

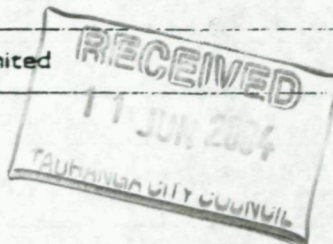


Tauranga City

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Rundle Engineering Design Consultants Limited

**PRODUCER STATEMENT - DESIGN No. 4201**

Issued by: **Graham N. RUNDLE**
to: **Mr & Mrs AR & SG O'BRIEN**
To be supplied to: **TAURANGA DISTRICT COUNCIL**
in respect of: **PROPOSED DWELLING FOR Mr & Mrs AR & SG O'BRIEN**

Rundle Engineering Design Limited has been engaged by
M. O'BRIEN

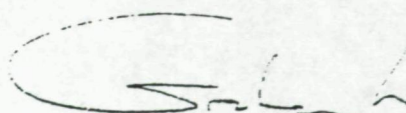
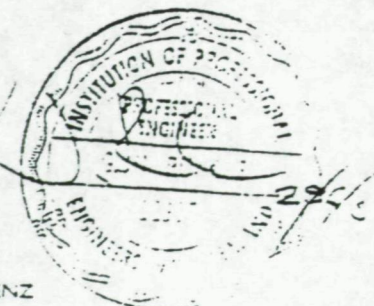
to provide engineering design services in respect of the requirements of
Clause B1

of the Building Regulations 1992 for those parts of the building work specified in the
accompanying calculations. The design has been prepared in accordance with

BI/MI & ASI

of the approved documents issued by the Building Industry Authority and the work
is described on **M. O'BRIEN**
drawings titled **PROPOSED DWELLING FOR Mr & Mrs AR & SG O'BRIEN**
and the specification and other documents according to which the building is proposed
to be constructed.

As an independent design professional covered by current policy of Professional
Indemnity Insurance to a minimum value of \$200,000, I believe on reasonable grounds
that subject to the safe ground bearing pressure being no less than **70 kPa** and all
proprietary products meeting the performance requirements, the drawings, specifications
and other documents to which the building is proposed to be constructed comply with the
relevant provisions of the building code.

Graham N. RUNDLE BE M.PENZ

Engineers Registration Board
Registration Number **7733**

CALCULATIONS

Page 1

Client: M. O'BRIEN

Project: PROPOSED DWELLING FOR Mr & Mrs AR & SG O'BRIEN

Project No. 4201

Floor beam: Garage Door Lintel

Beam span, L = 4.800 m

Steel: Provide 230 PFC 25.1

Grade: 300PLUS

Camber: 0mm

70 kPa

Support on 2/100 x 50 studs

each end.

Ä 500 x 500

min. pad

Bearing

B 500 x 500

min. pad

Steel beam design using NZS 3404:1992 for limit state design:

Loadings: UDL

Distance between top edge restraints, $L_x = 0.400$ m

A 0.0 m 4.8 m 0.0 m B $k_t = 1.0$

Roof: Sr 6.3 m Eaves, $S_e = 0.6$ m $k_l = 1.0$

$\psi_{lr} = 0.0$ Dead: Heavy 0.90 kPa x (S/2 + Se) = 3.35 kN/m $k_r = 1.0$

$\psi_{sr} = 0.7$ Live: 0.25 kPa x (S/2 + Se) = 0.93 kN/m $L_{ex} = 0.400$ m

Wall: H 0.0 m Dead: Light 0.26 kPa x H = 0.00 kN/m

Floor: Sf 0.0 m

$\psi_{lf} = 0.4$ Dead: 0.39 kPa x S/2 = 0.00 kN/m

$\psi_{sf} = 0.7$ Live: 1.50 kPa x S/2 = 0.00 kN/m

UDL Dead Load $w_G = 3.35$ kN/m

UDL Live Load $w_Q = 0.93$ kN/m

Total UDL Load $w_T = 4.28$ kN/m

Self weight:

