

■ ■ Pryda Rafter and Pole Buildings

Design and Selection



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Building Design Specification

Pryda Rafter and Pole Buildings are a complete structural system for farm or low risk buildings. They have been proven over many years and provide basic shelter for a variety of purposes. The design relies on the strength from cantilevered vertical poles, horizontal wall girts, and bolted rafters set to fall with purlins in between.

The timber specified in the selection chart is a minimum grade of G8 available in rough sawn or gauged. Higher grade VSG8 in gauged sizes can be utilized and LVL rafters are required for a clear span of 6m and some larger bay widths. Moisture content of G8 can be approximately 25% and for VSG8 16% at time of construction.

The rafter spans can equally apply to lean-to or gable designs. Greater pitches can be utilized in gable designs due to the shorter run, but in either design, you must take into consideration the roofing manufacturers minimum fall. Roof bracing layout where indicated is directed to pole location. Buildings with centre poles will require two pairs of Pryda Strapbrace per bay.

The designs have been based upon three sides being clad and open along the front. Any number of bays can be completely enclosed with secure doors etc. or be completely left open for access from all four sides. The horizontal girts are designed to span between the poles in single lengths without further structural support. Optional vertical anti-sag nogs can be fitted and secondary nogs will be required for back nailing the joins if a sheet ply is used for wall cladding.

This guide contains four worked examples from the selection chart on page 4 (highlighted in chart) to assist in developing price estimates for a range of structures within the scope of this guide. For designs of farm buildings and similar industrial structures outside the scope of this guide, Pryda's engineering department is available to develop design documentation for council permit applications. Please contact Pryda on **0800 88 22 44** or return the Enquiry Form on page 11 by fax to **09 477 3518** or email lin@pryda.co.nz. Designs are subject to charges.

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■ ■ Producer Statement - Design

Pryda Rafter and Pole Buildings

Pryda NZ has provided standard structural design details for rafter and pole buildings and associated fixings in the attached documents. These buildings are defined as Importance Level 1 Buildings in NZS1170:2002.

This design has been prepared in accordance with sound and widely accepted engineering principles, to support structural design actions as specified in NZS1170:2002. **Structural Design Actions** with capacities so induced not to exceed those specified in NZS 3603: 1990 **Timber Structures Standard** and using, where shown on the drawings, Pryda NZ connectors and fastenings.

I believe on reasonable grounds that the design of this rural farm building complies with the relevant provisions of the NZ Building Code (Approved Documents B1 - Verification method VM 1, and B2).

The following design criteria are applied and can be used in the attached table:

- Light weight roof
- Up to very high wind (50m/s - NZS3604:1999 + amendments)
- Snow loading 0.75 and 1.0 kPA.
- Good ground with a soil bearing capacity of greater than 300kPa.
- Importance Level 1 Buildings: "Structures presenting a low degree of hazard to life and other property".

Materials

- Timber in the chart is VSG8 or VHG/G8 as shown
- Round poles to be normal outer zone density with mod. of rupture of 38MPa
- Sawn timber treatment H3.2 and round poles minimum of H5 provided these are encased in concrete.
- Fittings in the sea spray zone to be 304 stainless steel.
- All fixings shall be Pryda approved product in accordance with details contained within this document.

Signed: 

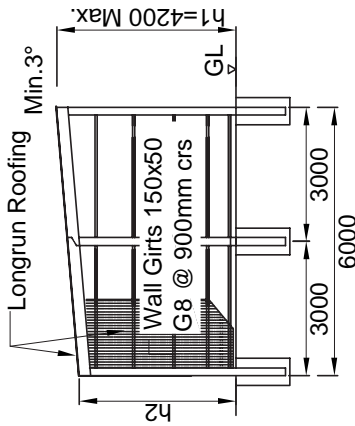
A C van Blerk B Sc (Eng). (Civil), MIPENZ (214689) CPEng IntPE.
ENGINEER - PRYDA TIMBER CONNECTORS

