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Our Ref: W5991

06 December 2019

161 Te Awa Road

Lake Hawea

Infrastructure Report

Lots 1 – 5 Being a Subdivision of Lot 13 DP 300251

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Table of Contents

1.0 SCOPE

PPGroup has been engaged by Tony Berben to design the concept infrastructure and low impact design (LID) stormwater solution for the proposed 5 lot subdivision. The subdivision incorporates a LID approach as the method of stormwater disposal integrated with the overall rural design framework and engineering design in order to achieve a high amenity rural development.

This report details the preliminary concept design for the disposal of stormwater and LID infrastructure to support an application for subdivision consent. The design has been prepared in accordance with the Queenstown Lakes District Council (QLDC) Land Development and Subdivision Code of Practice (LDSCOP).

The proposed stormwater disposal will meet objectives of low impact design including the attenuation and treatment of stormwater from the rural sections and roading within the proposed subdivision.

2.0 BACKGROUND INFORMATION

2.1 SITE DESCRIPTION

The subject site, Lot 13 DP 300251, is accessed via a right of way coming off the eastern end of Te Awa Road which in turn is located off Lake Hawea-Albert Town Road. The site is located approximately 2km southwest of the Lake Hawea town centre.

The site is surrounded by gently undulating open farm land to the north and south, lifestyle blocks to the east and Lake Hawea-Albert Town Road to the west.

Figure 1 – Site Location

2.2 PROPOSED SUBDIVISION

It is proposed to subdivide the overall site into 5 rural sections ranging in size from 1.85ha to 7.99ha.

2.3 TOPOGRAPHY

The site is gently undulating with a small terrace (3-4m) running north-south through the centre. The existing contour grades gently from the northwest corner of the site towards the southeast corner. The site contains an existing barn in the south east corner.

2.4 GEOTECHNICAL

A geotechnical report has been obtained for the site undertaken by Mt Iron GeoDrill. A summary of the main points from the report are;

- There are four main types of soil encountered.

  Unit 1 – Topsoil layer approximately 0.3m in depth.

  Unit 2a/2b – Fine Alluvium comprised of silt and sandy silt ranging from 0.3m – 1.8m below ground level.

  Unit 3a/3b – Alluvium layer comprised of silty gravel and gravelly silt ranging from 0.5m -1.5m below ground level.

  Unit 4 – Alluvium layer comprised of sandy gravel ranging from 0.3m – 1.8m below ground level.

- No active faults were mapped in the field, however the Cardrona fault passes the southeast corner of the site.

- No evidence of land instability was observed onsite during the field investigation.

- No water springs or seeps were observed during the site visit.

- No fill was encountered on the site during the investigation. If fill is found then Mt Iron Geodrill should be advised as soon as possible.

- Ground water inflows were not observed in any of the test pits or boreholes. The depth to water was not established during the site visit. Ground water depth is likely to be at a depth of greater than 10m based on a search of ORC bore records.

- Proposed structures should be designed to the relevant structural and building codes to mitigate the seismic ground shaking risk.

- The site sits within the alluvial fan zone (Grayburn South). Flooding and alluvial fan risk to the site is considered to be low. It is recommended that finished floor levels are at least 300mm higher than surrounding ground and landscaping is considered to direct water away from any house.

- Earthworks should be in accordance with recommendations of NZS 4431:1981 ‘Earthfill for Residential Development’.

- It is recommended that the site soils are not reused as structural fill.

- Un-retained batters can have a permanent batter angle of up to 2H:1V.

- The site is considered suitable for onsite stormwater disposal. It is considered that any area of each lot could be used for soak pit installation, however site-specific assessment and design would need to be undertaken.

- It is considered that each proposed lot is suitable for onsite wastewater disposal. It is recommended that assessment of ground permeability will be required before any wastewater design is undertaken.

The overall conclusion of the geotechnical report is that the proposed sub-division is geotechnically suitable provided the recommendations in the report are adhered to.

3.0 PROPOSED INFRASTRUCTURE

All infrastructure for the development has been designed in accordance with Council's Land Development and Subdivision Code of Practice (LDSCOP)

The following information is contained in Appendices A – B;

Appendix A: Earthworks and Roading Plans
Appendix B: Electricity & Telecom Supply Confirmation

4.0 EARTHWORKS

It is proposed to carry out minor earthworks across approximately 5706m² of the site to create roading access to proposed building platforms 2-5. The earthworks layout and details for the development are shown on plans W5991, Drawing No. 001, Sheets 200-202 Rev 1 dated 06 December 2019 contained within **Appendix A.**

4.1 AREAS & VOLUMES

The amount of earthworks involved in the development totals 2427m³ comprising

- topsoil volume of 1427m³
- cut volume 500m³
- fill volume of 500m³

The maximum depth of cut is approximately 1.0m and the maximum height of fill is approximately 0.5m. Topsoil has been estimated to be 0.25-0.3m thick over the site.

4.2 EROSION & SEDIMENT CONTROLS

The proposal is to use a combination of runoff swales, silt traps and the existing open pasture to capture any sediment laden stormwater during construction. Any runoff from the site will be conveyed out into the open paddocks adjacent the proposed earthworks area where flows will simply dissipate into the open pasture.

An important note is that all erosion controls are subject to change and being modified onsite every day during the course of works. Various controls would be amended or removed if considered not necessary either because of becoming redundant or being in the way of construction work. Additional controls would therefore be implemented as and when required to ensure that the site is suitability protected against erosion.

A detailed EMP/SMP would be prepared prior to starting site works by the civil contractor.

4.3 REGRASSING

Re-grassing of swales and cut/fill batters will occur as soon as possible in order to minimize the time any area is susceptible to erosion

4.4 DUST CONTROL

Control of dust will be required during, roading formation and trench excavation for services and drainage.

The following dust controls may be employed on site but are not limited to;

- Suspension of works during high winds,
- Limit the amount of exposed area at any one time,
- Use of water carts or K-line irrigation,
- Sequence earthwork operations to account for wind changes during the day,
- Re-topsoil finished areas as soon as possible and resow grass
- Have a stand by team available to control dust after hours

4.5 VEHICLE MOVEMENTS

All vehicles will access the site from the existing right of way via a stabilised construction entrance of 150mm compacted AP40 crossing extending 10m into the site.

Any mud dragged onto the sealed roads would be cleaned off at the end of each working day. Care will be taken to minimise any damage to the road surface by turning vehicles. Any damage that is caused would be repaired as soon as possible.

4.6 WORK DURATION

All work is to be carried out as quickly and efficiently as possible. If work is to stop for any extended period of time then the site is to be left as if the job has been completed, i.e. areas of bare soil smoothed out and re-vegetated.

During construction, hours of operation would be limited to between the hours of 0700 and 2000, Monday to Saturday.

4.7 NOISE & VIBRATION

During the hours of 0700 and 0800 the noise level emitted from this site would not exceed 40dBAL10 and between 0800 and 2000 would not exceed 50dBAL10.

All trucks operating to and from this site are to have current certificates of fitness and exhaust brakes are not to be used in the residential area.

All machinery operated on the site is to be in good mechanical condition and have exhausts and mufflers in good condition.

Vibrating rollers or compactors are not to be used where they are likely to cause damage to adjoining property.

The contractor would undertake monitoring of surrounding properties to ensure that construction activities do not cause any damage. If necessary standard construction activities would be changed if construction was causing adverse effect to adjacent properties. This is not anticipated to be an issue given the separation to neighboring dwellings.

5.0 ROAD DESIGN STATEMENT

5.1 SCOPE OF ROADING DESIGN STATEMENT

The intention of this roading design statement is to outline to Council details of the proposed roading network for the Development as a whole and in doing so give context to the application for subdivision consent.

This roading design statement covers all aspects of the proposed roading design as required by Section 3.2.6 of QLDC LDSCOP. This includes:

(a) Road dimensions and layout
(b) How target operating speeds have been achieved
(c) How Low Impact Stormwater Design principles have been considered for stormwater run-off from the roads
(d) Carparking

5.2 ROADING DIMENSIONS & LAYOUT

The road layout and details for the development are shown on plans W5991, Drawing No. 001, Sheets 300, 301 and 302 Rev 1 dated 06 December 2019 contained within **Appendix A.**

Proposed Right of Way & Private Driveways – (Road Type E1)

The proposed right of way and private driveways correspond to an E1 type road in table 3.2 of QLDC LDSCOP with some modifications to suit the functional and aesthetic goals of the proposed development. The E1 type road is classed as a rural lane serving 1-6 dwelling units with a target operating speed of 20 km/h. There are no proposed footpaths and pedestrian access is shared on the shoulder and berm.

The road reserve or right of way legal width has been increased from the minimum of 6m to 20m. The proposed roads will have a movement lane width of 3.5m compared with the minimum of 2.5m. Passing is proposed at the site entrance and each of the private driveway entrances. The distance between the passing at the site entrance and passing bay 1 is approximately 125m and is longer than the 100m allowed for under section 3.3.16 of the QLDC LDSCOP. In this case the road is being positioned down a lane of planted trees and a passing bay cannot by constructed without removing some of the trees. Given the low volume of traffic using the road and the available sight distances this distance between passing bays is considered acceptable. The distance between passing bay 1 and 2 is 75m while the distance between parking bay 2 and 3 is 30m.

The driveway pavement will consist of a minimum 150mm compacted depth layer of M4 AP40 road metal. The pavement will not be sealed. This minor departure from the engineering standards is considered acceptable as the road is in a rural area. Grassed swale drains will be formed on either side of a single cross fall driveway. All road grades are between 0.5% and 6.8%.

Existing Private Right of Way

The underlying allotment is currently accessed via Te Awa Road and an existing right of way over the neighbouring properties. The existing right of way currently serves 7 allotments and has a legal width of 8 metres. The existing movement lane is approximately 3.0m wide with some variations up to 3.5m in places and is constructed in metal.

This application seeks to add an additional four users to the existing right of way bringing the total number of users to 11. This corresponds to an E2 type road in table 3.2 of the QLDC LDSCOP. While the legal width of the existing right of way cannot easily be changed without significant negotiation, cost and legal work the movement lane can be partially upgraded to better reflect the requirements of an E2 type road.

An E2 type road requires a movement lane width of 5.5-5.7m. Unfortunately this is not easily achieved due to existing services such as power transformers and existing trees within the 8m legal width. It is proposed to upgrade the width of the existing right of way to 3.5m from Te Awa Road to the proposed site entrance. Two new passing bays and widening around the corner adjacent the underlying allotment are proposed as shown on the plans attached in **Appendix A**. The passing bays will increase the formation width to 5.5m wide over a length of 12m and will have 6m tapers at either end bringing the total length of the passing bay to 24m. The corner is proposed to be widened to 5.5m.

Passing is available at the existing intersection with Te Awa Road. The passing bays are then spaced out along the existing right of way so that the separation is not more than the 100m allowed for under section 3.3.16 of the QLDC LDSCOP.

As mentioned above the existing movement lane is constructed out of metal. The additional widening and passing bays will be kept consistent with this and will consist of a minimum 150mm compacted depth layer of M4 AP40 road metal. The pavement will not be sealed. This minor departure from the engineering standards is considered acceptable as the road is in a rural area.

Given the low volume of traffic using the right of way, the proposed widening to 3.5m, associated passing bays and widening at the corner are considered an acceptable solution to upgrade the right of way.

5.3 TARGET OPERATING SPEEDS

Section 3.3.5 of QLDC LDSCOP states that traffic management shall be included in the road design to ensure that the target operating speeds are achieved. Target operating speed can be managed by physical and psychological devices such as narrowed movement lanes, reduced forward visibility, slow points, build outs, lengths, chicanes, planting and landscaping and street furniture and art works. The two key geometric factors that contribute to achieving the target operating speed are carriageway width and forward visibility.

The lane planting between the site entranceway and passing bay 1 will create a feeling of narrowing and will help to achieve the target operating speed of 20km/h. The location of passing bays and the gravel surface will also promote a lower speed environment.

5.4 LOW IMPACT DESIGN (LID) PRINCIPLES FOR STORMWATER RUNOFF FROM ROADS

LID stormwater for the proposed type of roading is achieved via the use of grassed swales which are proposed to discharge to the existing paddock areas surrounding the proposed subdivision. Runoff will simply continue along established overland flowpaths over existing paddocks which will absorb the runoff via existing grass pasture.

A typical cross section for the proposed road is shown on sheet 301 in **Appendix A.**

5.5 CARAPRKING

Carparking can been provided in accordance with the QLDC LDSCOP fully within each allotment.

6.0 STORMWATER

6.1 PROPOSED STORMWATER MANAGEMENT

The proposed subdivision of 5 lots ranging in size from 1.85ha to 7.99ha sits within wider open paddocks comprised of grass pasture.

As mentioned in section 5.4 above, LID stormwater for the proposed type of roading is achieved via the use of grassed swales which are proposed to discharge to the existing paddock areas surrounding the proposed subdivision. Runoff will simply continue along established overland flowpaths over existing paddocks which will absorb the runoff via existing grass pasture.

The following Low Impact Design (LID) stormwater features are proposed within the subdivision

- Individual Allotment Soakage to Ground – each new allotment will be required to discharge stormwater from the future building and private accessways to ground via stormwater soakage installed at the time building occurs.

- Road Grassed Swales – each new right of way and private driveway access will include grassed swales which will be directed into open pastures along the existing overland flowpath routes. Runoff from the proposed driveways will therefore be dissipated via the existing grassed pastures surrounding the site.

- Attenuation – given the use of grassed swales and soakage to ground no attenuation is required. Furthermore the location of the subdivision within an existing large rural landscape means that any minor increased in runoff will be simply absorbed by the existing pasture surrounding the site.

