

Building Code Clause(s).....

PRODUCER STATEMENT – PS1 – DESIGN

(Guidance notes on the use of this form are printed on page 2)

ISSUED BY:..... **Andrew Melvin King-Turner Ltd**
 (Design Firm)

TO:..... **G & L Philp**
 (Owner/Developer)

TO BE SUPPLIED TO:..... **Tasman District Council**
 (Building Consent Authority)

IN RESPECT OF:..... **New House - 250UB31 beam, 89x5 SHS posts and pad footing only**
 (Description of Building Work)

AT:..... **184 Horton Road**
 (Address)

..... **TASMAN** **LOT** **DP** **SO**

Tasman District Council
BUILDING CONSENT AUTHORITY
APPROVED DOCUMENTS
 Consent Number BC **160489**
 Signed
 Date **23/06/2016**
 ALL WORK IS TO COMPLY WITH THE NZ BUILDING CODE
 DO NOT MAKE CHANGES WITHOUT PRIOR APPROVAL

We have been engaged by the owner/developer referred to above to provide ... **structural engineering design** ...
 (Extent of Engagement)
 services in respect of the requirements of Clause(s) **B1** of the Building Code for

All ☐ or Part only ☒ (as specified above), of the proposed building work.

The design carried out by us has been prepared in accordance with:

- ☒ Compliance Documents issued by the Ministry of Business, Innovation & Employment... **B1/AS1 & VM1** or
 (verification method / acceptable solution)
- ☐ Alternative solution as per the attached schedule.....

The proposed building work covered by this producer statement is described on the drawings titled **Geraint & Linda Philp, 184 Horton Rd, Beulah Estate, Tasman Lot 2 DP 324764**.... and numbered **598 Sht 3, 5, 14 & 18**..... ;
 together with the specification, and other documents set out in the schedule attached to this statement.

On behalf of the Design Firm, and subject to:

- (i) Site verification of the following design assumptions **refer inspection schedule**
- (ii) All proprietary products meeting their performance specification requirements;

I believe on reasonable grounds that a) the building, if constructed in accordance with the drawings, specifications, and other documents provided or listed in the attached schedule, will comply with the relevant provisions of the Building Code and that b), the persons who have undertaken the design have the necessary competency to do so. I also recommend the following level of construction monitoring/observation:

☐ CM1 ☒ CM2 ☐ CM3 ☐ CM4 ☐ CM5 (Engineering Categories) Or ☐ as per agreement with owner/developer (Architectural)

I, **Steven Geoffrey KING-TURNER**..... am:
 (Name of Design Professional)

☒ CPEng **142318** #

☐ Reg Arch #

I am a Member of : ☒ IPENZ ☐ NZIA and hold the following qualifications:.... **CPEng IntPE(NZ)**.....
 The Design Firm issuing this statement holds a current policy of Professional Indemnity Insurance no less than \$200,000*.
 The Design Firm is a member of ACENZ: ☐

SIGNED BY **Steven King-Turner** ON BEHALF OF ... **Andrew Melvin King-Turner Ltd**
 (Design Firm)

Date **22-10-15** (signature).....

Note: This statement shall only be relied upon by the Building Consent Authority named above. Liability under this statement accrues to the Design Firm only. The total maximum amount of damages payable arising from this statement 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*.

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

Inspection Schedule

This schedule to be kept on site and signed by the inspecting Engineer at the time of each inspection. On completion of the project this schedule is to be returned to the Engineer and a Producer Statement of Construction Review can be issued. Please advise the Engineer at least 24 hrs before an inspection is required.

PROJECT: G & L Philp
ADDRESS: 184 Horton Rd
Tasman

The following structural elements of this project require inspection by a suitably qualified Engineer or his representative during construction in order to ensure compliance with the New Zealand Standard Code of Practice under which they were designed. Such inspections are considered an integral part of the structural design process, and are carried out to ensure that the structure will perform adequately. Failure to notify the Engineer that an inspection listed below is required may in some circumstances limit the designers liability for subsequent problems. This is particularly applicable to inspections of foundations and reinforcing steel where verification of compliance with the structural design may not be possible after construction is complete.

Inspection Required	Inspected / Comments
Reinforcing to pad footing Structural steelwork - once installed	

Steven King-Turner
MIPENZ CPEng IntPE(NZ)

22-10-15
Date

Form 2A

Memorandum from licensed building practitioner: Certificate of design work
Section 45 and Section 30C, Building Act 2004

If there is insufficient room on the form for requested details, please continue on another sheet and attach the additional sheet(s) to this form.

THE BUILDING

Street address:	184 Horton Rd		
Suburb:			
Town/City	Tasman	Postcode:	

THE OWNER

Name(s):	G & L Philp		
Mailing address:			
Suburb:		PO Box/Private Bag:	
Town/City:		Postcode:	
Phone number:		Email address:	

BASIS FOR PROVIDING THIS MEMORANDUM

I am providing this memorandum in my role as the: Please tick the option that applies (✓)	
()	sole designer of all of the RBW design outlined in this memorandum – I carried out all of the RBW design myself – no other person will be providing any additional memoranda for the project
()	lead designer who carried out some of the RBW design myself but also supervised other designers – this memorandum covers their RBW design work as well as mine, and no other person will be providing any additional memoranda for the project
()	lead designer for all but specific elements of RBW – this memorandum only covers the RBW design work that I carried out or supervised and the other designers will provide their own memoranda relating to their specific RBW design
(✓)	specialist designer who carried out specific elements of RBW design work as outlined in this memorandum – other designers will be providing a memorandum covering the remaining RBW design work

IDENTIFICATION OF DESIGN WORK THAT IS RESTRICTED BUILDING WORK (RBW)

I, Steven KING-TURNER, carried out / supervised the following design work that is restricted building work

PRIMARY STRUCTURE: B1

Design work that is restricted building work	Description	Carried out/ supervised	Reference to plans and specifications
Tick(✓) if included Cross (X) if excluded	[If appropriate, provide details of the restricted building work]	[Specify whether you carried out this design work or supervised someone else carrying out this design work]	[If appropriate, specify references]

Primary structure

All RBW Design work relating to B1	(X)		() Carried out () Supervised	
Foundations and subfloor framing	(✓)	Pad footings to S115 posts	(✓) Carried out () Supervised	Sht 3 & 14
Walls	(X)		() Carried out () Supervised	
Roof	(X)		() Carried out () Supervised	
Columns and beams	(✓)	250UB31 beam + 89x55 S115 posts	(✓) Carried out () Supervised	Sht 5 & 18
Bracing	(X)		() Carried out () Supervised	
Other	(X)		() Carried out () Supervised	

WAIVERS AND MODIFICATIONS

Waivers or modifications of the building code are required () Yes (✓) No

If Yes, provide details of the waivers or modifications below:

Clause	Waiver/modification required
[List relevant clause numbers of building code]	[Specify nature of waiver or modification of building code]

Note: continue on another page if necessary.

ISSUED BY

Name: Steven KING-TURNER	LBP or Registration number: 142318
The practitioner is a: () Design LBP () Registered architect (✓) Chartered professional engineer	
Design Entity or Company (optional): Andrew Melvin King-Turner Ltd	
Mailing address (if different from below):	
Street address / Registered office: 12a Paru Paru Road	
Suburb:	Town/City: Nelson
PO Box/Private Bag: PO Box 7036	Postcode: 7042
Phone number: 546 4565	Mobile: 027 2473961
After Hours:	Fax: 546 8575
Email address: steven@amk.co.nz	Website:

DECLARATION

I Steven King-Turner *[name of practitioner]*, LBP,

state that I have applied the skill and care reasonably required of a competent design professional in carrying out or supervising the Restricted Building Work (RBW) described in this form, and that based on this, I also state that the RBW:

- Complies with the building code; or
- ~~Complies with the building code subject to any waiver or modification of the building code recorded on this form.~~

Signature: 

Date: 22-10-15

= Allow 3 kPa live load on floor (books)

$$\Rightarrow L = 5m \quad (0.5 kPa = G)$$

$$\text{TRIBUTARY WIDTH} = 6m/2 = 3m \times 3.5 kPa = 10.5 kN/m$$

+ WALL & ROOF LOAD

$$\text{WALL } 1.2m \times 0.5 = 0.6 kN/m$$

$$\text{Roof} = 3m \times 0.65 = 1.95 kN/m$$

$$\therefore \text{TOTAL UDL} = 10.5 + 0.6 + 1.95 = 13.1 kN/m$$

$$I_{req} = 44.4 \quad 256UB31 = 44.4 = 12m \delta$$

$$= 5000/12 = \text{SPAN}/420$$

✓✓
OK

$\Rightarrow$ CHECK STRENGTH $\Rightarrow$

$$1.2 \times ((0.5 + 0.4) \times 3m + 0.6) = 3.96 kN/m$$

$$1.5 \times (3.0 + 0.25) \times 3m = 14.63 kN/m$$

$$= 18.6 kN/m$$

$$\Rightarrow 18.6 \times 5^2 / 8 = 58 kNm$$

= BEAM FULLY RESTRAINED BY JOISTS.

$$\text{FOR } l_e = l = 99.9 kNm$$

$$l_e = 4m = 56.3 kNm \quad \therefore \text{OK}$$

END REACTIONS

$$ULF = 18.6 \times 5/2 = 46.5 kN$$

$$S8V = 13.1 \times 5/2 = (32.8 kN/100)^{1/2}$$

$$750D PAD = 58 kN$$

OK S8V

$$46.5 = 89 \times 884S \text{ POST } \phi_{Nc} = 278 kN$$

$$\phi_{Ab} = 15.5$$

$$\phi_e = 100 = 46.5 kNm$$

83 ULF ✓
OK

$$\Rightarrow 46.5/278 + \frac{46.5}{15.5} = 0.47 \checkmark \leq 1.0 \checkmark \text{ OK}$$

COMPUTED

Date

CHECKED

FOUNDATION - @ 240 WIDE - NED

300D x 750mm  FOOTING @ EACH

CORNER

9 June 2016

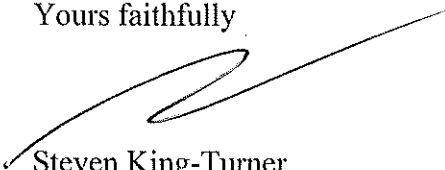
**RE: Lot 2 DP 324764, 184 HORTON ROAD, BEULAH ESTATE
SPECIFIC SITE INVESTIGATION**

The proposed building is to be located on the existing formed building platform as shown on Orange Residential Homes drawings "Geraint & Linda Philp, 184 Horton Rd, Beulah Estate, Tasman, Lot 2 DP 324764" job no 598 sheet 2.

Scala penetrometer testing has been carried out in the location of the proposed house to determine the suitability of the site for the proposed buildings, see attached. The scala testing indicates the cut meets the requirements of NZS3604 for good ground. The existing fill batter to the north east of the building site (scala test No 2) does not quite meet the definition of good ground but the underlying original ground does. Standard NZS3604 foundations are satisfactory, provide footing bear on original ground. Existing batter slopes are stable and grassed. These slopes are to remain planted to aid stability. Any new batter shall not exceed 1 vertical to 3 horizontal and the existing batter slopes shall not be altered without the approval of a chartered professional engineer.

Should you have any questions please feel free to contact me on 546 4565.