Date: 25 July 2008

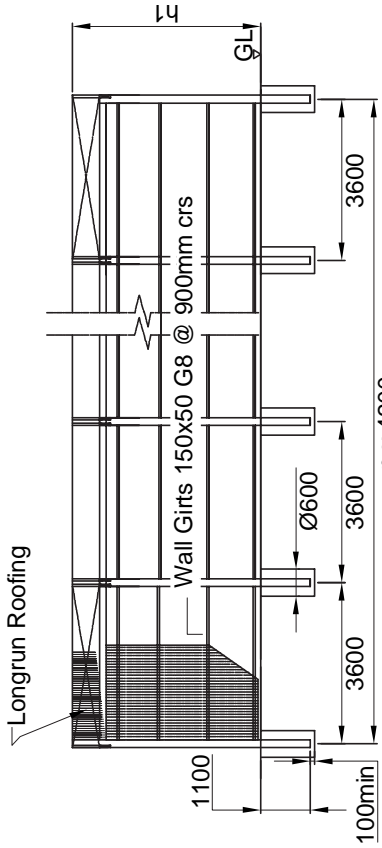
Timber size selection chart for Lean-to or Gable End Rafter and Pole Buildings

Wind Load	Snow Load (kPa)	Bay width (m)	Pulin Size ¹ @900mm crs	Girt Size ¹ @ 900mm crs	Rafters Size ¹				Pole Size and Embedment Depth ²								Example						
					Rafter Span (mm)				Average Pole Height														
					VSG8	3750	(VHG or G8)	3000	3.6m		4.2m		4.8m		SED	Depth		SED	Depth	SED	Depth	Page	
High Wind	0.75	3.6	VHG/G8	VHG/G8	6000	4500	3750	3000	3000	150	1000	175	1100	175	1100	175	1300	175	1300	P5			
		4.0	150x50	200x50	2/240x45 LVL	2/250x50	2/250x50	2/200x50	2/200x50	175	1100	175	1200	175	1200	200	1400	200	1400				
		4.2	200x50	200x50		2/250x50	2/250x50	2/200x50	2/200x50	175	1100	175	1200	175	1200	200	1400	200	1400	P6			
		4.5	200x50	200x50		2/250x50	2/250x50	2/200x50	2/200x50	2/200x50	175	1100	175	1200	175	1200	200	1400	200	1400	P7		
		4.8	250x50	200x50		2/250x50	2/250x50	2/200x50	2/200x50	2/200x50	175	1100	200	1300	200	1300	225	1400	225	1400	P8		
		5.4	250x50	250x50	2/240x45 LVL	2/300x50	2/300x50	2/250x50	2/250x50	175	1100	175	1100	200	1300	200	1400	225	1400	225	1400		
		3.6	200x50	200x50		2/250x50	2/250x50	2/200x50	2/200x50	175	1100	175	1100	175	1300	200	1400	200	1400	200	1400		
		4.0	200x50	200x50		2/300x50	2/300x50	2/250x50	2/250x50	2/250x50	175	1200	175	1200	200	1400	200	1500	200	1500	200	1500	
4.2	250x50	200x50	2/300x50	2/300x50		2/250x50	2/250x50	2/250x50	200	1200	200	1200	200	1400	200	1500	200	1500	200	1500			
Very High Wind	1.00	4.5	250x50	200x50	2/240x45 LVL	2/240x45 LVL	2/300x50	2/300x50	2/250x50	2/250x50	200	1300	200	1400	200	1600	200	1600	200	1600			
		4.8	250x50	250x50			2/300x50	2/300x50	2/250x50	2/250x50	200	1300	200	1300	200	1400	225	1600	225	1600	225	1600	
		5.4	250x50 VSG8	250x50 VSG8			2/300x50	2/300x50	2/250x50	2/250x50	200	1300	200	1300	225	1400	225	1600	225	1600	225	1600	

- Note:
1. All Rough Sawn sizes in mm
 2. Depth Based on Ø600mm concrete foundation, and a soil bearing capacity greater than 300kPa
 3. Double rafters use blocking @ 900mm centres
 4. SED - Small End Diameter



