

appendix 4

HOLMES CONSULTING GROUP
STRUCTURAL AND CIVIL ENGINEERS

17 February 1997

File No.: 29985

Architecture Warren & Mahoney
PO Box 1527
CHRISTCHURCH

Attention: Barry Dacombe

Dear Barry

CDB BUILDING - CONVERSION FOR PGG USE

We understand that PGG Ltd intend to completely refurbish the CDB building in Cambridge Terrace for their own use.

As part of the refurbishment project, they intend to do some structural upgrading work. We understand that the structural upgrading work is likely to cost in the order of \$150,000 to \$200,000.

A quick check against the Building Act shows:-

1. Because there isn't a "change of use" occurring, there is no requirement to structurally strengthen the building to current code standards.
2. With the alteration work, however, the Building Act requires that the structural strength of the building is not reduced as a consequence of that work.

Whilst the minimum legal requirements for structural improvement are quite modest, we consider it prudent to identify all areas of potential excessive vulnerability to seismic damage and recommend cost effective methods of reducing that vulnerability. This is particularly so when significant expenditure is budgeted for a major refurbishment and the building gets a new "lease of life".

The building is now 34 years old, and while it was designed and built to the structural standards of the day, it cannot be expected to perform as well as a more modern building designed and built to current standards.

We recently made a preliminary study of the building and have found a potential for seismic damage to some of the columns and to the base of sections of some of the shear walls. The shear walls can be expected to "rock" in a major seismic event, so damage to secondary elements will be likely.

We have a good knowledge of the building. Holmes Consulting Group's predecessor designed it in the early 1960's and we still have the drawings and some of the original calculations. We are well suited to do the current study and advise on the strengthening work. Also, our affiliate company, EQE New Zealand Ltd specialises in this seismic rehabilitation work, so can assist us with any of the more detailed analysis work.

Holmes Consulting Group Ltd
3rd Floor 61 Cambridge Terrace
PO Box 701 Christchurch New Zealand

Offices in Wellington Christchurch Auckland Queenstown Sydney

Telephone :(3) 366 - 3366
Facsimile :(3) 379 - 2169

Holmes Consulting Group - Page 2

The extent of work we propose is to include:-

1. A 3-D computer model of the structure will be developed using our ETABS structural software. This model will provide all structural actions for structural beams, columns and shear walls in the building.
2. Checking the strength of the existing members against the strength demands as per the computer model. That will then identify all elements with excessive vulnerability to seismic damage.
3. Design and documentation of strengthening systems, be they steel jacketing the columns or enhancing the shear strength of the shear walls by casting on structural facing walls.
4. Check and modify the connections of the major secondary components such as stairways and cladding systems if necessary.
5. Monitor the work of the contractor during the construction phase.

It is generally expensive and/or unrealistic to strengthen a building of this age to full new code requirements, but by identifying and enhancing any weak and vulnerable links in the building's strength will usually result in cost effective risk reduction.

The fee we propose for this seismic rehabilitation work is \$21,600 plus GST.

Thank you for the opportunity to offer our services and provide a fees quotation for this project.

As usual, our conditions of engagement are the combined ACENZ/IPENZ "Model Conditions of Engagement between Client and Consultant for Professional Services" - September 1996 Version.

This offer of service shall remain valid for 60 days.

Yours sincerely



R Grant Wilkinson
Director
HOLMES CONSULTING GROUP LTD
Christchurch Office

appendix 4

J. A. C. CONTRACTOR

21 April 1997

W.J.Fox, MNZIOB,
 Building and Construction Consultant,
 16 Highgate Avenue,
Christchurch.

Dear Sir,

PYNE GOULD CORPORATION LIMITED, CAMBRIDGE HOUSE PROJECT

We submit herewith our quotations for the various areas of work as discussed with you and measured and inspected on site.

(A) **The internal strip out of the office areas on the first, second, third and fourth floors of the building.**

Penthouse ?

Extent of work: Remove all internal partitions, fixtures, fittings and all miscellaneous materials and rubbish in the buildings on those floors. Remove all ceilings and the framing thereto, light fittings and heat detectors. Note all fire hose reels and heating radiators will be left including as required that section of the wall on which they are mounted. Remove all materials, fittings and fixtures etc. from the site, all salvage becomes our property to sell off or dispose of as we deem appropriate.