Yours faithfully



Steven King-Turner
MIPENZ CPEng IntPE(NZ)

{ref:184Horton RdLot2Site.docx}

SCALA PENETROMETER TEST

Depth	Blows	mm/Blow	Safe kPa	Ult kPa
0	0		141	422
100	5	20	141	412
160	10	12	211	619
240	15	16	168	492
290	20	10	242	716
340	25	10	242	716
380	30	8	284	856
420	35	8	284	856
460	40	8	284	856
500	45	8	284	856

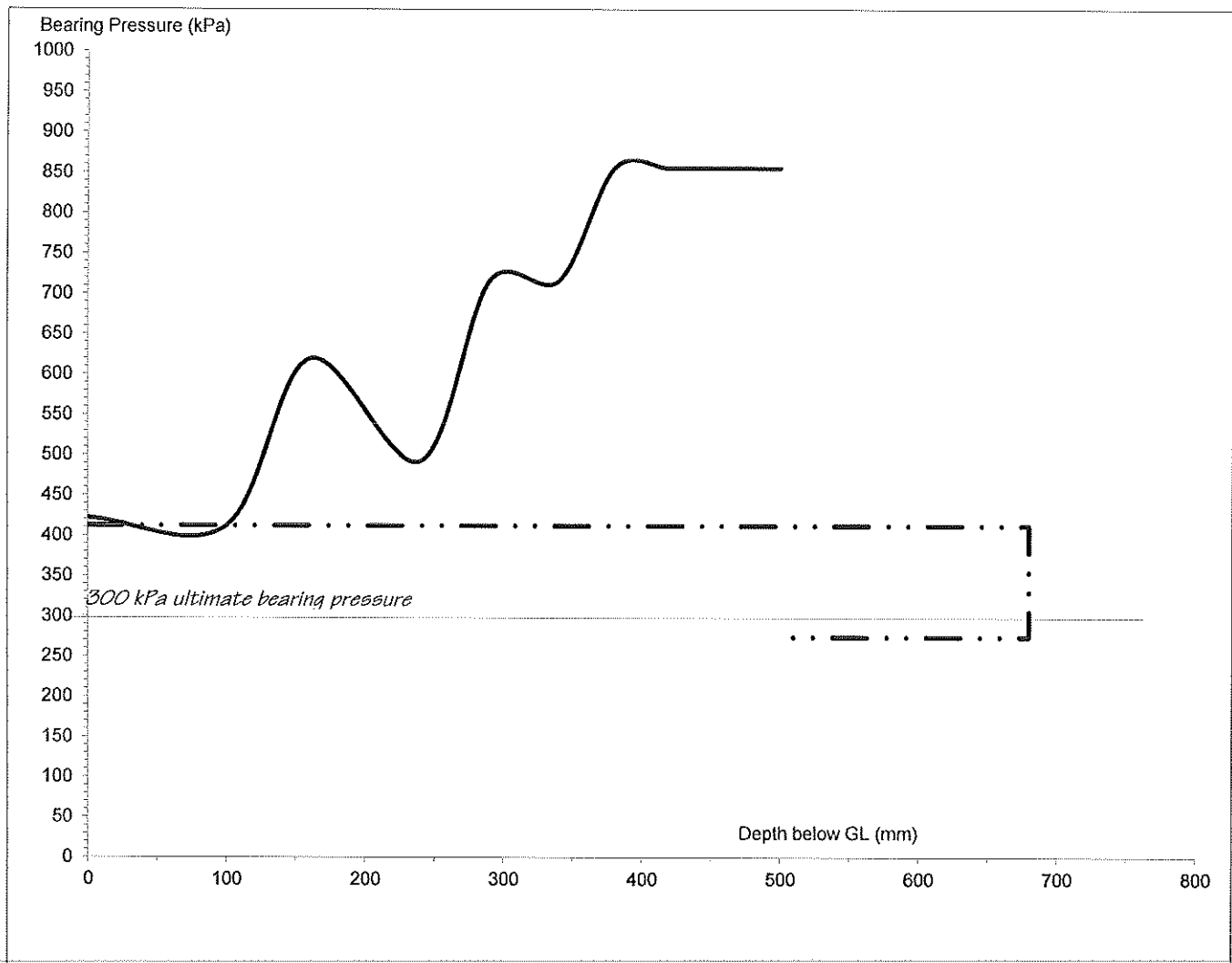
Job: G & L Philp

184 Horton Rd (Lot 2)

Beulah Estate

Test Date: 08-06-16

Test Num: No 1

Tasman District Council
BUILDING CONSENT AUTHORITY**RECEIVED**

Date 14/06/16

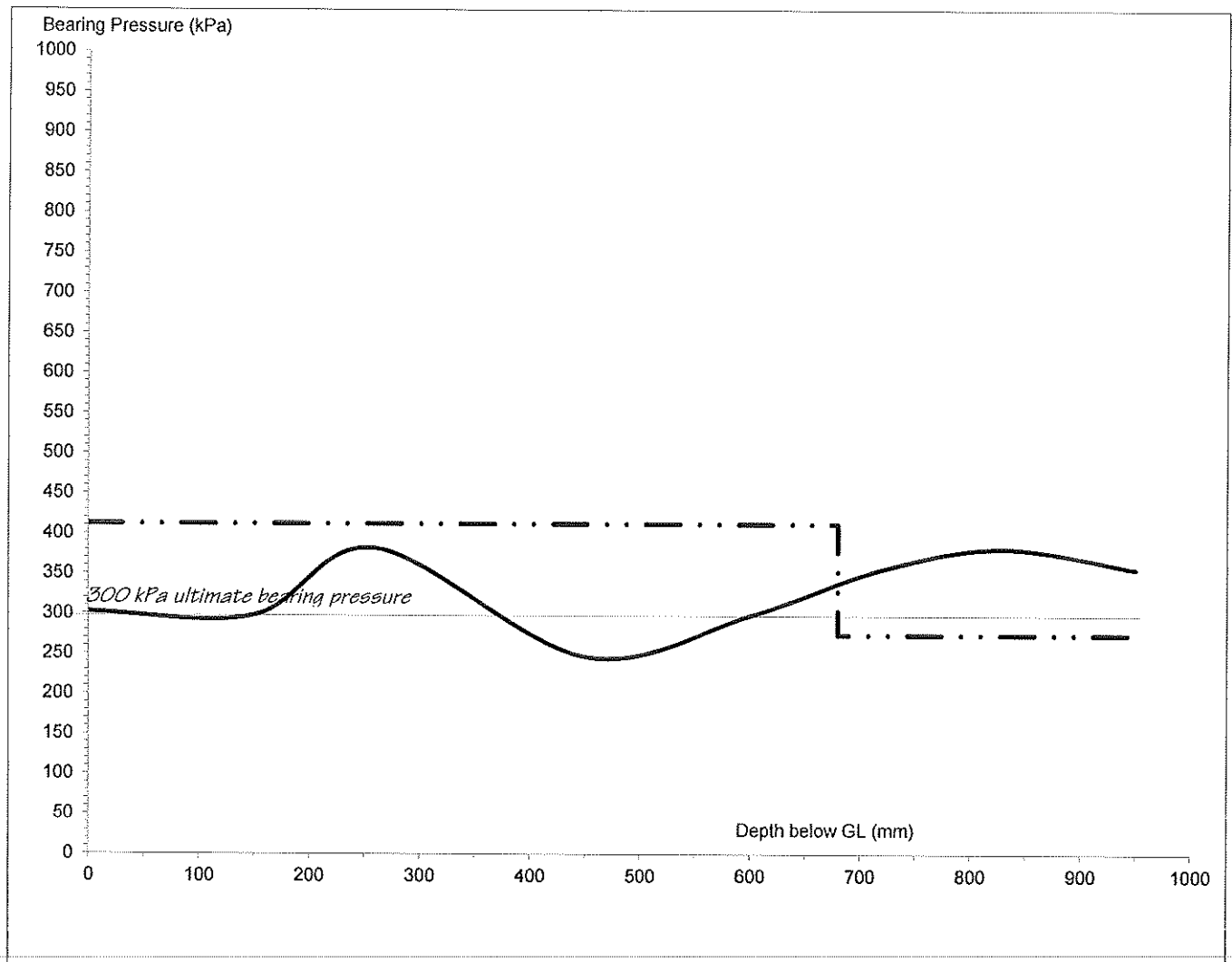
SCALA PENETROMETER TEST

Depth	Blows	mm/Blow	Safe kPa	Ult kPa
0	0		101	302
150	5	30	101	298
260	10	22	130	382
450	15	38	83	247
600	20	30	101	298
720	25	24	121	356
830	30	22	130	382
950	35	24	121	356

Job: **G & L Philp**
184 Horton Rd (Lot 2)
Beulah Estate

Test Date: **08-06-16**

Test Num: **No 2**



SCALA PENETROMETER TEST

Depth	Blows	mm/Blow	Safe kPa	Ult kPa
0	0		141	422
100	5	20	141	412
160	10	12	211	619
240	15	16	168	492
320	20	16	168	492
340	25	4	441	1488
370	30	6	346	1076
410	35	8	284	856

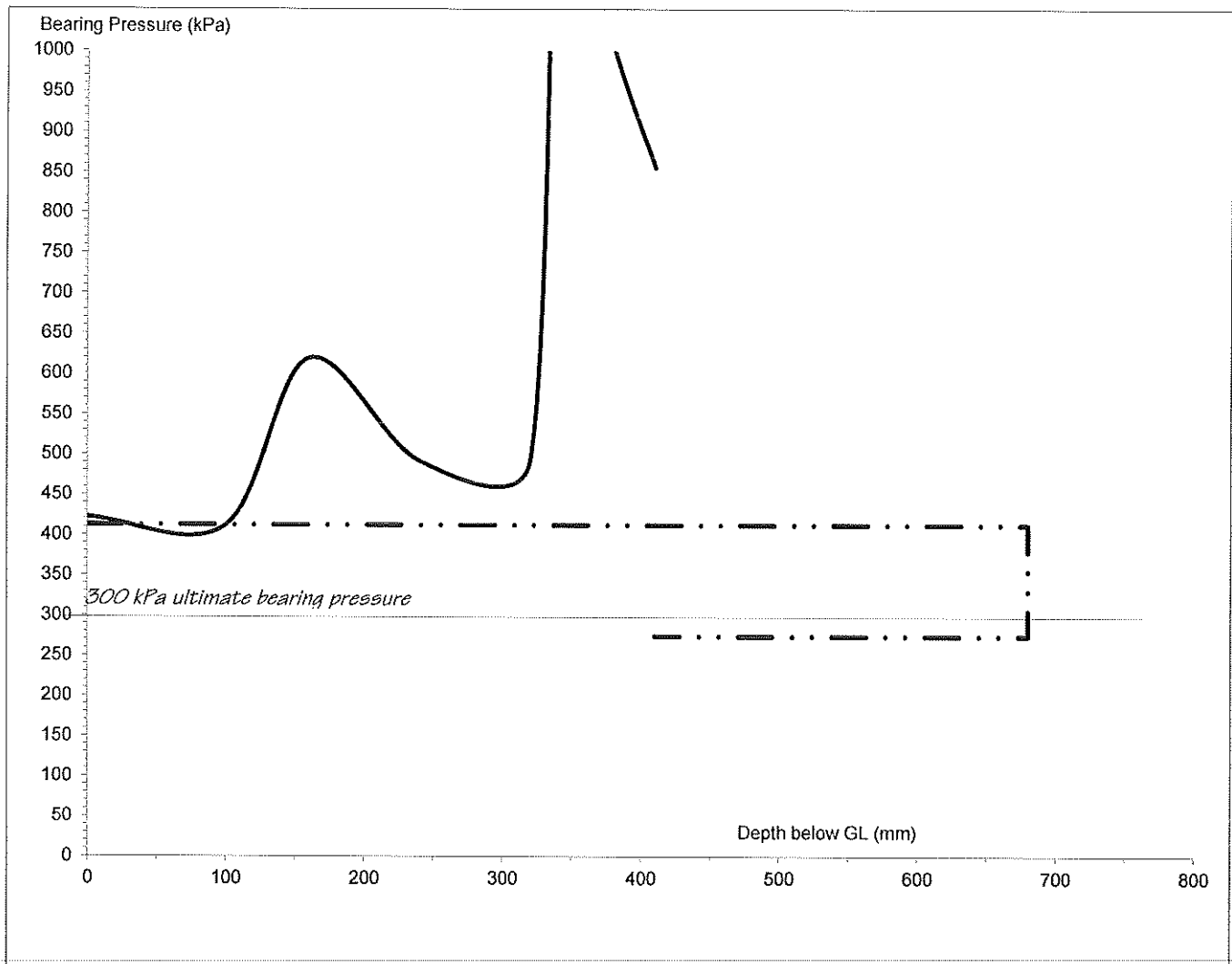
Job: G & L Philp

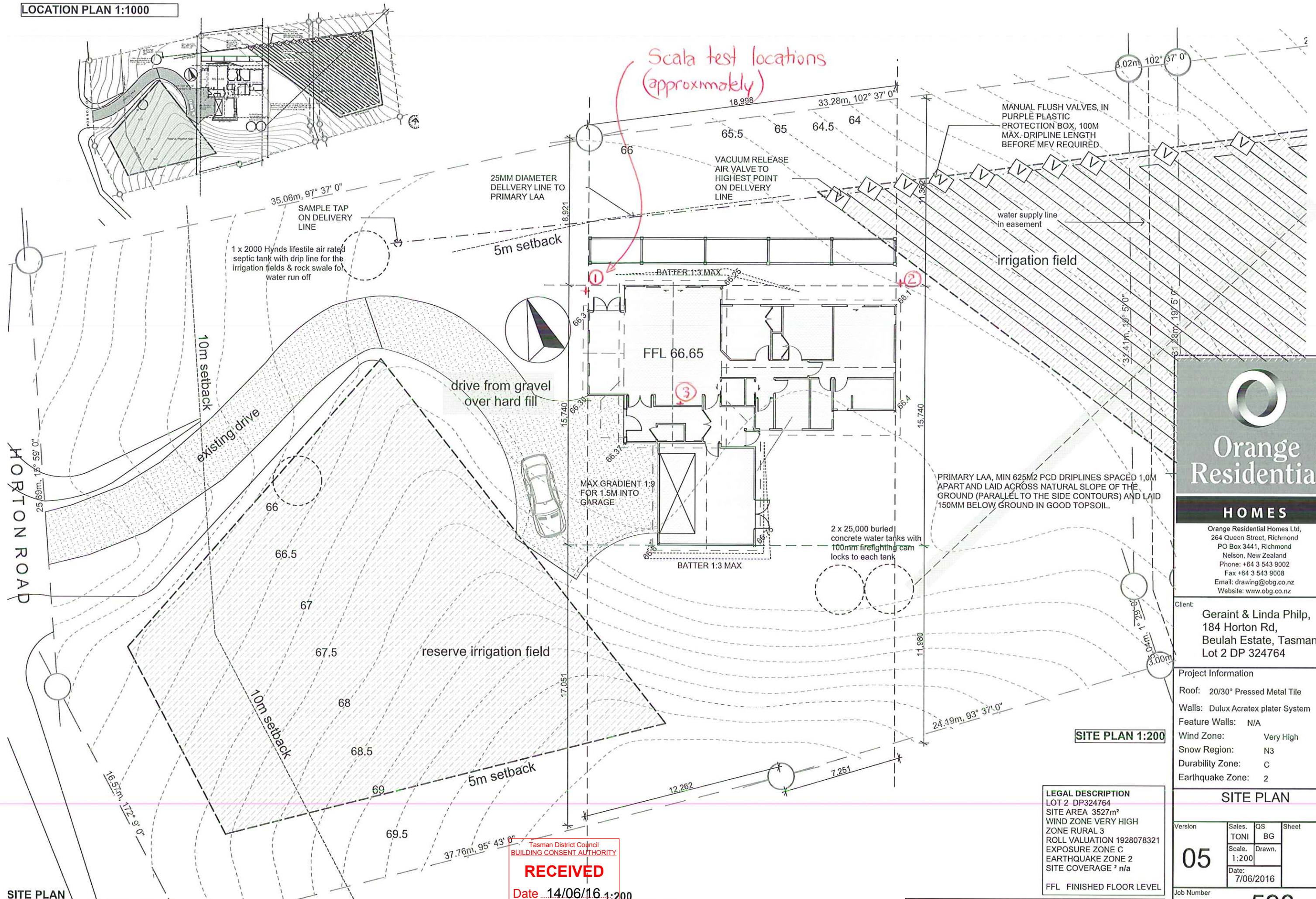
184 Horton Rd (Lot 2)