End Elevation



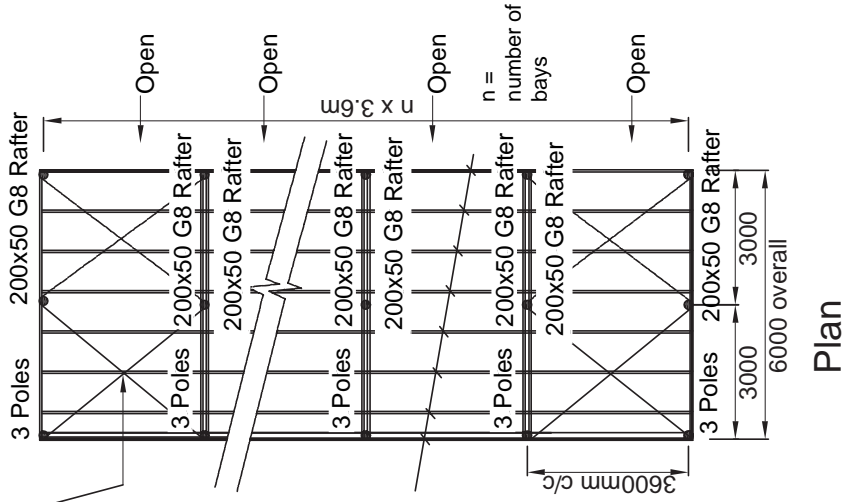
Rear Elevation

Roof brace every second bay: Pryda Strapbrace fixed to face of rafter with 6 nails and 2 nails to each purlin crossing. Nails to be Pryda Product Nails 30x3.15mm

All poles to be min. Ø175 SED

All Sawn timber H3.2 treated except poles to be H5 treated

150x50 G8 Purlins @900 c/c

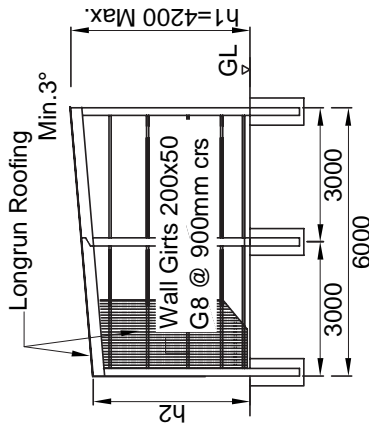


Plan

**Example: 3.6m Bay
3.0m Rafter Span 6.0m Depth**

Pryda New Zealand, A division of ITW NZ Ltd; Ph:0800 88 22 44 Fax 0800 27 79 32 e-mail: lin@pryda.co.nz

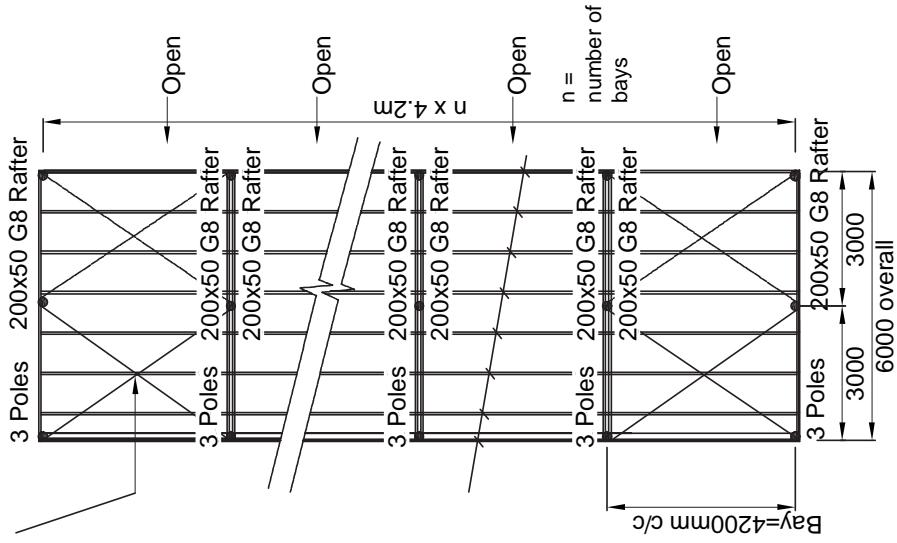
Job Name:	Project Number:	Dwg:
Designed for High Wind and 0.75 kPa snow	5	5
Drawn by: YL	Checked by: AvB	Date: 28/8/08
AvB	AvB	Scale: Not to scale



