Job Number:	RW/hite
Issue:	BWhite Consulting Ltd
PRODUCER STATEMENT-PS1-DESIGN	
ISSUED BY: BWhite Consulting Ltd (Design Engineer: Bevan White)	
TO BE SUPPLIED TO: Grey District Council IN RESPECT OF: Proposed NEW Farm Shed	
AT: 517 Otira High Way, Kumara, New Zealand	
LEGAL DESCRIPTION	
We have been engaged by Ezequote Pty Ltd to provide Specific Structural Engineering Design requirements of Clause(s) B1 of the Building Code for part only (as specified in the attachment to building work.	<u> </u>
☐ ALL ☑ Part only as specified: Purlins, Rafters, Girts, Poles, Columns, Pole embedment and	all connections
The design has been prepared in accordance with compliance documents to NZ Building Code is Innovation & Employment Clauses B1/VM1 and B1/VM4	sued by Ministry of Business,
The proposed building work covered by the producer statement is described on Ezequote drawin numbered A101 - A115 Rev-1 dated 16/05/2025 together with the following specification, and o schedule attached to this statement: Design Featured Report Dated 12/05/2025 and numbered "	ther documents set out in the
On behalf of BWhite Consulting Ltd, and subject to:	
 Site verification of the following design assumptions: an Ultimate foundation bearing pre with NZS3604:2011 The building has a design life of 50 years and an Importance Level 1 Unless specifically noted, compliance of the drawings to Non-Specific codes such as NZS checked by this practice This Certificate does not cover any other building code clause including weather tightness. Inspections of the building to be completed by Grey District Council. As BWhite Consulting producers, we cannot issue a producer Statement-PS4- Construction Review. This Producer Statement-Design is valid for a building consent issued within 1 year from the product of the product of the performance specification requirements. 	S3604 and NZS4229 have not been ess ess Iting Ltd are not undertaking
I believe on reasonable grounds that a) the building, if constructed in accordance with the drawing documents provided or listed in the attached schedule, will comply with the relevant provisions of the persons who have undertaken the design have the necessary competency to do so. I also reconstruction monitoring/observation:	of the Building Code and that b),
✓ CM1 ☐ CM2 ☐ CM3 ☐ CM4 ☐ CM5 or as per agreement with owner/developer (stated al	bove)
I, Bevan White am CPEng 108276 I am Member of Engineering New Zealand and hold the follow holds a current policy of Professional Indemnity Insurance no less than \$200,000	ring qualification: BECivil and
Signed by Bevan White on behalf of BWhite Consulting Ltd Dated: 12/05/2025	
Email: bwhitecpeng@gmail.com Phone: 0211-979786	
Note: This statement shall only be relied upon by the Building Consent Authority named above. Liability under this statement maximum amount of damages payable arising from this statement and all other statements provided to the Building Consent Au	

This form is to accompany Form 2 of the Building (Forms) Regulations 2004 for the application of a Building Consent

whether in contract, tort or otherwise(including negligence), is limited to the sum of \$200,000.

Date: 12/05/2025

18B Jules Crescent,

BWhite Consulting Ltd

Bell Block New Plymouth 4312

New Zealand File No:

DESIGN FEATURES SUMMARY FOR PROPOSED NEW FARM SHED 517 OTIRA HIGH WAY, KUMARA, NEW ZEALAND

Site Specific Loads

Roof Live Load	0.25 KPa	Roof Dead Load	0.25 KPa	Roof Live Point Load	1.1 Kn
Snow Zone	N2	Ground Snow Load	0 KPa	Roof Snow Load	0 KPa
Earthquake Zone	3	Subsoil Category	D	Exposure Zone	D
Importance Level	1	Ultimate wind & EQ ARI	100 Years	Max Height	4 m
Wind Region	NZ2	Terrain Category	2.96	Design Wind Speed	37.5 m/s
Wind Pressure	0.84 KPa	Lee Zone	NO	Ultimate Snow ARI	50 Years

Timber

Sawn Timber to be graded to the properties of SG6 and SG8 or better as mentioned on plans, with moisture content of 18% or less for dry and 25% or less for wet.

