

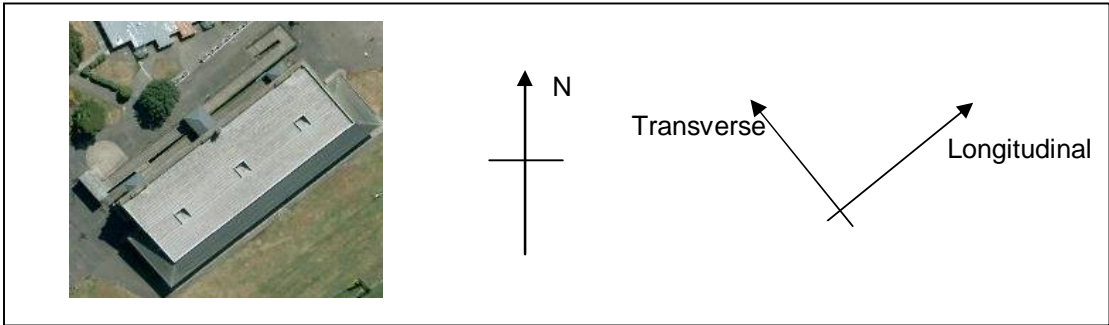
Table IEP-1 Initial Evaluation Procedure Step 1
As per NZSEE document "Assessment and Improvement of the Structural Performance of Buildings in Earthquake" (incl Corrigendum No.1)

| | | |
|-----------------------|----------------------------|---------------------------|
| Building Name: | Trentham Racecourse | Ref.: 15224 |
| Location: | 10 Racecourse Road | By: LIS |
| | Grandstand | Date: 28 June 2011 |

Step 1- General Information
1.1 Photos



1.2 Sketch Plan



1.3 List of relevant features

Constructed pre 1965, assumed built between 1935-1965
 Multi storey concrete structure
 Concrete ramps at rear.
 Irregular structure
 Appear to be a number of add-ons to the original building
 Importance level 3 Building as more than 300 people can congregate in one area

1.4 note information sources

- | | |
|-------------------------------|-------------------------------------|
| Visual Inspection of Exterior | <input checked="" type="checkbox"/> |
| Visual Inspection of Interior | <input type="checkbox"/> |
| Drawings | <input type="checkbox"/> |
| Specifications | <input type="checkbox"/> |
| Geotechnical Reports | <input type="checkbox"/> |
| Other | <input type="checkbox"/> |

Table IEP-2 Initial Evaluation Procedure Step 2

As per NZSEE document "Assessment and Improvement of the Structural Performance of Buildings in Earthquake" (incl Corrigendum No.1)

| | | | |
|------------------------------|---------------------------|--------------|--------------|
| Building Name: | Trentham Racecourse | Ref.: | 15224 |
| Location: | 10 Racecourse Road | By: | LIS |
| Direction Considered: | Longitudinal & Transverse | Date: | 28 June 2011 |

Step 1- Determine of (%NBS)_b-

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

| | | | | |
|---|--|------------------------|------------------------|------|
| a) Code | Pre- 1935 | & | Seismic Zone: A | |
| | 1935-1965 | | | Yes |
| | 1965-1976 | | B | |
| | | Seismic Zone: A | C | |
| | 1976-1992 | | B | |
| | | | C | |
| | 1992-2004 | | | |
| b) Soil Type | from NZS1170.5:2004, Cl3.1.3 | A or B Rock | | |
| | | C Shallow Soil | | Yes |
| | | D Soft Soil | | |
| | from NZS4203:1992, Cl 4.6.2.2, Cl3.1.3 | E Very Soft Soil | | |
| a) Rigid | | | | |
| | | b) Intermediate | | |
| c) Estimated Period, T | | | | 0.60 |
| d) (%NBS)_{nom} determined from Figure 3.3 | | | | 2.77 |
| Note 1: | For buildings designed prior to 1965 and known to be designed as public buildings in accordance with the code of the time, multiply (%NBS) _{nom} by 1.25. For buildings designed 1965-1976 and known to be designed as public buildings in accordance with the code of the time, multiply (%NBS) _{nom} by 1.33- Zone A, 1.2- Zone B. | | 1 | |
| Note 2: | For reinforced concrete buildings designed between 1976-84 multiply (%NBS) _{nom} by 1.2 | | 1 | |
| Note 3: | For URM Buildings designed prior to 1935 multiply (%NBS) _{nom} by 0.8 except for Wellington where the factor may be taken as 1. | | 1 | 2.77 |