We will leave all areas swept and vacuumed out. On the ground floor we have only allowed for the removal of fixtures and fittings, rubbish etc. at this stage, but we would be pleased to price any further required demolition and removal at the ground floor area once detailed requirements are established.

We have allowed for the demolition and removal of the concrete block walls that form the strongroom and safes, two on the first floor and one on the third floor. All demolition materials will be removed from the site. We have not allowed for the making good of any floors or the removal of any stuck down floorcoverings as we are informed this would be covered by the floorcoverings contract. We will co-operate and co-ordinate with this trade as required.

(A.1) Removal of rubbish, 36 number waste takers allowed for.	\$ 3,060.00
(A.2) Hoisting crane etc. (Crane 12 hours @ \$140.00 plus hoisting etc.)	\$ 2,240.00
(A.3) Electrical disconnection and temporary supply for carrying out the work	\$ 500.00
(A.4) Plumbing disconnection and capping off	\$ 550.00
(A.5) Fire protection and security disconnection	\$ 350.00
(A.6) Labour and equipment for demolition and removal. (66 total man days allowed for two tradesmen and two labourers. Average \$17.50 per hour)	\$ 9,240.00
	<u>\$15,940.00</u>
	Page 1 of 4

J. A. C. CONTRACTOR

- 2 -

Note 1. P.G.C. fax of 16/4/97 "materials and equipment being removed by client before our strip out commences" (copy herewith) has been taken into account. *Ground floor safe*

Note 2. No allowance for any costs relating to building consents has been included.

Note 3. No allowance for insurances, this is to be arranged by P.G.C.

Note 4. Herewith is a copy of J.A.C. Contractors "Health and Safety Plan. All work will be carried out in accordance with the plan and all persons employed on the site will be made aware of the plan and its conditions.

Note 5. It is anticipated that the work would be carried out between the 1st of May 1997 and the 13th of June 1997 and that we would be allowed uninterrupted access and occupation of the site as required in that period. We would take the responsibility of securing the building and site for that period but have assumed the retention of the existing security system and monitoring, not at our cost.

- (B) **The removal of the exterior balcony precast concrete balustrade panels.**
Extent of work: Gas cutting and the removal and disposal of the panels. Removal of the weld plates in the columns by cutting back the concrete on one side to a depth of 20mm and then gas cutting using a protective shield to remove the steel back to 20mm depth. Corrosion protection of the steel in the column and Expocrete filling and patching of the cut back area of the concrete leaving the surface ready for repainting. The above work in accordance with discussions and instructions from Mr. John Hare of Holmes Consulting Limited, Structural Engineers.

We have also allowed for the supply of 72 number "Ramset" safety eyelets to the concrete columns for future use by other trades and maintenance persons in the life cycle of the building. This is one safety harness fixing point to each column of the 2nd, 3rd and 4th floor balconies. Subsequent discussions indicate that the safety harness fixing points may be better incorporated into the steel column strengthening members refer (C) below. We will work to the Engineers/Architects instructions in respect of this.

- | | |
|--|-------------|
| (B.1) Remove 12 number L shaped corner panels and 57 number straight balcony balustrade panels note the L shaped panels at each side of the exterior stair balcony juncture are not allowed to be removed. (13 total man days allowed at average of \$17.50 per hour, tradesman and labourer). | \$ 1,820.00 |
| (B.2) Crane hire 34.5 hours @ \$140.00 per hour
(0.5 hours per panel removal and loading) | \$ 4,830.00 |
| (B.3) Gas and gas axes | \$ 850.00 |
| (B.4) cartage of panels and disposal | \$ 980.00 |