Beulah Estate

Test Date: 08-06-16

Test Num: No 3





SITE PLAN

Tasman District Council
BUILDING CONSENT AUTHORITY

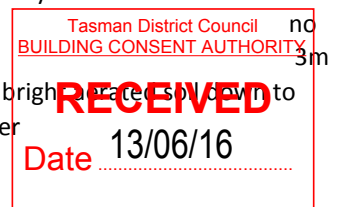
RECEIVED

Date 14/06/16 1:200

FOR FULL SET OUT DIMENSIONS SEE FOUNDATION PLAN

 Orange Residential									
HOMES									
Orange Residential Homes Ltd, 264 Queen Street, Richmond PO Box 3441, Richmond Nelson, New Zealand Phone: +64 3 543 9002 Fax +64 3 543 9008 Email: drawing@obg.co.nz Website: www.obg.co.nz									
Client: Geraint & Linda Philp, 184 Horton Rd, Beulah Estate, Tasman Lot 2 DP 324764									
Project Information Roof: 20/30° Pressed Metal Tile Walls: Dulux Acratex plater System Feature Walls: N/A Wind Zone: Very High Snow Region: N3 Durability Zone: C Earthquake Zone: 2									
SITE PLAN									
Version 05	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">Sales. TONI</td> <td style="text-align: center;">QS BG</td> </tr> <tr> <td style="text-align: center;">Scale. 1:200</td> <td style="text-align: center;">Drawn.</td> </tr> <tr> <td colspan="2" style="text-align: center;">Date: 7/06/2016</td> </tr> </table>	Sales. TONI	QS BG	Scale. 1:200	Drawn.	Date: 7/06/2016		Sheet 2	
Sales. TONI	QS BG								
Scale. 1:200	Drawn.								
Date: 7/06/2016									
Job Number 598									

1.0 PROJECT	PROJECT LOCATION LEGAL DESCRIPTION SIZE OF LAND (ha) SITE OWNER POSTAL ADDRESS CONTACT NUMBER EMAIL ADDRESS ARCHITECT/DESIGNER CONTACT NUMBER EMAIL ADDRESS PROJECT DESCRIPTION	184 Hortons Road, Tasman LOT 2 DP 324764 0.3527ha Geraint & Linda Philp Orange Residential 03-5439002 drawing@obg.co.nz Proposed 3 bedroom dwelling.
2.0 SYSTEM CAPACITY	Number of Habitable Rooms - RESIDENTIAL Number of Persons Flow Allowance per Person (l/person) TOTAL FLOW ALLOWANCE RESIDENTIAL (l/day) WATER SUPPLY TYPE RECOMMENDED WATER REDUCTION MEASURES SPECIFIED WATER RE-USE MEASURES	3 5 200 1000 50,000L Water Storage 6/3 flush WC; aerator taps or restrictors; water save whiteware; and water save shower heads. None specified
3.0 DESKTOP	RESOURCE MANAGEMENT (RMP Zone) NOTES FROM GEOTECH REPORT: ONSITE or ADJACENT BORE LEVELS (m) RAINFALL (NIWA) Rainfall intensity (mm) Rainfall annual - previous 12 months (mm) Evaporation annual (mm)	Rural - wastewater and aquifer protection area None reviewed None reviewed 90 1050 not recorded
4.0 SITE INSPECTION	DATE Site Aspect Pre-dominant wind direction LAND USE Previous Ground cover Existing Vegetation Proposed Landscaping SURFACE WATER Cut off drains or directional channelling required? Potential for flooding? Highest seasonal groundwater level? Groundwater level determined how?	22-Oct north north east pasture and orchard grass none on site owners discretion no - adjacent property has surface water control 3m excavation on site shows bright orange soil down to 3m indicating no ground water



Slope average (%)	20%
Slope shape -generally	linear divergent
SEPARATION DISTANCES	
Natural water resource (type & distance)	pond 370m to the south
Highest Seasonal Groundwater (m)	3m
Closest downstream boundary (m)	5m
Downstream Embankments / retaining walls (m)	5m
Distance from Buildings (m)	10m
Distance from Pasture animals (m)	200m
Other (m)	n/a
DESCRIPTION OF ADJACENT WWLA SYSTEM AND PERFORMANCE	Secondary treatment systems on adjacent properties appropriately sized for the occupancy. No obvious signs of issues.

**5.0
SOIL
TESTING**
*see soil logs for
detail*

TEST PIT ONE	
Type of Test Pit	hand dug
Depth of Test Pit (m)	0.9m
Depth of Topsoil (m)	0.2m
Recommended Depth of Land Application System	0.2m
Soil type	CL
Category	4
TEST PIT TWO	
Type of Test Pit	hand dug
Depth of Test Pit (m)	0.9m
Depth of Topsoil (m)	0.2m
Recommended Depth of Land Application System	0.2m
Soil type	LC
Category	5
TEST PIT THREE	
Type of Test Pit	hand dug
Depth of Test Pit (m)	0.9m
Depth of Topsoil (m)	0.2m
Recommended Depth of Land Application System	0.2m
Soil type	LC
Category	5

SOIL PROFILE PHOTO



SOIL PROFILE PHOTO



Tasman District Council
BUILDING CONSENT AUTHORITY

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Date 13/06/16

6.0 Design Calculations	Capacity Number of Persons Flow Allowance/Person Daily Flow Allowance Land Application Area Daily Flow Allowance Design Loading Rate Total Land Application Area	5 200L/day 1000L/day 1000L/day 1.6mm/day 625m
7.0 LAND APPLICATION SYSTEM	SYSTEM TYPE LOADED BY NUMBER OF DOSES SIZE OF DOSE (litres) LAS PRODUCT Depth of effluent lines (mm) No. and length effluent lines (m) Distance between effluent lines (m) Diameter of effluent lines (mm) Distance between emitters (m) Emitter Flow Rates (l/hr) Flush Valves Rqd (Y/N) Air Release Valve Rqd (Y/N) Total Lot Area (ha) Land Application Area calculated at (sqm) Reserve Area (sqm) Separation to groundwater (m) Separation to FGL (m) Land Application Area to be planted (Y/N)	Pressure compensated irrigation Pump up to 5/day 200L 150mm 6 x 100m and 1 x 50m 1.0m 17mm 0.6m 1.6l/hr y y 0.3527ha 625m ² 625m ² 2.8m 0.2m owner's discretion
8.0 WASTE WATER SYSTEM	WASTE WATER SYSTEM TREATMENT LEVEL SYSTEM DESCRIPTION TOTAL WORKING VOLUME (l) MAXIMUM DAILY FLOW RATE (l/day) DESIGN DAILY FLOW RATE (L/DAY) EFFLUENT QUALITY EXPECTED BOD5 mg/L TSS mg/L PO4 mg/L TN mg/L CFU /100ml Other	Secondary Hynds Advanced Treatment wastewater system. 7500 2000L/DAY 1000 ≤ 15 ≤ 15 ≤ 8 ≤ 42 ≤ 1000 n/a

9.0 AEE	A description of the sensitivity of the receiving environment, in particular the potential for the proposed system to have any impact on ground and surface water and/or coastal water quality. Your AEE must identify the location of any downstream bores and any potential adverse effects An established subdivision with developed properties already constructed. A man made pond 370m to the south is the only significant water resource near this property. The soil appears well aerated therefore water flow is good. The property has had grazing and orchard operating in the past therefore agricultural levels of nutrients established in the soil, the proposed waste water system will have almost no accumulated effects on the soil due to effluent quality. Details (where appropriate) of any seasonal fluctuations in flows and how this may affect the seasonal or long term performance or capacity of the system This residential dwelling will have normal seasonal fluctuations. Details of any proposed mitigation/contingency measures to be undertaken to help prevent or reduce the actual or potential effect The system comes with local and optional remote alarm options to keep check on operation. The system has built in 48 hour storage for any mechanical failure. No potential or actual effects were considered as requiring any other contingency. Any possible alternative methods of discharge, including discharge into any other receiving environment No alternatives were considered. Where the scale or significance of the activities effect are such that monitoring is required a description of how, once the proposal is approved effects will be monitored and by whom Only manufacturers operation and maintenance monitoring deemed necessary for this system.
10.0 INSTALLATION SUMMARY	Install Hynds Advanced Treatment wastewater system discharging to 625m of 17mm pressure compensated dripline.
11.0 OPERATION SUMMARY	As per Hynds system operation manual.
12.0 MAINTENANCE SUMMARY	As per Hynds maintenance schedule. Note a generic operation and maintenance booklet has been provided for general system care for improved operation.
13.0 REFERENCES	AS/NZS 1546.1:2008 Onsite Domestic Wastewater Treatment Units Part 1: Septic Tanks AS/NZS 1546.3:2008 Onsite Domestic Wastewater Treatment Units Part 3: Aerated Wastewater Treatment Systems AS/NZS 1547:2012 Onsite Domestic Wastewater Management Onsite Wastewater Systems: Design and Management Manual Third Edition ARC Technical Publication TP58 USEPA Onsite Wastewater Treatment Systems Manual 2002 New Zealand Building Code

Tasman District Council
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Date 13/06/16

14.0
PHOTOGRAPHS



TOP PHOTO: North area identified for irrigation area.

BOTTOM PHOTO: South area identified for irrigation area.

Gary Stevens Consultant

ATTACHMENTS:

SOIL LOGS
PRODUCER STATEMENT DESIGN
LOCATION PLAN
GSC CROSS SECTION
O & P Manual

Tasman District Council
BUILDING CONSENT AUTHORITY

RECEIVED

Date 13/06/16

PRODUCER STATEMENT DESIGN

22 October 2015

Producer Statement - Design number GLP-01 has been issued by **Gary Stevens** to Orange Residential to be supplied to Tasman District Council in respect of the following project:

Project Description	On-site Wastewater & Land Application System
Street Address	184 Hortons Road, Tasman
Legal Description	Lot 2 DP 324764

Gary Stevens has been engaged by Orange Residential to provide design services in respect of the requirements of AS/NZS 1547:2012 for work only as specified.

The design has also been prepared in accordance with Verification Method and Acceptable Solutions of the New Zealand Building Code.

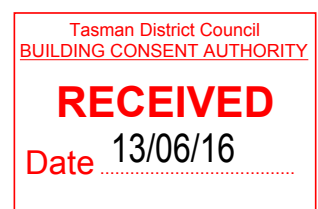
The work is described on Gary Stevens Report on Wastewater & Land Application System and drawings and the specification and other documents according to which the building is proposed to be constructed.

As an independent design professional covered **I believe on reasonable grounds** that subject to:

- (i) The site verification of the following design assumptions [refer inspection schedule where required], and
- (ii) All proprietary products meeting the performance specification requirements, the drawings, specifications, and other documents according to which the building is proposed to be constructed comply with the relevant provisions of the building code.



Gary Stevens Consultant



Inspection Schedule

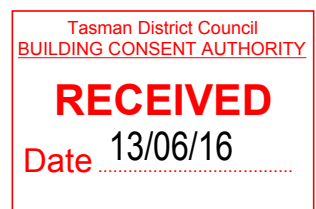
This inspection schedule must accompany Producer Statement of Design number GLP-01 issued by **Gary Stevens**.

The following inspections are required to verify the proposed work has been completed as described on **Gary Stevens** Report on Wastewater & Land Application System and drawings and the specification and other documents according to which the building is proposed to be constructed.