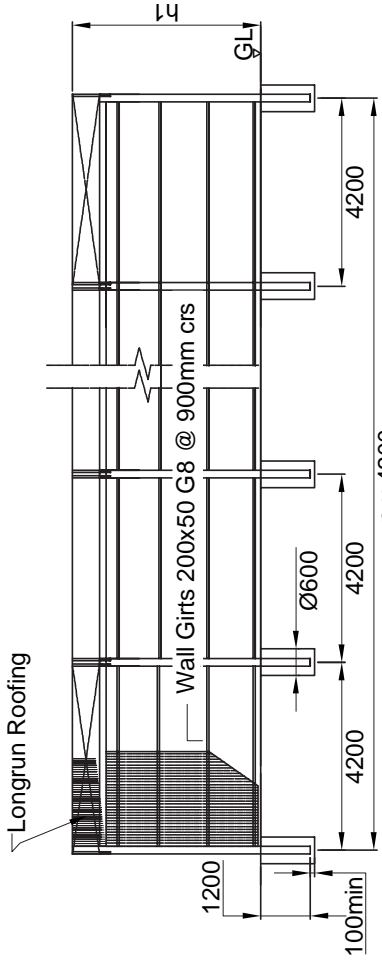
End Elevation

Roof brace every second bay:
 Pryda Strapbrace fixed to face of rafter with 6 nails and 2 nails to each purlin crossing. Nails to be Pryda Product Nails 30x3:15mm
 All poles to be min. Ø175 SED
 All Sawn timber H3.2 treated except poles to be H5 treated