7.0 WASTEWATER

The geotechnical report considers that each proposed lot is suitable for onsite wastewater disposal. It has recommended that an assessment of ground permeability is required before any waste water system is designed. Each site is capable of installing its own waste water treatment and disposal at the time of building.

The existing dwelling on proposed Lot 1 has an existing operational septic system.

8.0 POTABLE WATER SUPPLY

8.1 PROPOSED POTABLE WATER SUPPLY

The existing allotment is part of the Hawea Water Scheme that pumps water from the Hawea River. The existing dwelling on proposed Lot 1 is supplied water via this scheme.

There is also an existing bore located in the northeast corner of Lot 1 which was installed by McNeill Drilling in 2005. It is proposed to utilise this existing bore to service the subdivision however water from the Hawea Water Scheme is available and could be partially used if necessary. Bacterial and chemical water tests were carried out by Citilab when the water bore was commissioned and show the water as being suitable for drinking purposes. These are attached in **Appendix C** along with the water bore log from McNeill Drilling.

The proposed subdivision will be provided with sufficient water of at least 2100 litres per day to each site. Individual sites will be required to install their own water tank at the time of building to provide sufficient static water for firefighting. These are able to be located adjacent the private accessways to each building platform.

9.0 NETWORK UTILITY SERVICES

Confirmation of supply of power and telecommunications has been obtained from the suppliers of these services. Written confirmations of supply availability are contained in **Appendix B.**

Power & Telecommunications will be supplied to the site from existing infrastructure installed within the existing right of way or Albert Town – Lake Hawea Road.

10.0 CONCLUSION

<u>Earthworks</u>
Earthworks for the site are proposed to create the new right of way and private accesses.

The geotechnical investigation did not identify any issues apart from the requirement to strip and remove all vegetation, topsoil, root affected or other potentially deleterious material prior to placement of fill.

<u>Roading</u>
Roading comprises a simple metal right of way and private access ways to each lot and building platform. Proposed locations for passing bays have been indicated on the concept roading plan.

<u>Stormwater</u>

The subdivision is able to achieve a low impact design by using ground soakage for each individual building platform and through the use of grassed swales along the proposed right of way and private access ways.

Waste Water

The geotechnical report considers that each proposed lot is suitable for onsite wastewater disposal.

Potable Water

It is proposed that each lot will connect into the existing water bore located in the northeast corner of Lot 1.

Network Utility Services

Chorus and Aurora have both confirmed that access to their services is available.

Paterson Pitts Limited Partnership
Hamlin Boyde-Manson
Licensed Cadastral Surveyor

APPENDIX A – EARTHWORKS AND ROADING PLANS

Lot 2 DP 308814

LOT 4

LOT 5

LOT 3

LOT 2

LOT 1

BP 1

BP 2

BP 3

BP 4

BP 5

Lot 7
DP 311830

Lot 6
DP 311830

Lot 5
DP 311830

Lot 4
DP 311830

Lot 1
DP 303793

351.00 350.50 350.00 349.50 349.00 348.50 348.00 347.50 347.00 346.50 346.00 345.50 345.00 344.50 344.00 343.50 343.00 342.50 342.00 341.50 341.00

NOTES

1. The contractor shall be responsible for locating all existing services prior to commencement of works. The contractor shall make good at their own expense any damage to existing services

2. Levels are approximately in terms of Dunedin Vertical Datum 1958

3. All works are to be installed as per the QLDC Land Development and Subdivision Code of Practice. Standard drawings are available from the Engineer

4. Contours at 0.5m interval

LEGEND

CUT
- 3.0m +
- 2.5m to 3.0m
- 2.0m to 2.5m
- 1.5m to 2.0m
- 1.0m to 1.5m
- 0.5m to 1.0m
- 0.2m to 0.5m
- 0.0m to 0.2m

FILL
- 0.0m to 0.2m
- 0.2m to 0.5m
- 0.5m to 1.0m
- 1.0m to 1.5m
- 1.5m to 2.0m
- 2.0m to 2.5m
- 2.5m to 3.0m
- 3.0m +

Depth Contours (at 0.5m intervals)

AA Section Views

Lot Boundaries

Topsoil Strip Area = 5706m²
@250mm = 1427m³

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Client & Location:

T. Berben

161 Te Awa Road, Hawea

Purpose & Drawing Title:

Engineering Drawings
Earthworks
Topsoil Strip Area

Surveyed by:	Others	Original Size:	Scale:
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Drawn by:	HBM		
Checked by:	MJB		DO NOT SCALE
Approved by:	MJB		
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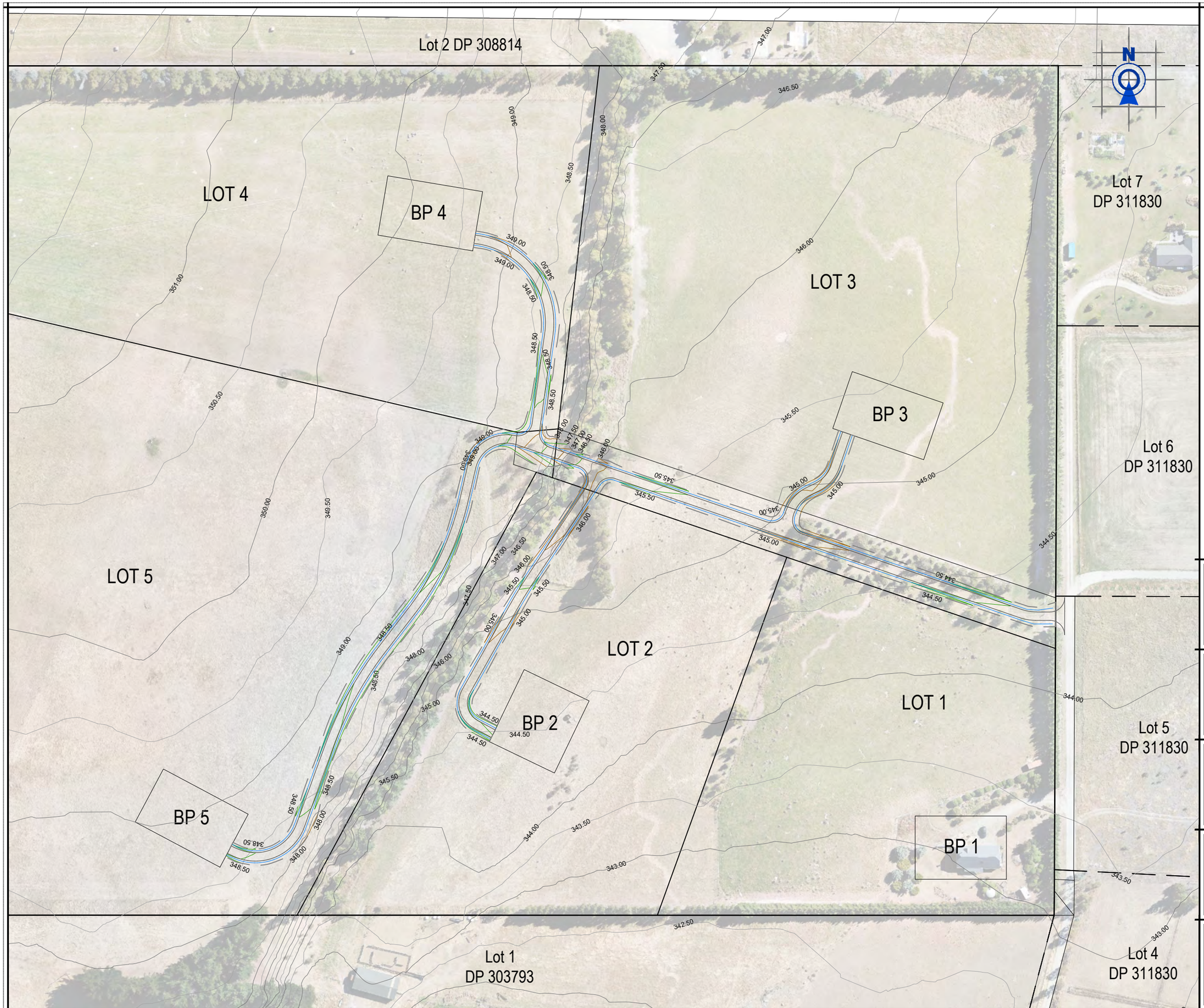

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4. Contours at 0.5m interval

LEGEND

CUT
- 3.0m +
- 2.5m to 3.0m
- 2.0m to 2.5m
- 1.5m to 2.0m
- 1.0m to 1.5m
- 0.5m to 1.0m
- 0.2m to 0.5m
- 0.0m to 0.2m

FILL
- 0.0m to 0.2m
- 0.2m to 0.5m
- 0.5m to 1.0m
- 1.0m to 1.5m
- 1.5m to 2.0m
- 2.0m to 2.5m
- 2.5m to 3.0m
- 3.0m +

Depth Contours (at 0.5m intervals)

AA Section Views

Lot Boundaries

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Client & Location:

T. Berben

161 Te Awa Road, Hawea

Purpose & Drawing Title:

Engineering Drawings
Earthworks
Final Contours

Surveyed by:	Others	Original Size:	Scale:
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4. Contours at 0.5m interval

LEGEND

CUT
- 3.0m +
- 2.5m to 3.0m
- 2.0m to 2.5m
- 1.5m to 2.0m
- 1.0m to 1.5m
- 0.5m to 1.0m
- 0.2m to 0.5m
- 0.0m to 0.2m

FILL
- 0.0m to 0.2m
- 0.2m to 0.5m
- 0.5m to 1.0m
- 1.0m to 1.5m
- 1.5m to 2.0m
- 2.0m to 2.5m
- 2.5m to 3.0m
- 3.0m +

Depth Contours (at 0.5m intervals)

AA Section Views

Lot Boundaries

Earthworks Quantities

Cut volume = 500m³

Fill Volume = 500m³

Earthworks Area = 5706m²

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Client & Location:

T. Berben

161 Te Awa Road, Hawea

Purpose & Drawing Title:

Engineering Drawings
Earthworks
Cut Fill Areas

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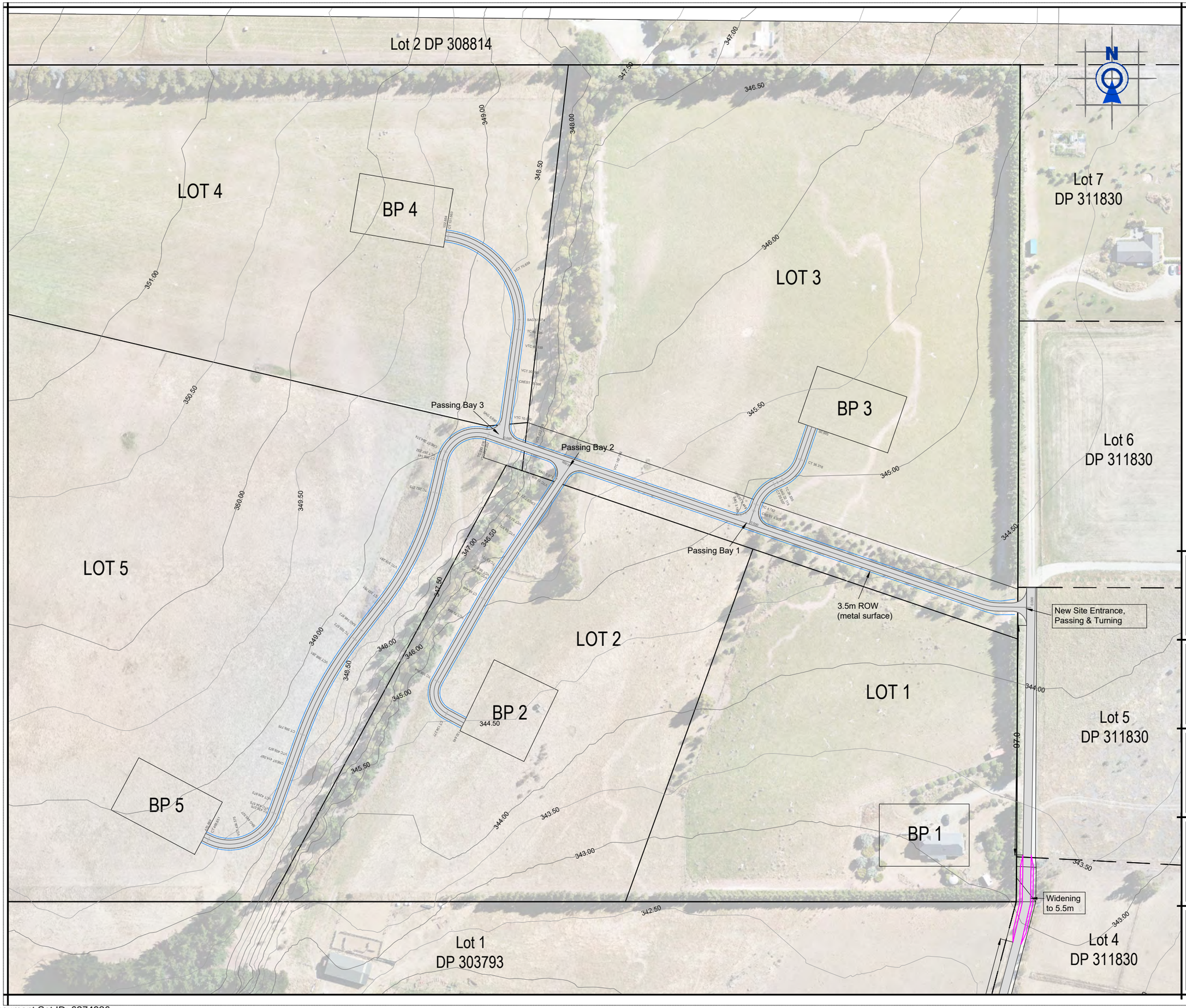

