



**Opus International  
Consultants Ltd**  
Hamilton Office  
Opus House, Princes Street  
Private Bag 3057, Waikato Mail  
Centre, Hamilton 3240  
New Zealand

t: +64 7 838 9344  
f: +64 7 838 9324  
w: www.opus.co.nz

22 April 2013

R C Hall  
BHC Consulting  
714 Te Aute Raod  
RD 2  
Hastings  
4172

2-S8400.02

Dear Bob

### **Gisborne District Council: 2002 Office Extension**

Thank you for your letter dated 10 April 2013 which raises a number of items for further consideration. We write to respond to your comments as follows:

1. We note that you consider the shear walls to have been designed as nominally ductile. However, a ductility of  $\mu=3.0$  has been used to calculate the seismic demands on the shear walls and building as a whole. NZS 3101 requires that a capacity design approach is used for the connecting elements and foundations to ensure the building behaves as expected. This does not appear to be the case based on the building consent calculations dated 7 November 2001 and as such we have based our assessment on a ductility of  $\mu=1.25$  throughout.
2. We would be grateful if you could supply us with a copy of your calculations for our consideration.
3. We have checked the diaphragm using a finite elements analysis undertaken using an ETABS model and a capacity calculated using an available concrete thickness of 102mm (160mm slab minus the depth of the Traydec 300 profile). However, if you wish to submit further strut and tie calculations we would be more than happy to consider your analysis.
4. A rocking analysis using the approach outlined in the SESOC Journal (Vol. 24, No.1-April 2011) was undertaken as part of our assessment. For the two 6.0m long shear walls this resulted in a change of period from 0.182 seconds to 0.397 seconds. Unfortunately this does not result in a reduction of the seismic loads experienced by the building.

We look forward to receiving any further information you may wish to submit but you should have any queries or require further clarification in connection with the above please do not hesitate to contact us.



Regards

A handwritten signature in black ink, appearing to read 'G. Salter', with a long horizontal flourish extending to the right.

Graeme Salter  
Senior Design Engineer (Structures)