(%NBS)_{nom} if revised by notes 1, 2 or 3

| Longitudinal Direction | | | |
|--|---|------|----------|
| 2.2 NZS4203:1992 Zone Factor For Site if T ≤ 1.5sec, Factor A=1 | | | |
| a) Near Fault Factor, N(T,D) (from NZS1170.5:2004, Cl 3.1.6) | | 1.00 | |
| b) Near Fault Scaling Factor = | 1/N(T,D) | 1.00 | Factor A |
| 2.3 Hazard Fault Scaling Factor, Factor B | | | |
| a) Hazard Factor, Z, for site (from NZS1170.5:2004, table 3.3) | | 0.42 | |
| b) Hazard Scaling Factor | For pre 1992 = 1/Z For 1992 onwards = Z ₁₉₉₂ /Z <small>(Where Z₁₉₉₂ is the Zone actor from NZS4203:1992, figure 4.5(b))</small> | 2.38 | Factor B |
| 2.4 Risk Period Scaling Factor, Factor C | | | |
| a) Building Importance Level (from NZS1170.0:2004, table 3.1 and 3.2) | | 3 | |
| b) Return Period Scaling Factor from accompanying Table 3.1 (from NZS4203:1992, Table 4.6.4) | | 0.8 | Factor C |
| 2.5 Ductility Scaling Factor, D | | | |
| a) Assessed Ductility of Existing Structure, μ (shall be less than maximum given in accompanying Table 3.2) | | 2 | |
| b) Ductility Scaling Factor | For pre 1992 = k _μ For 1992 onwards = 1 <small>(Where k_μ is NZS1170.5:2004 Ductility Factor, from accompanying Table 4.3)</small> | 1.57 | |
| | | 1.57 | Factor D |
| 2.6 Structural Performance Scaling Factor, Factor E | | | |
| a) Structural Performance Factor, Sp from accompanying Figure 3.4 | | 0.7 | |
| b) Structural Performance Scaling Factor = | 1/S _p | 1.43 | Factor E |
| 2.7 Longitudinal Direction Baseline (% NBS)_b | | | |
| (equals (%NBS) _{nom} x A x B x C x D x E) | | 12 | |

| Transverse Direction | | | |
|--|------------------|------|----------|
| 2.2 NZS4203:1992 Zone Factor For Site if T ≤ 1.5sec, Factor A=1 | | | |
| a) Near Fault Factor, N(T,D) (from NZS1170.5:2004, Cl 3.1.6) | | 1.00 | |
| b) Near Fault Scaling Factor = | 1/N(T,D) | 1.00 | Factor A |
| 2.3 Hazard Fault Scaling Factor, Factor B | | | |
| a) Hazard Factor, Z, for site (from NZS1170.5:2004, table 3.3) | | 0.42 | |
| b) Hazard Scaling Factor For pre 1992 = 1/Z For 1992 onwards = Z ₁₉₉₂ /Z (Where Z ₁₉₉₂ is the Zone actor from NZS4203:1992, figure 4.5(b)) | | 2.38 | Factor B |
| 2.4 Risk Period Scaling Factor, Factor C | | | |
| a) Building Importance Level (from NZS1170.0:2004, table 3.1 and 3.2) | | 3 | |
| b) Return Period Scaling Factor from accompanying Table 3.1 (from NZS4203:1992, Table 4.6.4) | | 0.8 | Factor C |
| 2.5 Ductility Scaling Factor, D | | | |
| a) Assessed Ductility of Existing Structure, μ (shall be less than maximum given in accompanying Table 3.2) | | 2 | |
| b) Ductility Scaling Factor For pre 1992 = k _μ For 1992 onwards = 1 (Where k _μ is NZS1170.5:2004 Ductility Factor, from accompanying Table 4.3) | | 1.57 | |
| | | 1.57 | Factor D |
| 2.6 Structural Performance Scaling Factor, Factor E | | | |
| a) Structural Performance Factor, Sp from accompanying Figure 3.4 | | 0.7 | |
| b) Structural Performance Scaling Factor = | 1/S _p | 1.43 | Factor E |
| 2.7 Transverse Direction Baseline (% NBS)_b (equals (%NBS) _{nom} x A x B x C x D x E) | | | |
| | | 12 | |