1. *Inspect Installation of Hynds Advanced Wastewater Treatment System.*
 2. *Inspect installation of pressure compensated drip-line irrigation system.*
 3. *Check operation & Maintenance schedule is appropriate for this system.*
-

NOTES

- a) The treatment recommended for this site is secondary treatment. The Hynds Environmental Domestic Aerated Wastewater Treatment System has been selected to best compliment the pressure compensated drip line irrigation land application system selected.
- b) The effluent quality expected from this system is: BOD5 <15mg/L; TSS <15mg/L; PO4 <8mg/L; Total N <42mg/L; FC <100 cfu per 100mls.
- c) The treatment process occurs through a series of treatment chambers before disposal via a self-compensating drip irrigation field. The system has the ability to process and treat 1,600 litres per day within a 24-hour period (although larger flows are possible). The treatment process occurs as follows:
 - ✓ anaerobic breakdown of the wastewater effluent within a 3000 litre pre-treatment chamber, complete with outlet Zabel bio filter;
 - ✓ two stage aerobic digestion;
 - ✓ effluent clarification;
 - ✓ recycling of activated sludge;
 - ✓ irrigation pump chamber;
 - ✓ fine filtering of suspended solids through a disc/mesh filter;



- ✓ final disposal of the treated effluent through pressurised and compensated drip irrigation network system.

Pre-treatment Chamber

- d) (Anaerobic) 3000L - The pre-treatment or anaerobic chamber is situated at the beginning of the treatment process. The chamber is designed to retain the wastewater so the larger settling solids are retained and form sludge at the bottom of the chamber.
- e) Solids that float combine to form a thick scum on the top of the effluent. Anaerobic organisms break down the sludge resulting in the formation of Hydrogen Sulphide gas. In a well functioning system, this gas should be contained effectively by the solid scum. Further removal of the solids takes place in a biological filter situated at the outlet of the pre-treatment chamber.

TREATMENT STAGES OF A HYNDS LIFESTYLE WASTEWATER SYSTEM



- | | |
|-------------------------------------|----------------------------------|
| 1. Wastewater enters from dwelling. | 2. Primary treatment tank. |
| 3. Biological filter. | 4. First stage aeration chamber. |
| 5. Second stage aeration chamber. | 6. Laminar plate clarification. |
| 7. Pump out / irrigation. | |

Biological Disc Filter

f) A biological filter is installed at the outlet of the pre-treatment tank as a standard feature in the Lifestyle Advanced system. The Hynds filter performs three main functions in the pre-treatment tank as follows:

- ✓ reduces surge action and offers flow control;
- ✓ retains the solids in the tank;
- ✓ lowers the BOD5

Submerged Aerated Filtration Chambers

- g) (Aerobic Digestion) 1530L – (Stage 1) The submerged aerated filtration chamber is a two-stage process. The wastewater is initially infused with oxygen by an electric blower (stored above ground) and a fine bubble diffuser system at the base of the tank.
- h) Biomass filter media is situated above the diffusers and aerobic bacteria rapidly multiply on the surface of these biomass filters to create a large biological filter. The effluent is cleansed as it passes through the filter. The bacteria will eventually die and fall off the biomass. This is called slough and is passed into the next chamber.

Submerged Aerated Filtration

- i) Chambers (Aerobic Digestion) 1530L – (Stage 2) The submerged aerated filtration process is repeated in a second chamber, which improves the quality of effluent produced. This effluent then passes into the laminar plate separator.

Laminar Plate Separator and Sludge Return System

- j) Final clarification of the effluent occurs in a laminar plate separator, which is located at the end of the stage 2 aeration chamber. The effluent enters the separator chamber near the base of the tank before passing up through a series of diagonal honeycombed plates to the outlet pipe.
- k) The laminar plates remove any fine suspended particles remaining in the effluent and this material drops to a hopper at the base of the separator tank. The velocity of the flow up through the plates is controlled by specifically sized outlet holes, which ensures a high level of suspended solid removal.
- l) A venturi system, driven by the electric blower used for aeration, constantly takes effluent from the bottom of the hopper back to the inlet of the pre-treatment chamber. The slough produced in the aeration stages is also passed back to the pre-treatment tank at this stage. This high energy activated sludge helps break down the anaerobic sludge in the pre-treatment chamber, thereby reducing the frequency that this chamber will require to be pumped out.

Irrigation Pump Chamber

- m) 1000L The irrigation chamber offers a storage buffer to cope with the daily and surge loads placed on the system. The chamber houses a submersible pump which feeds the disposal field, operated by a float switch.
- n) The standard Lifestyle wastewater system has been designed to allow a specified 'balance' between the irrigation chamber volume and the pump to handle the design input. Increased pump sizing is required for irrigation fields positioned higher than 2 metres above the top of the dome lid

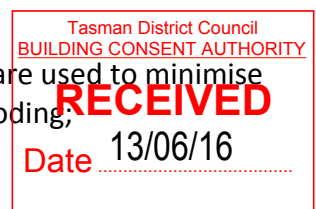
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The Disposal Field

- o) The Lifestyle wastewater system utilises a pressure compensated drip line emitter system to irrigate the disposal field.
- p) The disposal field should be designed to maximise the evapo-transpiration potential which is a combination of plant transpiration and surface evaporation. Minimal soakage and percolation rates can be accommodated.
- q) The disposal field allows a residual amount of stimulated aerobic bacteria to be transported into the anaerobic disposal fields, hence lengthening the bed's life further by producing an enhanced zone of bacterial activity.
- r) This system incorporates an irrigation filter (described below) as well as combinations of flushing valves, air release valves, and check valves to ensure that the disposal beds perform at an optimum level.
- s) The system owner may use this disposal method to irrigate new or existing shrubs or grasses although this is dependent on their water needs together with the systems daily output volume.
- t) The application rate of the treated effluent for each site must be determined by performing a site investigation and referencing TP58 or the New Zealand/Australian Standard for relevant design values.
- u) The disposal field area (in m^2) may then be determined by dividing the daily flow by the application rate. The length of the drip-line and the layout of the disposal field are configured by following the basic principals detailed below:
 - ✓ appropriate choice of drip-line diameter and emitter output rates;
 - ✓ appropriate choice of emitter spacing and drip-line trench spacing;
 - ✓ determine drip-line length;
 - ✓ design layout of irrigation field including (feeder pipe) manifold;
 - ✓ placement of field either in - bush block with natural vegetation cover - or in bark/mulch garden - or trenching in shallow trench (of typical trench cross-section 50 - 100mm depth and width);
 - ✓ optional bedding material of topsoil or scoria where conditions require;
 - ✓ placing drip-lines laterally across contours to ensure treated effluent does not run down the lines laid on a slope;
 - ✓ ensure that system is continually pressurised above 5m head to allow the emitters to work output correctly;
 - ✓ use of air valves at the top of the system;
 - ✓ use of flushing valves at the bottom of the system;
 - ✓ use of check valves when vertical falls greater than 4m occur. These valves are used to minimise working systems from emptying in small zones which may result in local flooding;



- ✓ disposal fields with total irrigation line length greater than 350m may need a higher pressure irrigation pump.

Irrigation Filter

- v) An irrigation filter is included when using pressure compensated drip line emitters within the disposal field. This filter is a disk-mesh configuration which retains any non-digestable particles still remaining in suspension after treatment.
- w) The filter acts to lengthen the life of the disposal field by significantly reducing any potential blockages within the disposal field emitters.
- x) A range of disk-mesh filters are available for varying design flows.

Monitoring Systems

- y) The Lifestyle wastewater system is monitored by an electronic control system. A small remote alarm plate is located inside the dwelling and contains an audible and visible alarm, activating whenever a fault or high water level occurs. The audible alarm may be deactivated at the alarm plate and must be reactivated once the fault has been corrected or the high water status light has switched off.

System Requirements

- ✓ The following requirements must be observed to ensure problem-free operation:
- ✓ *Do not switch off the system once commissioned;*
- ✓ *Check detergents to see if they are biodegradable or suitable for use in a septic tank*
- ✓ *Do not allow non-biodegradable chemicals to enter the system*
- ✓ *Try to spread wash loads over the week*
- ✓ *Fix all leaking faucets*
- ✓ *Ensure that rain or surface water cannot enter the sewer drainage system. eg. via low gully traps at the house*
- ✓ *Never make adjustments to the system or controller*

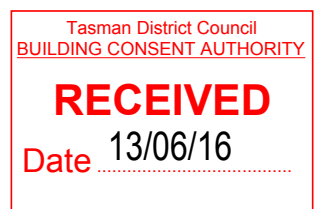
Operation and Maintenance

The Treatment unit shall be installed by a Hynds approved installer, and as per the installation instructions. Hynds Environmental system comes with a Maintenance Servicing Contract which ensures that the system continues to function efficiently. Servicing is performed by trained Technical Representatives.

Servicing includes: all filters cleaned; irrigation lines flushed; electrical equipment tested; testing of alarm system; and system performance reviewed.

All services are recorded on Service Report Sheets which are supplied to the system owner and kept by Hynds Environmental for future system reference. An additional copy is sent to the Local Regional Authority officer if required.

The treatment unit shall be commissioned by a Hynds approved installer prior to use by the owner. A copy of the commissioning report shall be forwarded to Gary Stevens for the purpose of operation & maintenance review and for construction review. Producer statement of construction review will be forwarded to the Territorial Authority once Gary Stevens can approve the installation.



FOR FULL SET OUT DIMENSIONS SEE FOUNDATION PLAN

TASMAN DISTRICT COUNCIL - APPROVED

23/06/2016

1	SITE PLAN
2	FOUNDATION PLAN
3	DRAINAGE PLAN
4	FLOOR PLAN
5	FIRST FLOOR PLAN
6	FOUNDATION PLAN UPPER...
7	ELEVATIONS
8	ELEVATIONS
09	SECTION
10	SECTIONS
11	BRACING PLAN LOWER...
12	BRACING PLAN UPPER...
13	FOUNDATION DETAILS
14	CLADDING DETAILS
15	CLADDING DETAILS
16	hyBEAM DETAILS
17	DECKDETAILS
18	ROOFDETAILS
19	ROOFDETAILS
20	ELECTRICAL PLAN
21	ROOF FRAMING PLAN
22	LINTEL FIXINGS
23	SPECIFICATION

Show 625m of irrigation in yellow shaded areas on site location plan.
Show lines along contours at 1m spacing and return.
Irrigation must be 5m from boundary.
Every 100m of irrigation show a flush valve.
At the highest point of the irrigation show an air release valve.
Show 625m² reserve area.

MAX GRADIENT 1:9
FOR 1.5M INTO
GARAGE

NEW GRAVEL OVER
NEW HARDFILL

76.92 m² NEW GRAVEL OVER
EXISTING HARDFILL

1 x 2000 Hynds lifestyle air rated
septic tank with drip line for the
irrigation fields & rock swale for
water run off

HORTON ROAD

SITE PLAN

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SITE LOCATION PLAN

1:1000

1:200

598

 Orange Residential			
HOMES			
Orange Residential Homes Ltd, 264 Queen Street, Richmond PO Box 3441, Richmond Nelson, New Zealand Phone: +64 3 543 9002 Fax +64 3 543 9008 Email: drawing@obg.co.nz Website: www.obg.co.nz			
Client: Geraint & Linda Philp, 184 Horton Rd, Beulah Estate, Tasman Lot 2 DP 324764			
Project Information Roof: 25° Corrugated Profiled Metal Walls: 50mm Equus System Feature Walls: N/A Wind Zone: Very High Snow Region: N3 Durability Zone: C Earthquake Zone: 2			
SITE PLAN			
Version 05	Sales: RU Scale: 1:200 Date: 19/10/15	QS: BG Drawn:	Sheet 1
Job Number 598			

Carex virgata

Endemic species that forms dense, light green tussocks up to 1m tall. Thrives in a variety of habitats including swamps, drain margins, seepages and wet pastures. Useful in the creation of bird habitat.

***Cortaderia fulvida* (toetoe)**

Branching from the base and forming a clump to 4m high. Long strap-shaped leaves with red-orange coloured veins, flower heads cream yellow. New shoots exhibit pale waxy cover on lower parts (unlike pampas grass). Prefers good drainage and semi-shade. Will struggle to compete if dried out in summer.

***Cyperus ustulatus* (toetoe upoko-tangata, giant umbrella sedge)**

Vigorous leafy sedge growing to 1m in open damp places. Tolerates immersion in standing water within a range of habitats from seepages to wetlands.

***Dicksonia squarrosa* (wheki, tree fern)**

Tree fern up to 7m tall that exhibits tolerance of wet open ground, and floods. Found to shelter and accumulate with other native plants. The base of the fern attracts biodiversity. Useful application to streambank and seepage habitats.

***Elatostema rugosum* (parataniwha)**

Herbaceous plant up to 0.5m tall that spreads by rhizomes. Bronze coloured foliage with serrated edge. Grows on moist sites in light to heavy shade. Intolerant of dry habitats.

Hypolepis dicksonioides

Large fern that prefers fertile moist, but well-drained ground, grows vigorously and spores into planted areas with abundance. Does however, die back during winter.