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Purpose & Drawing Title:

Engineering Drawings
Roading Layout

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Approved by:	MJB		
Job No: W5991	Drawing No: 001	Sheet No: 300	Revision No: 1
			Date Created: 06/12/2019

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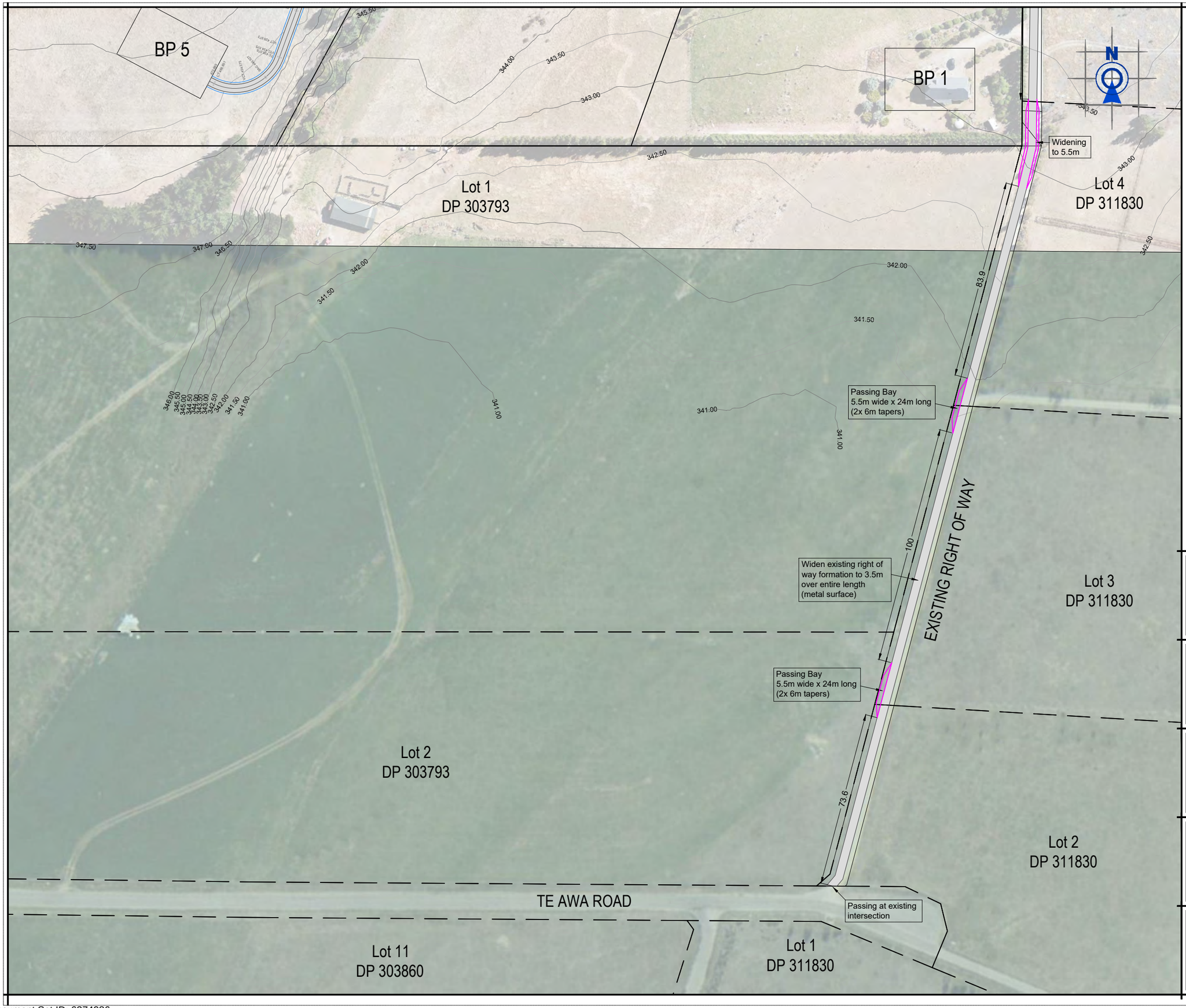

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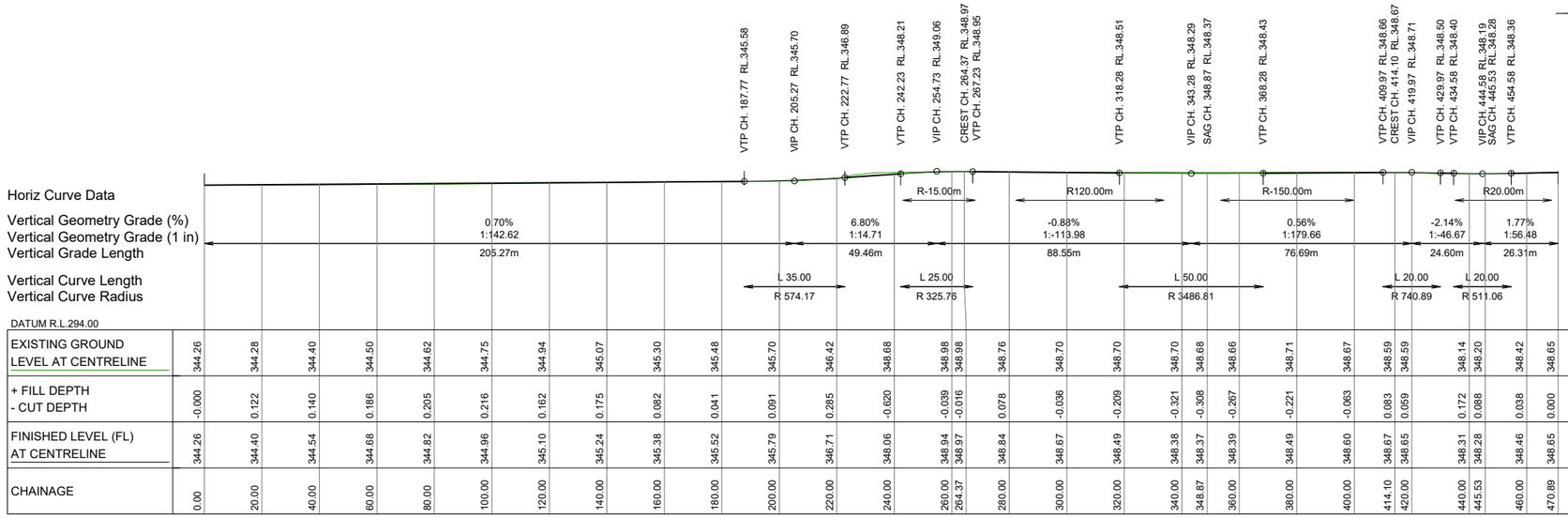

DATUM R.L.294.00

EXISTING GROUND LEVEL AT CENTRELINE	344.26	344.28	344.40	344.50	344.62	344.75	344.94	345.07	345.30	345.48	345.70	346.42	348.68	348.98
+ FILL DEPTH - CUT DEPTH	-0.000	0.122	0.140	0.186	0.205	0.216	0.162	0.175	0.082	0.041	0.091	0.285	-0.620	-0.039
FINISHED LEVEL (FL) AT CENTRELINE	344.26	344.40	344.54	344.68	344.82	344.96	345.10	345.24	345.38	345.52	345.79	346.71	348.06	348.94
CHAINAGE	0.00	20.00	40.00	60.00	80.00	100.00	120.00	140.00	160.00	180.00	200.00	220.00	240.00	260.00

EXISTING GROUND LEVEL AT CENTRELINE	348.98	348.76	348.70	348.70	348.70	348.68	348.66	348.71	348.67	348.59	348.59	348.14	348.20	348.42	348.65
+ FILL DEPTH - CUT DEPTH	-0.016	0.078	-0.036	-0.209	-0.321	-0.308	-0.267	-0.221	-0.063	0.083	0.059	0.172	0.088	0.038	0.000
FINISHED LEVEL (FL) AT CENTRELINE	348.97	348.84	348.67	348.49	348.38	348.37	348.39	348.49	348.60	348.67	348.65	348.31	348.28	348.46	348.65
CHAINAGE	264.37	280.00	300.00	320.00	340.00	348.87	360.00	380.00	400.00	414.10	420.00	440.00	445.53	460.00	470.89

Road 1 Longsection Scale 1:200 @A3

DATUM R.L.294.00

EXISTING GROUND LEVEL AT CENTRELINE	344.98	344.98	344.98	344.98	345.14	345.28
+ FILL DEPTH - CUT DEPTH	0.167	0.299	0.042	0.000	0.030	0.002
FINISHED LEVEL (FL) AT CENTRELINE	345.15	345.28	345.02	344.98	345.17	345.29
CHAINAGE	0.00	5.93	20.00	22.11	40.00	51.00

Road 2 Longsection Scale 1:200 @A3

DATUM R.L.294.00

EXISTING GROUND LEVEL AT CENTRELINE	345.74	345.78	346.10	346.13	346.03	345.40	344.97	344.92	344.62	344.48
+ FILL DEPTH - CUT DEPTH	0.256	0.152	-0.023	-0.049	-0.059	0.070	0.040	-0.105	-0.014	0.000
FINISHED LEVEL (FL) AT CENTRELINE	345.99	345.94	346.08	346.08	345.97	345.47	345.01	344.81	344.61	344.48
CHAINAGE	0.00	1.81	20.00	23.14	40.00	60.00	80.00	100.00	120.00	132.64

Road 3 Longsection Scale 1:200 @A3

DATUM R.L.297.00

EXISTING GROUND LEVEL AT CENTRELINE	348.62	348.59	348.59	348.43	348.24	348.28	348.78	349.33	349.38
+ FILL DEPTH - CUT DEPTH	-0.790	-0.038	0.001	-0.002	0.109	0.126	0.044	-0.018	-0.005
FINISHED LEVEL (FL) AT CENTRELINE	347.83	348.55	348.59	348.43	348.35	348.40	348.82	349.31	349.38
CHAINAGE	0.00	20.00	25.37	40.00	51.07	60.00	80.00	100.00	102.88

Road 4 Longsection Scale 1:200 @A3

TYPICAL CROSS SECTION - Private Accessway Scale 1:50 @A3

NOTES

1. The contractor shall be responsible for locating all existing services prior to commencement of works. The contractor shall make good at their own expense any damage to existing services

2. Levels are approximately in terms of Dunedin Vertical Datum 1958

3. All works are to be installed as per the QLDC Land Development and Subdivision Code of Practice. Standard drawings are available from the Engineer

FOR CONSENT

PATERSONPITTSGROUP
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WANAKA
19 Reece Crescent
or P.O. Box 283
Wanaka 9343
T 03 443 0110
E wanaka@ppgroup.co.nz

Client & Location:

T. Berben
161 Te Awa Road, Hawea

Purpose & Drawing Title:

Engineering Drawings
Roading Sections

Surveyed by:	Others	Original Size: A1	Scale: Varies @ A1 Varies @ A3
Designed by:	HBM		
Drawn by:	HBM		
Checked by:	MJB		
Approved by:	MJB		DO NOT SCALE

Job No:	Drawing No:	Sheet No:	Revision No:	Date Created:
W5991	001	302	1	06/12/2019

C:\12DS\DATA\WKSBSSVR02\W5991 - TONY BERBEN_10150\5 - DRAWINGS\1 - DWG\W5991 ENGINEERING DESIGN.DWG

APPENDIX B – ELECTRICITY & TELECOM SUPPLY CONFIRMATION

Chorus Property Development Team
PO Box 9405
Waikato Mail Centre
Hamilton 3240
Email: develop@chorus.co.nz

Chorus Ref #: WNK53180
Your Ref #:

Tony Berben

29 July 2019

Dear Tony Berben

New Property Development Agreement:
WNK53180 : WNK: 161 Te Awa Road, Albert Town. 5 Lots (Lots 2-5 New, Lot 1 Existing)

Thank you for choosing Chorus New Zealand Limited (Chorus) to connect your development. We will help you get your new build ready and connected to some of the best broadband and voice services available in the world.

Please find attached your New Property Development Agreement and quote based on the scheme plans you have provided. This contract provides details of what we intend to do at your development along with any actions that are your responsibility. We understand there's a lot of information to digest. We recommend you go through the contract with your lawyer if you are concerned about any parts of it.

To progress your development with Chorus:

- Read, sign and complete the required details of the attached agreement to confirm that you accept the conditions and the quoted cost. The quote will expire 90 days from the date of issue. If this happens, you may need to reapply if you want to proceed with connecting your development.

- Once you have signed and sent us the agreement, please pay for your share of the build ($7,360.00 incl. GST) within 30 days. You'll find all the options for payment on Page 2 of your contract.

- When we receive your completed agreement and payment, we will start the process to connect your development to our network. Once the design plan is finalised, we can proceed to provide you with materials and work with you to ensure these are installed correctly.

- Once your development is connected, the new occupants will be able to place an order with their broadband or phone provider to get their services up and running.

- Please take note of the design and build timeframes required to connect your development to our network:
  - Design: up to 28 working days from the date we receive your completed agreement and payment.
  - Build: usually 1-3 months from the materials being installed. This depends on the progress of your development, council requirements, or changes to the scope of work.

Key responsibilities:

So it's clear who does what, we've outlined the jobs that you'll need to do, and what we need to do to get your development connected. More detailed information can be found in your contract.