Table 3.1: Return period scaling factor

| NZS1170.5:2004 Return Period Factor R | | | | Return Period Scaling Factor, C | | | |
|---------------------------------------|--|----------------------------------|------------------------|---------------------------------|---------|---------|---------|
| Importance Level | Comment | Annual Probability of Exceedance | Return Period Factor R | Pre 1965 | 1965-76 | 1976-92 | 1992-04 |
| 1 | Minor structures (failure not likely to endanger human life) | 1/100 | 0.5 | 2 | 2 | 2 | 1.2 |
| 2 | Normal structures and structures not failing into other levels | 1/500 | 1 | 1 | 1 | 1 | 1 |
| 3 | Major structures (affecting crowds) | 1/1000 | 1.3 | 0.8 | 0.8 | 1.1 | 0.9 |
| 4 | Post-disaster structures (post-disaster functions or dangerous activities) | 1/2500 | 1.8 | 0.6 | 0.6 | 1 | 0.7 |
| 5 | Exceptional structures are outside the scope of the IEP, special study required. | | | | | | |

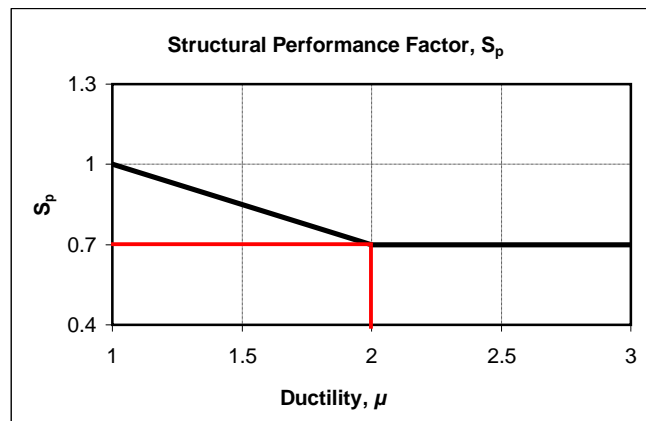
Where R is the return period factor appropriate to the current use of the building, as shown in Table 3.5 of NZS 1170.0:2002

Table 3.2: Ductility factors to be used for existing buildings

| Structure Type | Maximum allowable ductility factor for IEP | | | |
|----------------|--|-----------|-----------|-----------|
| | Pre 1935 | 1935-1965 | 1965-1976 | 1976-2004 |
| All buildings | 2 | 2 | 2 | 6 |

