to risk on Council maps. No issues.

Scoring system (for each heading)

Evidence of effective protection measures OR evidence that risk is not present OR that effects are insignificant: Score = 0; Otherwise, Score =1.

User Input: Items in red type require or allow user input.