***Phormium tenax* (harakeke, flax)**

Fast growing clump-forming flax with large stiff leaves, to 3m. Full exposure and sun. Moist to wet conditions. Does not have deep or wide roots. Easily propagated from split fans or grown from seed. Attracts birds, especially Tui.

Trees and shrubs

Consideration needs to be given to the effects of roots land application on wastewater distribution pipe networks. This problem can be more significant for large tree species.

***Carpodetus serratus* (putaputaweta, marbleleaf)**

Lowland forest tree up to 7m tall. Large bunches of cream coloured flowers appear in spring followed by black berries.

Coprosma areolata

Species that grows to 4m tall. Low tolerance to drought, with medium to high fertility.

***Coprosma robusta* (karamu, shining karamu)**

Shrubs or small trees growing to 3m+, with glossy green leaves. Masses of orange-red fruit in autumn are attractive to birds. Hardy plant.

***Coprosma tenuicaulis* (swamp coprosma)**

Endemic species that grows to 3m tall. Leaves pale green with slender branches. Will tolerate a range of swampy to boggy habitats including standing water.

***Cordyline australis* (ti kouka, cabbage tree)**

Palm-like in appearance with large heads of linear leaves and panicles of scented flowers. Sun to semi-shade. Prefers damp to moist soil. Grows eventually to 12m+ height.

***Dacrycarpus dacrydioides* (kahikatea, white pine)**

Tree that grows to 40m. Moderately growing species, which prefers wetland and boggy environments. Application of this species must consider the possible impact of its root systems on the wastewater disposal field.

Plough irrigation lines to **150mm in depth** within identified irrigation area. Install flush valves at every 100m line and air release valve at highest point.

Plant irrigation field with appropriate trees and shrubs to improve effluent disposal

1000mm minimum separation between irrigation lines & 600mm between dripper heads.
Secured every metre on slope ground.

DWG No. GSC-09 Irrigation Lines on Slope May 16 Copyright gary.gsconsulting@gmail.com 0211081391

Note: Check Paragraph 7.0 of Gary Stevens Site/Soil Evaluation for size and dimension of Land Application system.
All changes to the Waste Water & Land Application System to be approved prior to installation by Gary Stevens.

Gary Stevens Consultant

**ONSITE WASTE WATER & LAND APPLICATION
OPERATION & MAINTENANCE BOOKLET****GSC**

Gary Stevens - *Consultant*
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RICHMOND 7020
Mobile 021-1081391
gary.gsconsulting@gmail.com

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REFERENCES

NEW ZEALAND BUILDING CODE
AS/NZS 1547:2012
AUCKLAND REGIONAL COUNCIL – TP 58
USEPA 2002 – ON-SITE WASTE WATER DESIGN

INTRODUCTION

This booklet has been prepared to provide the home owner basic knowledge and understanding of their on-site waste water and land application system.

It is important we have a reference when operating or maintaining our system, in order to identify possible causes for change in the normal operation of our system, therefore identifying possible remedies or operational changes that may allow our system to operate at its best.

Although secondary or tertiary treatment may be part of your system (covered under specific maintenance contract), all systems incorporate a primary treatment system. This booklet concentrates on the primary process and the care, required to allow the system to operate effectively.

This booklet is by no means an exhaustive reference document. However it will explain the general operation and maintenance requirements of your type of system.

It is important that when any problem with your system, cannot be easily identified the Installer or Designer or Territorial Authority representative be notified as soon as possible to allow them to view the problem under current operating conditions.

DATE OF INSTALLATION	
WASTE WATER SYSTEM TYPE	
LAND APPLICATION SYSTEM TYPE	
OWNER AT INSTALLATION	
INSTALLER OF SYSTEM	
MAINTENANCE CONTRACTOR	
DESIGNER OF SYSTEM	Gary Stevens
TERRITORIAL AUTHORITY	
BUILDING CONSENT NUMBER	
RESOURCE CONSENT NUMBER	

Table 1 – Fill In Your System Information

PRIMARY TREATED WASTE WATER SYSTEM

The septic tank used is a small anaerobic oxidation plant, which removes suspended solids from the wastewater and breaks them down anaerobically. The resultant effluent is low in settled solids but high in biological oxygen demand (BOD) and requires biological treatment before release to the environment.

Other solids settle to the bottom of the tank, whilst most fats, oils and greases float, and the middle zone of wastewater within the tank overflows to the disposal beds. No enzymes are to be added to the system but natural bacteria are permitted. These bacteria can be added to the system, reducing the amount of sludge and therefore increasing the time between the pumping out of the tank, and reducing the smell of the tank.

Operation & Maintenance

For longevity of the on-site sewage management system the following maintenance regime should be employed by the owner/occupier of the dwelling. Bleach, bleach-based products, whiteners, nappy soakers and spot removers shall not be disposed into the on-site system. They shall be disposed of by other means.

- a) The effluent filter is to be checked three monthly initially and cleaned as required by the manufacturer and the contents of the septic tank pumped out on average every three (3) to five (5) years. Generally speaking households of meat eaters would need to pump out their septic every 3 to 5 years and vegetarians every 4 to 6 years.
- b) Ensure that the septic tank is mosquito and fly proof. Hygiene products, condoms, tampons, sanitary napkins, disposable nappies and cotton buds and the like shall not be disposed of via the on-site disposal system. They should be disposed of into garbage bins in sealed plastic bags.
- c) Only the recommended amounts of disinfectants should be used. Biodegradable products for septic systems are recommended.
- d) The septic tank should be serviced annually including the assessment of sludge and scum levels, and checked for blockages of the outlet and inlet square junctions on a regular basis, at least annually.
- e) No vehicular, stock or pedestrian access should be made across the disposal field
- f) Vegetation from the land application area needs to be harvested to promote young growth and the area may need to be replanted with new plants every five years, depending on plant condition. This work should be undertaken during dry season
- g) Effluent from disposal system should not be discharged to the storm water system or over the ground. The effluent distribution pipes and aggregate are to be inspected for blockage etc. and flushed clean or replaced as required.

MAINTENANCE AND ENHANCEMENT OF EXISTING ON-SITE SEPTIC SYSTEMS:

All Septic Tank owners are strongly encouraged to:

PUMP-OUT SEPTIC TANK

Check the respective depths of sludge, liquid wastewater and scum in the septic tank at least once per year.

Pump out the tank once the combined depth of sludge and scum occupies 50% of the tank depth. For a standard household, this should be in the order of once every 3 to 5 years. (This may be required more frequently where houses are fully occupied and/or there is no outlet filter and for tanks serving public toilets, and less frequently, up to once every 5 years or longer, where occupancy is low or intermittent, and/or where an effective outlet filter has been maintained).

INSTALL AND MAINTAIN AN OULET FILTER

These are required to be installed on all new septic tank systems and are STRONGLY recommended to be retrofitted to old septic tanks. They are often the most effective and cheapest option for improving the performance and life of a wastewater system. They ensure all solids of 3mm diameter or greater are retained and biodegraded within the septic tank, and do not access or clog the soakage lines. (Supplier details can be obtained from your local council).

Check the bio-mat build up on the filter regularly, at least once per month, and clean it as required, to avoid excessive build up affecting filter performance.

To clean the filter, remove it from the septic tank and hose down, discharging the rinse water back into the septic tank, or elsewhere into dense vegetation where it will not cause any nuisance, and reinstate the filter into the septic tank.

AVOID USE OF TOXIC SUBSTANCES

- a) Non-biodegradable chemicals, e.g. don't use drain cleansers or disinfectants.
- b) Sanitary napkins, other hygienic products, dental floss, kitty litter, etc.
- c) Oil and fat flushed into the system.
- d) Detergents (toxic detergents and other household cleaners should be avoided as they kill the bacteria in the septic tank)
- e) Do not use or minimise the use of garbage disposal units.
- f) Compost food scraps or put them in the rubbish.

MINIMISE WATER USAGE / IMPROVE WATER CONSERVATION

Particularly important on sites where area available for wastewater disposal and the system's capacity constrained, where any seepage or run off could access natural water and affecting water quality or where disposal areas may be accessed by children.

- a) Install water reduction fixtures on water outlets and/or low flush toilets. (This is particularly important on small sites and/or where there is high occupancy in the dwelling where the disposal system capacity is threatened).
- b) Do not leave taps running for long periods.
- c) Install push button taps on public facilities.
- d) Fix water leaks.

- e) Do not connect rain gutters or storm water drains to septic tanks.

ENHANCE EVAPOTRANSPIRATION AND DISCOURAGE ACCESS TO DISPOSAL AREAS

- a) Densely plant the disposal area, maintain plantings and check regularly for even wastewater distribution and even plant growth.
- b) Where the disposal area is grassed, it should be regularly mowed to optimize growth and prevent the grass from becoming rank.
- c) Do not pave the disposal area.
- d) Use planting, low chain, signage and/or a small fence to discourage access in public areas.
- e) Use signs, low fences and plantings to prevent any vehicle or stock access.
- f) Records should be kept of all maintenance undertaken on the wastewater systems, particularly when contractors are involved. This includes tank pump outs, tank inspections, and access openings. **Do not** add or alter any part of your system without Council approval.

KEY DOS & DON'TS FOR THE HOUSEHOLDER

All wastewater (toilets, shower, sinks, laundry) produced on the site is discharged to an on-site wastewater treatment and land disposal system. The wastewater treatment system is a fragile biological process and therefore requires care by all residents.

Below is a list of hints for caring for your wastewater system.

DO

- Minimise your water use.
- Minimise the length of showers.
- Use showers in preference to baths.
- Use bio-degradable soaps and cleaners.
- Check all your cleaning products to see if they are suitable for septic tanks.
- Minimise use of strong toilet cleaners.
- Scrape all plates and dishes to remove as much fat and grease as possible. Clean with paper towels and place in the rubbish.
- Report/fix all leaking taps as soon as possible.
- Use phosphate free/low phosphorus based laundry detergents.

DO NOT

- Don't pour any toxic/strong chemicals (paint, oil, grease, paint thinners, pesticides down any drains).
- Don't flush any products down the toilet, other than standard toilet paper.
- Don't discard any drugs down the sink or toilet.
- Don't use strong cleaners.
- Don't tip chlorine cleaners or disinfectant based products into the system.
- Don't use huge amounts of cleaners.
- Don't use chemical drain cleaning products.
- Don't do all your laundry on one day.
- Don't install in-sink garbage grinders. If a grinder exists, don't discharge high volumes of scraps, especially carbohydrates or fats/oils down it.
- Don't put coffee grounds down the sink.

GENERAL PROBLEM SOLVING GUIDE

The following is a list of suggested actions in the event of actual problems with your system:

Problem	Solution
Odour	a) Insert activated carbon filters into the septic tank vents. b) In the case of an aerobic treatment plant, contact supplier and ensure system is sufficiently aerated.
Septic tank bacterial breakdown	c) Use soft soap solutions or biodegradable cleaners for cleaning. d) Use only detergents low in alkaline salts, phosphorous, and chlorine levels. e) Avoid heavy use of detergents and the use of disinfectants and other household cleaners as they affect the bacterial action within septic tanks. f) Do not discharge any pharmaceutical medication or disinfectants into the wastewater system. g) Minimise discharge of food waste and fats and oils into kitchen sink/garbage grinders.
Septic tank overflow/odours	h) Engage drain layer/contractor to investigate any blockages immediately. i) Pump out the septic tank. j) Decrease water usage until problem is remedied. k) Mitigate by installing high level alarms, 24 hour storage in new tanks and 12 hour storage in existing tanks as a warning system. l) Mitigate initial problems by removing inspection covers annually to check depth of the scum mat and sludge. The tank should be cleaned out when combined depth of scum and sludge occupy half the tanks volume or at least every 3 years. (Tea leaves and other kitchen wastes should be composted as they are slow to break down, filling your system more rapidly).
Blocked filter	m) Cleaning is required. (This often only involves a quick hose down of the filter. It should then be undertaken regularly at a frequency of once 2 weeks to 3 months depending upon the type of filter in place).
Clogged disposal system	n) Pump out the tank and the disposal lines. o) Inspect and/or consider reconstruction of disposal system and/or individual lines. p) Upgrade the system to improve treatment system such as a pressure compensating drip irrigation system.
Overflow on disposal field	q) Pump out septic tank and reduce water usage in immediate term. r) Increase the disposal field area. s) Re-locate the disposal area further away from the house and trees or on the northern side of the house to increase evaporation (i.e. provide good exposure to sun and wind). t) Ensure the wastewater disposal area is densely planted to increase evapo-transpiration. u) Restrict/avoid access to the field.
Excessively high volume wastewater discharge/Unknown usage	v) Install a water meter. w) Install water reduction fixtures. x) Decrease water usage. y) Increase the disposal field area.

Rainfall run-off causing water-logging of disposal field	z) Check that no roof downpipes discharge to gully traps or on land where it could drain onto the disposal area. - aa) Install storm water cut-off drains upslope of disposal area (such drains need to be maintained over time).
Potential impact on groundwater/surface water	- bb) Ensure all wastewater drainage lines, and irrigation pipes are located at least 15m from any watercourse. - cc) Regular system maintenance. - dd) Regular pump outs. - ee) Install outlet filters. - ff) Clean filter. - gg) Avoid the use of phosphorous based household detergents.
Continuing Unresolved Problems	- hh) Engage a consultant experienced in wastewater treatment and disposal systems. ii) Upgrade the whole system. - jj) Enter into a maintenance contract with a wastewater systems contractor/drain-layer/system supplier with a high level of experience in wastewater treatment and disposal system maintenance and operation.