The following standards have been used in the design of this structure

- NZS 3603:1993 Timber Structures Standard
- NZS 3604:2011 Timber Framed Buildings. Standards New Zealand, 2011
- NZS 3404:1997 Steel Structures
- AS/NZS 1170 2003 Structural Design Actions
- AS/NZS 1170.2 2021 Structural Design Actions-Wind Action
- Branz. "Engineering Basis of NZS 3604". April 2013

Yours Faithfully

BWhite CONSULTING LTD

Bevan White

Director | BE Civil . CMengNZ CPEng

Email: bwhitecpeng@gmail.com Contact: 0211 979 786

Job No.: Steve Aldridge Address: 517 Otira High Way, Kumara, New Zealand Date: 12/05/2025 Latitude: -42.618794 Longitude: 171.173354 Elevation: 74.5 m

General Input

Roof Live Load	0.25 KPa	Roof Dead Load	0.25 KPa	Roof Live Point Load	1.1 Kn
Snow Zone	N2	Ground Snow Load	0 KPa	Roof Snow Load	0 KPa
Earthquake Zone	3	Subsoil Category	D	Exposure Zone	D
Importance Level	1	Ultimate wind & Earthquake ARI	100 Years	Max Height	4 m
Wind Region	NZ2	Terrain Category	2.96	Design Wind Speed	37.5 m/s
Wind Pressure	0.84 KPa	Lee Zone	NO	Ultimate Snow ARI	50 Years
Wind Category	High	Earthquake ARI	100		

Note: Wind lateral loads are governing over Earthquake loads, So only wind loads are considered in calculations

Pressure Coefficients and Pressues

Shed Type = Mono Enclosed

For roof Cp, i = -0.3

For roof CP,e from 0 m To 1.9 m Cpe = -1.0067 pe = -0.76 KPa pnet = -0.76 KPa

For roof CP,e from 1.90 m To 3.80 m Cpe = -0.8467 pe = -0.64 KPa pnet = -0.64 KPa

For wall Windward Cp, i = -0.3 side Wall Cp, i = -0.3

For wall Windward and Leeward CP,e from 0 m To 6 m Cpe = 0.7 pe = 0.53 KPa pnet = 0.78 KPa

For side wall CP,e from 0 m To 3.80 m Cpe = pe = -0.49 KPa pnet = -0.49 KPa

Maximum Upward pressure used in roof member Design = 0.76 KPa

Maximum Downward pressure used in roof member Design = 0.40 KPa

Maximum Wall pressure used in Design = 0.78 KPa

Maximum Racking pressure used in Design = 0.91 KPa

Design Summary

Purlin Design

Purlin Spacing = 900 mm Purlin Span = 4350 mm Try Purlin 200x50 SG8 Dry

Moisture Condition = Dry (Moisture in timber is less than 16% and timber does not remain in continuous wet

condition after installation)

K1 Short term = 1 K1 Medium term = 0.8 K1 Long term = 0.6 K4 = 1 K5 = 1 K8 Downward = 1.00

K8 Upward =0.80 S1 Downward =11.27 S1 Upward =17.42

Shear Capacity of timber = 3 MPa Bending Capacity of timber = 14 MPa NZS3603 Amt 4, table 2.3

Capacity Checks

M1.35D	0.72 Kn-m	Capacity	2.23 Kn-m	Passing Percentage	309.72 %
M1.2D+1.5L 1.2D+Sn 1.2D+WnDn	2.43 Kn-m	Capacity	2.97 Kn-m	Passing Percentage	122.22 %
$M_{0.9D\text{-W}nUp}$	-1.14 Kn-m	Capacity	-2.97 Kn-m	Passing Percentage	260.53 %
V _{1.35D}	0.66 Kn	Capacity	9.65 Kn	Passing Percentage	1462.12 %
V1.2D+1.5L 1.2D+Sn 1.2D+WnDn	1.37 Kn	Capacity	12.86 Kn	Passing Percentage	938.69 %
$ m V_{0.9D-WnUp}$	-1.05 Kn	Capacity	-16.08 Kn	Passing Percentage	1531.43 %