200x50 G8 Purlins @900 c/c



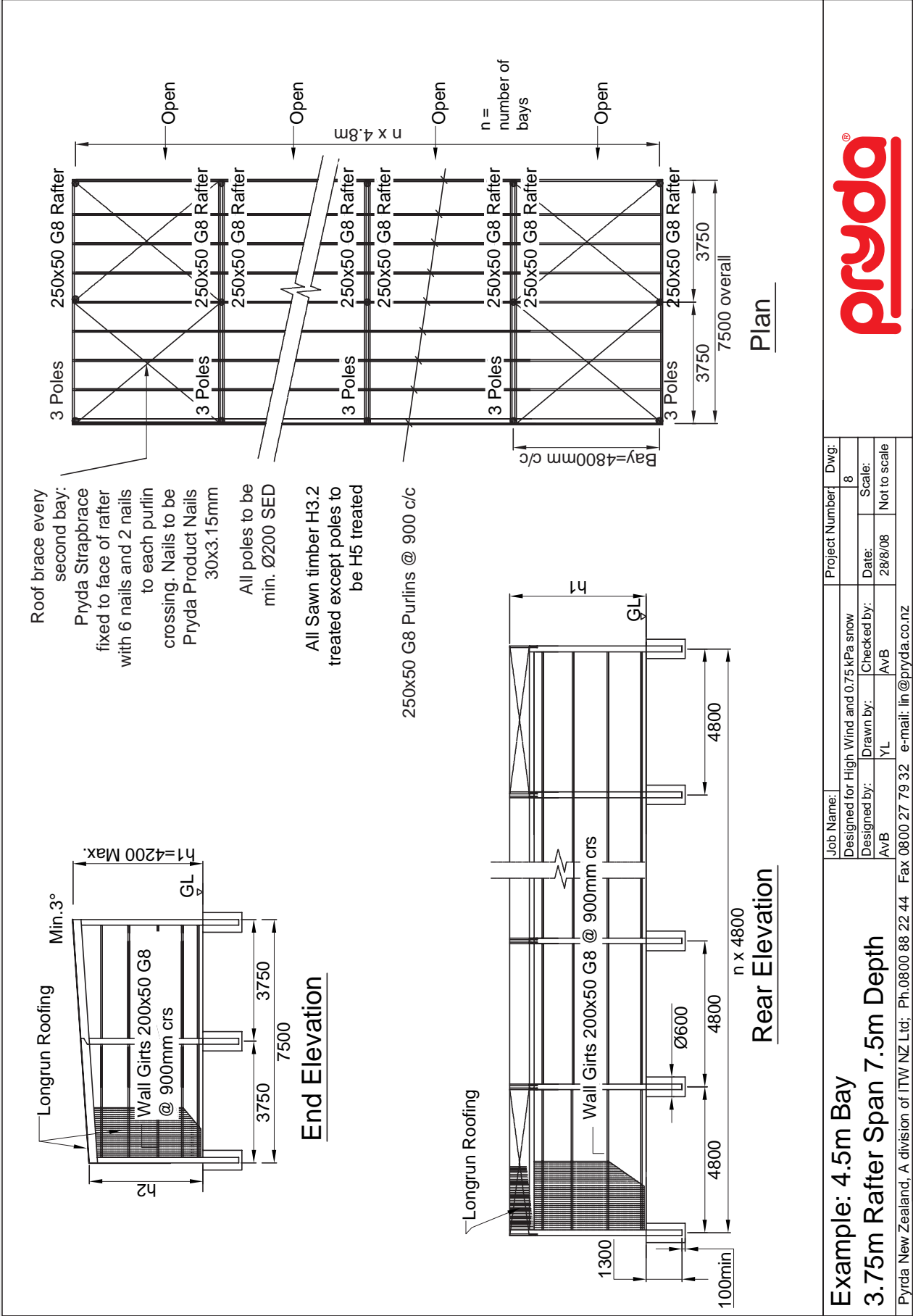
Plan



Rear Elevation

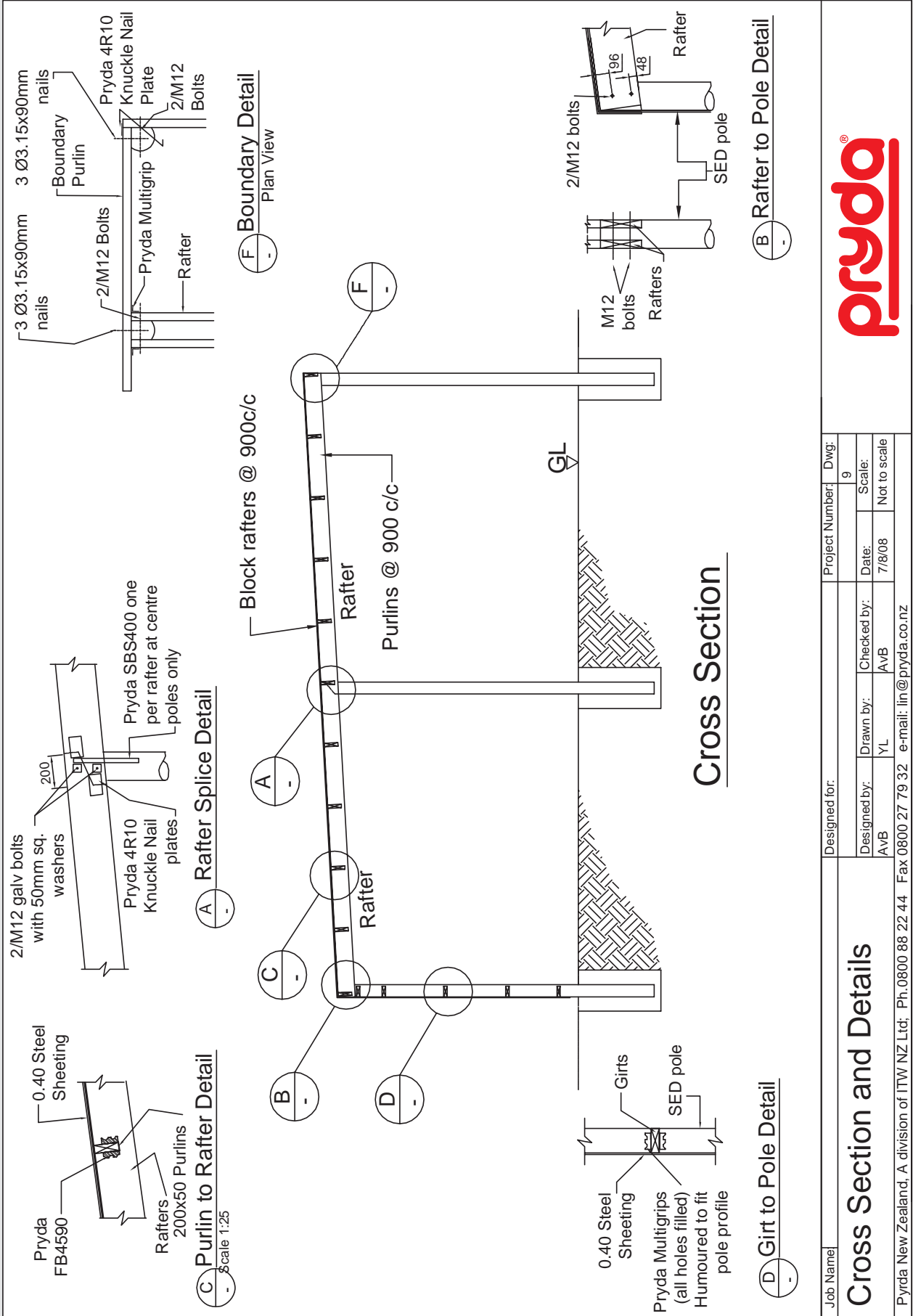
**Example: 4.2m Bay
 3.0m Rafter Span 6.0m Depth**