WHO TO CONTACT IF YOUR SYSTEM IS FAILING OR YOU OBSERVE A FAILING SYSTEM:

- a) Engage an environmental or geotechnical consultant experienced in wastewater treatment and disposal systems.
- b) An Environmental Health Officer at your local council.

ON-SITE WASTEWATER PACKAGE TREATMENT PLANTS**KEY MAINTENANCE REQUIREMENTS TO BE UNDERTAKEN BY SYSTEM MAINTENANCE CONTRACTOR**

Wastewater system owners are strongly encouraged to enter into a maintenance contract with the system supplier or other contractor experienced in wastewater treatment system operation and maintenance. Note all secondary treatment systems have specific operation & maintenance schedules. These should be followed as per the manufacturers or designers instructions.

The minimum system maintenance requirements for the most basic on-site treatment and disposal systems include but are not limited to the following 3 monthly actions:

- a) **REMOVE AND CLEAN** (hose down) the effluent outlet filters from the outlet of the septic tank and in the outlet from the treatment system or the following rising main. Ensure appropriate protective clothing is worn and the rinse water is discharged to ground, ideally densely vegetated where it will not run-off.
- b) **MEASURE THE SLUDGE DEPTH.** This can be done by removing septic tank lid/vent and poking a stick into the tank and noting the change in density of material at the liquid:sludge layer interface within the tank. If the layer is more than one third total tank depth (this equate to more than 0.7m from top of a 2m septic tank), the tank needs to be pumped out.
- c) **CHECK ALL ELECTRICAL PARTS.** In particular check and test that all visual and audible alarms for pump chamber and aerator blower are working.
- d) **CLEAR THE AERATOR** by lifting the aerator out of the septic tank and checking for any material that would cause drag. Clean the aerator by hosing it.
- e) **FLUSH ALL THE DISPOSAL LINES** if the system consists of pressure compensating drip irrigation lines, remove the flush valves and flush with fresh water from the hose, then reinstall the valves.
- f) **WALK OVER THE DISPOSAL AREA AND LOOK CLOSELY FOR ANY SIGNS OF FAILURE.** This can include uneven vegetative growth, uneven effluent distribution, any wet patches and/or signs of effluent ponding, or clogging or channelling of the soils. In the event any such problems are identified, contract the installer and/or a maintenance contractor to remedy the situation. Also consider measure to reduce water usage.

HOUSEHOLD CLEANING CHEMICALS EFFECTS ON DISPOSAL SYSTEM RECEIVING SOILS

Use of many cleaning chemicals in facilities served by on-site disposal systems can result in high concentrations of the constituents in those cleaning agents being discharged into the receiving soils. These chemicals and constituents have a massive impact on the quality and condition of the receiving soils over time.

Many of the chemicals can disrupt soil structure and decreased hydraulic conductivity while others can act as bactericides, destroying the essential micro-organisms required to achieve the high level of biodegradation in the treatment and disposal systems. This then increased the potential environmental impacts of the contaminants in the receiving environment.

Improved wastewater treatment technologies can only assist so much in reducing the composition and concentration of some cleaning agents, not the strong acids and strong alkaline agents.

The following matters need to be considered when using cleaning agents in a domestic situation:

- a) Laundry powders are often extremely high in sodium which will destroy the salt balance in the soils. Check the labels.
- b) Grey-water consisting of washing machine wash cycle discharge water can have an alkaline pH of up to 10. Although this will be diluted in a septic tank, it will impact on micro-organism populations and also lead to effects on soils structure.
- c) Wastewater flows from dishwashing machines can have an impact on wastewater treatment systems, not only in terms of wastewater flow volumes and additional organic waste, but more importantly in terms of the strong cleaning chemicals.
- d) Highly corrosive cleaners (such as toilet and drain cleaners) that have precautionary labels warning users to minimise direct contact, are an indication that they can adversely affect the wastewater treatment system. Up to 1 cup of bactericides such as bleach can be sufficient to impact on all the micro-organisms/bugs in a septic tank, severely affecting tank performance for some time.
- e) All cleaning chemicals must be used with care and in all cases, the less that is discharged the better this will be for the receiving soils in the long term.
- f) The best solution of optimizing the long term effectiveness of the soils within a wastewater disposal field is to minimise the use and discharge of strong cleaning chemicals at source.

The following table identifies specific ingredients in general household products and their impact on the environment:

Ingredient	Use	Impact
Alkyl benzene sulfonates (ABS)	Common surfactant in laundry detergents, cleaners.	Very slow to biodegrade; the manufacturing process can release carcinogens and toxins to environment.
Alkyl phenoxy polyethoxy ethanols (also nonyl phenols)	Used as surfactant in laundry detergents, cleaners.	Slow to biodegrade in the environment; linked with chronic health problems.

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Butyl cellosolve (also, butyl oxitol, ethylene glycol monbutyl, butoxyethanol, ethylene glycol)	Used as solvent in spray cleaners, all-purpose cleaners.	A toxic synthetic – can irritate mucous membranes and cause liver and kidney damage.
Chlorine – also as hypochlorite, sodium hypochlorite, sodium dichloroisocyanurate, hydrogen chloride and hydrochloric acid	Household bleaching agent.	Most frequently involved in household and industrial poisonings. Reacts with organics in the environment to form carcinogenic toxins, the most well known being dioxin. Serious impact on small wastewater treatment plants.
EDTA: ethylene-diamino-tetra-acetate	A builder used as phosphate substitute in detergents.	Slow to biodegrade.
Formaldehyde	Not a common ingredient these days but may be found in deodorisers, disinfectant, germicides, chemical toilet additives, particle board.	Extremely potent; carcinogenic and respiratory irritant; serious impact on small wastewater treatment plants.
Methanol	Used as solvent in glass cleaners.	Acutely toxic and can cause blindness.
Phosphates	Used in detergents and cleaners as a builder and deflocculating agent.	Non-toxic but major cause of eutrophication in receiving aquatic ecosystem, causing serious ecological imbalance.
Polycarboxylates	Laundry and dishwasher detergents as an anti-redeposition agent.	Not much known; non-biodegradable and petroleum based.

SUBSTITUTES FOR HOUSEHOLD CLEANING CHEMICALS

Use of the following readily biodegradable substitutes for common potentially harmful household cleaning chemicals will reduce the stress on a septic system, significantly enhance the performance of the whole system and increase the life of the disposal field, while reducing the potential effects of the receiving soils.

GENERAL CLEANERS:

Use soft soap cleaners and bio-degradable cleaners and those low in chlorine levels.

AMMONIA-BASED CLEANERS:

Instead sprinkle baking soda on a damp sponge. For windows, use a solution of 2 – Tbs white vinegar to 1 – litre of water. Place the mixture into a spray bottle.

DISINFECTANTS:

In preference use Borax: ½ cup in 4 – litres of water.

DRAIN DECLOGGERS:

Avoid declogging chemicals. Instead use a plunger or metal snake, or remove and clean trap.

SCOURING CLEANERS AND POWDERS:

Instead sprinkle baking soda on a damp sponge or add 4 – Tbsp baking soda to 1 litre warm water. It's cheaper and won't scratch.

TOILET CLEANERS:

Sprinkle on baking soda, then scrub with toilet brush.

LAUNDRY DETERGENT:

Choose one with a zero phosphate content and low in alkaline salts (in particular, a low sodium level) and no chlorine.

Use of the following alternatives to standard chemicals is less likely to be of any consequence to the performance of the on-site wastewater system, but are included for completeness only:

CARPET/UPHOLSTERY CLEANERS:

Sprinkle dry cornstarch or baking soda or commercial dry cleaning spray, then vacuum. For tougher stains, blot with white vinegar in soapy water.

FURNITURE/FLOOR POLISHES:

To clean, use oil soap and warm water. Dry with soft cloth. Polish with 1 part lemon juice to 2 parts oil (any kind) or use natural products with lemon oil or beeswax in mineral oil.

METAL CLEANERS:

Brass and copper: scrub with a used half of lemon dipped in salt. Stainless steel: scouring pad and soapy water. Silver: rub gently with toothpaste and wet cloth.

OVEN CLEANERS:

Sprinkle salt on drips, then scrub. Use baking soda and scouring pads on older spills.

TYPICAL WATER USE PERCENTAGE

Information only. The following table indicates the general water use percentages.

Fixture	Typical % Range (Ref 3)	Typical % Range (Ref 2)
Toilet (Note 1)	26.7 (22.6 – 30.6)	30 (20 – 40)
Shower/Bath (Note 2)	16.8 (11.8 – 20.2)	20 (15 – 25)
Washing Machine	21.7 (17.8 – 28.0)	20 (15 – 25)
Dishwasher	1.4 (0.9 – 2.2)	7 (5 – 10)
Taps	15.7 (12.4 – 18.5)	10 (8 – 12)
Leaks & Other Domestic Usage	16	13 (10 – 17)

Sources: Crites & Tchobanoglous (1998) and USEPA (2002) [Refs 2 & 3].

Note:

Toilet use based on United States examples using on average 11 to 22.5litres/flush [Ref 2]. Lower percent flows are representative of New Zealand toilet systems.

Average shower water use is dependent upon individual showering habits and the length of showering. When estimates are being made it is important to allow a factor of safety and over rather than under estimate potential water usage.

LIST OF WATER TOLERANT PLANTS SUITABLE FOR ON-SITE WASTEWATER DISPOSAL SYSTEMS

GENERAL MATTERS TO CONSIDER WHEN PLANTING A LAND DISPOSAL AREA:

Plants that are suitable for planting in moist conditions, such as those associated with wastewater land disposable fields need to be selected on the basis of both their tolerance for such moist conditions and for their potential for high level of growth/high transpiration of moisture in such conditions.

Standard lawn grass is a proven effective high transpiration plant species in such conditions, as are a large number of other plant species seen in typical domestic gardens.

Consideration needs to be given to effects of roots from plants and from trees in particular on wastewater distribution pipe networks/emitter lines in land application systems. Potential for root intrusion/disruption to the pipe system must be considered prior to selection and planting of a plant or tree species.

Advice on such matters for particular plant species can be obtained from garden centre specialists and landscaping consultants.

Grasses, ground covers, and other plants***Astelia grandis* (swamp astelia)**

Large clump forming plant with bright green, flax-like foliage. Female plants produce upright panicles of orange berries in the centre of the plant. This endemic species will not tolerate eutrophic conditions and prefers peat soils.

***Blechnum novaezealandiae* (kiokio)**

Large, robust fern growing to 1 or even 2m, hardy species that tolerates most conditions, but does best in well drained, shady area.

Carex

There are many members of this genus which grow naturally in damp to wet areas. They all have quite fine drooping foliage and are vigorous in moist conditions. Most prefer very light shade. The following species have been identified for their suitability.

Carex dissita

Endemic species with dull green to reddish tufts often 0.5m tall (although this can vary). Tolerates a range of swampy habitats, but is also noted to grow on drier soils under forest cover.

Carex flagellifera

Endemic species with dense spreading reddish-brown tufts to 0.5m tall. Prefers damp soil and full sun, but is noted to thrive in a variety of habitats including boggy pasture.

Carex geminata

Robust and vigorous endemic species that grows to 1.5m tall. Thrives in a range of wet habitats. Suitable for a larger area.

Carex lessoniana

Robust and vigorous endemic species that grows to 1.5m tall. Similar to *C.geminata* in that the species is spreading and suitable for a larger wet area.

***Carex secta* (purei, makura)**

Endemic species that exhibits tall spreading tussocks. Has been noted to grow to 3m tall, widespread in swampy area. Useful in the creation of bird habitat.

***Geniostoma rupestre* (hangehange)**

Common forest shrub with pale green glossy foliage, growing to 2-3m. Tiny flowers give off strong scent in spring. Looks best in sunny position where it retains a bushy habit, and prefers well-drained soil.

***Hebe stricta* (koromiko)**

Shrub or small tree growing to 2-5 in height. Natural forms have white to bluish flowers. Plant in full sun. Tolerates exposure. (NB Many cultivars and hybrids are available commercially, but these are all unsuitable for use near existing natural vegetation.)

***Laurelia novae-zelandiae* (pukatea)**

Large upright tree (to 30m) with attractive bright green foliage and distinctive whitish bark. Fast growing and able to handle a wide variety of soils. It will tolerate periodic flooding, breathing roots develop in water logged soils. Can be grown from seed. Tolerant of some sun and frost. Not tolerant of wind.

***Leptospermum scoparium* (manuka)**

Shrub or small tree growing to 4m+ in height. Ubiquitous shrub varying in form throughout New Zealand. Ideal to provide shelter for other plants as it is quick growing and hardy. Requires full sun. Hardy and tolerant of difficult conditions, including waterlogging and drought.