Deflections

Modulus of Elasticity = 6700 MPa NZS3603 Amt 4, Table 2.3 considering at least 4 members acting together

k2 for Long Term Loads = 2

Deflection under Dead and Live Load = 17.13 mm Limit by Woolcock et al, 1999 Span/240 = 17.92 mm Deflection under Dead and Service Wind = 12.56 mm Limit by Woolcock et al, 1999 Span/100 = 43.00 mm

Reactions

Maximum downward = 1.37 kn Maximum upward = -1.05 kn

Number of Blocking = 1 if 0 then no blocking required, if 1 then one midspan blocking required

Rafter Design Internal

Internal Rafter Load Width = 4500 mm Internal Rafter Span = 5850 mm Try Rafter 2x300x50 SG8 Dry

Moisture Condition = Dry (Moisture in timber is less than 16% and timber does not remain in continuous wet condition after installation)

K1 Short term = 1 K1 Medium term = 0.8 K1 Long term = 0.6 K4 = 1 K5 = 1 K8 Downward = 1.00

K8 Upward = 1.00 S1 Downward = 6.81 S1 Upward = 6.81

Shear Capacity of timber = 3 MPa Bending Capacity of timber = 14 MPa NZS3603 Amt 4, table 2.3

Capacity Checks

M1.35D	6.50 Kn-m	Capacity	10.08 Kn-m	Passing Percentage	155.08 %
M1.2D+1.5L 1.2D+Sn 1.2D+WnDn	13.48 Kn-m	Capacity	13.44 Kn-m	Passing Percentage	99.70 %
$M_{0.9D\text{-W}nUp}$	-10.30 Kn-m	Capacity	-16.8 Kn-m	Passing Percentage	163.11 %
V _{1.35D}	4.44 Kn	Capacity	28.94 Kn	Passing Percentage	651.80 %
V _{1.2D+1.5L} 1.2D+Sn 1.2D+WnDn	9.21 Kn	Capacity	38.6 Kn	Passing Percentage	419.11 %
$ m V_{0.9D ext{-}WnUp}$	-7.04 Kn	Capacity	-48.24 Kn	Passing Percentage	685.23 %

Deflections

Modulus of Elasticity = 5400 MPa NZS3603 Amt 4, Table 2.3

k2 for Long Term Loads = 2

Deflection under Dead and Live Load = 16.875 mm Limit by Woolcock et al, 1999 Span/240 = 25.00 mm Deflection under Dead and Service Wind = 21.875 mm Limit by Woolcock et al, 1999 Span/100 = 60.00 mm

Reactions

Maximum downward = 9.21 kn Maximum upward = -7.04 kn

Rafter to Pole Connection check

Bolt Size = M12 Number of Bolts = 2

Calculations as per NZS 3603:1993 Amend 2005 clause 4.4

Joint Group for Rafters = J5 Joint Group for Pole = J5

Minimum Bolt edge, end and spacing for Load perpendicular to grains = 60 mm

Factor of Safety = 0.7

For Perpendicular to grain loading

K11 = 14.9 fpj = 12.9 Mpa for Rafter with effective thickness = 100 mm

For Parallel to grain loading

K11 = 2.0 fcj = 36.1 Mpa for Pole with effective thickness = 100 mm

Capacity under short term loads = 21.67 Kn > -7.04 Kn

Rafter Design External

External Rafter Load Width = 2250 mm External Rafter Span = 5813 mm Try Rafter 300x50 SG8 Dry

Moisture Condition = Dry (Moisture in timber is less than 16% and timber does not remain in continuous wet condition after installation)

K1 Short term = 1 K1 Medium term = 0.8 K1 Long term = 0.6 K4 = 1 K5 = 1 K8 Downward = 0.94

K8 Upward =0.94 S1 Downward =13.93 S1 Upward =13.93

Shear Capacity of timber = 3 MPa Bending Capacity of timber = 14 MPa NZS3603 Amt 4, table 2.3

