Intrax
Engineering Confidence

SPECIALISING IN
STRUCTURAL
CIVIL
GEOTECHNICAL
SURVEYING

Building Act 1993
Building Regulations 2006

REGULATION 1507: CERTIFICATE OF COMPLIANCE—DESIGN

To

Relevant building surveyor:

Postal address: Postcode:

From

Building practitioner: Rosario Stivala

Category and class: Engineer (Civil) Registration No: EC - 33502

Postal address: Intrax Consulting Engineers

964A, Mt Alexander Road, Essendon Postcode: 3040

Property details (if applicable)

Number:	Street/road: GILLWELL ROAD		City/suburb/town: LALOR	
Lot/s:211	LP/PS:	Volume:	Folio:	Crown Allotment:
Sections:	Parish:	Country:	Municipal District:	

Compliance

I did not prepare the design and I certify that the part of the design described as roof framing (excluding trusses) & ground floor footings with the following provisions of the Regulations:

BCA Vol 2 Parts 2.1 & 3.11 (Residential)

& Australian Standards: AS1684.2-2006, AS1720.1-1997, AS4100-1998, AS2870-1996, AS1170-2002, AS3600-2001, AS3700-2001

Design documents

Drawing Nos: 26379- Sheets - S1 to S6 - Rev. A

Prepared by: Intrax Consulting Engineers Date: 12.05.10

Specifications:

Prepared by: Date:

Computations: 26379- Pages - 1 to 3

Prepared by: Intrax Consulting Engineers Date: 12.05.10

Test Reports: 2095237

Prepared by : Macgregor Consulting Engineers Date: 30.04.10

Other Documentation:

Prepared by: Date:

The Geotechnical report is not part of this certification

Signature

Signed: Date:

Rosario Stivala 13.05.10

Intrax
Engineering Confidence

CIVIL
STRUCTURAL
GEOTECHNICAL
FEATURE SURVEYS
FORESIC INVESTIGATIONS

JOB NO: 26379

SHEETS: 3

DATE: 12.05.10

STRUCTURAL COMPUTATIONS

FOR: SIMONDS HOMES

PROJECT: PROPOSED RESIDENCE

AT: Lot 211 GILWELL ROAD, LALOR

DESIGNED BY: **Sunayana Kankanady**

B.E. Civil

"T" Lintel V3.00b

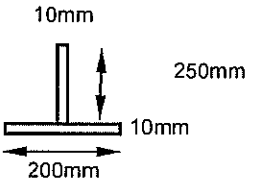
Sunayana | Intrax Consulting Engineers Pty Ltd

Geometry:	**(GL1) 250mm x 10mm pl. vertical, 200mm x 10mm pl. horizontal**	
Design:	**M* = 26.0kNm < øMb(4800,αm=1.21) = 30.3 kNm**	**OK (0.86)**
Defl'n:	**δdl = 6.8mm (Span / 709), δll = 0.7mm (Span / 7292)**	**OK**
Reactions:	**(1 End) Rdl.max = 14.5kN, Rll.max = 2.0kN R*dn.max = 20.3kN**	
	(1 End) Rdl.min = 13.3kN, Rll.min = 1.7kN, R*dn.min = 18.5kN	

Geometry

Span = Le = 4800 mm

αm = 1.21



Vertical web		Horizontal flange	
Thickness =	10 mm	Thickness =	10 mm
Height =	250 mm	Width =	200 mm
Yield strength =	250 MPa	Yield strength =	250 MPa

Loading

Uniform dead loads

Roof dead load (wdl) =	0.90 kPa *	2000 mm +	kN/m =	1.80	kN/m
Floor dead load (wdl) =	kPa *	mm +	kN/m =	0.00	kN/m
Wall dead load (wdl) =	4.30 kPa *	625 mm +	kN/m =	2.69	kN/m
Other dead load (wdl) =	kPa *	mm +	kN/m =	0.00	kN/m
Include S.Wt =	Y (Y)es,(N)o		S.Wt =	0.35	kN/m
			Σwdl =	4.84	kN/m