Jobs for you:

- Provide us with your power plans if you want power and telecommunications in the same trench
- Trenching – opening and backfill
- Notify us by emailing develop@chorus.co.nz when you require the telecommunication materials
- Pick up materials from our depot and store them safely
- Lay the materials – we will oversee this to make sure it meets standard requirements
- Provide us with your 'As Builts' when installation is complete
- Provide us the Land Title Plans showing easements if applicable
- Register easements
- Install the 20mm lead-in greenpipe within the property boundary

See Appendix A for useful guides.

Jobs for Chorus:

- Provide a design based on the scheme plans and power plans you submit to us
- Provide the telecommunication materials to be picked up by you from our depot
- Oversee the laying of the materials in your trenches within your development
- Laying of materials outside of your development e.g. council land
- Jointing, testing and commissioning works once our network is in the ground
- Update our records so the new occupants can connect to the network through their broadband or phone provider
- Send you a clearance letter when your development is complete

Please don't hesitate to contact us if you have any questions, or for more information, visit www.chorus.co.nz/develop-with-chorus. We look forward to working with you.

Regards

Aimee Smith

AURORA ENERGY LIMITED
PO Box 5140, Dunedin 9058
PH 0800 22 00 05
WEB www.auroraenergy.co.nz

25 July 2019

Tony Berben
Aurecon

Sent via email only: tony.berben@aurecongroup.com

Dear Tony,

ELECTRICITY SUPPLY AVAILABILITY FOR PROPOSED FOUR LOT SUBDIVISION.
TE AWA ROAD, LAKE HAWEA – LOT 13 DP 300251.

Thank you for your inquiry outlining the above proposed development.

Subject to technical, legal and commercial requirements, Aurora Energy can make a Point of Supply[1] (PoS) available for this development.

Disclaimer

This letter confirms that a PoS can be made available. This letter does not imply that a PoS is available now, or that Aurora Energy will make a PoS available at its cost.

Next Steps

To arrange an electricity connection to the Aurora Energy network, a connection application will be required. General and technical requirements for electricity connections are contained in Aurora Energy's Network Connection Standard. Connection application forms and the Network Connection Standard are available from www.auroraenergy.co.nz.

Yours sincerely

Richard Starkey
COMMERCIAL MANAGER

[1] Point of Supply is defined in section 2(3) of the Electricity Act 1993.

APPENDIX C – WATER BORE LOG AND WATER TESTS

Citilab
Analysts Consultants

new zealand accredited laboratory

LABORATORY ANALYSIS REPORT

#21959

Thursday, 14 April 2005

McNeill Drilling
(Boundary Rd)
P.O. Box 95
ALEXANDRA

ATTENTION: Graeme Stewart

Your Order #:- D61459 .

Job Start:24/03/05 11:02:18

LAB. REF.	Sample Taken:	Sample Description	Test start:	Test complete:	ANALYSIS	RESULT	comments Analytical Method	Detection Limits
85970	23/03/05 16:30:00	Tony Berben ~ Bore Water					.... (Citilab to include explanatory notes with report)	
			25/03/05 14:13:50	29/03/05 15:47:24	Acidity Requires CO2	22 g/m³ as CaCO3	APHA 2310, B	1 g/m³ as CaCO3
			24/03/05 17:17:56	29/03/05 10:14:28	Alkalinity to pH 4.5	30 g/m³ as CaCO3	APHA 2320, B	1 g/m³ as CaCO3
			24/03/05 17:17:57	29/03/05 10:15:26	Alkalinity to pH 8.3	<1 g/m³ as CaCO3	APHA 2320, B	1 g/m³ as CaCO3
>> Referral: Hill Laboratories, Hamilton.			25/03/05 14:13:57	14/04/05 10:57:11	Bromide (IC) Referral	<0.05 g/m³	Ion Chromatography	0.05 g/m³
>> Referral: Hill Laboratories, Hamilton.			25/03/05 14:14:00	14/04/05 10:57:14	Chloride (IC) Referral	1.3 g/m³	Ion Chromatography	0.5 g/m³
			24/03/05 17:18:00	31/03/05 17:11:24	Colour *	<0.5 C.P.U	Spectrophotometer	0.5 C.P.U.
			24/03/05 17:18:01	25/03/05 14:19:48	Conductivity	8.6 mS/m	APHA 2510, B	0.01 mS/m
>> Referral: Hill Laboratories, Hamilton.			25/03/05 14:14:17	14/04/05 10:57:15	Fluoride (IC) Referral	0.14 g/m³	Ion Chromatography	0.05 g/m³
			13/04/05 16:47:02	14/04/05 10:57:18	Total Hardness By Calculation	28.3 g/m³ as CaCO3	APHA 2340, C	2 g/m³ as CaCO3
			24/03/05 15:08:09	24/03/05 16:14:54	pH	6.35 @ 20°C	APHA 4500 - H+, B	0.02 pH unit
>> Referral: Hill Laboratories, Hamilton.			25/03/05 14:14:36	14/04/05 10:57:22	Phosphate (IC) Referral	<0.4 g/m³	Ion Chromatography	0.4 g/m³
>> Referral: Hill Laboratories, Hamilton.			25/03/05 14:14:37	14/04/05 10:57:23	Sulphate (IC) Referral	5.0 g/m³	Ion Chromatography	0.5 g/m³
			24/03/05 15:07:50	24/03/05 16:48:16	Turbidity - class 1	40 NTU	APHA 2130, B	0.05 NTU
>> Referral: Hill Laboratories, Hamilton.			25/03/05 14:13:55	14/04/05 10:57:26	Arsenic-Total Referral	0.001 g/m³	ICP-MS	0.001 g/m³
>> Referral: Hill Laboratories, Hamilton.			25/03/05 14:13:58	14/04/05 10:57:29	Calcium-Total (ICP) ICP-MS (Referral)	8.59 g/m³	ICP-MS	0.05 g/m³
>> Referral: Hill Laboratories, Hamilton.			25/03/05 14:14:18	14/04/05 10:57:34	Iron-Total (ICP) ICP-MS (Referral)	2.49 g/m³	ICP-MS	0.02 g/m³
>> Referral: Hill Laboratories, Hamilton.			25/03/05 14:14:20	14/04/05 10:57:37	Magnesium-Total (ICP) ICP-MS (Referral)	1.66 g/m³	ICP-MS	0.02 g/m³
>> Referral: Hill Laboratories, Hamilton.			25/03/05 14:14:22	14/04/05 10:57:39	Manganese-Total (ICP) ICP-MS (Referral)	0.0370 g/m³	ICP-MS	0.0005 g/m³
			24/03/05 11:19:47	29/03/05 16:07:53	E. coli (Quanti-Tray)	<1.0 MPN/100 mL	Inhouse	1.0 MPN/100 mL
>> Referral: Hill Laboratories, Hamilton.			25/03/05 14:14:23	14/04/05 10:57:40	Nitrate (IC) Referral	8.4 g/m³	Ion Chromatography	0.02 g/m³

Analyst's Comments: Units: In accordance with modern practice the previous 'mg/L' is now expressed as the equivalent 'g/m³'.

These samples were collected by yourselves and analysed as received at the laboratory.

The detection limits given are those attainable in a relatively clean matrix. Detection limits may be higher for individual samples should insufficient sample be available, or if the matrix requires that dilutions be performed during analysis.

Dr. Frank Ho
Laboratory Services Manager

new zealand accredited laboratory

Citilab is accredited by International Accreditation New Zealand (IANZ).
The tests reported here have been performed in accordance with its terms of accreditation - with exception of any marked *, which are not accredited.

Richard Allan
Microbiology Technician

10 Tahuna Rd, P.O. Box 781, Dunedin
Telephone (03) 455 7938, Fax (03) 455 7940
Email: mail@citilab.co.nz
Website: www.citilab.co.nz

Citilab Analysts Consultants

new zealand accredited laboratory

Sample 85970 Tony Berben — Batch 21959

Determinants	Results (mg/L or specified)	MAV[1] or GV[2]	Target range	Comments
Acidity	22	-	Low	Ok
Alkalinity	30	-	Low	Ok
Bromide	<0.05	-	Low	Ok
Chloride	1.3	250	<250	Ok
Colour	<0.5	10 (CPU)	<5 (CPU)	Ok
Conductivity	8.6	-	<40, low	Ok
Fluoride	0.14	1.5	<0.75	Ok
Total hardness	28.3	200	<200	Soft
pH	6.35	7.0 to 8.0	7.0 to 8.5	Low*
Phosphate	<0.4	-	low	Ok
Sulphate	5.0	250	<125	Ok
Turbidity (1)	40	<2.5 NTU	<2.5 NTU	High*
Total arsenic	0.001	0.01	<0.005	Ok
Total calcium	8.59	-	low	Ok
Total iron	2.49	0.2	<0.2	High*
Total magnesium	1.66	-	low	Ok
Total manganese	0.0370	0.5	<0.5	Ok
E.coli	<1.0	<1	<1	Ok
Nitrate	8.4	50	<25	Ok

[1]MAV means Maximum Acceptable Values quoted from Drinking Water Standards for New Zealand 2000. [2]GV means Guideline Values from the same source above.
mg/L equals to g/L and is often quoted as ppm (parts per million).

Overall comment:

The water is deemed to be **SUITABLE** for drinking purpose with respect to the tested parameters according to the New Zealand Drinking Water Standards. The low pH indicated that the water was slightly "aggressive" and as such may cause corrosion on metal surfaces under certain circumstances. The iron content was high and as such can cause usually staining to laundries and cooking utensils. The water was quite turbid and an appropriate filtration or sedimentation system should be able to bring about significant improvement in turbidity and possibly the iron content.

Frank Ho

Dr. Frank Ho
Manager
Laboratory Services

10 Tahuna Rd, P.O. Box 781, Dunedin
Telephone (03) 455 7938, Fax (03) 455 7940
Email: mail@citilab.co.nz
Website: www.citilab.co.nz

MCNEILL DRILLING

MCNEILL DRILLING CO. LTD

WATER BORE/WELL SUMMARY FORM

CLIENTS NAME: Tony Berben PO Box 436 Wanaka	RESOURCE CONSENT NO:
FULL ADDRESS: 161 TeAwa Road Hawea	BORE SIZE: 150mm
RAPID NO:	START DATE: 22.03.05
GRID REFERENCE: E2212237 N5613255	FINISH DATE: 23.03.05
DRILLER: Mike Simmons	
MEASURED FROM: Ground Level	MACHINE: TH60
TOTAL DEPTH BORE: 27.68	DRILL METHOD: Tubex
TOP LEADER: 24.90	
STATIC WATER LEVEL: 21.56	
SCREEN: SLOT: 2.5mm	LENGTH: 1.00
TYPE: Stainless Steel	SIZE: 140mm
PVC SLOTTED: TOP:	BASE:
SCREEN/LEADER/SUMP: 2.78	SUMP SIZE: 125mm
TOTAL CASING USED: 25.25	
AIRLIFTED/PUMPED AT: 81 litres per minute	
TEST PUMP PERIOD: 1 hour and 30 minutes	
DRAWDOWN FROM SWL: 0.18	
AIR/PUMP INTAKE: 23.90	
BACTERIAL WATER TEST: Citilab	
CHEMICAL WATER TEST: Citilab	
EXTRA NOTES: 1.60 1.00 0.12	
2.78	

BORE LOG:	
0.00 – 0.30	Top soil
0.30 – 1.00	Yellow silt
1.00 – 1.50	Yellow sandy coarse gravel
1.50 – 12.40	Coarse cobbley gravel
12.40 – 23.30	Yellow silty coarse gravel
23.30 – 26.10	Yellow silty sandy gravel
26.10 – 30.20	Coarse silty sand
30.20 – 36.50	Fine silty sand
36.50 – 39.00	Grey silt

GEOTECHNICAL ASSESSMENT REPORT

PPG TE AWA GEOTECH

161 TE AWA ROAD
HAWEA FLAT

CLIENT: TONY BERBEN

DATE: 18 October 2019

JOB REF: G20084

MT IRON GEODRILL
info@mtirongeodrill.com (03) 443 7491 027 5342589 mtirongeodrill.com

TABLE OF CONTENTS

Gavin Tippett
Engineering Geologist
B.Sc (Geol), P.G.Dip.Eng.Geol, M.Sc (Eng.Geol), MEngNZ

ENGINEERING NEW ZEALAND OFFICIAL MEMBER

1 INTRODUCTION

This report presents the results of a geotechnical assessment carried out by Mt Iron Geodrill on behalf of Tony Berben for the proposed development of LOT 13 DP 300251 located at 161 Te Awa Road, Hāwea Flat as indicated in the attached Appendix A.

The work was commissioned by Tony Berben in a signed SFA, dated 7 August 2019.

The scope of work for the geotechnical assessment includes recommendations on:

- Natural hazards assessment
- Liquefaction assessment
- Foundation bearing capacity assessment for design
- Suitability for onsite wastewater disposal
- Suitability for onsite stormwater disposal
- Suitability for onsite material reuse as fill

Mt Iron Geodrill conducted the work in general accordance with our proposal, reference G20084 PPG Te Awa Geotech dated 5 August 2019.

The following report presents the results of field investigations, provides discussion and recommendations relevant to the above scope of work.

Limitations

Findings presented as a part of this report are for the sole use of Tony Berben and the Queenstown Lakes District Council in accordance with the specific scope and the purposes outlined above. While other parties may find this reporting useful, the findings are not intended for use by other parties and may not contain sufficient information for the purposes of other parties or other uses.

Our professional services are performed using a degree of care and skill normally exercised, under similar circumstances, by reputable consultants practising in this field at this time. No other warranty, expressed or implied, is made as to the professional advice presented in this report.