Self Weight $w_G = 0.25$ kN/m

Loadings: Point

2.4 m 2.4 m

Roof: L = 6.3 m B = 3.0 m

$\psi_{lr} = 0.0$ Dead: Heavy 0.90 kPa x (L/2 x B/2) = 4.22 kN

$\psi_{sr} = 0.7$ Live: 0.25 kPa x (L/2 x B/2) = 1.17 kN

Wall: H 0.0 m L = 0.0 m

Dead: Light 0.26 kPa x H x L = 0.00 kN

$R_{AG} = 10.7$ kN

Floor: L 0.0 m B = 0.0 m

$\psi_{lf} = 0.4$ Dead: 0.40 kPa x (L/2 x B/2) = 0.00 kN

$R_{AQ} = 2.8$ kN

$\psi_{sf} = 0.7$ Live: 0.23 kPa x (L/2 x B/2) = 0.00 kN

$R_{SG} = 10.7$ kN

$R_{SC} = 2.8$ kN

Total Dead Load $P_G = 4.22$ kN

Total Live Load $P_Q = 1.17$ kN

Total Load $P_T = 5.39$ kN

Load Case: 1.4G

$w_u^* = 4.7$ kN/m $P_u^* = 5.9$ kN

$M^* = 21.6$ kNm

$V^* = 15.0$ kN

Load Case: 1.2G & 1.6Q

$w_u^* = 5.5$ kN/m $P_u^* = 6.9$ kN

$M^* = 25.1$ kNm

$V^* = 17.4$ kN

Serviceability: G

$w_s = 3.4$ kN/m $P_s = 4.219$ kN

$V_s = 10.7$ kN

Serviceability: G + ψ_1 Q

$w_s = 3.4$ kN/m $P_s = 4.219$ kN

$V_s = 10.7$ kN

Serviceability: G + ψ_3 Q

$w_s = 4.0$ kN/m $P_s = 5.039$ kN

$V_s = 12.7$ kN

Stress:

$\phi M_b = \alpha_s \alpha_m \phi M_{sx} > M^*$ - Eq. 3.4 NZS 3603:1993

Load Case: 1.4G

$\phi M_b = 73.2$ kNm $\downarrow$ OK

Load Case: 1.2G & 1.6Q

$\phi M_b = 73.2$ kNm $\downarrow$ OK

$\phi = 0.9$

Deflections:

Camber = 0mm

$f_{ty} = 300$ MPa

Serviceability: G

$\delta_G = 6$ mm Span/ 744

$E = 200.000$ MPa

Serviceability: G + ψ_1 Q

$\delta_{G + \psi_1 Q} = 6$ mm Span/ 744

$d = 230$ mm

Serviceability: G + ψ_3 Q

$\delta_{G + \psi_3 Q} = 8$ mm Span/ 628

$b_f = 75$ mm

Roof & Floor: $\delta < L/300 - G \& \psi_1 Q - \text{sag}$ OK

$Z_{ex} = 271 \times 10^3 \text{ mm}^3$

Floor: Normal $\delta < L/400 - G \& \psi_3 Q - \text{sag}$ OK

$I_x = 26.8 \times 10^8 \text{ mm}^4$

Floor: Supporting framed wall $\delta < L/300 - G \& \psi_3 Q - \text{sag}$ OK

Weight = 25.1 kg/m

Floor: Vibration $\delta < 1 \text{ mm} - Q_b = 1.0$ kN OK

$J = 108 \times 10^3 \text{ mm}^4$

Ceiling: Flat finish $\delta < L/500 - G - \text{sag}$ OK

$I_w = 15 \times 10^9 \text{ mm}^4$

Textured $\delta < L/250 - G - \text{sag}$ OK

$I_y = 1.76 \times 10^8 \text{ mm}^4$

Suspended $\delta < L/360 - G - \text{sag}$ OK

$\alpha_s = 1.016$

Stopped $\delta < L/200 - G \& \psi_3 Q - \text{cracking}$ OK

$\alpha_m = 1.35$

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Wall Bracing Calculation Sheet A

Job Details

box 1

Name O BRIEN
 Street and Number PALOMINO PLACE
 Lot and DP Number LOT 158
 City/Town/District PAPAMOA
 Location of Storey: single/upper of two/lower of two
 Building height to apex 5.2 m Roof weight light/heavy heavy
 Roof height above eaves 2.6 m Cladding weight light/heavy heavy
 Stud height 2.4 m Room in roof space Y
 Average roof pitch 22
 Building length BL = 19.8 m Gross Building
 Building width BW = 14.65 m Plan Area, GPA = 220 m²

Note: When the average roof pitch is over 25 degrees, use the eaves length and width to determine BL and BW.