Table 3.3: Ductility scaling factor

| Soil Type | Structural Ductility Scaling Factor, k_u | | | | | | | | |
|-----------|--|---|-----------|------|-----------|------|-----------|------|--|
| | 1.0 or less | | 1.25 | | 1.5 | | 2 | | |
| | A,B,C & D | E | A,B,C & D | E | A,B,C & D | E | A,B,C & D | E | |
| Period, T | | | | | | | | | |
| ≤ 0.40s | 1 | 1 | 1.14 | 1.25 | 1.29 | 1.50 | 1.57 | 1.70 | |
| 0.50s | 1 | 1 | 1.18 | 1.25 | 1.36 | 1.50 | 1.71 | 1.75 | |
| 0.60s | 1 | 1 | 1.21 | 1.25 | 1.43 | 1.50 | 1.86 | 1.80 | |
| 0.70s | 1 | 1 | 1.25 | 1.25 | 1.50 | 1.50 | 2.00 | 1.85 | |
| 0.80s | 1 | 1 | 1.25 | 1.25 | 1.50 | 1.50 | 2.00 | 1.90 | |
| ≥ 1.00s | 1 | 1 | 1.25 | 1.25 | 1.50 | 1.50 | 2.00 | 2.00 | |





Where SP is the Structural Performance Factor from NZS1170.5:2004, Cl 4.4.2.