1.1 RELATED DOCUMENTS

The following sources were used in compiling this report:

- NZS 3604: 2011 Timber Framed Buildings
- NZS 1170.5: 2004 Structural design actions Part 5 Earthquake actions – New Zealand
- Geology of the Wakatipu area 1:250,000 QMap (Qm18), GNS Science: 2000
- QLDC GIS Web maps
- ORC Publication, - Seismic Hazard in Queenstown Lakes District, August 2015

2 SITE INFORMATION

- The property is located at 161 Te Awa Road, Hawea Flat (LOT 13 DP 300251).
- The property is approximately 20ha in size and is roughly rectangular in shape
- The property has an existing two-story building in the southeast corner of the site.
- The adjacent sites to the North and East are pasture land for livestock grazing with low-density housing.
- The property is situated on the outwash plains of the relic Hawea glacier which has been reworked by the Hawea River (situated to the east of the site)
- No known geotechnical reports have been done for the site.

Investigation was undertaken across five different areas of the property for a proposed development. This being the proposed five lots.

Figure 1 - Site location is shown by the red arrow

3 GEOLOGY

The geology of the site is mapped by the Qm18 as comprising:

- *OIS2 (Late Pleistocene) outwash deposits– Unweathered to slightly weathered, well sorted, sandy gravel forming large outwash terraces in Clutha catchment.*

With the below unit being mapped in the western part of the site:

- *OIS1 (Holocene) fan deposits - loose, commonly angular, boulders, gravel, sand, and silt forming alluvial fans; grades into scree (upslope) & valley alluvium*

The Qmap is at a 1:250,000 scale so only details the larger units present. Site investigations have confirmed both the Fan deposits in the western part of the site and the outwash deposits on the eastern part.

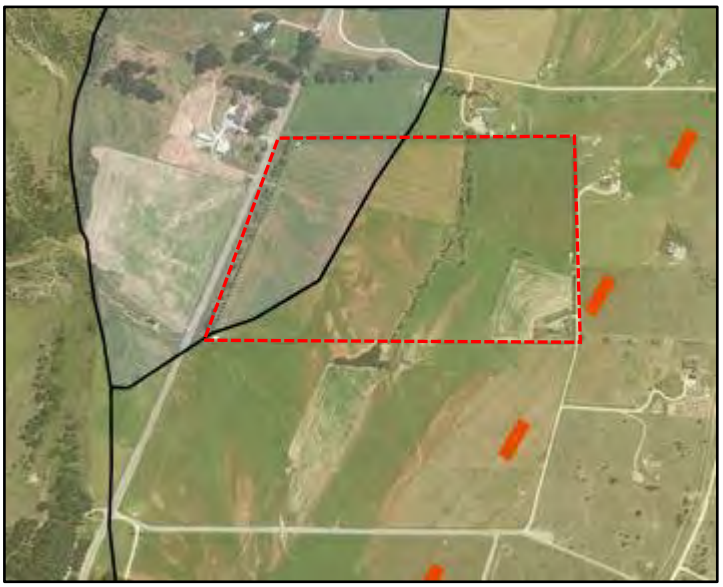


Figure 2 - Geology Map (site outlined in red), dashed orange line is the approximate location of NW Cardrona Fault, pale blue (western part of site) is the fan deposits and pale yellow (eastern part of site) is outwash deposits. North is top of page.

The soils underlying the site are the result of deposition of sediments from the glacial outwash from the Hāwea Formation Glacier. These deposits appear to have been overprinted to some degree by alluvial fan deposits from several small creeks running off the hills to the west of the site, namely the Gray Brun, with reworking and deposition of the Hawea River coincidental to the processes. These processes are likely to have occurred for at least 18,000 years.

The soil profiles onsite are typical fan deposits with a semi-chaotic nature with grain sizes ranging from silt through to boulders. These deposits show some layering but are generally variable in both vertical and lateral extents. Lenses of different material can be found within soil types, i.e. sand lenses found within silty soils.

No active faults were mapped in the field, however the active Cardrona fault shown on the published Qm 18 is mapped to past the southeast corner of the site (approximately southwest to northeast), although the actual position of the fault is unknown where it crosses the glacial sediments, as there is no visible fault trace. It is believed that the return period for a rupture event on the NW Cardrona fault is in the order of 6200 years for a magnitude 7 event. It is therefore likely that at least two events of this size have occurred since the deposition of the sediments underlying the subject site. As there is no visible fault trace across the glacial deposits then it is likely that movement has been taken up by the sediments across the Wanaka basin or that there has been no movement along this part of the fault.

It is considered that the former model is more likely as there is evidence for several movements of the fault further south in the Cardrona Valley which have occurred since the deposition of the sediments in the Wanaka basin.

There is a significant seismic risk to the Wanaka region when the rupture of the alpine fault system occurs; recent probability predictions estimate a magnitude 7.5 or greater is highly likely within the next 45 years. Significant ground shaking is expected from this type of event.

4 SITE ASSESSMENT

Site assessment involved both onsite investigation and desktop study of available data and reports. The desktop study consisted of:

- Review of existing data and reports for the area;
- Air photo interpretation.

Fieldwork was carried out on the 19 March 2019 and comprised of:

- Geotechnical observations of outcrops and cuttings on and near the site.
- Eight (8) Test Pits
- Nine (9) Boreholes
- Ten (10) Shear Vane Tests
- Five (5) Scala Penetrometer Tests (several not done due to unfavourable ground conditions).

All fieldwork was carried out in the full-time presence of a Mt Iron Geodrill representative who located the test pits, carried out testing and produced engineering logs of the test pits and boreholes.

Test pits were located by handheld GPS using zone 59 UTM co-ordinates, with an error of ± 4m. Approximate locations are shown in Appendix A.

5 RESULTS OF INVESTIGATION

5.1 SURFACE CONDITIONS

Surface conditions at the time of site visit, including:

- The site is relativity flat with a terrace riser transecting the site (from south to north) in approximately the centre of the site.
- No evidence of land instability was observed onsite during the time of field investigation.
- No water springs or seeps where observed during the site visit
- There are numerous mature trees in tree lanes around the sides of the current paddocks.
- The site is currently used for stock grazing

5.2 INTERPRETED SUBSURFACE CONDITIONS

The typical soil types encountered during the field investigations have been divided into four (4) geotechnical units as summarised in Table 1. Engineering logs of the test pits are presented in Appendix B.

TABLE 1 – SUMMARY OF GEOTECHNICAL UNITS AND SOIL TYPES

UNIT	SOIL TYPE	DESCRIPTION
1	TOPSOIL	TOPSOIL - SILT: pale grey, organic, high dilatancy silt
2a	FINE ALLUVIUM	SILT: light brown, low to moderate dilatancy, low plasticity silt, some minor sub-rounded, poorly graded gravel.
2b	FINE ALLUVIUM	Sandy SILT: brown, low to moderate dilatancy, low plasticity silt, fine grained sand.
3a	ALLUVIUM	Silty GRAVEL: brown, fine to coarse, well graded, sub-rounded to angular gravel, moderate dilatancy silt.
3b	ALLUVIUM	Gravelly SILT: brown, moderate dilatancy silt, some fine to coarse, poorly graded gravel with frequent cobbles < 200mm.
4	ALLUVIUM	Sandy GRAVEL: grey brown, fine to coarse, well graded, rounded to sub-angular gravel, fine to coarse, well graded sand, some fines.

Table 2 contains a summary of the distribution of the above geotechnical units in each borehole location.

TABLE 2 – SUMMARY OF DISTRIBUTION OF GEOTECHNICAL UNITS ENCOUNTERED AT TEST PIT LOCATIONS

LOCATION	DEPTH ENCOUNTERED BELOW EXISTING GROUND LEVEL (m)					
	UNIT 1	UNIT 2a	UNIT 2b	UNIT 3a	UNIT 3b	UNIT 4
TP1	0.0 - 0.3	0.3 - >1.8	-	-	-	-
TP2	0.0 - 0.3	0.3 - 1.5	1.5 - >1.8	-	-	-
TP3	0.0 - 0.3	0.3 - 0.9	-	0.9 - >1.5	-	-
TP4	0.0 - 0.3	0.3 - 1.0	-	1.0 - >1.5	-	-
TP5	0.0 - 0.3	0.3 - 0.5	-	0.5 - 0.8	-	0.8 - >1.8
TP6	0.0 - 0.3	0.3 - 1.2	-	-	-	1.2 - >1.8
TP7	0.0 - 0.3	-	-	-	-	0.3 - >1.5
TP8	0.0 - 0.3	0.3 - 0.5	-	-	-	0.5 - >1.8
BH1	0.0 - 0.3	0.3 - >0.5	-	-	-	-
BH2	0.0 - 0.3	0.3 - >0.5	-	-	-	-
BH3	0.0 - 0.3	0.3 - >0.6	-	-	-	-
BH4	0.0 - 0.3	0.3 - >0.4	-	-	-	-
BH5	0.0 - 0.3	0.3 - >0.5	-	-	-	-
BH6	0.0 - 0.3	0.3 - >0.6	-	-	-	-
BH7	0.0 - 0.3	-	-	-	0.3 - >0.5	-
BH8	0.0 - 0.3	0.3 - 1.0	-	1.0 - >1.1	-	-
BH9	0.0 - 0.3	0.3 - 1.0	-	1.0 - >1.1	-	-

- Unit not encountered

> Unit extends below depth

5.3 SHEAR VANE RESULTS

The results of shearvane testing are shown below. results are to be considered to be undrained condition.

TABLE 3 - VANE SHEAR RESULTS

TEST LOCATION	TEST DEPTH (m)	MATERIAL	PEAK SHEAR (kPa)	RESIDUAL SHEAR (kPa)
TP1	0.5	SILT	109	32
TP2	0.5	SILT	151	32
BH1	0.5	SILT	144	32
BH2	0.5	SILT	193	67
BH3	0.6	SILT	217	128
TP3	0.5	SILT	215	55
TP4	0.5	SILT	156	35
BH5	0.5	SILT	173	40
TP5	0.4	SILT	151	80
TP6	0.5	SILT	176	109
BH6	0.5	SILT	225	193
BH8	0.5	SILT	215	55
BH9	0.5	SILT	215	55

It is considered likely that BH3, TP6 and BH6 results may have been influenced by sand within the silt material causing higher than expect residual values.

5.4 EXISTING FILL

No fill was encountered on the site during the site investigation. If it is found that the site was subject to earthworks, then Mt Iron Geodrill should be advised as soon as practicable.

6 GROUNDWATER

Groundwater inflows were not observed in any of the test pits or boreholes at the time of the field investigations. The depth to water was not established during the site visit.

A search of ORC bore records in the area indicate that groundwater is likely to be at a depth of greater than ~10m. There are several recorded bores in the local area, of which only a couple record depth to water. There is a bore approximately 500m from the site towards Mt Aspiring Rd which has a recorded water depth of 10.5m. Others in the wider area record depth to water as ~8m and 14.9m. however, these are somewhat distant to the site and may not provide an accurate indication to the depth of water at the site.

It should be noted that fluctuations in the groundwater levels can occur as a result of seasonal variations, temperature, rainfall and other similar factors, the influence of which may not have been apparent at the time of investigation.

7 LABORATORY TESTING

No material was sampled for laboratory testing.

8 NATURAL HAZARDS

The following Natural Hazards have been identified for the site:

- Alluvial Fan
- Overland flow
- Seismic Fault

A seismic ground shaking risk for the Wanaka region, on the whole, has been identified and prudent design to mitigate the risk of seismic ground shaking should be applied to all proposed structures. Design to the relevant structural and building codes is expected to mitigate this issue.

Freeze and thaw effects are relevant for the region and it is recommended that all foundations are embedded at least 0.4m below finished ground levels with careful consideration given to final ground level clearances from exterior claddings.

8.1 FLOODING & ALLUVIAL FANS

The risk of flooding has been included with the alluvial fan hazard as it is considered they are one and the same for this site.

Based on the geomorphology, aerial photographs and QLDC GIS Web-maps, it appears that the subject property sits within an alluvial fan zone (Grayburn South). It is known that there is a low flooding risk associated with two small streams, which run down from the hills one past he southwest corner of the site and the other larger stream approximately 50m to the north. limited Control works have been undertaken within the creek to the north help control flooding downstream. Flooding and alluvial fan risk to the site is considered to be low.

However, to further reduce the risk of flooding to buildings it is recommended that the finished floor heights should be at least 300mm higher than the surrounding ground and the use of landscaping be considered to direct water away from the house. Landscape design should be such that land modification does not result in the pooling of water around the house.

8.2 SEISMIC FAULTS

As outlined in Section 3 above the Northwest Cardrona Fault is mapped to through the southeastern corner of the site.

However, the actual position of the fault is unknown where it crosses the glacial sediments, as there is no visible fault trace. It is believed that the return period for a rupture event on the NW Cardrona fault is in the order of 6200 years for a magnitude 7 event. It is therefore likely that at least two events of this size have occurred since the deposition of the sediments underlying the subject site. As there is no visible fault trace across the glacial deposits then it is likely that movement has been taken up by the sediments across the Wanaka basin or that there has been no movement along this part of the fault.

It is considered that the former model is more likely as there is evidence for several movements of the fault further south in the Cardrona Valley which have occurred since the deposition of the sediments in the Wanaka basin.

It is expected that rupture on the NW Cardrona Fault would produce Peak Ground Accelerations (PGA) in the order of 0.4g. However, the risk to buildings at the site are considered to be the same as for those in the wider Wanaka area.

The greater risk to the site and the again the wider Wanaka area is from the Alpine Fault, approximately 75km to the west. It is believed that the Alpine Fault could be capable of producing a magnitude 8.0 event and has a recurrence interval of 350 - 400 years. It is expected likely to a magnitude 7.5 or greater event could occur in the next 45 years. An alpine Fault event is likely to result in PGA of 0.3g for the region.