Note: For heavy roofs use the roof plan at eaves level to determine GPA.

Wind Zone

box 2

Region: R1 0 ☒ Inland 0 ☒ Exposure: Sheltered 0 ☒ Topography: Gentle 0 ☒
 R2 1 ☐ Coastal 1 ☐ Exposed 1 ☐ Moderate 1 ☐
 Extreme 3 ☐
 Total points 0
 Wind Zone: Low (0) Very high (3)
Medium (1) Specific Design (4)
High (2)

Earthquake Zone

box 3

From figure EQ1 select Earthquake Zone:

A B C

BUs required Wind

box 4

From Table W1A/W1B

W along = 54 BUs/m

W across = 54 BUs/m

Total wind load,

W ALONG:

W along x BW = 793.8 BUs

W ACROSS

W across x BL = 1069.2 BUs

BUs required Earthquake

box 5

From Table EQ1

E = 5.9 BUs/m²

Note: For a room in the roof space use E + 1

Total earthquake load,

EQ ALONG and EQ ACROSS

E x GPA BUs = 1298 BUs



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Wall Bracing Calculation Sheet B

Along

Wall or Bracing Line		Bracing Elements Provided			Wind		Earthquake	
1	2	3	4	5	6 W	7 W	6 E	7 E
Line Label	Minimum BUs Required	Bracing Element No.	Bracing Type	Length Element (m) L	Rating BU/m W	BUs Achieved (BU/m x L) W	Rating BU/m E	BUs Achieved (BU/m x L) E
A		①	CP6	1.8			100	180
		②	CP6	1.8			100	180
		③	CP6	1.6			100	160
B		④	GIB 1	2.1			50	125
		⑤	GIB 2	2.4			70	168
		⑥	GIB 1	2.7			50	135
C		⑦	GIB 2	2.4			70	168
		⑧	GIB 2	2.4			70	168
		⑨	GIB 2	2.4			70	168
D		⑩	GIB 2	2.4			70	168
		⑪	CP6	1.4			100	140
		⑫	CP6	1.8			100	180
E		⑬	CP6	1.2			100	120
		⑭	CP6	1.2			100	120

Totals Achieved

W

E

2160

From Sheet A

Totals Required

W

E

1298

Wreq/Ereq = 793.8 / 1298 = .61

*If Wreq/Ereq is 1 or less complete E column only
If Wreq/Ereq is 1.5 or more complete W column only
Otherwise complete both W and E

Across

Wall or Bracing Line		Bracing Elements Provided			Wind		Earthquake	
1	2	3	4	5	6 W	7 W	6 E	7 E
Line Label	Minimum BUs Required	Bracing Element No.	Bracing Type	Length Element (m) L	Rating BU/m W	BUs Achieved (BU/m x L) W	Rating BU/m E	BUs Achieved (BU/m x L) E
M		⑮	CP6	1.8	100	180	100	180
		⑯	CP6	1.8	100	180	100	180
		⑰	GIB 2	2.7	80	216	70	189
N		⑱	CP6	1.2	100	120	100	120
		⑲	CP6	1.2	100	120	100	120
		㉀	GIB 2	3.0	80	240	70	210
O		㉁	GIB 2	2.0	85	150	60	120
		㉂	GIB 2	3.0	80	240	70	210
		㉃	GIB 2	3.0	80	240	70	210
P		㉄	GIB 2	1.2	110	132	95	114
		㉅	CP6	0.9	100	90	100	90
		㉆	CP6	1.0	100	100	100	100
Q		㉇	CP6	1.8	100	180	100	180

Totals Achieved

W

2488

E

2023

From Sheet A

Totals Required

W

1069.2

E

1298

Wreq/Ereq =



Wellness Systems Ltd

3. Hiloki Phue Tauranga

Name: PRINCE
TENGO

Description:

