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Job Number:	BWhite
Issue:	Consulting Ltd
PRODUCER STATEMENT-PS1-DESIGN	•
ISSUED BY: BWhite Consulting Ltd (Design Engineer: Bevan White)	
TO BE SUPPLIED TO: District Council IN RESPECT OF: Proposed NEW Farm Shed	
AT: Q2Q9+MCQ Upper Moutere, New Zealand	
LEGAL DESCRIPTION	
We have been engaged by Ezequote Pty Ltd to provide Specific Structural Engineering De requirements of Clause(s) B1 of the Building Code for part only (as specified in the attachme building work.	-
☐ ALL	and all connections
The design has been prepared in accordance with compliance documents to NZ Building Co- Innovation & Employment Clauses B1/VM1 and B1/VM4	de issued by Ministry of Business,
The proposed building work covered by the producer statement is described on Ezequote dr dated together with the following specification, and other documents set out in the schedule Featured Report Dated 3/13/2025 and numbered "Second Page"	
On behalf of BWhite Consulting Ltd, and subject to:	
 Site verification of the following design assumptions: an Ultimate foundation bearing with NZS3604:2011 The building has a design life of 50 years and am Importance Level 1 Unless specifically noted, compliance of the drawings to None-Specific codes such a been checked by this practice This Certificate does not cover any other building code clause including weather tig Inspections of the building to be completed by District Council. As BWhite Consulting inspections, we cannot issue a producer Statement-PS4- Construction Review. This Producer Statement- Design is valid for a building consent issued within 1 year. All proprietary products meeting their performance specification requirements 	s NZS3604 and NZS4229 have not thtness ing Ltd are not undertaking
I believe on reasonable grounds that a) the building, if constructed in accordance with the draw documents provided or listed in the attached schedule, will comply with the relevant provision the presons who have undertaken the design have the necessary competency to do so. I also construction monitoring/observation:	ons of the Building Code and that b),
☑ CM1 ☐ CM2 ☐ CM3 ☐ CM4 ☐ CM5 or as per agreement with owner/developer (state	ed above)
I, Bevan White am CPEng 108276 I am Member of Engineering New Zealand and hold the folds a current policy of Professional Indemnity Insurance no less than \$200,000	llowing qualification: BECivil and
Signed by Bevan White on behalf of BWhite Consulting Ltd Dated: 3/13/2025	
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 state maximum amount of damages payable arising from this statement and all other statements provided to the Building Consent	

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: 3/13/2025

BWhite

Consulting Ltd

Bell Block New Plymouth 4312

New Zealand File No:

DESIGN FEATURES SUMMARY FOR PROPOSED NEW FARM SHED Q2Q9+MCQ UPPER MOUTERE, 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	N3	Ground Snow Load	0 KPa	Roof Snow Load	0 KPa
Earthquake Zone	2	Subsoil Category	D	Exposure Zone	C
Importance Level	1	Ultimate wind & EQ ARI	100 Years	Max Height	3.725 m
Wind Region	NZ2	Terrain Category	2.57	Design Wind Speed	47.37 m/s
Wind Pressure	1.35 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

Date: 3/13/2025

Council: Council

BWhite Consulting Ltd

Subject: B2 compliance in respect of Proposed shed at Q2Q9+MCQ Upper Moutere, New Zealand

Council typically requests a Producer Statement/Other means of compliance for Design for Clause B2 of the Building Code-Durability

We are not able to provide a Producer Statement for durability because compliance needs to be shown on material-by-material basis using a variety of compliance methods, and not all materials used have a clear compliance path.