Capacity Checks

M1.35D	3.21 Kn-m	Capacity	4.72 Kn-m	Passing Percentage	147.04 %
M1.2D+1.5L 1.2D+Sn 1.2D+WnDn	6.65 Kn-m	Capacity	6.30 Kn-m	Passing Percentage	94.74 %
$M_{0.9D\text{-W}nUp}$	-5.08 Kn-m	Capacity	-7.87 Kn-m	Passing Percentage	154.92 %
V _{1.35D}	2.21 Kn	Capacity	14.47 Kn	Passing Percentage	654.75 %
V _{1.2D+1.5L} 1.2D+Sn 1.2D+WnDn	4.58 Kn	Capacity	19.30 Kn	Passing Percentage	421.40 %
$ m V_{0.9D ext{-}WnUp}$	-3.50 Kn	Capacity	-24.12 Kn	Passing Percentage	689.14 %

Deflections

Modulus of Elasticity = 5400 MPa NZS3603 Amt 4, Table 2.3

k2 for Long Term Loads = 2

Deflection under Dead and Live Load = 18.75 mm Limit by Woolcock et al, 1999 Span/240= 25.00 mm Deflection under Dead and Service Wind = 21.88 mm Limit by Woolcock et al, 1999 Span/100 = 60.00 mm

Reactions

Maximum downward = 4.58 kn Maximum upward = -3.50 kn

Rafter to Pole Connection check

Bolt Size = M12 Number of Bolts = 2

Calculations as per NZS 3603:1993 Amend 2005 clause 4.4

Joint Group for Rafters = J5 Joint Group for Pole = J5

Factor of Safety = 0.7

For Perpendicular to grain loading

K11 = 14.9 fpj = 12.9 Mpa for Rafter with effective thickness = 50 mm

For Parallel to grain loading

K11 = 2.0 fcj = 36.1 Mpa for Pole with effective thickness = 100 mm

Eccentric Load check

V = phi x k1 x k4 x k5 x fs x b x ds (Eq 4.12) = -25.20 kn > -3.50 Kn

6/12

Single Shear Capacity under short term loads = -10.84 Kn > -3.50 Kn

Intermediate Design Sides

Intermediate Spacing = 3000 mm Intermediate Span = 3650 mm Try Intermediate 2x200x50 SG8 Dry

Moisture Condition = Dry (Moisture in timber is less than 16% and timber does not remain in continuous wet condition after installation)

K1 Short term = 1 K4 = 1 K5 = 1 K8 Downward = 1.00

K8 Upward = 1.00 S1 Downward = 11.27 S1 Upward = 0.72

Shear Capacity of timber = 3 MPa Bending Capacity of timber = 14 MPa NZS3603 Amt 4, table 2.3

Capacity Checks

$M_{Wind+Snow}$	1.95 Kn-m	Capacity	7.46 Kn-m	Passing Percentage	382.56 %
$ m V_{0.9D ext{-}WnUp}$	2.14 Kn	Capacity	32.16 Kn	Passing Percentage	1502.80 %

Deflections

Modulus of Elasticity = 5400 MPa NZS3603 Amt 4, Table 2.3

Deflection under Snow and Service Wind = 15.025 mm Limit by Woolcock et al, 1999 Span/100 = 36.50 mm

Reactions

Maximum = 2.14 kn

Girt Design Front and Back

Girt's Spacing = 900 mm Girt's Span = 4500 mm Try Girt 150x50 SG8 Dry

Moisture Condition = Dry (Moisture in timber is less than 16% and does not remain in continuous wet condition after installation)

K1 Short term = 1 K4 = 1 K5 = 1 K8 Downward = 1.00

K8 Upward =0.89 S1 Downward =9.63 S1 Upward =15.23

Shear Capacity of timber = 3 MPa Bending Capacity of timber = 14 MPa NZS3603 Amt 4, table 2.3