J. A. C. CONTRACTOR

- 3 -

(B.5) Safety Harness eyelets			
B.5.1	72 number Ramset safety eyelets @ \$14.75 each	\$1,062.00	
B.5.2	72 number 20 diameter Dynabolts @ \$2.36 each	\$ 169.92	
B.5.3	Labour 15 minutes each x 72		
	= 18 hours @ \$17.50 average	\$ 315.00	\$ 1,546.92
(B.6) Cutting back weld plates, corrosion treating and epoxy mortaring 69 x 2 = 138 connections			
B.6.1	Concrete breaking 138 x 15 minutes = 34.5 hours @ \$17.50 average	\$603.75	
B.6.2	Plant hire	\$150.00	
B.6.3	Gas cutting and gas	\$850.00	
B.6.4	Labour as B.6.1. above	\$603.75	
B.6.5	Treat with Expocrete 5 and epoxy mortar Labour as B.6.1. above	\$603.75	
B.6.6	Materials	\$585.00	\$ 3,396.25
			<u>\$13,423.17</u>
(C) <u>Supply fit and fix secondary mild steel support posts to perimeter columns</u>			
1st floor, 2nd floor, 3rd floor and 4th floor, all in accordance with Holmes Consulting Limited details and further verbal instructions. 18 number posts on four levels = 72 posts total.			
On the 2nd, 3rd and 4th floors the posts to be from structural slab level of balconies to the soffit of the beam or slab as applicable in the soffit space. On the 1st floor the post to be let into the floor slab to the depth of the base plate and fixings, to enable it to be covered and the floor patched around the post. The soffit of the balconies to be cut out and then made good.			
(C.1) Supply of steelwork by Pegasus Engineering Limited (the lowest quote)			\$25,641.00
(C.2) Cutting holes in topping slab or floor slab 72 number x \$21.00			\$ 1,512.00
(C.3) Packing holes with "Conbextra GP" and leveling to slab or balconies, including waterproofing as required 7 number x \$10.00			\$ 700.00
(C.4) Dynabolts and bolting 72 x 4 = 288 x \$5.00			\$ 1,440.00
(C.5) Cartage and lifting 72 x \$7.00			\$ 504.00
(C.6) Painting, sandblasting to SA25. Paint "Duspec" No 122A 4 coat system 151 M ² x \$25.00 M ²			\$ 1,510.00 \$ 3,775.00
(C.7) Plastic protection wrap			\$ 302.00
			<u>\$35,384.00</u>

J. A. C. CONTRACTOR

- 4 -

Note 1 Investigations on site show that the lengths will vary allowance has been made to site measure each post.

Note 2 Where posts butt to slab soffit and not to beam soffit the fixings will be bolted right through from floor to floor.

Summary of Quotations:

Quotation (A)	Strip out	\$15,940.00
Quotation (B)	Removal of panels	\$13,414.42
Quotation (C)	Steel support posts	\$35,384.00
		\$64,738.42
	Preliminary & General 4%	\$ 2,589.54
		\$67,327.96
	Margin 6%	\$ 4,039.68
	GST Exclusive	\$71,367.64

Due to the nature of the work we recommend that a client contingency sum of \$5,000 is allowed, this to be expended only as required and instructed by the Architect and/or Structural Engineer.

Should you so desire the prices for the individual sections of the work could be made to stand alone, but we would reserve the right to reassess the pricing in respect of P&G, cartage, craneage etc. as we have assumed that the sections of work would be coordinated in many areas, e.g. cut out, demolition, removal and cart away as well as providing minimum down time and site set up. The work to the balustrades and the supply and erection of the steel posts could be delayed to the end of May 1997 if necessary, but the cut out and demolition would be best done in conjunction with interior strip out.

It has been assumed that power for lights and tools and water will be made available from the existing building at no cost. Also that the toilets accessible externally on the ground floor and the yard storage sheds/office may be used at no cost to us.

Our quotation is based on a direct contract between P.G.C and J.A.C. Contractor with progress payments being claimed and paid on a 20th of the month basis. Payments to be certified by the Architects. A retention of 10% to apply with release of 5% at practical completion and the remainder 60 days following practical completion.

Please advise if there is any further information you require at this time.

Yours faithfully,



J.A. Creasey,
J.A.C. Contractor.