Job Name:	Project Number:	Dwg:
Designed for High Wind and 0.75 kPa snow	f	6
Drawn by: YL	Checked by: AvB	Date: 28/8/08
AvB	AvB	Scale: Not to scale



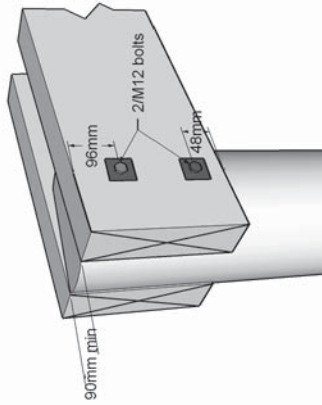
Example: 4.5m Bay
3.75m Rafter Span 7.5m Depth

Job Name:	Project Number:	Dwg:
Designed for High Wind and 0.75 kPa snow	8	8
Designed by: AvB	Drawn by: YL	Checked by: AvB
Date: 28/8/08	Date: 28/8/08	Scale: Not to scale

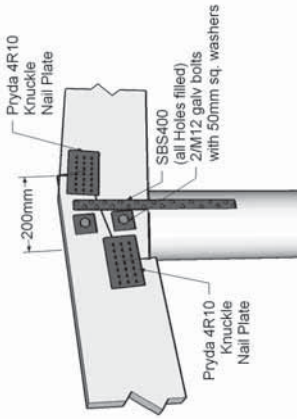


Job Name:	Designed for:			Project Number:	Dwg:
Cross Section and Details		Drawn by:	Checked by:	9	9
Pryda New Zealand, A division of ITW NZ Ltd; Ph.0800 88 22 44 Fax 0800 27 79 32 e-mail: lin@pryda.co.nz		YL	AVB	Date:	Scale:
		AVB	AVB	7/8/08	Not to scale