Figure 3.4: Structural performance factor, SP

| Table IEP-3 Initial Evaluation Procedure Step 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---------------------------|---------------|-----------------------|-----|---------------------------|--|---------------|-----|-----|-------------------------------------|--|--|--------------------|-----|--|--|--|--|----------------------|---|--|--|--------|-------------|---------------|------------|--------------|---------------|----------|---|-----|-----|-----|---|-----|-----|-----|--|--------|-------------|---------------|------------|--------------|---------------|----------|-------------------------------|-----|-----|-----|----------------------------------|-----|-----|-----|-------------------------------|-----|-----|-----|--|---------------------|--|----------------|-----|--|--|--|---------------------|-----|--|--|--|-----------------------|---|
| As per NZSEE document "Assessment and Improvement of the Structural Performance of Buildings in Earthquake" (incl Corrigendum No.1) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Building Name: | Trentham Racecourse | Ref.: | 15224 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Location: | 10 Racecourse Road | By: | LIS | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Direction Considered: | Longitudinal Direction | Date: | 28 June 2011 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>Step 3- Assessment of Performance Achievement Ratio (PAR) (Refer Appendix B- Section B3.2)</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 60%;"></td> <td style="text-align: center;">For Factors A to C</td> <td style="width: 10%;"></td> <td style="width: 10%; text-align: center;">Severe</td> <td style="width: 10%; text-align: center;">0.4</td> <td style="width: 10%; text-align: right;">max</td> </tr> <tr> <td>Critical Structural Weakness</td> <td></td> <td></td> <td style="text-align: center;">Significant</td> <td style="text-align: center;">0.7</td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td style="text-align: center;">Insignificant</td> <td style="text-align: center;">1</td> <td></td> </tr> </table> <p>3.1 Plan Irregularity <i>Effect on Structural Performance</i> Significant <input type="button" value="▼"/> 0.7 Factor A</p> <p style="text-align: center; font-size: small;">Comment: Due to canopy mass/centre of rigidity offset > 0.3 width</p> <p>3.2 Vertical Irregularity <i>Effect on Structural Performance</i> Insignificant <input type="button" value="▼"/> 1.0 Factor B</p> <p>3.3 Short Columns <i>Effect on Structural Performance</i> Insignificant <input type="button" value="▼"/> 1.0 Factor C</p> <p>3.4 Pounding Potential (Estimate D1 and D2 and set D = the lower of the two or = 1.0 if no potential for pounding)</p> <p>a) Factor D1 - Pounding Effect</p> <div style="border: 1px solid black; padding: 5px; font-size: small;"> <p>Note: Values given assume the building has a frame structure. For stiff buildings (e.g. with shear walls), the effect of pounding may be reduced by taking the co-efficient to the right of the value applicable to frame buildings.</p> </div> <p style="text-align: center;">Factor D1 1.0</p> <table border="1" style="width: 100%; border-collapse: collapse; font-size: x-small;"> <thead> <tr> <th style="width: 40%;"></th> <th style="width: 15%; text-align: center;">Severe</th> <th style="width: 15%; text-align: center;">Significant</th> <th style="width: 30%; text-align: center;">Insignificant</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">Separation</td> <td style="text-align: center;">0<Sep<0.005H</td> <td style="text-align: center;">.005<Sep<.01H</td> <td style="text-align: center;">Sep>.01H</td> </tr> <tr> <td style="text-align: center;">Alignment of Floors within 20% of Storey Height</td> <td style="text-align: center;">0.7</td> <td style="text-align: center;">0.8</td> <td style="text-align: center;">1.0</td> </tr> <tr> <td style="text-align: center;">Alignment of Floors not within 20% of Storey Height</td> <td style="text-align: center;">0.4</td> <td style="text-align: center;">0.7</td> <td style="text-align: center;">0.8</td> </tr> </tbody> </table> <p>b) Factor D2- Height Difference Effect</p> <p style="text-align: center;">Factor D2 1.0</p> <table border="1" style="width: 100%; border-collapse: collapse; font-size: x-small;"> <thead> <tr> <th style="width: 40%;"></th> <th style="width: 15%; text-align: center;">Severe</th> <th style="width: 15%; text-align: center;">Significant</th> <th style="width: 30%; text-align: center;">Insignificant</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">Separation</td> <td style="text-align: center;">0<Sep<0.005H</td> <td style="text-align: center;">.005<Sep<.01H</td> <td