Therefore it is considered that the overall risk to the site is no greater than for any other site in the local area.

9 DISCUSSION AND RECOMMENDATIONS

9.1 SITE PREPARATION

Site preparation and earthworks suitable for structure and pavement support should consist of:

- Prior to the placement of any new fill, the proposed areas should be stripped to remove all vegetation, topsoil, root affected or other potentially deleterious material. Stripping is generally expected to be required to depths of about 0.3m;
- New site fill beneath structures should be compacted to a minimum density ratio of 95% Standard Compaction within acceptable limits of optimum moisture content (OMC);
- All new fill should be supported by properly designed and constructed retaining walls or else battered at 1V:2H or flatter and protected against erosion;
- Earthworks should be in accordance with the recommendations of NZS 4431:1989 '*Earth Fill for Residential development'.*

9.2 EXCAVATION CONDITIONS

Where excavation is required, it is anticipated that all site materials could be excavated by conventional dozer blade or excavator (1.7 ton) bucket at least to the depths indicated on the appended logs. The depths of topsoil material, depth to rock and levels of refusal, where encountered, during fieldwork are summarised in Table 2.

9.3 SUITABILITY OF SITE SOILS AS FILL

It is recommended that the site soils are not reused as structural fill. They may only be used for landscaping only.

9.4 SUBSOIL SUBCLASS FOR SEISMIC DESIGN

Soils on this site are considered to fall in the site subsoil 'Class D – Deep Soil sites' in accordance with NZS 1170.5.2004.

9.5 BEARING CAPACITY STRESSES AND SETTLEMENT

Below are the preliminary bearing capacities for each of the building platforms for the proposed lots. It is recommended that each building platform be fully assessed at the time of building consent once the final type of building, footing system and footprint are known.

TABLE 4 - PRELIMINARY BEARING CAPACITY RESULTS

LOT	ALLOWABLE BEARING CAPACITY (kPa)	GOOD GROUND NEAR SURFACE	DEPTH GOOD GROUND ENCOUNTERED	SOIL CONDITIONS
1	70	NO	1.1m	Silts overlying Gravels
2	70	NO	1m	Silts overlying Gravels
3	70	NO	N/A	Silts
4	70	NO	1.2m	Silts overlying Gravels
5	100	YES	0.4m	Loose boulder gravels

9.5.1 Calculations

Bearing capacity assessed using the Terzaghi bearing capacity equation.

$$Gross\ q_{ult} = cN_c + p_oN_q + 1/2\gamma BN_\gamma$$

Where:

q_{ult} = ultimate bearing capacity of the soil
cN_c = is due to cohesion and friction in the soil
p_o = total over burden pressure at the foundation level
γ = bulk unit weight of the soil
B = width of the footing (for strip footing)
N_c, N_q & N_γ are termed bearing capacity factors and are related to the friction angle of the soil

The soil parameters used for the bearing capacity assessment are detailed in Table 2 below

A standard footing size of 0.4m wide by 0.4m embedment has been used for the calculations. These dimensions are considered to be consistent with NZS3604:2011 standard footings. All calculations assume drained conditions.

TABLE 5 - BEARING CAPACITY SOIL PARAMETERS

PARAMETER	SILTS	GRAVELS (Lot 5)
Ø (Friction Angle)	28°	35°
γ (bulk unit weight of soil below footing level)	17 kN/m^3	18 kN/m^3
γ (bulk unit weight of soil above footing level)	16 kN/m^3	17 kN/m^3
C (cohesion)	3 kN	-
c_u (shear strength of soil)	144	-
B (Width of footing)	0.4 m	0.4 m
(depth of embedment)	0.4 m	0.4 m
CALCULATED ULTIMATE BEARING CAPACITY q_{ult}	210 kPa (Strip Footing)	>300 kPa (Strip Footing)

Once the Gross Ultimate Bearing Capacity q_{ult} is gained it is divided by 3 to get the Allowable bearing capacity for the soil at foundation level.

There is a slight advantage to using a depth factor in the calculations of bearing capacity, but these are used with caution which has been done in this case. Based on the parameters above and a strip footing width of 0.4 m and embedment depth of 0.4 m an allowable bearing capacity of 70 kPa is highly likely to be achieved in the silt materials.

As the results are lower than the 300kPa requirement in NZS 3604:2011 for good ground Mt Iron Geodrill consider that likely solutions could include either:

- Have specific engineering and design conducted for the lower bearing capacities encountered for standard strip type footings. These could include larger footings to provide lower bearing pressures, or undercut and compacted fill replacement;
- Footings extended to bear below these depths with driven timber piles in accordance with NZS3604:2011 section 6.6, with design undertaken by a suitability qualified person;
- Use of raft type slab system designed by a suitability qualified person.

Please note that where fill is placed under a residential building it must be placed in accordance with NZS4431 and where the depth of fill exceeds 600mm it must be certified by an inspecting engineer in accordance with that Standard.

If specific design of the footings is the chosen option, based on the lower estimated bearing capacities onsite, we can provide more advice and liase with the structural engineer as required.

At the time of construction, all foundation excavation subgrades should be inspected by a suitably qualified Geoprofessional to ensure foundation conditions are as reported and the appropriate design assumptions for bearing capacity by the structural engineer are met.

9.6 BATTER SLOPE ANGLES

Temporary and permanent batter angles are summarised in the table below up to a maximum cut height of 3.0 m in fully drained conditions. Batters greater than 3.0m high will need specific inspection and assessment by a suitably qualified geotechnical professional during construction. Where more than one soil type is present in the batter slope the batter must still be to the slopes recommended for each type.

Should water or seepage be encountered during excavation of the proposed batters then a Geoprofessional shall assess additional slope drainage requirements. The type, spacing and details would be confirmed at that stage.

Where steeper batters than those recommended are proposed, they will be subject to specific design by a geotechnical professional.

TABLE 6 – BATTER ANGLE SUMMARY

Material Type	Temporary Construction Batters (H):(V)	Permanent Batters (H):(V) (unretained)
Engineered Fill	1:1	2:1
Soils encountered	1:1	2:1

9.7 GEOTECHNICAL SOIL PARAMETERS

Geotechnical soil parameters for retaining design are tabulated below:

TABLE 7 – GEOTECHNICAL SOIL PARAMETERS

Soil/Rock Type	Bulk Density (kN/m^3)	Effective Cohesion (kPa)	Effective Friction Angle (˚)
Topsoil/Fill	16	-	25
Engineered Fill	18	0	30
Natural soils (silts)	17	3	28
Natural soils (gravels)	18	0	35

All retaining structures should be designed by a Chartered Professional Engineer and have full height of retaining drainage measures installed with a collection drain at the base, to suitable outfall to the stormwater system.

9.8 SUITABILITY FOR ONSITE STORMWATER DISPOSAL

It is considered that the site is suitable for onsite stormwater disposal. It is considered that any area of each lot could be used for soak pit installation, however site-specific assessment and design would need to be undertaken. All soak pit should be kept away from service trenches and at least 1.5 times the depth of the pit from all footings.

9.9 SUITABILITY FOR ONSITE WASTEWATER DISPOSAL

It is considered that each proposed lot is suitable for onsite wastewater disposal.

It is highly recommended that assessment of ground permeability will be required before any wastewater design is undertaken.

Consideration will need to be given to the type and layout of systems used at the time of design.

10 CONCLUSIONS

Geotechnical investigation was carried out on the proposed five lots within the subject property. Provided the recommendations made in this report are adhered to, we consider that the proposed sub-division is geotechnically suitable.

11 APPLICABILITY

This report is only to be used by the parties named above for the purpose that it was prepared and shall not be relied upon or used for any other purpose without the express written consent of the principal and Mt Iron Geodrill Ltd.

The extent of testing associated with this assessment is limited to discrete locations and variations in ground conditions can occur between and away from such locations. If subsurface conditions encountered during construction differ from those given in this report further advice should be sought without delay.

12 COMPETENCY STATEMENT

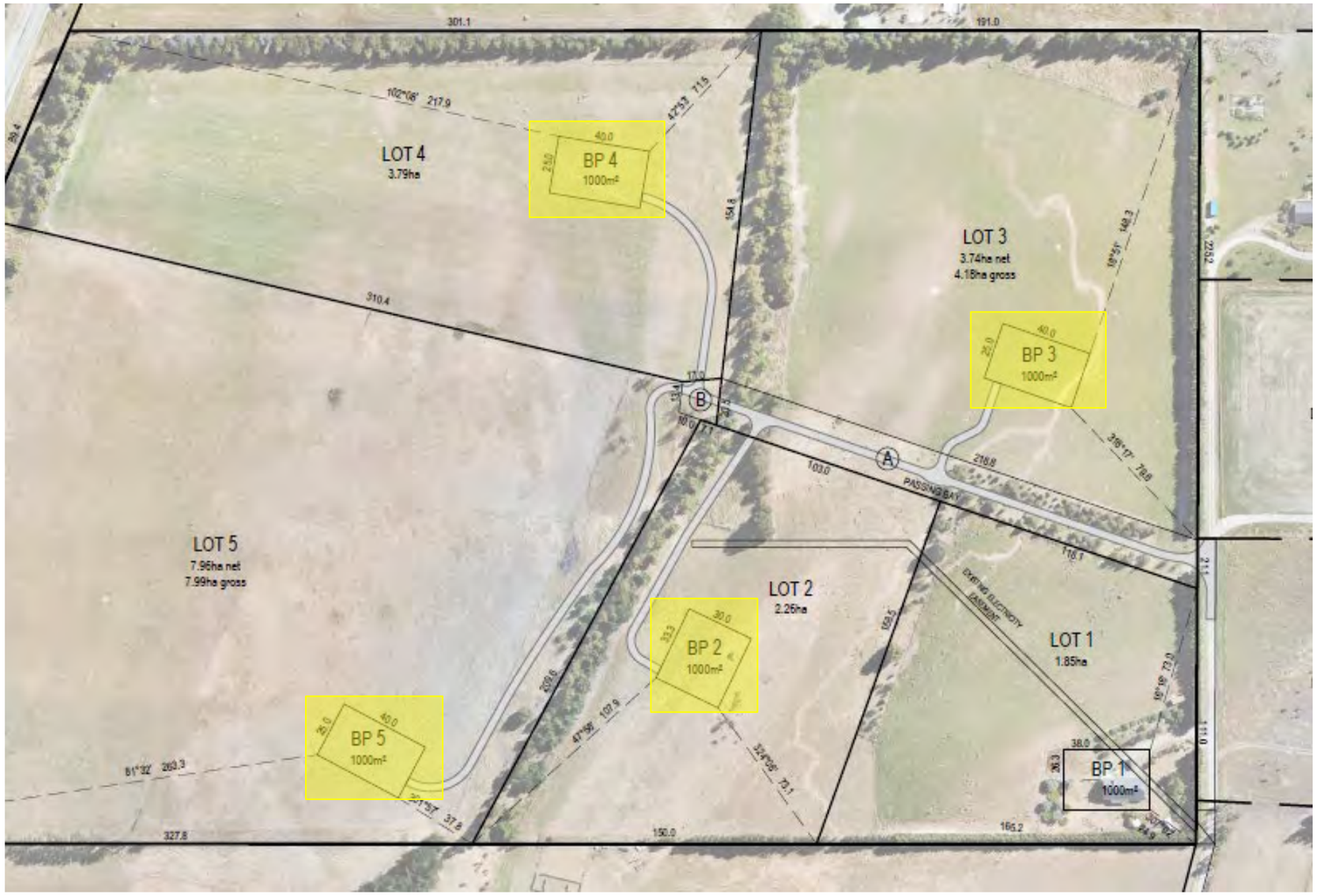
I, Gavin Tippett, am a member of Engineering New Zealand (MEngNZ 1153129), and hold the following qualifications:

- BSc (Geology),
- PGDip Engineering Geology,
- M.Sc (Engineering Geology).

Mt Iron Geodrill holds a current policy of Professional Indemnity Insurance no less than $200,000.