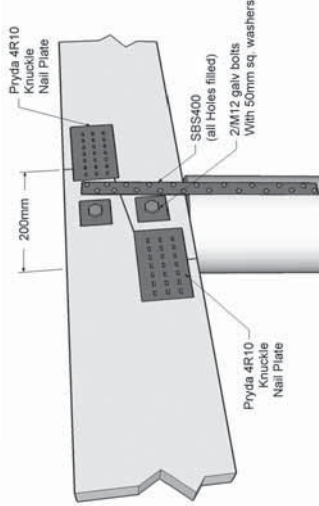




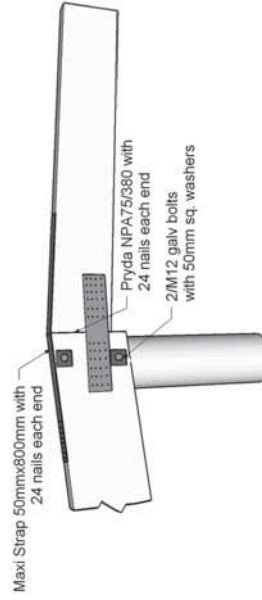
RAFTER TO POLE



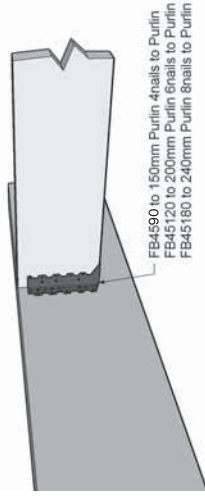
RAFTER APEX
GABLE DESIGN



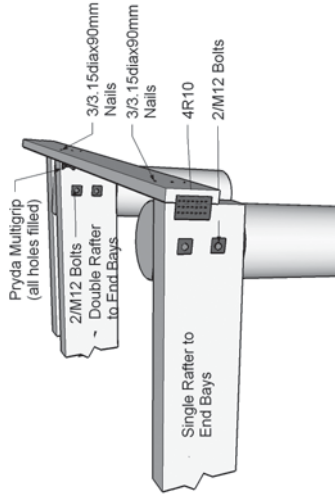
RAFTER SPLICE
LEAN-TO DESIGN



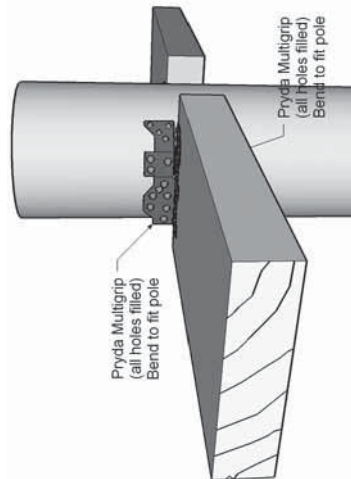
CANOPY OVERHANG



PURLIN TO RAFTER



BOUNDARY PURLIN



GIRT TO POLE

Job Name	Designed for:			Project Number:	Dwg:
3D Details	Drawn by:	Checked by:	Date:	10	
	AVB	AVB	7/8/08	Scale:	
	e-mail: lin@pryda.co.nz			Not to scale	
Pryda New Zealand, A division of ITW NZ Ltd; Ph.0800 88 22 44 Fax 0800 27 79 32					

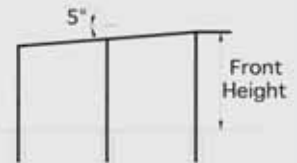
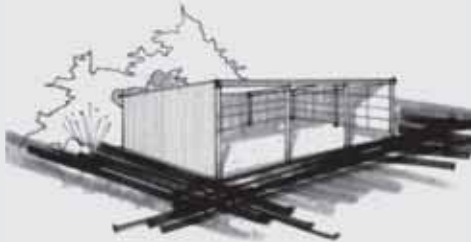
■ ■ Rafter and Pole Building - Enquiry Form

Customer Details

Customer Name Postal Address

Phone: Home Work Mobile
 Fax Email

Full delivery address: Lot DP



Design Specifications

Wind Load: Medium High Very High Snow Load kPa

Soil Bearing Capacity at least 300kPa? Yes No Please Specify kPa

Cladding: Walls Roof

Roof Shape: Lean-To Gable

Dimensions

Bay Width (e.g. 3.6m, 4.2m, 4.5m) m Front Height (e.g. 3.6m, 4.0m) m

Building Depth (e.g. 6m, 8m, 9m) m Back Height (e.g. 2.7m, 3.0m) m

Number of Bays (e.g. 2, 3, 4) bays **OR** Roof Pitch (e.g. 5°) °

Canopy (optional) 800mm 1000mm 1200mm

Other Requirements

Customer Name Signed

Supplied by:

Date

Fax or Email completed form to:
 Pryda New Zealand - Engineering Dept
 Fax: (09) 477 3518
 Email: lin@pryda.co.nz



:: Pryda New Zealand

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