style="text-align: center;">Sep>.01H</td> </tr> <tr> <td style="text-align: center;">Height Difference > 4 Storeys</td> <td style="text-align: center;">0.4</td> <td style="text-align: center;">0.7</td> <td style="text-align: center;">1.0</td> </tr> <tr> <td style="text-align: center;">Height Difference 2 to 4 Storeys</td> <td style="text-align: center;">0.7</td> <td style="text-align: center;">0.9</td> <td style="text-align: center;">1.0</td> </tr> <tr> <td style="text-align: center;">Height Difference < 2 Storeys</td> <td style="text-align: center;">1.0</td> <td style="text-align: center;">1.0</td> <td style="text-align: center;">1.0</td> </tr> </tbody> </table> <p style="text-align: center;">Factor D 1.0 Lesser of D1 and D2</p> <p>3.5 Site Characteristics- (Stability, landslide threat, liquefaction etc)</p> <p style="text-align: center;">Insignificant <input type="button" value="▼"/> 1.0 Factor E</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 60%;"></td> <td style="text-align: center;">For Factor E</td> <td style="width: 10%;"></td> <td style="width: 10%; text-align: center;">Severe=</td> <td style="width: 10%; text-align: center;">0.5</td> </tr> <tr> <td></td> <td></td> <td></td> <td style="text-align: center;">Significant=</td> <td style="text-align: center;">0.7</td> </tr> <tr> <td></td> <td></td> <td></td> <td style="text-align: center;">Insignificant=</td> <td style="text-align: center;">1</td> </tr> </table> <p>3.6 Other Factors</p> <p style="text-align: center;">1.0 Factor F</p> <p style="font-size: small;">For ≤3 Storeys - Max value 2.5, otherwise Max value 1.5. No min.</p> <p>Rationale for choice of Factor F.</p> <div style="border: 1px solid black; background-color: #e0ffe0; padding: 10px; font-size: small;"> <p>No reason to use an enhanced factor.</p> </div> <p>3.7 Performance Achievement Ratio (PAR) 0.7 (equals A x B x C x D x E x F)</p> | | | | | For Factors A to C | | Severe | 0.4 | max | Critical Structural Weakness | | | Significant | 0.7 | | | | | Insignificant | 1 | | | Severe | Significant | Insignificant | Separation | 0<Sep<0.005H | .005<Sep<.01H | Sep>.01H | Alignment of Floors within 20% of Storey Height | 0.7 | 0.8 | 1.0 | Alignment of Floors not within 20% of Storey Height | 0.4 | 0.7 | 0.8 | | Severe | Significant | Insignificant | Separation | 0<Sep<0.005H | .005<Sep<.01H | Sep>.01H | Height Difference > 4 Storeys | 0.4 | 0.7 | 1.0 | Height Difference 2 to 4 Storeys | 0.7 | 0.9 | 1.0 | Height Difference < 2 Storeys | 1.0 | 1.0 | 1.0 | | For Factor E | | Severe= | 0.5 | | | | Significant= | 0.7 | | | | Insignificant= | 1 |
| | For Factors A to C | | Severe | 0.4 | max | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Critical Structural Weakness | | | Significant | 0.7 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | Insignificant | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Severe | Significant | Insignificant | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Separation | 0<Sep<0.005H | .005<Sep<.01H | Sep>.01H | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Alignment of Floors within 20% of Storey Height | 0.7 | 0.8 | 1.0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Alignment of Floors not within 20% of Storey Height | 0.4 | 0.7 | 0.8 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Severe | Significant | Insignificant | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Separation | 0<Sep<0.005H | .005<Sep<.01H | Sep>.01H | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Height Difference > 4 Storeys | 0.4 | 0.7 | 1.0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Height Difference 2 to 4 Storeys | 0.7 | 0.9 | 1.0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Height Difference < 2 Storeys | 1.0 | 1.0 | 1.0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | For Factor E | | Severe= | 0.5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | Significant= | 0.7 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | Insignificant= | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| Table IEP-3 Initial Evaluation Procedure Step 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---------------------------|---------------|---------------------------|-----|-----|---------------------------|--|---------------|-----|-----|-------------------------------------|--|--|--------------------|-----|--|--|--|--|----------------------|---|--|------------------|-----|--|--------|-------------|---------------|------------|--------------|---------------|----------|---|-----|-----|-----|---|-----|-----|-----|------------------|-----|--|--------|-------------|---------------|------------|--------------|---------------|----------|-------------------------------|-----|-----|-----|----------------------------------|-----|-----|-----|-------------------------------|-----|-----|-----|---------------------|----------------|-----|--|---------------------|-----|--|-----------------------|---|