Enc: Safety plan Duspec 122A
 P.G.C. 16/4/97 fax Pegasus quotation

J. A. C. Contractor, P. O. Box 10, Pigeon Bay, Banks Peninsula. 3550425 or (03)3046889

J. A. C. CONTRACTOR

Builders and General Contractors

SAFETY AND HEALTH MANAGEMENT PLAN (Outline for Clients and Consultants)

INTRODUCTION:

The J.A.C. Contractors Safety and Health Management Plan has been prepared in accordance with the requirements contained in the Health and Safety in Employment Act 1992 and recognising the fundamental object of the Act which is to promote excellence in safety and health by employers.

It should be noted that a strong management commitment to safety and health at work is part of J.A.C. Contractors philosophy and the requirements of the new Act are recognised as part of J.A.C. Contractors duties as an employer.

THE PLAN:

As provided for in the Health and Safety in Employment Act the key elements of the firms Safety and Health Management Plan are the systematic identification of hazards and the control of these by options of elimination, isolation or minimisation. Steps in the identification of hazards and the assessment of the significance are assisted by a range of checks which identify particular matters on construction sites that may contribute to hazards or may have associated dangers.

Site safety meetings involving employees and management are held in accordance with a defined programme. At these meetings issues of safety are discussed, recommendations are made and previous recommendations are monitored to assess the state of compliance.

If any person on site observes an unsafe practice a particular form is available on which details of the practice are described and remedial action is noted. A specified procedure exists for issuing such a notice which ensures that prompt action occurs, and which is supervised by site management personal.

The Safety and Health Management Plan also provides for:

- * The provision of information on specific hazards, including a requirement for the provision of Material Safety Data Sheets to accompany the delivery of any hazardous substances to be used on site;
- * The training of employees about the hazards inherent in the Construction industry and the special hazards which may exist at a particular site.
- * The supervision responsibilities of various levels of site management with regard to employees at that site.
- * Emergency procedures to be developed for each site, to be displayed in accessible area, and for emergency drills to be held as required.

J. A. C. CONTRACTOR
Builders and General Contractors

- 2 -

Safety and Health Management Plan (cont'd)

J.A.C. Contractors recognises that even on the best managed site accidents will occur. The firms philosophy, reflecting the Act, is that by reporting, careful recording and thorough investigation of accidents by a set procedure the cause can be clearly identified and remedial measures can be put in place to prevent a recurrence.

The Safety and Health Management Plan recognises the responsibility of J.A.C. Contractors, as Principal, for the safety and health of everyone on site, including sub-contractors. However, as employers themselves, sub-contractors have all the duties of the Act which apply to employers. J.A.C. Contractors therefore makes it a priority to obtain written assurances from sub-contractors, along prescribed lines, that their own safety and health management standards are able to provide high levels of safety for their employees.

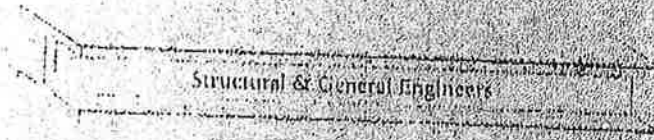
EMPLOYEE'S SAFETY BOOKLET:

In addition to the Safety and Health Management Plan, J.A.C. Contractors provides to each employee and sub-contractor beginning work on one of the firms construction sites a copy of a booklet titled 'A Guide to Health and Safety in Employment'.

J.A.C. Contractor/1994
Updated with corrections 1997

PEGASUS INDUSTRIAL ENGINEERING LTD

1st Floor 165/2 • 22 Klondyke Drive • CHRISTCHURCH • Phone (03) 349 7782 • Fax (03) 349 7752



17th April 1997

JAC Contractors
 Fax No. 355-9481
 CHRISTCHURCH

Attention: Andrew

Dear Sir,

RE: STEELWORK FOR PYRE GOULD CORPORATION
 (REF: Q 1292)

We have pleasure in submitting our quotation of \$ 25,641.00 (Twenty Five Thousand Six Hundred & Forty One Dollars Only) for the SUPPLY ONLY of the following:

72off 200x100x9 RHS posts complete with 10mm top & baseplates

PLEASE NOTE:

- # This quotation excludes G.S.T
- # All Tenders/Contracts of \$ 10,000.00 or less STRICTLY NO RETENTIONS ARE TO BE HELD
- # Excludes all crange, hoisting & erection.
- # All steelwork is prime paint finished less otherwise stated

We have been unable to put a price on the wedges as all indications are that the cost would be extremely high & even then we couldn't guarantee that we could in fact cut & straighten the steel to produce a satisfactory product. The alternative would be to have the wedges machined, again cost prohibit this as a viable option.