Uniform live loads

Roof live load (wll) =	0.25 kPa *	2000 mm +	kN/m =	0.50	kN/m
Floor live load (wll) =	kPa *	mm +	kN/m =	0.00	kN/m
Other live load (wll) =	kPa *	mm +	kN/m =	0.00	kN/m
Short term LL (Ψs) =	0.7		Σwll =	0.50	kN/m

Point loads

Dead load (Pdl) = 4.56 kN — Position = 1800 mm from LHS

Live load (Pll) = 1.20 kN

w* = 1.2*wdl + 1.5*wll =	6.56 kNm	Rdl = wdl*L/2 + pdl*(L-pos)/L =	14.5 kN
p* = 1.2*pdl + 1.5*pll =	7.27 kNm	Rll = wll*L/2 + pll*(L-pos)/L =	2.0 kN
M* =	26.0 kNm	R*.max = 1.2*Rdl + 1.5*Rll =	20.3 kN
	(Max at 1984mm)		

Properties

Area =	4500 mm^2	Warping constant (Iw) =	0 mm^6 (Cl H4)
Stiffness (Ix) =	31.8 $x10^6$ mm^4	Torsional constant (J) =	150 $x10^3$ mm^4
Stiffness (Iy) =	6.69 $x10^6$ mm^4	Elastic modulus (Zt) =	174 $x10^3$ mm^3
Shear modulus (G) =	80000 MPa	Elastic modulus (Zb) =	412 $x10^3$ mm^3
Elastic modulus (E) =	200000 MPa	Min. elastic modulus (Zmin) =	174 $x10^3$ mm^3
Elastic (y.top) =	183 mm	Plastic modules (S) =	316 $x10^3$ mm^3
Plastic (yp.top) =	225 mm	Eff. elastic mod.(Compact) (Zc) =	261 $x10^3$ mm^3

Capacity - Cl 5.6.1.2

Web λe = dw/tw*√(fyw/250) = 25.0 > 22, Slender — Cl 5.2.2

Zex = Zmin*(22/Sw)² = 135 $x10^3$ mm^3

Msx =	33.7 kNm	øMsx =	30.3 kNm	βx =	191.7
Moa =	154.4 kNm	αs =	0.916	αm =	1.21
		øMbx = αm*αs*øMsx ≤ øMsx =	30.3 kNm		

Deflections

Ireq'd DL (L/360) =	16.1 $x10^6$ mm^4	< Critical	δDL =	6.8 mm	Span / 709
Ireq'd LL (L/360) =	1.6 $x10^6$ mm^4		Ψs.δLL =	0.7 mm	Span / 7292
			1kN midspan δ =	0.4 mm	

Timber roof beam design V3.01

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Beam:	(RB1) 2 / 360mm x 45mm HYSPAN Hyspan LVL (Single span)	
Bending:	M(dl)* = 16.35kNm < øM(dl) = 37.28kNm, M* = 19.39kNm < øM = 61.48kNm	OK (0.44,0.32)
	Mw* = 0.11kNm < øMw = 70.00kNm	OK (0.00)
Shear:	V(dl)* = 15.21kN < øV(dl) = 56.97kN, V* = 18.04kN < øV = 93.95kN	OK (0.27,0.19)
	Vw* = 18.04kNm < øVw = 99.94kNm	OK (0.18)
Deflection:	δdl = L/426 (10mm) , δll = L/3187 (1mm), δwl = L/1377 (-3mm)	OK
Reactions:	(Each end) Rdl = 11.3kN, Rll = 3.0kN, R*wl = -10.2kN, R*dn = 18.0kN, R*up = -0.1kN	

Geometry

(For a member in a house or secondary member in a building)

Importance = H (H)ouse,Primary (B)uilding elements, (I)mportant

Span (L) =	4300 mm	Span type =	S (S)ingle,(D)ouble
Centres (cts) =	5600 mm	Edge restrained =	C (T)ension, (C)omp.
Lay =	600 mm		

Loadings

Roof area (A) =	24.08 m^2	Apply wind reduction =	Y (Y)es,(N)o		
LL = 1.8/A+0.12 ≥ 0.25 =	0.25 kPa	Roof reduction (Ka) =	0.91		
		Ratio qs/qu* =	0.68 (Refer wind analysis)		