We can confirm that for the structural elements shown in our documentation under Clause B1:

Timber

Timber treatment has been selected to meet or exceed the requirements of table 1A of B2/AS1 and NZS3602

Steel fixing

Steel fixings are protected against weather as per table 4.1 and 4.2 of NZS3604-2011. Exposure Zone C

Yours Faithfully

BWhite CONSULTING LTD

Bevan Whiite

Director | BE Civil . CMengNZ CPEng

Email: bwhitecpeng@gmail.com

Contact: 0211 979 786

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Note: This letter shall only be relied on by the Building Consent Authority named in Engineering New Zealand/ACE New Zealand Producer Statement PS1(B1) - Design in relation to the Building Work. Liability under this letter accrues to the Design Review Firm only. The total maximum amount of damages payable arising from this letter and all other statements provided to the Building Consent Authority in relation to this Building Work whether in contract, tort or otherwise (including negligence), is limited to the sum of \$200,000

Job No.: 2502052 Address: Q2Q9+MCQ Upper Moutere, New Date: 3/13/2025

Zealand

Latitude: -41.210786 **Longitude:** 173.018608 **Elevation:** 66.5 m

General Input

Roof Live Load	0.25 KPa	Roof Dead Load	0.25 KPa	Roof Live Point Load	1.1 Kn
Snow Zone	N3	Ground Snow Load	0 KPa	Roof Snow Load	0 KPa
Earthquake Zone	2	Subsoil Category	D	Exposure Zone	C
Importance Level	1	Ultimate wind & Earthquake ARI	100 Years	Max Height	3.725 m
Wind Region	NZ2	Terrain Category	2.57	Design Wind Speed	47.37 m/s
Wind Pressure	1.35 KPa	Lee Zone	NO	Ultimate Snow ARI	50 Years
Wind Category	Very 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 3.73 m Cpe = -0.9 pe = -1.09 KPa pnet = -1.09 KPa

For roof CP,e from 3.73 m To 7.45 m Cpe = -0.5 pe = -0.61 KPa pnet = -0.61 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 3.73 m Cpe = -0.65 pe = -0.79 KPa pnet = -0.79 KPa

For side wall CP,e from 0 m To 3.73 m Cpe = pe = -0.79 KPa pnet = -0.79 KPa

Maximum Upward pressure used in roof member Design = 1.09 KPa

Maximum Downward pressure used in roof member Design = 0.65 KPa

Maximum Wall pressure used in Design = 1.25 KPa

Maximum Racking pressure used in Design = 1.46 KPa

Design Summary

Purlin Design

Purlin Spacing = 1000 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	0.8 Kn-m	Capacity	2.23 Kn-m	Passing Percentage	278.75 %
M1.2D+1.5L 1.2D+Sn 1.2D+WnDn	2.5 Kn-m	Capacity	2.97 Kn-m	Passing Percentage	118.80 %
$M_{0.9D\text{-W}nUp}$	-2.05 Kn-m	Capacity	-2.97 Kn-m	Passing Percentage	144.88 %
V _{1.35D}	0.73 Kn	Capacity	9.65 Kn	Passing Percentage	1321.92 %
V1.2D+1.5L 1.2D+Sn 1.2D+WnDn	2.07 Kn	Capacity	12.86 Kn	Passing Percentage	621.26 %
V _{0.9D-WnUp}	-1.88 Kn	Capacity	-16.08 Kn	Passing Percentage	855.32 %

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 = 18.12 mm

Limit by Woolcock et al, 1999 Span/240 = 17.92 mm

Deflection under Dead and Service Wind = 16.44 mm

Limit by Woolcock et al, 1999 Span/100 = 43.00 mm

Reactions

Maximum downward = 2.07 kn Maximum upward = -1.88 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 = 8850 mm Try Rafter 2x610x45 LVL11

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 = 11.05 S1 Upward = 11.05

Shear Capacity of timber = 5 MPa Bending Capacity of timber = 38 MPa NZS3603 Amt 4, table 2.3

Capacity Checks

M1.35D	14.87 Kn-m	Capacity	90.18 Kn-m	Passing Percentage	606.46 %
M1.2D+1.5L 1.2D+Sn 1.2D+WnDn	41.85 Kn-m	Capacity	120.24 Kn-m	Passing Percentage	287.31 %
$M_{0.9D\text{-W}nUp}$	-38.11 Kn-m	Capacity	-150.28 Kn-m	Passing Percentage	394.33 %
V _{1.35D}	6.72 Kn	Capacity	88.28 Kn	Passing Percentage	1313.69 %
V _{1.2D+1.5L} 1.2D+Sn 1.2D+WnDn	18.92 Kn	Capacity	117.7 Kn	Passing Percentage	622.09 %
V _{0.9D-WnUp}	-17.22 Kn	Capacity	-147.14 Kn	Passing Percentage	854.47 %