***Melicytus ramiflorus* (mahoe)**

A fast growing yet long lived tree to 7m height. Prefers well drained fertile soils. Tolerates some frost, wind and sun. Birds are attracted to the blue berries.

***Pennantia corymbosa* (kaikomako)**

Slow growing species that will reach 12m in moist, fertile sites. Useful species application in bank stabilization or wetland habitats.

***Plagianthus betulinus* (ribbonwood)**

Fast growing species to 15m. Similar application to that of *Pennantia corymbosa*.

***Rhopalostylis sapida* (nikau)**

New Zealand's only native palm, with red berries attractive to birds. Requires light shade, plenty of moisture and protection from wind when young. Grows well in areas of permanent dampness.

***Syzygium maire* (maire tawake)**

Attractive and moderately growing wetland tree to 15m with bronze foliage, large bunches of reddish fruit and distinctive whitish bark. Requires a sheltered sunny position. Tolerates some frost.

***Vitex lucens* (puriri)**

Fast growing to 20m in fertile, open but sheltered conditions. Will struggle with poor drainage during adolescence.

ONSITE WASTE WATER AND LAND APPLICATION SYSTEM MANAGEMENT CONTRACT

OWNER	
ADDRESS OF SYSTEM	
POSTAL ADDRESS	
PHONE CONTACT	
TERRITORIAL AUTHORITY	
INSTALLER/MAINTENANCE	
DESIGNER	Gary Stevens Consultant

1. System Commissioned as per designer and manufacturers requirements
2. Inspections as detailed by resource consent and manufacturers operating instructions will be carried out at required intervals by the authorised service agent.
3. The inspections will include but are not limited to the following:
 - (a) All components of the installation to have visual inspection.
 - (b) Visual inspection of downstream of system.
 - (c) Adjustment to any electrical controls and testing for correct operation.
 - (d) Check effluent filter and clean where required as per manufacturer's instructions.
 - (e) Visual and where required sample analysis of discharged effluent and reporting on the same.
4. Complete any repairs/replacement of system components.
5. All emergency repairs labour and parts outside of warranty period are to be paid for on completion of work.
6. Provide report with compliances and any issues and work completed to owner.

The above Service Contract is hereby AGREED by:

Owners Signature	Date
Service Agent	Date

BC160489

DUPLICATE THIS FORM IS NECESSARY
PAIN DISTRICT COUNCIL - APPROVED

23/06/2016

Client name: G & L Philp Lot number: 2 DP: 324764

Project Location: 184 Hortons Road Grid reference: E N

Date of inspection: 22/10/2015 Surface level if known: R L

Pit/borehole no: 1

Slope: 20 % Slope shape: linear divergent Ground cover: grass Surface condition: dry Indicative drainage: imperfect

Surface stones: 10 % Vegetation: none Water table depth: 3 metres

Land surface notes: good grass cover, dry topsoil layer over firm clay loam layer. Some stones 10-75mm.

Layer	Lower depth mm	Horizon	Moisture condition*	Colour (moist)	Field texture	Coarse fragments % volume	Structure	Modified Emerson	Soil category	Sample taken (Y/N)	Consistency	Permeability	Ribbon Length
1	200		dry	brown	CL	10	moderate	6	4	n	firm	n/a	40
2	400		dry	brown	ZCL	20	moderate	5	4	n	firm	n/a	50
3	900		dry	y/brown	LC	20	strong	5	5	n	very firm	n/a	60
4													
5													

Use another form if >5 layers or major horizons.

Describe moisture condition as: dry, moist, very moist, saturated.

Overall Soil Category assigned: 5

Soil appears favourable for (List system types): irrigation

Maximum depth of system: 200mm

Notes/comments/observations: firm ground on slope ideal for ploughing in irrigation.
A second organic layer below topsoil near ridge line.

Soil Colours	
Pale	may develop from pale rocks, maybe leached from darker minerals, maybe anaerobic
Dark	may develop from dark rocks (basalts), may indicate high levels of decomposing organic materials
Bright Reds	usually well aerated soil, high in iron or aluminium oxide
Dull Yellows	formed when iron rich soils have a higher water content over a long period
Grey Soils	maybe leached off dark minerals, low organic matter levels or maybe anaerobic for long periods
Bleached Soils	usually formed by severe water logging when minerals become soluble and move out of the horizon

BC160489

DUPLICATE THIS FORM IF NECESSARY
DRAINAGE DISTRICT COUNCIL - APPROVED

23/06/2016

Client name: G & L Philp Lot number: 2 DP: 324764

Project Location: 184 Hortons Road Grid reference: E N

Date of inspection: 22/10/2015 Surface level if known: R L

Pit/borehole no: 2

Slope: 20 % Slope shape: linear divergent Ground cover: grass Surface condition: dry Indicative drainage: imperfect

Surface stones: 10 % Vegetation: none Water table depth: 3 metres

Land surface notes: good grass cover, dry topsoil layer over firm clay loam layer. Some stones 10-75mm.

Layer	Lower depth mm	Horizon	Moisture condition*	Colour (moist)	Field texture	Coarse fragments % volume	Structure	Modified Emerson	Soil category	Sample taken (Y/N)	Consistency	Permeability	Ribbon Length
1	200		dry	brown	CL	10	moderate	6	4	n	firm	n/a	40
2	900		dry	y/brown	LC	20	strong	5	5	n	very firm	n/a	65
3													
4													
5													

Use another form if >5 layers or major horizons.

Describe moisture condition as: dry, moist, very moist, saturated.

Overall Soil Category assigned: 5

Soil appears favourable for (List system types): irrigation

Maximum depth of system: 200mm

Notes/comments/observations: firm ground on slope ideal for ploughing in irrigation.

Soil Colours	
Pale	may develop from pale rocks, maybe leached from darker minerals, maybe anaerobic
Dark	may develop from dark rocks (basalts), may indicate high levels of decomposing organic materials
Bright Reds	usually well aerated soil, high in iron or aluminium oxide
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Bleached Soils	usually formed by severe water logging when minerals become soluble and move out of the horizon

BC160489

DUPLICATE THIS FORM IF NECESSARY
DRAINAGE DISTRICT COUNCIL - APPROVED

23/06/2016

Client name: G & L Philp Lot number: 2 DP: 324764

Project Location: 184 Hortons Road Grid reference: E N

Date of inspection: 22/10/2015 Surface level if known: R L

Pit/borehole no: 3

Slope: 20 % Slope shape: linear divergent Ground cover: grass Surface condition: dry Indicative drainage: imperfect

Surface stones: 10 % Vegetation: none Water table depth: 3 metres

Land surface notes: good grass cover, dry topsoil layer over firm clay loam layer. Some stones 10-75mm.

Layer	Lower depth mm	Horizon	Moisture condition*	Colour (moist)	Field texture	Coarse fragments % volume	Structure	Modified Emerson	Soil category	Sample taken (Y/N)	Consistency	Permeability	Ribbon Length
1	200		dry	brown	CL	10	moderate	6	4	n	firm	n/a	40
2	900		dry	y/brown	LC	20	moderate	5	5	n	very firm	n/a	65
3													
4													
5													

Use another form if >5 layers or major horizons.

Describe moisture condition as: dry, moist, very moist, saturated.

Overall Soil Category assigned: 5

Soil appears favourable for (List system types): irrigation

Maximum depth of system: 200mm

Notes/comments/observations: firm ground on slope ideal for ploughing in irrigation.

Soil Colours	
Pale	may develop from pale rocks, maybe leached from darker minerals, maybe anaerobic
Dark	may develop from dark rocks (basalts), may indicate high levels of decomposing organic materials
Bright Reds	usually well aerated soil, high in iron or aluminium oxide
Dull Yellows	formed when iron rich soils have a higher water content over a long period
Grey Soils	maybe leached off dark minerals, low organic matter levels or maybe anaerobic for long periods
Bleached Soils	usually formed by severe water logging when minerals become soluble and move out of the horizon

LEGAL DESCRIPTION
LOT 2 DP 324764
SITE AREA 3527m²
WIND ZONE VERY HIGH
ZONE RESIDENTIAL
ROLL VALUATION XXXXXX
EXPOSURE ZONE C
EARTHQUAKE ZONE 2
SITE COVERAGE 2 5.14%
FFL FINISHED FLOOR LEVEL

FOR FULL SET OUT DIMENSIONS SEE FOUNDATION PLAN

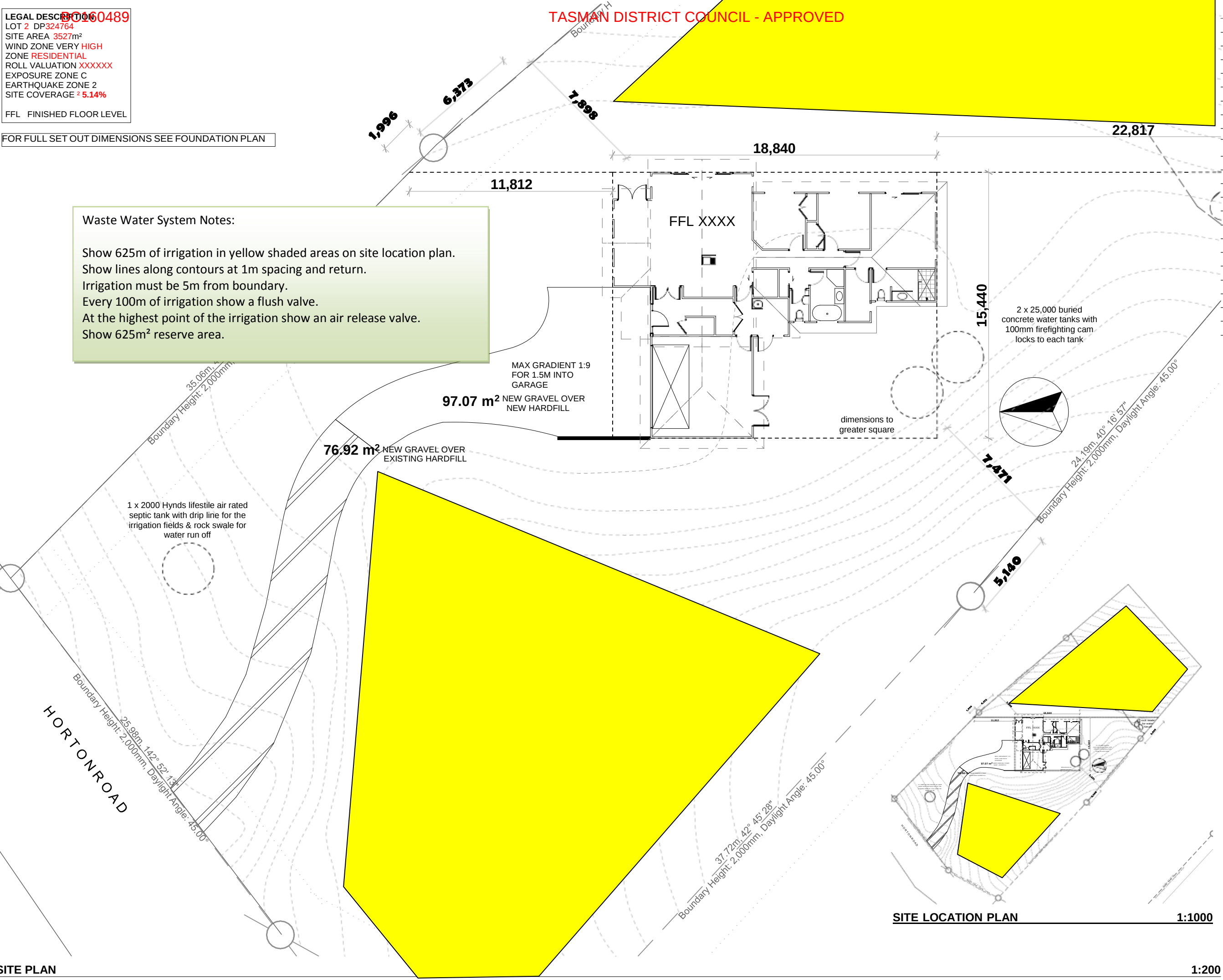
TASMAN DISTRICT COUNCIL - APPROVED

23/06/2016

1	SITE PLAN
2	FOUNDATION PLAN
3	DRAINAGE PLAN
4	FLOOR PLAN
5	FIRST FLOOR PLAN
6	FOUNDATION PLAN UPP...
7	ELEVATIONS
8	ELEVATIONS
09	SECTION
10	SECTIONS
11	BRACING PLAN LOWER ...
12	BRACING PLAN UPPER ...
13	FOUNDATION DETAILS
14	CLADDING DETAILS
15	CLADDING DETAILS
16	hyBEAM DETAILS
17	DECK DETAILS
18	ROOF DETAILS
19	ROOF DETAILS
20	ELECTRICAL PLAN
21	ROOF FRAMING PLAN
22	LINTEL FIXINGS
23	SPECIFICATION

Waste Water System Notes:

Show 625m of irrigation in yellow shaded areas on site location plan.
Show lines along contours at 1m spacing and return.
Irrigation must be 5m from boundary.
Every 100m of irrigation show a flush valve.
At the highest point of the irrigation show an air release valve.
Show 625m² reserve area.