Yours faithfully

Phillippa Luoni (A.N.Z.I.Q.S.)
 QUANTITY SURVEYOR



PYNE GOULD CORPORATION LTD.

178 GARHILL AVENUE, P.O. BOX 1871, CHRISTCHURCH
 PHONE: 0-3-365 0000 FAX: 0-3-370 0010

DISPATCH

16 APR 1997

233 CAMBRIDGE TERRACE
 RECOVERIES EX 233 CAMBRIDGE TERRACE
 BY NORTH SOUTH AIRPORT PARK LIMITED

Fourth Floor

Carpet west side of lift well.

Third Floor

West side of lift well, grey carpet north and south sides.

Second Floor

Hot water tap - cafeteria.
 Three light fittings - boardroom.
 2x blue drapes - boardroom.
 2x PDU heaters - boardroom.
 Carpet room 214.

First Floor

Red and blue carpets east side.
 MTR cabinet room 108.
 3x chairs north east corner.
 Green carpet office under fire exit sign.
 Green carpet in office next to fire exit sign.
 2x glass panels east side of lift well.

18 113.

Ground Floor
 Safe

HOLMES CONSULTING GROUP
STRUCTURAL AND CIVIL ENGINEERS

JN:	/
RGW	
BJW	
DZB	
CBL	
JEG	
BAG	
GH	
TMB	
ARF	
PWS	
BGJ	
HSM	
PJM	
JBM	

FACSIMILE

TO WJ Fox B&C Consultant **FAX No.** 03 355 9471
ATTENTION Bill Fox **JOB No.** 29985
FROM John Hare **DATE** 25 March 1997
No. of Pages 2
SUBJECT Interlm Report - Preliminary analysis

Please phone (03) 366-3366 if this fax is not received in full

Bill,

We have now completed the initial assessment of the building in its existing form. The results are as follows:

1. The building will survive with minimal damage to the main structure to a level corresponding to 50% of full code loading.
2. At levels in excess of this significant cracking and movement develop in the main cross walls (initially at the wall on line b, through the piers, and the lintels of the wall adjacent to line c), and in the lintels of the main wall on line E. This damage is focused at the first floor level, due to the presence of significant extra walls from ground to first floor levels.
3. In conjunction with the cracking and movement noted above, the walls rock on their foundations, with significant uplift starting to occur, particularly at C/d and F/d, and D/f.
4. As the main structure deforms, the columns are subject to significant lateral drift requirements, particularly resulting from torsional response of the structure. This is most pronounced in the relatively stiff 16" dia. ground floor columns from about 50% of code load, through to the upper level 10" sq columns, at about 85% of code loading.

From this we conclude the following:

1. The potential failure of the columns is a life safety issue, as it could result in the loss of support and consequential collapse of all or part of the building.
2. The cracking and movement of the walls does not appear to carry any life safety implications. The failure is concentrated in the lateral walls, which do not carry significant gravity loads. However, as the damage becomes more extensive, the lateral load carrying capacity drops, resulting in increased deflection and consequent non-structural damage. This may have implications for business continuance in the event of a major earthquake, unless personnel and resources can be temporarily relocated.

Our preliminary recommendations are as follows:

- **LIFE SAFETY:** The 16" dia gravity columns at ground floor need to be jacketed with structural steel or alternatively a composite fibreglass/kevlar wrap.
- **LIFE SAFETY:** The upper level 10" sq columns need either to be jacketed as above, or to have secondary structural support provided. This could take the form of concrete grouted steel tubes or RHS members. Ideally these would be located on the grid junctions over the 16" dia columns, but this may conflict with the general wall cladding line, and the first floor fit-out. Alternatively, these columns could be located immediately behind the existing

COPIES TO: HCG Chch - Grant Wilkinson

Holmes Consulting Group Ltd
3 rd Floor 61 Cambridge Terrace
PO Box 701 Christchurch New Zealand