Capacity Checks

$M_{Wind+Snow}$	1.78 Kn-m	Capacity	1.87 Kn-m	Passing Percentage	105.06 %
$ m V_{0.9D ext{-}WnUp}$	1.58 Kn	Capacity	12.06 Kn	Passing Percentage	763.29 %

Deflections

Modulus of Elasticity = 6700 MPa NZS3603 Amt 4, Table 2.3

Deflection under Snow and Service Wind = 39.78 mm Limit by Woolcock et al, 1999 Span/100 = 45.00 mm Sag during installation = 24.86 mm

Reactions

Maximum = 1.58 kn

Girt Design Sides

Girt's Spacing = 1300 mm Girt's Span = 3000 mm Try Girt 150x50 SG8 Dry

Moisture Condition = Dry (Moisture in timber is less than 16% and does not remain in continuous wet condition after installation)

K1 Short term = 1 K4 = 1 K5 = 1 K8 Downward = 1.00

K8 Upward =0.79 S1 Downward =9.63 S1 Upward =17.59

Shear Capacity of timber = 3 MPa Bending Capacity of timber = 14 MPa NZS3603 Amt 4, table 2.3

Capacity Checks

$M_{Wind+Snow}$	1.14 Kn-m	Capacity	1.65 Kn-m	Passing Percentage	144.74 %
$ m V_{0.9D ext{-}WnUp}$	1.52 Kn	Capacity	12.06 Kn	Passing Percentage	793.42 %

Deflections

Modulus of Elasticity = 6700 MPa NZS3603 Amt 4, Table 2.3

Deflection under Snow and Service Wind = 11.35 mm Limit by Woolcock et al. 1999 Span/100 = 30.00 mm Sag during installation = 4.91 mm

Reactions

Maximum = 1.52 kn

Middle Pole Design

Geometry

200 SED H5 (Minimum 225 dia. at Floor Level) Dry Use Height 3700 mm

Area 35448 mm2 As 26585.7421875 mm2

Ix	100042702 mm4	Zx	941578 mm3
Iy	100042702 mm4	Zx	941578 mm3
Lateral Restraint	3700 mm c/c		

Loads

Total Area over Pole = 13.5 m^2

Dead	3.38 Kn	Live	3.38 Kn	
Wind Down	5.40 Kn	Snow	0.00 Kn	
Moment wind	12.25 Kn-m			
Phi	0.8	K8	0.80	
K1 snow	0.8	K1 Dead	0.6	
K1 wind	1			

Material

Peeling	Steaming	Normal	Dry Use
fb =	36.3 MPa	$f_S =$	2.96 MPa
fc =	18 MPa	fp =	7.2 MPa
ft =	22 MPa	E =	9257 MPa

Capacities

PhiNcx Wind	406.33 Kn	PhiMnx Wind	21.77 Kn-m	PhiVnx Wind	62.96 Kn
PhiNcx Dead	243.80 Kn	PhiMnx Dead	13.06 Kn-m	PhiVnx Dead	37.77 Kn

Checks

(Mx/PhiMnx)+(N/phiNcx) = 0.59 < 1 OK

 $(Mx/PhiMnx)^2 + (N/phiNcx) = 0.35 < 1 OK$

Deflection at top under service lateral loads = 27.52 mm < 37.00 mm

Drained Lateral Strength of Middle pile in cohesionless soils Free Head short pile

Assumed Soil Properties

Gamma	18 Kn/m3	Friction angle	30 deg	Cohesion	0 Kn/m3
K0 =	$(1-\sin(30)) / (1+\sin(30))$				
Kp =	$(1+\sin(30))/(1-\sin(30))$				

Geometry For Middle Bay Pole

 $D_S =$ 0.6 mm Pile Diameter

L =1600 mm Pile embedment length

f1 =3000 mm Distance at which the shear force is applied

f2 = $0 \, \mathrm{mm}$ Distance of top soil at rest pressure

Loads

Moment Wind = 12.25 Kn-m

Shear Wind = 4.08 Kn

Pile Properties

Safety Factory 0.55

Hu =7.93 Kn Ultimate Lateral Strength of the Pile, Short pile

Ultimate Moment Capacity of Pile 14.27 Kn-m Mu =

Checks

Applied Forces/Capacities = 0.86 < 1 OK

End Pole Design

Geometry For End Bay Pole

Geometry

175 SED H5 (Minimum 200 dia. at Floor Level)	Dry Use	Height	3700 mm
Area	27598 mm2	As	20698.2421875 mm2
Ix	60639381 mm4	Zx	646820 mm3
Iy	60639381 mm4	Zx	646820 mm3
Lateral Restraint	mm c/c		