SITE PLAN

1:200

SITE LOCATION PLAN

1:1000

Orange Residential

HOMES

Orange Residential Homes Ltd,
264 Queen Street, Richmond
PO Box 3441, Richmond
Nelson, New Zealand
Phone: +64 3 543 9002
Fax +64 3 543 9008
Email: drawing@obg.co.nz
Website: www.obg.co.nz

Client:

Geraint & Linda Philp,
184 Horton Rd,
Beulah Estate, Tasman
Lot 2 DP 324764

Project Information

Roof: 25° Corrugated Profiled Metal
Walls: 50mm Equus System
Feature Walls: N/A
Wind Zone: Very High
Snow Region: N3
Durability Zone: C
Earthquake Zone: 2

SITE PLAN

Version	Sales	QS	Sheet
05	RU	BG	1
	Scale:	Drawn:	
	1:200		
	Date:		
	19/10/15		

Job Number

598

Plough irrigation lines in identified irrigation area. Install flush valves at every 100m line and air release valve at highest point.

Plant irrigation field with appropriate trees and shrubs to improve effluent disposal

1000mm minimum separation between irrigation lines
& 500mm between dripper heads.
Secured every metre on slope ground.

DWG No. GSC-09 Irrigation Lines on Slope October 15 Copyright gary.gsconsulting@gmail.com 0211081391

Note: Check Paragraph 7.0 of Gary Stevens Site/Soil Evaluation for size and dimension of Land Application system.
All changes to the Waste Water & Land Application System to be approved prior to installation by Gary Stevens.

Design Certificate – Technical basis for structural design methodology contained in designIT for houses - New Zealand.

designIT for houses, New Zealand has been developed by experienced timber engineers to assist designers in selecting appropriate sizes of structural laminated veneer lumber products manufactured by Carter Holt Harvey (including hySPAN, hy90, hyONE and hyJOIST) and other generic stress grades of timber, to be used as structural elements for the construction of buildings that fall within the scope of NZS 3604.

The design methodology used for the software complies with the loading and general design requirements contained within AS/NZS 1170 and with timber structural design in accordance with NZS 3603:1993 including Amendment 4 (Verification method B1/VM1, 6.1).

designIT relies on the accurate input of span and loading information by the user. Where accurate inputs are submitted the product and/or stress grade and the size given will comply with the structural requirements of the New Zealand Building Code, provided the installation is in accordance with the installation requirements provided by designIT and/or in product literature and/or NZS 3604, or specific engineering design, as appropriate.

References:

NZS 3603:1993 Timber Structures Standard. AS/NZS 1170:2002 Structural design actions, Parts 0 and 1.
NZS 3604:2011 Timber-framed buildings. AS/NZS 1170:2011 Structural design actions, Part 2: Wind actions.
AS 1720.1 – 2010 Timber structures. Part 1: Design methods. AS/NZS 1170:2003 Structural design actions, Part 3: Snow and ice actions.
AS 1684.1 – 1999 Residential timber framed construction. Part 1: Design criteria.

This Design Certificate, and any associated warranty/certification, is void where there has been substitution of alternate products not detailed within the Member Specification.

Version date: 8 July 2015

For further information or advice please contact: Carter Holt Harvey Woodproducts New Zealand
173 Captain Springs Road, Onehunga. Auckland
Telephone 0800 808 131
Facsimile 0800 808 132
Email: designit@chhwoodproducts.co.nz

Specifier details:

Specifier:	Tony		
Business name:	kad		
Address:			
Email:			
Phone:	Mobile:	Facsimile:	

Project & Site details:

Project:	philp	Ref. no.:
At (address):		
For (owner/s):		
Wind zone:		
Snow loading	Snow region: N0, snow loading not applicable	

MEMBER DESIGN DETAILS

Member 1

- 1) Member code and description FJ2 - Floor joist - Supporting floor loads only
- 2) Date prepared 23/11/2015
- 3) Serviceability criteria AS 1720.1-2010 and AS 1684.1-1999
- 4) Design inputs

Span	5.8 m - single
Joist spacing	400 mm
Lateral restraint condition	Bottom edge restrained by ceiling / ceiling battens at 600 crs max.
Floor dead load	40 kg/m ²
Floor live load	1.5 kPa/1.8 kN

5) Member specification

DESIGN CERTIFICATE – Technical basis for structural design methodology contained in designIT for commercial floors - New Zealand.

designIT for commercial floors, New Zealand has been developed by experienced timber engineers to assist designers in selecting appropriate sizes of plywood and structural laminated veneer lumber products manufactured by Carter Holt Harvey (including hySPAN, hy90, hyONE and hyJOIST), to be used as flooring, joists and bearers for the construction of commercial, industrial and other heavily loaded floors.

The design methodology used for the software complies with the loading and general design requirements contained within AS/NZS 1170:2002 (including amendments) and with timber structural design in accordance with NZS 3603:1993 including Amendment 4 (Verification method B1/VM1, 6.1).

designIT relies on the accurate input of span and loading information by the user. Where accurate inputs are submitted the product and/or stress grade and the size given will comply with the structural requirements of the New Zealand Building Code, provided the installation is in accordance with the installation requirements provided by designIT for commercial floors.

References:

AS/NZS 1170:2002 Structural design actions, Parts 0, 1 and 2.

NZS 3603:1993 Timber Structures Standard.

AS 1720.1 - 2010 Timber structures. Part 1: Design methods.

This Design Certificate, and any warranty or certification contained within or arising from this Design Certificate, is void where there has been any substitution of alternate products which are not detailed within the Member Design Details below.

Version date: 26 February 2015

For further information or advice please contact:

Carter Holt Harvey Woodproducts New Zealand
173 Captain Springs Road, Orehunga. Auckland
Telephone 0800 808 131
Facsimile 0800 808 132
Email: designit@chhwoodproducts.co.nz

Specifier details:

Specifier:	Owner		
Business name:	HP		
Address:			
Email:			
Phone:	Mobile:	Facsimile:	

Project & Site details:

Project:		Ref. no.:
At (address):		
For (owner/s):		

MEMBER DESIGN DETAILS**Member 1**

1) Member code and description FJ1, Floor joists supporting floor loads only

2) Date prepared 19/10/2015

3) Flooring specification

Size, stress grade and product 19 mm F11 ecoPLY

4) Design inputs

Span 5.9 m - Single span
Floor dead load 50 kg/m²
Floor live load 3.0 kPa/2.7 kN
Joist spacing 400 mm

5) Member specification

Size, stress grade/product Use HJ360 90 hyJOIST

6) Serviceability

Load case	Limit ³ on average deflection ²	Estimated average deflection ²	Rigidity ratio ⁴
Long term load - $G + \psi_L Q$ *	15.0 mm	11.7 mm (long term)	$\frac{15.0}{11.7} = 1.29$

*Critical serviceability load case

See 'Notes for interpretation of serviceability data' at the end of this report

7) Reactions

Load case	Limit states design reaction ^{2,3}	
	k_1 ¹	End ⁴ kN
1.35G	0.60	-3.0
1.2G + 1.5Q	0.80	-6.2
1.2G + 1.5Q	0.94	-5.0

See 'Notes for interpretation of reaction data' at the end of this report

8) Installation requirements

Provide at least 30 mm bearing at end supports (floor loads only)

Bearing requirements for joists supporting load bearing walls may be greater - refer CHH Woodproducts for guidance

Install in accordance with designIT for Commercial Floors Guide for Installation

Notes for interpretation of serviceability data

- "average deflection" is an engineering concept based upon a notional estimated load, notional member rigidity and, in some cases, an approximate model of material response to environmental conditions. These parameters are, 'standardised' in AS 1170 and AS 1720. Deflections calculated using this methodology cannot therefore be usefully compared with deflections calculated using other methods, eg GLTAA design methodology.
- Deflection is the flexural response to load – 'out-of-level' measurements of installations are not necessarily deflections and can incorporate 'initial out-of-straightness', whether intended or not. Furthermore, loads can be higher/lower than the notional estimate and in any comparison with measured levels, material variability needs to also be considered. AS 1720 gives the following basis for estimation of upper bound deflections for various materials.

F-grades – visually graded to AS 2082 / AS 2858	Average + 100%
MGP grades - mechanically graded to AS 1748	Average + 43%
GL grades for glulam to AS 1328	Average + 33%
LVL to AS 4357 (includes hySPAN and hyJOIST (LVL flanges))	Average +18%

 As can be seen, comparison of the 'average deflection' for different materials, even if calculated on the same basis, does not give the whole picture!
- The limits referred are those specified in AS 1684.1 for the stated load case.
- 'Rigidity ratio' expresses the rigidity of the specified beam relative to the rigidity of a notional beam just meeting the serviceability requirements of AS 1684.1

Notes for interpretation of reaction data

- Duration of load factor ' k_1 ' for strength of timber as per table 2.3, AS 1720.1
- Negative (-) reactions relate to the 'gravity' or 'downwards' force on the support
- Positive reactions relate to the 'upwards' forces or 'tie-down' requirement on the support
- End reaction includes allowance for overhang/cantilever where one has been designed

Size, stress grade/product

Use HJ360 90 hyJOIST

6) Serviceability

Load case	Limit ³ on average deflection ²	Estimated average deflection ²	Rigidity ratio ⁴
Long term load - $G + \psi_L Q$	15.0 mm	6.2 mm (long term)	$\frac{15.0}{6.2} = 2.41$
Floor flexibility *	2.0 mm per 1 kN	1.0 mm	$\frac{2.0}{1.0} = 1.99$

*Critical serviceability load case

See 'Notes for interpretation of serviceability data' at the end of this report

7) Reactions

Load case	k_1 ¹	Limit states design reaction ^{2,3}
		End ⁴ kN
1.35G	0.60	-1.7
1.2G + 1.5Q	0.80	-3.4
1.2G + 1.5Q	0.94	-3.5

See 'Notes for interpretation of reaction data' at the end of this report

8) Installation requirements

Provide at least 30 mm bearing at end supports (floor loads only)

Bearing requirements for joists supporting load bearing walls may be greater - refer published literature/ Floor joist calculator for guidance

Install in accordance with hyJOIST design and installation guide

Member 2

1) Member code and description

B1 - Deck bearer - Bearer - Supporting floor loads only

2) Date prepared

23/11/2015

3) Serviceability criteria

AS 1720.1-2010 and AS 1684.1-1999

4) Design inputs

Span	3.6 m - single
Floor load width 'FLW'	0.9 m
Floor dead load	40 kg/m ²
Floor live load	2.0 kPa/1.8 kN

5) Member specification

Size, stress grade/product	Use 2/240 x 45 SG8 Laserframe
Material type	Dry softwood, machine stress graded and verified (NZS 3622)
Assumed design density	< 480 kg/m ³

6) Serviceability

Load case	Limit ³ on average deflection ²	Estimated average deflection ²	Rigidity ratio ⁴
Long term load - $G + \psi_L Q$ *	12.0 mm	9.4 mm (long term)	$\frac{12.0}{9.4} = 1.28$

*Critical serviceability load case

See 'Notes for interpretation of serviceability data' at the end of this report

7) Reactions

Limit states design reaction^{2,3}

Load case	k_1 ¹	End ⁴ kN
1.35G	0.60	-2.9
1.2G + 1.5Q	0.80	-5.9
1.2G + 1.5Q	0.94	-3.7

See 'Notes for interpretation of reaction data' at the end of this report

8) Installation requirements

Provide at least 30 mm bearing at end supports
Nail lamination required - refer AS 1684

Notes for interpretation of serviceability data

- "average deflection" is an engineering concept based upon a notional estimated load, notional member rigidity and, in some cases, an approximate model of material response to environmental conditions. These parameters are, 'standardised' in AS/NZS 1170, AS 1684.1 and AS 1720. Deflections calculated using this methodology cannot therefore be usefully compared with deflections calculated using other methods, eg GLTAA design methodology.
- Deflection is the flexural response to load – 'out-of-level' measurements of installations are not necessarily deflections and can incorporate 'initial out-of-straightness', whether intended or not. Furthermore, loads can be higher/lower than the notional estimate and in any comparison with measured levels, material variability needs to also be considered. AS 1720 gives the following basis for estimation of upper bound deflections for various materials.

No 1 Framing – visually graded to NZS 3631	Average + 100%
SG grades - mechanically graded to AS/NZS 1748	Average + 43%
GL grades for glulam to AS/NZS 1328	Average + 33%
LVL to AS/NZS 4357 (includes hySPAN and hyJOIST)	Average +18%

As can be seen, comparison of the 'average deflection' for different materials, even if calculated on the same basis, does not give the whole picture!
- The limits referred are those specified in AS 1684.1 for the stated load case.
- 'Rigidity ratio' expresses the rigidity of the specified beam relative to the rigidity of a notional beam just meeting the serviceability requirements of AS 1684.1

Notes for interpretation of reaction data

- Duration of load factor ' k_1 ' for strength as per NZ 3603:1993
- Negative (-) reactions relate to the 'gravity' or 'downwards' force on the support
- Positive reactions relate to the 'upwards' forces or 'tie-down' requirement on the support
- End reaction includes allowance for overhang/cantilever where one has been designed