Deflections

Modulus of Elasticity = 9900 MPa NZS3603 Amt 4, Table 2.3

k2 for Long Term Loads = 2

Deflection under Dead and Live Load = 6.16 mm Limit by Woolcock et al, 1999 Span/240 = 37.50 mm Deflection under Dead and Service Wind = 9.41 mm Limit by Woolcock et al, 1999 Span/100 = 90.00 mm

Reactions

Maximum downward = 18.92 kn Maximum upward = -17.22 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 =J2 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 = 12.6 fpj = 22.7 Mpa for Rafter with effective thickness = 90 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 = 29.11 Kn > -17.22 Kn

Rafter Design External

External Rafter Load Width = 2250 mm External Rafter Span = 4310 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

M _{1.35D}	1.76 Kn-m	Capacity	4.72 Kn-m	Passing Percentage	268.18 %
M1.2D+1.5L 1.2D+Sn 1.2D+WnDn	4.96 Kn-m	Capacity	6.30 Kn-m	Passing Percentage	127.02 %
$M_{0.9D\text{-W}n\text{Up}}$	-4.52 Kn-m	Capacity	-7.87 Kn-m	Passing Percentage	174.12 %
V _{1.35D}	1.64 Kn	Capacity	14.47 Kn	Passing Percentage	882.32 %
$V_{1.2D+1.5L\ 1.2D+Sn\ 1.2D+WnDn}$	4.61 Kn	Capacity	19.30 Kn	Passing Percentage	418.66 %
V0.9D-WnUp	-4.19 Kn	Capacity	-24.12 Kn	Passing Percentage	575.66 %

Deflections

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

k2 for Long Term Loads = 2

Deflection under Dead and Live Load = 5.93 mm

Limit by Woolcock et al, 1999 Span/240= 18.75 mm

Deflection under Dead and Service Wind = 8.16 mm

Limit by Woolcock et al, 1999 Span/100 = 45.00 mm

Reactions

Maximum downward = 4.61 kn Maximum upward = -4.19 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 > -4.19 Kn

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Single Shear Capacity under short term loads = -10.84 Kn > -4.19 Kn

Girt Design Front and Back

Girt's Spacing = 1100 mm

Girt's Span = 4500 mm

Try Girt 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

K4 = 1

K5 = 1

K8 Downward = 1.00

K8 Upward = 0.97

S1 Downward =11.27

S1 Upward = 12.60

Shear Capacity of timber = 3 MPa

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

Capacity Checks

MWind+Snow

3.48 Kn-m

Capacity

3.63 Kn-m

Passing Percentage

104.31 %

 $V_{0.9D\text{-WnUp}}$

3.09 Kn

Capacity

16.08 Kn

Passing Percentage

520.39 %

Deflections

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

Deflection under Snow and Service Wind = 32.87 mm

Limit by Woolcock et al, 1999 Span/100 = 45.00 mm

Sag during installation = 24.86 mm

Reactions

Maximum = 3.09 kn

Girt Design Sides

Girt's Spacing = 1100 mm

Girt's Span = 4500 mm

Try Girt 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

K4 = 1

K5 = 1 K8 Downward = 1.00

K8 Upward =0.97

S1 Downward =11.27

S1 Upward = 12.60

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

Capacity Checks

MWind+Snow

3.48 Kn-m

Capacity

3.63 Kn-m

Passing Percentage

104.31 %

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V_{0.9D-WnUp} 3.09 Kn Capacity 16.08 Kn Passing Percentage 520.39 %

Deflections

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

Deflection under Snow and Service Wind = 32.87 mm Limit by Woolcock et al. 1999 Span/100 = 45.00 mm Sag during installation = 24.86 mm

Reactions

Maximum = 3.09 kn

Middle Pole Design

Geometry

175 SED H5 (Minimum 200 dia. a	t Floor Level)	Dry Use	Height	3725 mm
Area		27598 mm2	As	20698.2421875 mm2
Ix		60639381 mm4	Zx	646820 mm3
Iy		60639381 mm4	Zx	646820 mm3
Lateral Restraint		3725 mm c/c		