Appendix A – SITE PLANS

- Testing location plans



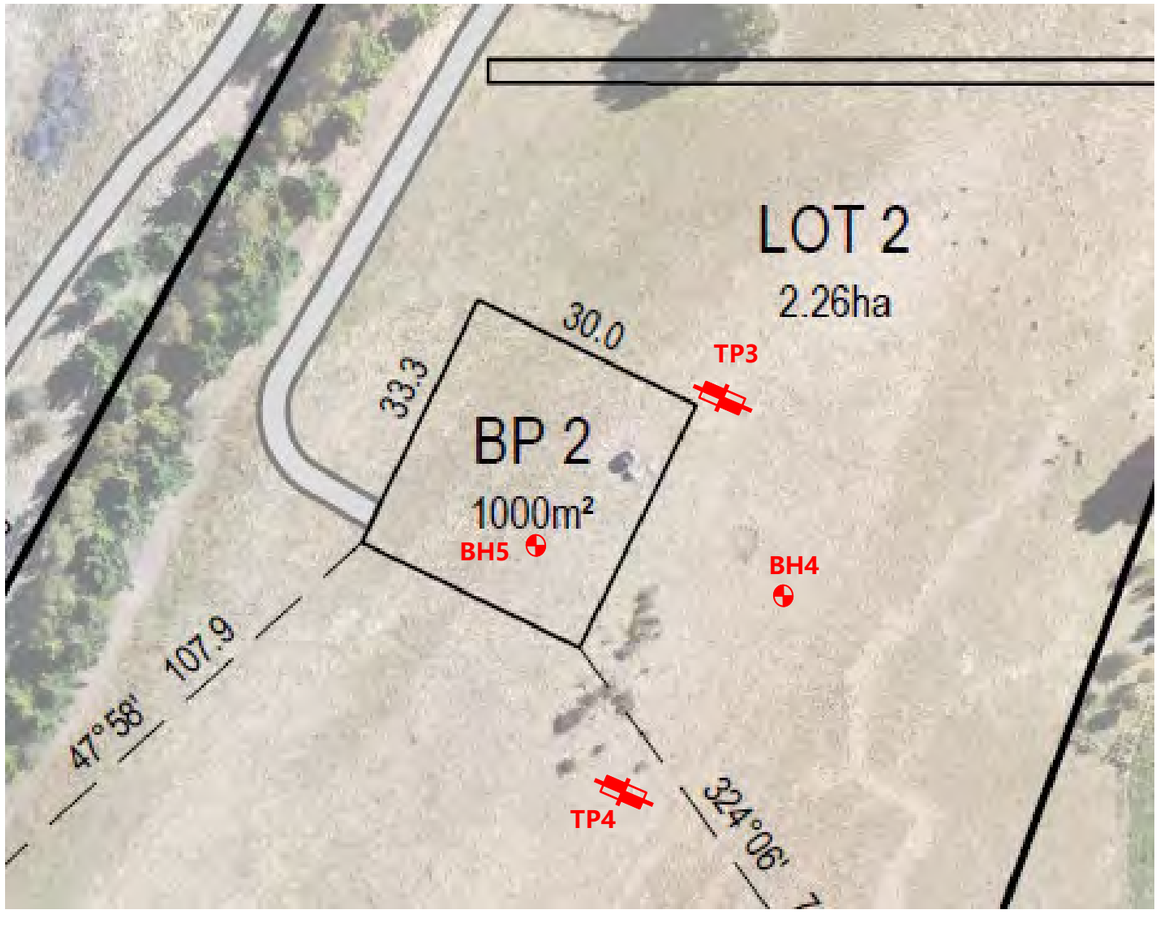
LEGEND

Areas where geotechnical assessment was undertaken

All test locations are approximate only

Base plan taken from Google Earth

	Project:	Client:	Drawing Title:	Scale:	Drawing Number
MT IRON GEODRILL	PPG Te Awa Geotech 161 Te Awa Road, Lot 2 DP 308814 Lake Hawea	Paterson Pitts Group	Site investigation and Layout Plan	As Shown	Figure 1
				Job No. G20084	Revision: 27/08/2019



LEGEND

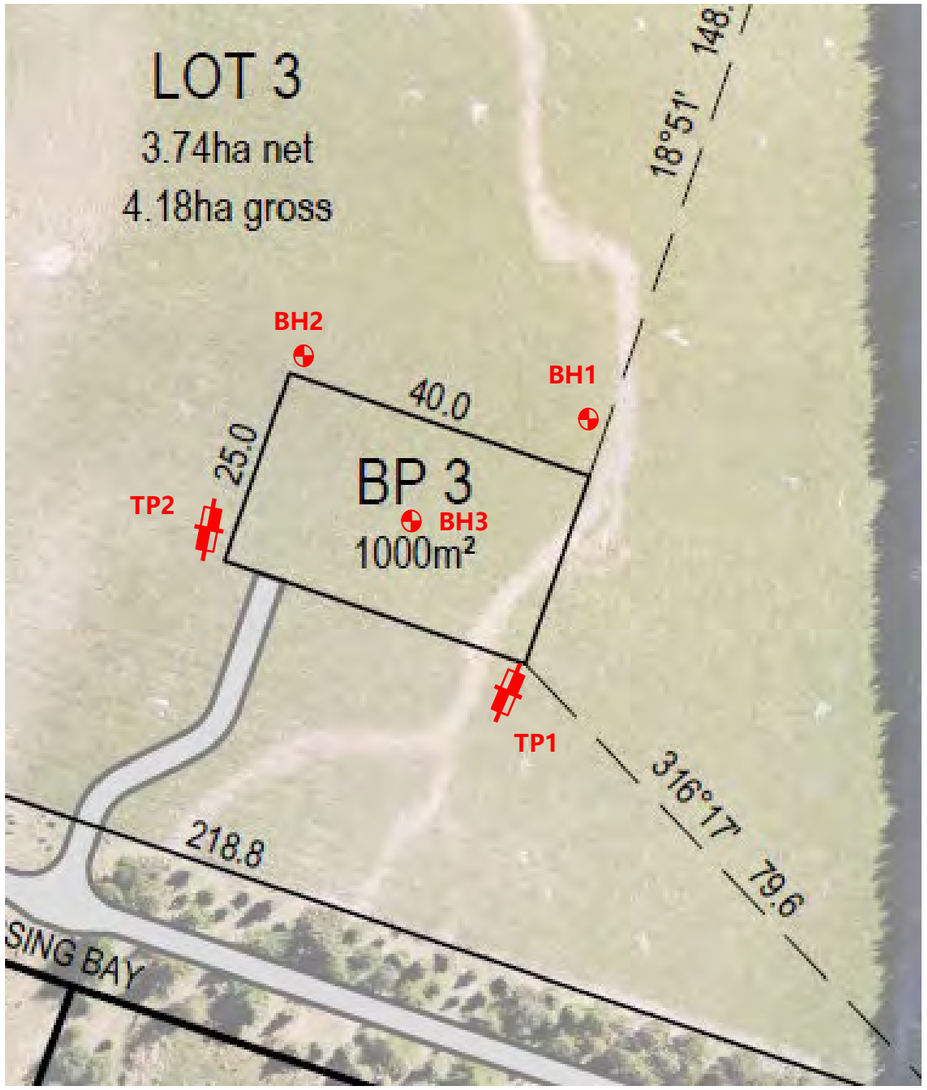
BH1 **Borehole Location**

TP1 **Testpit Location**

All test locations are approximate only

Base plan taken from Paterson Pitts Group scheme plan

	Project: PPG Te Awa Geotech 161 Te Awa Road, Lot 2 DP 308814 Lake Hawea	**Client:** Paterson Pits Group	**Drawing Title:** Site investigation Plan	**Scale:** As shown	**Drawing Number** Figure 1
				Job No. G20084	**Revision:** 27-08-2019



LEGEND

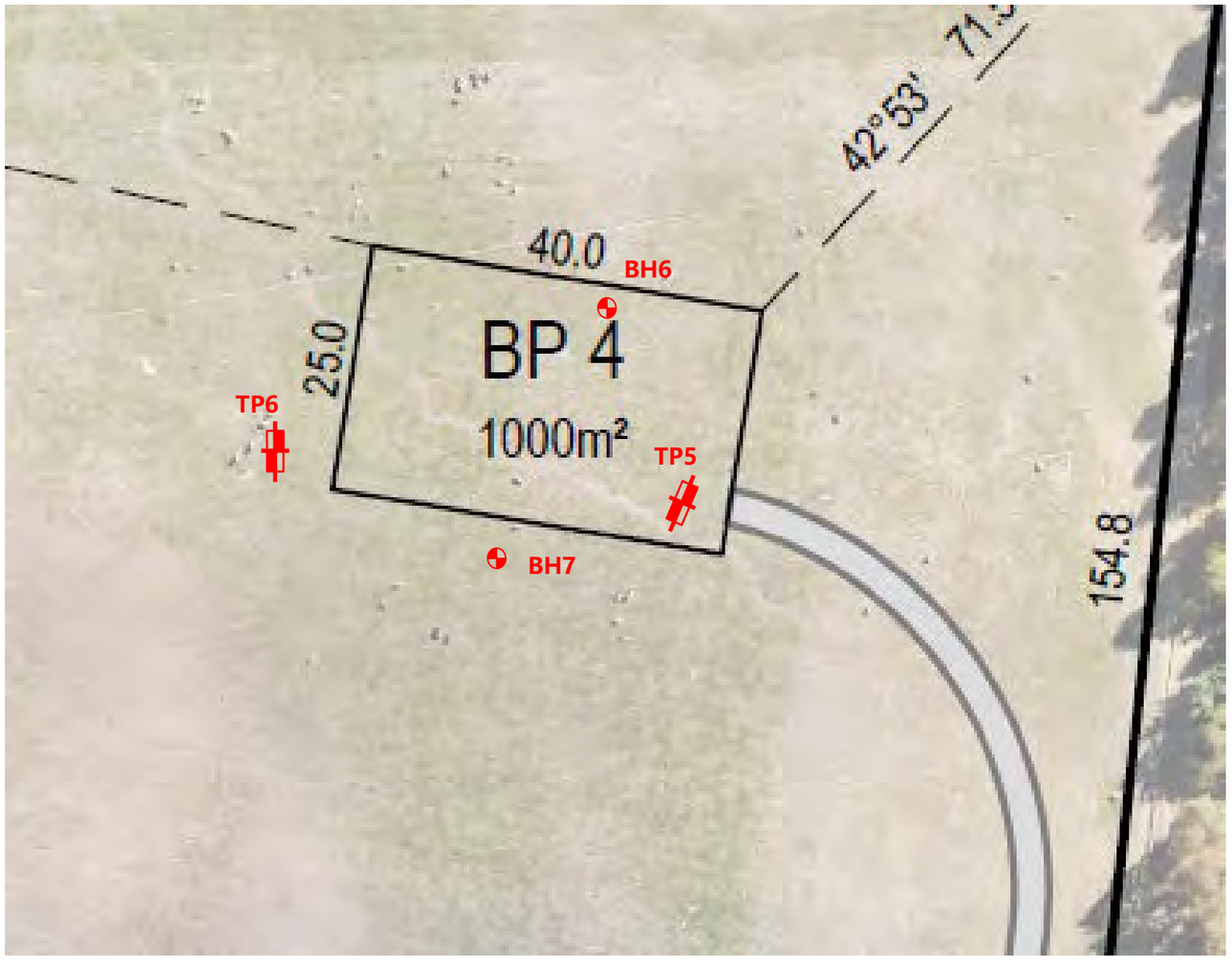
BH1 **Borehole Location**

TP1 **Testpit Location**

All test locations are approximate only

Base plan taken from Paterson Pitts Group scheme plan

	Project:	Client:	Drawing Title:	Scale:	Drawing Number
MT IRON GEODRILL	PPG Te Awa Geotech 161 Te Awa Road, Lot 2 DP 308814 Lake Hawea	Paterson Pits Group	Site investigation Plan	As shown	Figure 1
				Job No. G20084	Revision: 27-08-2019



LEGEND

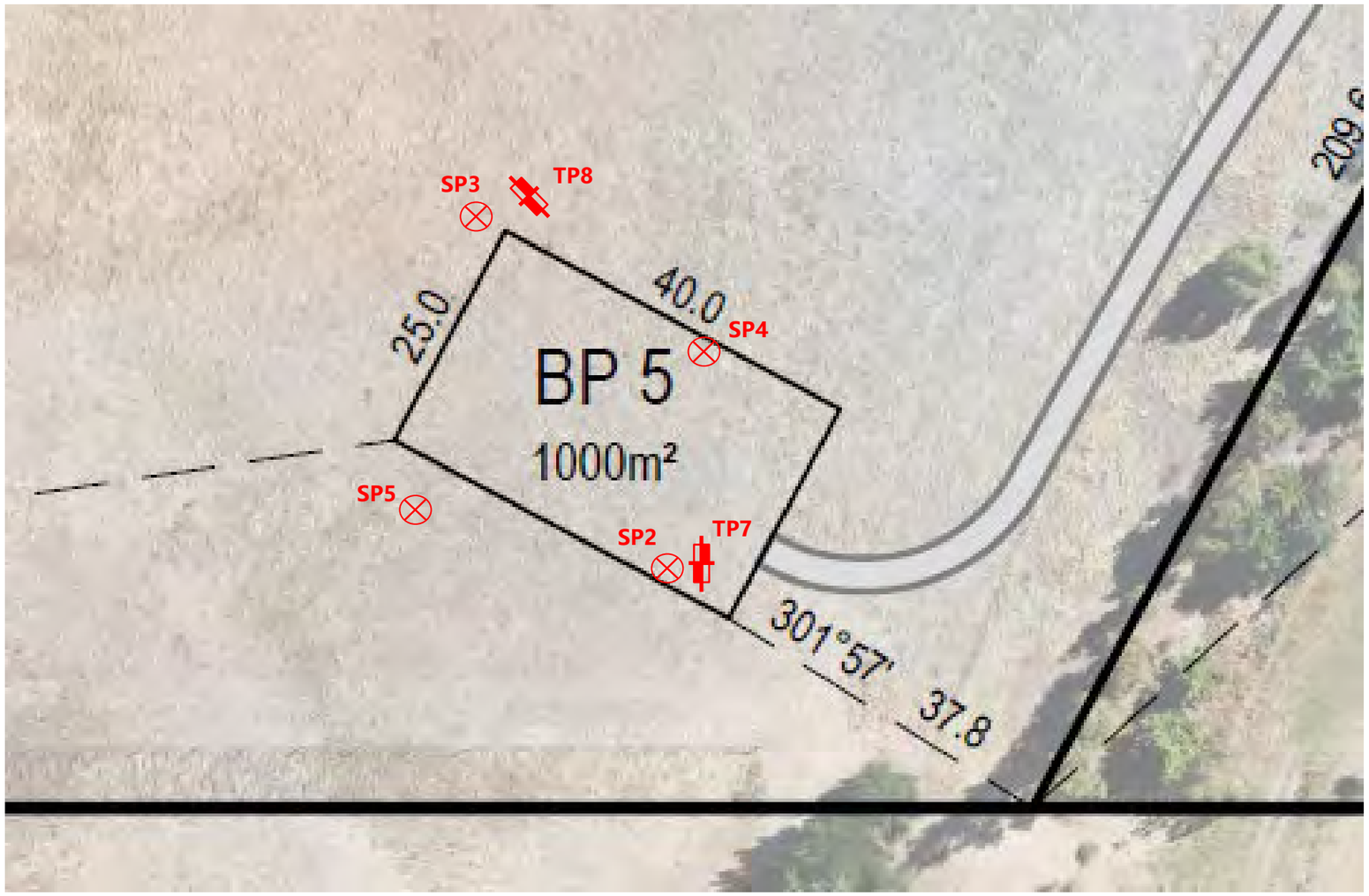
BH1 **Borehole Location**

TP1 **Testpit Location**

All test locations are approximate only

Base plan taken from Paterson Pitts Group scheme plan

	Project:	Client:	Drawing Title:	Scale:	Drawing Number
MT IRON GEODRILL	PPG Te Awa Geotech 161 Te Awa Road, Lot 2 DP 308814 Lake Hawea	Paterson Pits Group	Site investigation Plan	As shown	Figure 1
				Job No. G20084	Revision: 27-08-2019