Uniform dead loads

Roof dead load (wdl) =	0.90 kPa *	5600 mm +		kN/m =	5.04 kN/m
Wall (wdl) =	kPa *	mm +		kN/m =	0.00 kN/m
Include S.Wt =	Y (Y)es,(N)o			S.Wt =	0.20 kN/m
				Σwdl =	5.24 kN/m

Uniform live loads

Roof live load (wll) =	0.25 kPa *	5600 mm +		kN/m =	1.40 kN/m
Other live load (wll) =	kPa *	mm +		kN/m =	0.00 kN/m
Long term LL factor (Ψl) =	0.0			Σwll =	1.40 kN/m

Uniform wind loads

Ult. wind load (qu*) =	0.75 kPa *	5600 mm			
cpe =	0.7	cpi = 0.5		Σwwl* =	-4.76 kN/m (up)

Point loads

Dead load (pdl) =	kN	Position =	mm from LHS
Live load (pll) =	kN	Shear using PL at support =	Y (Y)es,(N)o
Wind load (pwl*) =	kN		

w(dl+Ψl.ll)* =	7.08 kN/m	M(dl+Ψl.ll)* =	16.35 kNm (Max at 2150mm)
w* =	8.39 kN/m	M* =	19.39 kNm (Max at 2150mm)
w*up =	0.05 kN/m (up)	Mw* =	0.11 kNm (Max at 2150mm) (up)
p(dl+Ψl.ll)* =	0.00 kN	V(dl+Ψl.ll)* =	15.21 kN
p* =	0.00 kN	V* =	18.04 kN
p*up =	0.00 kN (up)	Vw* =	18.04 kN (up)

Bending Capacity - Cl 3.2

Member =	2 / 360mm x 45mm HYSPAN Hyspan LVL		Area (A) =	32400	mm^2
Description =	HYSPAN seasoned softwood		Section modulus (Zx) =	1944	$x10^3$ mm^3
Design depth (dD) =	360 mm		Stiffness (Ix) =	349.9	$x10^6$ mm^4
Design width (dW) =	45 mm		Modulus of elasticity (E) =	13200	MPa
S1=1.25*dD/dW*(Lay/dD)^0.5) =	12.91	For comp. edge restrained - Cl 3.2.3.2			
k12 = 1.5-0.05*rb*S =	0.803	for 10 < ρb*S ≤ 20 - Cl 3.2.4			
k12u = 1.5-0.05*rbu*S =	0.859	for 10 < ρbu*S ≤ 20 - Cl 3	F'b =	48.0	MPa
Strength reduction factor (ø) =	0.9	Refer Cl 2.3	F's =	5.3	MPa
øM(dl) = ø*0.57*k4*k6*k9*k11*k12*[F'b*Zx] =	37.28 kNm		Material constant (ρb) =	1.08	
øM = ø*k1*k4*k6*k9*k11*k12*[F'b*Zx] =	61.48 kNm		Stress reversal (ρbu) =	0.99	
øMw = ø*1.00*k4*k6*k9*k11*k12u*[F'b*Zx] =	70.00 kNm		Duration factor (k1) =	0.94	
øV(dl) = ø*0.57*k4*k6*k11*A*F's/1500 =	56.97 kN		Factor (k4) =	1.00	
øV = ø*k1*k4*k6*k11*A*F's/1500 =	93.95 kN		Temp. factor (k6) =	1.00	
øVw = ø*1.00*k4*k6*k11*A*F's/1500 =	99.94 kN		Sharing factor (k9) =	1.00	
			Size factor (k11) =	0.97	

Deflections

			j2 =	2.0	
Ireq'd DL+Ψl.LL (L/300) =	246.6 $x10^6$ mm^4	< Critical	δDL+Ψl.LL=	10.1 mm	Span / 426
Ireq'd LL (L/240) =	26.4 $x10^6$ mm^4		δLL =	1.3 mm	Span / 3187
Ireq'd WL (L/180) =	-45.7 $x10^6$ mm^4		δWL =	-3.1 mm	Span / 1377