Offices in Auckland Christchurch New Plymouth Sydney Wellington



Telephone: (03) 379-3366
Facsimile: (3) 379-2169
An accredited certification body listed under registration No. S1280992NW

Duspec No. 122A



Title: DULUX Acrathane IF epoxy acrylic for Structural Steel

Substrate: Mild Steel

Substrate Characteristics

IRON AND STEEL: New mild steel surfaces should be inspected for millscale, rust, sharp edges, burr marks and welding flux. Some steel surfaces may have forming or machine oils, salts, chemical contamination or mortar splashes on them which must be removed. All surfaces should be cleaned and prepared according to appropriate surface preparation method and specification.

Surface Preparation

PS604 ABRASIVE BLAST CLEANING: Surfaces contaminated with oils, salts, acids or other chemicals should be cleaned prior to abrasive blast cleaning to prevent recirculation of contaminants with abrasive grit. The surface should be blast cleaned with the selected process (open dry blasting, closed recirculated blasting, wet blasting) to the specified AS1627:4 standard (Class 1, 2, 2.5 or 3). The blast cleaned surface should be treated or primed within 4 hours after preparation or before the surface becomes re-contaminated. Reference: Australian Standard 1627, Part 4.

Application Details	Data Sheet		Theoretical Spreading Rate	Dry Film Thickness	Recoat	
	Number	Packs			Min	Max
First Coat: DULUX Zincanode 402 Apply with Brush, roller, conventional or airless spray.	PC122	Two	6.4 sq.m/l	75 microns	4 Hours	Indefinite
Second Coat: DULUX Luxepoxy 4 White Primer Apply with Brush, roller, conventional or airless spray.	PC200	Two	8.6 sq.m/l	50 microns	8 Hours	Indefinite
Third Coat: DULUX Luxepoxy 4 White Primer Apply with Brush, roller, conventional or airless spray.	PC200	Two	8.6 sq.m/l	50 microns	8 Hours	Indefinite
Fourth Coat: DULUX Acrathane IF Apply with Brush, roller, conventional or airless spray.	PC218	Two	8.6 sq.m/l	50 microns	16 Hours	Indefinite

Explanatory Notes

Practical spreading rates will vary from quoted theoretical figures depending on substrate porosity, surface roughness, overspray losses, application methods and environmental conditions (eg wind).

Application techniques should be adjusted to achieve the recommended Dry Film Thickness.

Dry times apply to a single coat at 25C and 50% Relative Humidity. Allow longer times under cool, moist or still conditions. Do not apply paint if Relative Humidity is above 85% or temperature is within 3C of Dew Point, or the surface temperature is greater than 50C.

PROJECT REFERENCE:	PREPARED BY:	DUSPEC No:	VERSION:	ISSUE DATE:	PAGE No:
		122A	1.01	13 /06 /96	1

Holmes Consulting Group - Page 2

columns, outside the general cladding line, but there would be waterproofing and egress issues to consider (as discussed WJF/HJH 20/3).

- **DAMAGE REDUCTION:** Consideration could be given to strengthening the transverse shear walls. This could include infilling of windows in the walls on line b, and strengthening the lintels of the walls on lines c and e.
- **DAMAGE REDUCTION:** The egress stairs at the rear of the building may be significantly damaged by the degree of movement implicit in the higher load levels. While this may not result in failure, consideration could be given to replacement with a lightweight stair, possibly incorporating a new lift shaft if planning allowed.

Note that we consider the life safety issues above are essential, but the damage reduction measures are optional. We will present our estimate of the damage reduction potential in terms of probabilities of occurrence in our full report.

A fuller investigation is still required to confirm the capacity of those elements which link the main structure together, but we do not anticipate any significant concerns with this. Our next task is to design the remedial elements noted above.

We require notification of any alterations required to the main structure to suit replanning. We recommend that modifications which weaken in any way the main structure are avoided, to minimise cost, and to satisfy section 38 of the Building Act, which would otherwise require compensating new structure - probably expensive.

Please call me at 09 522 4596 if you have any questions today, I will be in Chch tomorrow.

Regards

John Hare