| As per NZSEE document "Assessment and Improvement of the Structural Performance of Buildings in Earthquake" (incl Corrigendum No.1) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Building Name: | Trentham Racecourse | | Ref.: 15224 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Location: | 10 Racecourse Road | | By: LIS | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Direction Considered: | Transverse Direction | | Date: 28 June 2011 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>Step 3- Assessment of Performance Achievement Ratio (PAR) (Refer Appendix B- Section B3.2)</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 40%;"></td> <td style="text-align: center;">For Factors A to C</td> <td style="width: 10%;"></td> <td style="text-align: center;">Severe</td> <td style="text-align: center;">0.4</td> <td style="text-align: center;">max</td> </tr> <tr> <td>Critical Structural Weakness</td> <td></td> <td></td> <td style="text-align: center;">Significant</td> <td style="text-align: center;">0.7</td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td style="text-align: center;">Insignificant</td> <td style="text-align: center;">1</td> <td></td> </tr> </table> <p>3.1 Plan Irregularity <i>Effect on Structural Performance</i> Insignificant ▼ 1.0 Factor A</p> <p>3.2 Vertical Irregularity <i>Effect on Structural Performance</i> Insignificant ▼ 1.0 Factor B</p> <p>3.3 Short Columns <i>Effect on Structural Performance</i> Insignificant ▼ 1.0 Factor C</p> <p>3.4 Pounding Potential (Estimate D1 and D2 and set D = the lower of the two or = 1.0 if no potential for pounding)</p> <p>a) Factor D1 - Pounding Effect</p> <div style="border: 1px solid black; padding: 5px; margin: 5px 0;"> <p>Note: Values given assume the building has a frame structure. For stiff buildings (e.g. with shear walls), the effect of pounding may be reduced by taking the co-efficient to the right of the value applicable to frame</p> </div> <table style="width: 100%; border-collapse: collapse; margin: 5px 0;"> <tr> <td style="text-align: center;">Factor D1</td> <td style="border: 2px solid black; text-align: center; width: 100px;">1.0</td> </tr> </table> <p>Table for selection of Factor D1</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 30%;"></th> <th style="width: 15%; text-align: center;">Severe</th> <th style="width: 15%; text-align: center;">Significant</th> <th style="width: 15%; text-align: center;">Insignificant</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">Separation</td> <td style="text-align: center;">0<Sep<0.005H</td> <td style="text-align: center;">.005<Sep<.01H</td> <td style="text-align: center;">Sep>.01H</td> </tr> <tr> <td style="text-align: center;">Alignment of Floors within 20% of Storey Height</td> <td style="text-align: center;">0.7</td> <td style="text-align: center;">0.8</td> <td style="text-align: center;">1.0</td> </tr> <tr> <td style="text-align: center;">Alignment of Floors not within 20% of Storey Height</td> <td style="text-align: center;">0.4</td> <td style="text-align: center;">0.7</td> <td style="text-align: center;">0.8</td> </tr> </tbody> </table> <p>b) Factor D2- Height Difference Effect</p> <table style="width: 100%; border-collapse: collapse; margin: 5px 0;"> <tr> <td style="text-align: center;">Factor D2</td> <td style="border: 2px solid black; text-align: center; width: 100px;">1.0</td> </tr> </table> <p>Table for selection of Factor D2</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 30%;"></th> <th style="width: 15%; text-align: center;">Severe</th> <th style="width: 15%; text-align: center;">Significant</th> <th style="width: 15%; text-align: center;">Insignificant</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">Separation</td> <td style="text-align: center;">0<Sep<0.005H</td> <td style="text-align: center;">.005<Sep<.01H</td> <td style="text-align: center;">Sep>.01H</td> </tr> <tr> <td style="text-align: center;">Height Difference > 4 Storeys</td> <td style="text-align: center;">0.4</td> <td style="text-align: center;">0.7</td> <td style="text-align: center;">1.0</td> </tr> <tr> <td style="text-align: center;">Height Difference 2 to 4 Storeys</td> <td style="text-align: center;">0.7</td> <td style="text-align: center;">0.9</td> <td style="text-align: center;">1.0</td> </tr> <tr> <td style="text-align: center;">Height Difference < 2 Storeys</td> <td style="text-align: center;">1.0</td> <td style="text-align: center;">1.0</td> <td style="text-align: center;">1.0</td> </tr> </tbody> </table> <p style="text-align: right; margin-right: 100px;">1.0 Factor D Lesser of D1 and D2</p> <p>3.5 Site Characteristics- (Stability, landslide threat, liquefaction etc)</p> <p style="margin-left: 100px;">Insignificant ▼ 1.0 Factor E</p> <table style="margin-left: 100px;"> <tr> <td style="text-align: center;">For Factor E</td> <td style="text-align: center;">Severe=</td> <td style="text-align: center;">0.5</td> </tr> <tr> <td></td> <td style="text-align: center;">Significant=</td> <td style="text-align: center;">0.7</td> </tr> <tr> <td></td> <td style="text-align: center;">Insignificant=</td> <td style="text-align: center;">1</td> </tr> </table> <p>3.6 Other Factors</p> <p style="margin-left: 100px;">1.0 Factor F</p> <p style="margin-left: 100px;">For ≤3 Storeys - Max value 2.5, otherwise Max value 1.5. No min.</p> <p>Rationale for choice of Factor F.</p> <div style="border: 1px solid black; background-color: #e0f0ff; padding: 10px; margin: 5px 0;"> <p>No reason to use an enhanced factor.</p> </div> <p>3.7 Performance Achievement Ratio (PAR) 1 (equals A x B x C x D x E x F)</p> | | | | | | For Factors A to C | | Severe | 0.4 | max | Critical Structural Weakness | | | Significant | 0.7 | | | | | Insignificant | 1 | | Factor D1 | 1.0 | | Severe | Significant | Insignificant | Separation | 0<Sep<0.005H | .005<Sep<.01H | Sep>.01H | Alignment of Floors within 20% of Storey Height | 0.7 | 0.8 | 1.0 | Alignment of Floors not within 20% of Storey Height | 0.4 | 0.7 | 0.8 | Factor D2 | 1.0 | | Severe | Significant | Insignificant | Separation | 0<Sep<0.005H | .005<Sep<.01H | Sep>.01H | Height Difference > 4 Storeys | 0.4 | 0.7 | 1.0 | Height Difference 2 to 4 Storeys | 0.7 | 0.9 | 1.0 | Height Difference < 2 Storeys | 1.0 | 1.0 | 1.0 | For Factor E | Severe= | 0.5 | | Significant= | 0.7 | | Insignificant= | 1 |
| | For Factors A to C | | Severe | 0.4 | max | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Critical Structural Weakness | | | Significant | 0.7 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | Insignificant | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Factor D1 | 1.0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Severe | Significant | Insignificant | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Separation | 0<Sep<0.005H | .005<Sep<.01H | Sep>.01H | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Alignment of Floors within 20% of Storey Height | 0.7 | 0.8 | 1.0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Alignment of Floors not within 20% of Storey Height | 0.4 | 0.7 | 0.8 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Factor D2 | 1.0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Severe | Significant | Insignificant | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Separation | 0<Sep<0.005H | .005<Sep<.01H | Sep>.01H | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Height Difference > 4 Storeys | 0.4 | 0.7 | 1.0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Height Difference 2 to 4 Storeys | 0.7 | 0.9 | 1.0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Height Difference < 2 Storeys | 1.0 | 1.0 | 1.0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| For Factor E | Severe= | 0.5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Significant= | 0.7 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Insignificant= | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| Table IEP- Initial Evaluation Procedure Step 4, 5 and 6 | | | | | | |
|---|---------------------|---------------------------|----------|----------|----------|-----|
| As per NZSEE document "Assessment and Improvement of the Structural Performance of Buildings in Earthquake" (incl Corrigendum No.1) | | | | | | |
| Building Name: | Trentham Racecourse | Ref.: 15224 | | | | |
| Location: | 10 Racecourse Road | By: LIS | | | | |
| | | Date: 28 June 2011 | | | | |
| Step 4- Structural Performance Score | Longitudinal | Transverse | | | | |
| 4.1 Assessed Baseline (%NBS) _b | 11.8 | 11.8 | | | | |
| 4.2 Performance Achievement Ratio (PAR) | 0.70 | 1.00 | | | | |
| 4.3 PAR x Baseline (%NBS) _b | 8.3 | 11.8 | | | | |
| 4.4 Percentage New Building Standard (%NBS) | | 8 | | | | |
| Step 5- Potentially Earthquake Prone | %NBS<34 | Yes | | | | |
| Step 6- Potentially Earthquake Risk | %NBS<67 | Yes | | | | |
| Step 7 Grading for Seismic Risk | Seismic Grade | E | | | | |
| Relationship between Grade and SPS: | | | | | | |
| Grade: | A+ | A | B | C | D | E |
| %NBS: | >100 | 100 to 80 | 80 to 67 | 67 to 33 | 33 to 20 | <20 |
| <p>Evaluation by..... </p> <p style="margin-left: 150px;">Name: Lily Simpson</p> <p>Reviewed by..... </p> <p style="margin-left: 150px;">Name: Ignatius Black</p> <p style="margin-left: 100px;">CPEng. No: 259219</p> | | | | | | |