Loads

Total Area over Pole = 20.25 m^2

Dead	5.06 Kn	Live	5.06 Kn
Wind Down	13.16 Kn	Snow	0.00 Kn
Moment wind	17.05 Kn-m		
Phi	0.8	K8	0.68
K1 snow	0.8	K1 Dead	0.6
K1wind	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 268.86 Kn PhiMnx Wind 12.71 Kn-m PhiVnx Wind 49.01 Kn

PhiNcx Dead 161.32 Kn PhiMnx Dead 7.62 Kn-m PhiVnx Dead 29.41 Kn

Checks

(Mx/PhiMnx)+(N/phiNcx) = 1.43 < 1 OK

 $(Mx/PhiMnx)^2 + (N/phiNcx) = 1.89 < 1 OK$

Deflection at top under service lateral loads = 59.22 mm < 37.25 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

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

Geometry For Middle Bay Pole

Ds = 0.6 mm Pile Diameter

L= 1500 mm Pile embedment length

f1 = 2794 mm Distance at which the shear force is applied

f2 = 0 mm Distance of top soil at rest pressure

Loads

Moment Wind = 17.05 Kn-m

Shear Wind = 6.10 Kn

Pile Properties

Safety Factory 0.55

Hu = 7.00 Kn Ultimate Lateral Strength of the Pile, Short pile

Mu = 11.74 Kn-m Ultimate Moment Capacity of Pile

Checks

Applied Forces/Capacities = 1.45 < 1 OK

End Pole Design

Geometry For End Bay Pole

Geometry

175 SED H5 (Minimum 200 dia. at Floor Level)	Dry Use	Height	3425 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		

Loads

Total Area over Pole = 10.125 m^2

Dead	2.53 Kn	Live	2.53 Kn
Wind Down	6.58 Kn	Snow	0.00 Kn
Moment Wind	5.68 Kn-m		
Phi	0.8	K8	0.76
K1 snow	0.8	K1 Dead	0.6
K1wind	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

PhiNex Wind	300.17 Kn	PhiMnx Wind	14.19 Kn-m	PhiVnx Wind	49.01 Kn
PhiNcx Dead	180.10 Kn	PhiMnx Dead	8.51 Kn-m	PhiVnx Dead	29.41 Kn

Checks

(Mx/PhiMnx)+(N/phiNcx) = 0.44 < 1 OK

 $(Mx/PhiMnx)^2+(N/phiNcx) = 0.20 < 1 \text{ OK}$

Deflection at top under service lateral loads = 19.69 mm < 37.16 mm

Ds =	0.6 mm	Pile Diameter
L =	1300 mm	Pile embedment length
f1 =	2794 mm	Distance at which the shear force is applied
f2 =	0 mm	Distance of top soil at rest pressure

Loads

Total Area over Pole = 10.125 m^2

Moment Wind = 5.68 Kn-m Shear Wind = 2.03 Kn

Pile Properties

Safety Factory 0.55

Hu = 4.78 Kn Ultimate Lateral Strength of the Pile, Short pile

Mu = 7.90 Kn-m Ultimate Moment Capacity of Pile

Checks

Applied Forces/Capacities = 0.72 < 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

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

Geometry For End Bay Pole

Ds = 0.6 mm Pile Diameter

L= 1300 mm Pile embedment length

f1 = 2794 mm Distance at which the shear force is applied

f2 = 0 mm Distance of top soil at rest pressure

Loads

Moment Wind = 5.68 Kn-m Shear Wind = 2.03 Kn

Pile Properties

Safety Factory 0.55

Hu = 4.78 Kn Ultimate Lateral Strength of the Pile, Short pile

Mu = 7.90 Kn-m Ultimate Moment Capacity of Pile

Checks

Applied Forces/Capacities = 0.72 < 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(1500) x Ks(1.5) x 0.5 x tan(30) x Pi x Dia of Pile(0.6) x Height of Pile(1500)

Skin Friction = 18.17 Kn

Weight of Pile + Pile Skin Friction = 22.56 Kn

Uplift on one Pile = 17.52 Kn

Uplift is ok