Telephone:
5750861
Fax: 5750661

Address: L64
CARLSBURG
PACIFIC COVE

Job:

Q1102-29

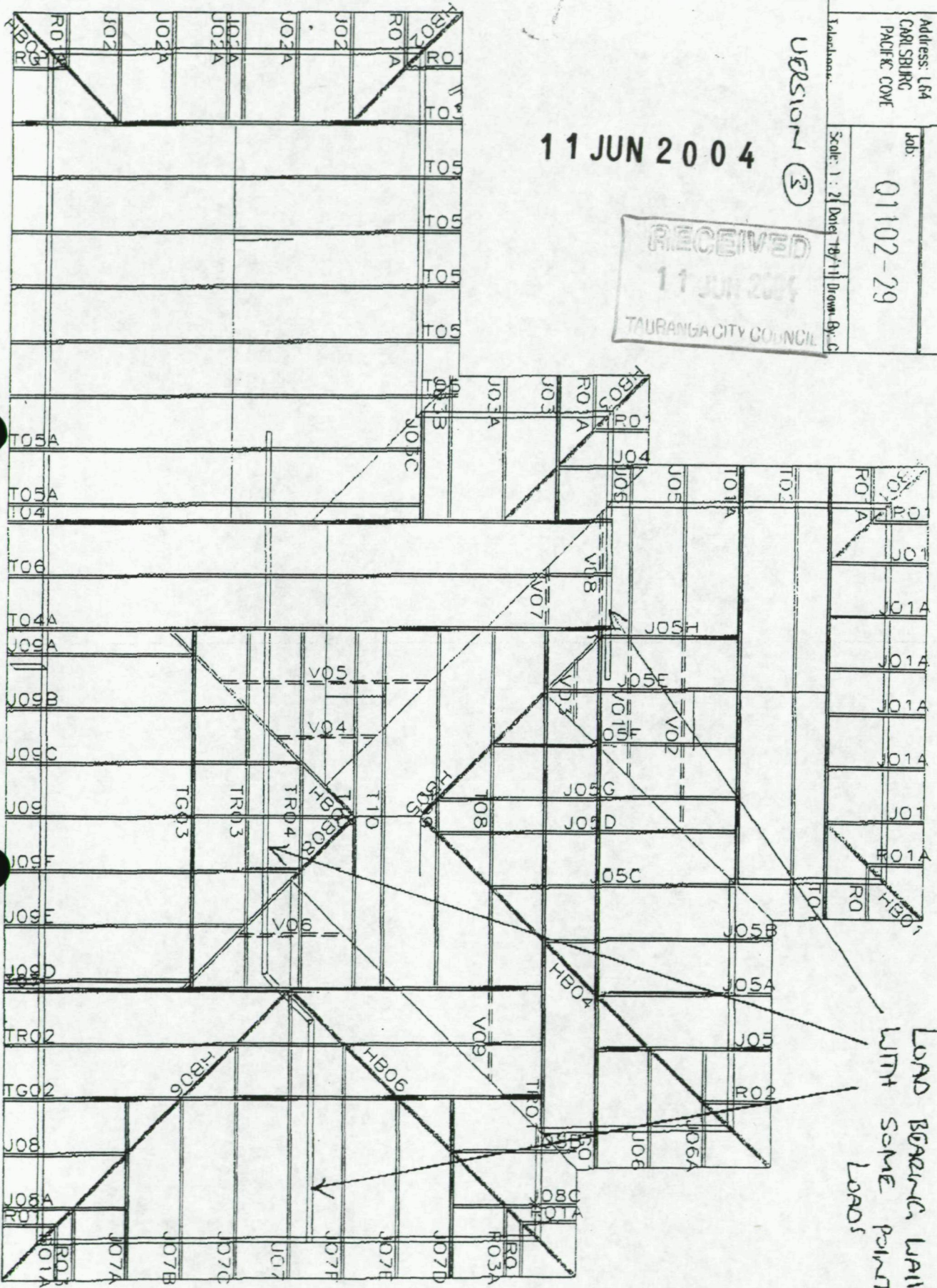
Salisbury:

Scale: 1 : 21 Date: 18/11 Drawn By: C

Roof
Version 3

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