Lateral Restraint

Loads

Total Area over Pole = 13.5 m^2

Dead	3.38 Kn	Live	3.38 Kn
Wind Down	5.40 Kn	Snow	0.00 Kn
Moment Wind	6.13 Kn-m		
Phi	0.8	K8	0.68
K1 snow	0.8	K1 Dead	0.6
K1wind	1		

Material

10/12

Peeling	Steaming	Normal	Dry Use
fb =	36.3 MPa	$f_S =$	2.96 MPa
fc =	18 MPa	fp =	7.2 MPa
ft =	22 MPa	E =	9257 MPa

Capacities

PhiNex Wind	271.57 Kn	PhiMnx Wind	12.84 Kn-m	PhiVnx Wind	49.01 Kn
PhiNcx Dead	162.94 Kn	PhiMnx Dead	7.70 Kn-m	PhiVnx Dead	29.41 Kn

Checks

(Mx/PhiMnx)+(N/phiNcx) = 0.52 < 1 OK

 $(Mx/PhiMnx)^2 + (N/phiNcx) = 0.27 < 1 \text{ OK}$

Deflection at top under service lateral loads = 24.48 mm < 39.90 mm

Ds = 0.6 mm Pile Diameter

L= 1300 mm Pile embedment length

f1 = 3000 mm Distance at which the shear force is applied

f2 = 0 mm Distance of top soil at rest pressure

Loads

Total Area over Pole = 13.5 m^2

Moment Wind = 6.13 Kn-m Shear Wind = 2.04 Kn

Pile Properties

Safety Factory 0.55

Hu = 4.55 Kn Ultimate Lateral Strength of the Pile, Short pile

Mu = 8.02 Kn-m Ultimate Moment Capacity of Pile

Checks

Applied Forces/Capacities = 0.76 < 1 OK

Drained Lateral Strength of End pile in cohesionless soils Free Head short pile

Assumed Soil Properties

Gamma 18 Kn/m3 Friction angle 30 deg Cohesion 0 Kn/m3

11/12

$$K0 = \frac{(1-\sin(30))}{(1+\sin(30))}$$

 $Kp = \frac{(1+\sin(30))}{(1-\sin(30))}$

Geometry For End Bay Pole

Ds = 0.6 mm Pile Diameter

L= 1300 mm Pile embedment length

f1 = 3000 mm Distance at which the shear force is applied

f2 = 0 mm Distance of top soil at rest pressure

Loads

Moment Wind = 6.13 Kn-m Shear Wind = 2.04 Kn

Pile Properties

Safety Factory 0.55

Hu = 4.55 Kn Ultimate Lateral Strength of the Pile, Short pile

Mu = 8.02 Kn-m Ultimate Moment Capacity of Pile

Checks

Applied Forces/Capacities = 0.76 < 1 OK

Uplift Check

Density of Concrete = 24 Kn/m3

Density of Timber Pole = 5 Kn/m3

Due to cast in place pile, the surface interaction between soil and pile will be rough thus angle of friction between both is taken equal to soil angle of internal friction

Ks (Lateral Earth Pressure Coefficient) for cast into place concrete piles = 1.5

Formula to calculate Skin Friction = Safecty factor (0.55) x Density of Soil(18) x Height of Pile(1600) x Ks(1.5) x 0.5 x tan(30) x Pi x Dia of Pile(0.6) x Height of Pile(1600)

Skin Friction = 20.68 Kn

Weight of Pile + Pile Skin Friction = 24.83 Kn

Uplift on one Pile = 7.22 Kn

Uplift is ok

Last Page