LEGEND

BH1 **Borehole Location**

TP1 **Testpit Location**

All test locations are approximate only

Base plan taken from Paterson Pitts Group scheme plan

MT IRON GEODRILL	**Project:** PPG Te Awa Geotech 161 Te Awa Road, Lot 2 DP 308814 Lake Hawea	**Client:** Paterson Pits Group	**Drawing Title:** Site investigation Plan	**Scale:** As shown	**Drawing Number** Figure 1
				Job No. G20084	**Revision:** 27-08-2019

Appendix B – ENGINEERING LOGS

- Test Pit Logs (TP1 - TP8)
- Borehole Logs (BH1 - BH9)
- Scala Penetrometer Test Results

BH1

TEST PIT LOG

CO-ORDINATES:	360861 5056998	JOB NUMBER:	G20084	EQUIPMENT TYPE & MODEL:	Yanmar ViO17
± m:	4m	PROJECT:	PPG Te Awa Geotech	COMPANY:	Mt Iron Geodrill
ELEVATION:	340	LOCATION:	161 Te Awa Road LAKE HAWEA	OPERATOR:	G. TIPPETT
DATUM:	MSL / UTM	DATE:	23/08/2019	PIT DIMENSIONS:	
		LOGGED BY:	W. HAMILTON	Wide:	Long:

METHOD	DEPTH (m)	BLOWS/50mm	WATER	SAMPLES	GRAPHIC	DESRIPTION: Soil Name, Plasticity or Particle Characteristics, Colour, Secondary Components & Minor Components	MOSITURE	CONSISTENCY DENSITY	Structure and Additional Observations Geological / Depositional
HA	0	*No Scala undertaken*	N			TOPSOIL: dark brown, organic rich, moderate dilatancy silt.	M	S	TOPSOIL
						SILT: light brown, low to moderate dilatancy, low plasticity silt, some minor sub-rounded, poorly graded gravel.		Vst	ALLUVIUM
				S V		Shear Vane @ 0.5m: 144 kPa, residual 32 kPa.			
	1					END @ 0.5m. Limit of investigation.			
	2								
	3								
	4								

METHOD:
- **N** Natural Exposure
- **X** Existing Excavation
- **E** Excavator
- **HA** Hand Auger

SAMPLES:
- **U50** Undisturded Sample 50mm Diameter
- **D** Disturbed Sample
- **V** Vane Shear (kPa)
- **Bs** Bulk Disturded Sample
- **E** Environmental Sample
- **INF** Infiltration test

MOISTURE:
- **D** Dry
- **M** Moist
- **W** Wet
- **S** Saturated

CONSISTENCY / DENSITY:

VS	Very Soft	VL	Very Loose
S	**Soft**	L	Loose
F	**Firm**	MD	Medium Dense
St	**Stiff**	D	Dense
VSt	**Very Stiff**	VD	Very Dense
H	**Hard**		
Fb	**Friable**		

NOTE:
A scala result of 2.5 blows per 50mm is equivelent to a geotechnical ultimate bearing capacity of 300kPa in accordance with NZS 3604-2011, Section 3.3.7.

WATER:
- ◁ Water Inflow
- ▼ **Standing Water Level**
- ▽ **Estimated High Water Level**
- **N** **Nil Water Observed**

BH2

TEST PIT LOG

CO-ORDINATES: 360834 5057017
± m: 4m
ELEVATION: 340
DATUM: MSL / UTM

JOB NUMBER: G20084
PROJECT: PPG Te Awa Geotech
LOCATION: 161 Te Awa Road LAKE HAWEA

DATE: 23/08/2019
LOGGED BY: W. HAMILTON

EQUIPMENT
TYPE & MODEL: Yanmar ViO17
COMPANY: Mt Iron Geodrill
OPERATOR: G. TIPPETT

PIT DIMENSIONS:
Wide: Long:

METHOD	DEPTH (m)	BLOWS/50mm	WATER	SAMPLES	GRAPHIC	DESRIPTION: Soil Name, Plasticity or Particle Characteristics, Colour, Secondary Components & Minor Components	MOSITURE	CONSISTENCY DENSITY	Structure and Additional Observations Geological / Depositional
HA	0	*No Scala undertaken*	N			TOPSOIL: dark brown, organic rich, moderate dilatancy silt.	M	S	TOPSOIL
				S V		SILT: light brown, low to moderate dilatancy, low plasticity silt, some minor sub-rounded, poorly graded gravel. Shear Vane @ 0.5m: 193 kPa, residual 67 kPa.		Vst	ALLUVIUM
	1					END @ 0.5m. Limit of investigation.			
	2								
	3								
	4								

METHOD:
- **N** Natural Exposure
- **X** Existing Excavation
- **E** Excavator
- **HA** Hand Auger

SAMPLES:
- **U50** Undisturded Sample 50mm Diameter
- **D** Disturbed Sample
- **V** Vane Shear (kPa)
- **Bs** Bulk Disturded Sample
- **E** Environmental Sample
- **INF** Infiltration test

MOISTURE:
- **D** Dry
- **M** Moist
- **W** Wet
- **S** Saturated

CONSISTENCY / DENSITY:

VS	Very Soft	VL	Very Loose
S	**Soft**	L	Loose
F	**Firm**	MD	Medium Dense
St	**Stiff**	D	Dense
VSt	**Very Stiff**	VD	Very Dense
H	**Hard**		
Fb	**Friable**		

NOTE:
A scala result of 2.5 blows per 50mm is equivelent to a geotechnical ultimate bearing capacity of 300kPa in accordance with NZS 3604-2011, Section 3.3.7.

WATER:
- ◁ Water Inflow
- ▼ **Standing Water Level**
- ▽ **Estimated High Water Level**
- **N** **Nil Water Observed**

BH3

TEST PIT LOG

CO-ORDINATES:	360843 5057002	JOB NUMBER:	G20084	EQUIPMENT TYPE & MODEL:	Yanmar ViO17
± m:	4m	PROJECT:	PPG Te Awa Geotech	COMPANY:	Mt Iron Geodrill
ELEVATION:	340	LOCATION:	161 Te Awa Road LAKE HAWEA	OPERATOR:	G. TIPPETT
DATUM:	MSL / UTM	DATE:	23/08/2019	PIT DIMENSIONS:	
		LOGGED BY:	W. HAMILTON	Wide:	Long:

METHOD	DEPTH (m)	BLOWS/50mm (0 5 10)	WATER	SAMPLES	GRAPHIC	DESRIPTION: Soil Name, Plasticity or Particle Characteristics, Colour, Secondary Components & Minor Components	MOSITURE	CONSISTENCY DENSITY	Structure and Additional Observations Geological / Depositional
HA	0	*No Scala undertaken*	N			TOPSOIL: dark brown, organic rich, moderate dilatancy silt.	M	S	TOPSOIL
						SILT: light brown, low to moderate dilatancy, low plasticity silt, some minor sub-rounded, poorly graded gravel.		Vst	ALLUVIUM
				SV		Shear Vane @ 0.5m: 217 kPa, residual 128 kPa.			
	1					END @ 0.6m. Limit of investigation.			
	2								
	3								
	4								

METHOD:
- **N** Natural Exposure
- **X** Existing Excavation
- **E** Excavator
- **HA** Hand Auger

SAMPLES:
- **U50** Undisturded Sample 50mm Diameter
- **D** Disturbed Sample
- **V** Vane Shear (kPa)
- **Bs** Bulk Disturded Sample
- **E** Environmental Sample
- **INF** Infiltration test

MOISTURE:
- **D** Dry
- **M** Moist
- **W** Wet
- **S** Saturated

CONSISTENCY / DENSITY:

VS	Very Soft	VL	Very Loose
S	**Soft**	L	Loose
F	**Firm**	MD	Medium Dense
St	**Stiff**	D	Dense
VSt	**Very Stiff**	VD	Very Dense
H	**Hard**		
Fb	**Friable**		

NOTE:
A scala result of 2.5 blows per 50mm is equivelent to a geotechnical ultimate bearing capacity of 300kPa in accordance with NZS 3604-2011, Section 3.3.7.

WATER:
- ◁ Water Inflow
- ▼ **Standing Water Level**
- ▽ **Estimated High Water Level**
- **N** **Nil Water Observed**

BH4

TEST PIT LOG

CO-ORDINATES: 360698 5056873
± m: 4m
ELEVATION: 340
DATUM: MSL / UTM

JOB NUMBER: G20084
PROJECT: PPG Te Awa Geotech
LOCATION: 161 Te Awa Road LAKE HAWEA

DATE: 23/08/2019
LOGGED BY: W. HAMILTON

EQUIPMENT
TYPE & MODEL: Yanmar ViO17
COMPANY: Mt Iron Geodrill
OPERATOR: G. TIPPETT

PIT DIMENSIONS:
Wide: Long:

METHOD	DEPTH (m)	BLOWS/50mm	WATER	SAMPLES	GRAPHIC	DESRIPTION: Soil Name, Plasticity or Particle Characteristics, Colour, Secondary Components & Minor Components	MOSITURE	CONSISTENCY DENSITY	Structure and Additional Observations Geological / Depositional
HA	0	*No Scala undertaken*	N			TOPSOIL: dark brown, organic rich, moderate dilatancy silt.	M	S	TOPSOIL
						Silty GRAVEL: brown, fine to coarse, well graded, sub-rounded to angular gravel, moderate dilatancy silt.		D	ALLUVIUM
						END @ 0.4m. Limit of investigation.			
	1								
	2								
	3								
	4								

METHOD:
- **N** Natural Exposure
- **X** Existing Excavation
- **E** Excavator
- **HA** Hand Auger

SAMPLES:
- **U50** Undisturded Sample 50mm Diameter
- **D** Disturbed Sample
- **V** Vane Shear (kPa)
- **Bs** Bulk Disturded Sample
- **E** Environmental Sample
- **INF** Infiltration test

MOISTURE:
- **D** Dry
- **M** Moist
- **W** Wet
- **S** Saturated

CONSISTENCY / DENSITY:

VS	Very Soft	VL	Very Loose
S	Soft	L	Loose
F	Firm	MD	Medium Dense
St	Stiff	D	Dense
VSt	Very Stiff	VD	Very Dense
H	Hard		
Fb	Friable		

NOTE:
A scala result of 2.5 blows per 50mm is equivelent to a geotechnical ultimate bearing capacity of 300kPa in accordance with NZS 3604-2011, Section 3.3.7.

WATER:
- ◁ Water Inflow
- ▼ **Standing Water Level**
- ▽ **Estimated High Water Level**
- **N** **Nil Water Observed**

BH5

TEST PIT LOG

CO-ORDINATES:	360684 5056877	JOB NUMBER:	G20084	EQUIPMENT TYPE & MODEL:	Yanmar ViO17
± m:	4m	PROJECT:	PPG Te Awa Geotech	COMPANY:	Mt Iron Geodrill
ELEVATION:	340	LOCATION:	161 Te Awa Road LAKE HAWEA	OPERATOR:	G. TIPPETT
DATUM:	MSL / UTM	DATE:	23/08/2019	PIT DIMENSIONS:	
		LOGGED BY:	W. HAMILTON	Wide:	Long:

METHOD	DEPTH (m)	BLOWS/50mm (0 5 10)	WATER	SAMPLES	GRAPHIC	DESRIPTION: Soil Name, Plasticity or Particle Characteristics, Colour, Secondary Components & Minor Components	MOSITURE	CONSISTENCY DENSITY	Structure and Additional Observations Geological / Depositional	DEPTH (m)
HA	0	*No Scala undertaken*	N			TOPSOIL: dark brown, organic rich, moderate dilatancy silt.	M	S	TOPSOIL	0
						SILT: light brown, low to moderate dilatancy, low plasticity silt. Shear Vane @ 0.5m: 173 kPa, residual 40 kPa. END @ 0.5m. Limit of investigation.		Vst	ALLUVIUM	
	1									1
	2									2
	3									3
	4									4

METHOD:
- **N** Natural Exposure
- **X** Existing Excavation
- **E** Excavator
- **HA** Hand Auger

SAMPLES:
- **U50** Undisturded Sample 50mm Diameter
- **D** Disturbed Sample
- **V** Vane Shear (kPa)
- **Bs** Bulk Disturded Sample
- **E** Environmental Sample
- **INF** Infiltration test

MOISTURE:
- **D** Dry
- **M** Moist
- **W** Wet
- **S** Saturated

CONSISTENCY / DENSITY:

VS	Very Soft	VL	Very Loose
S	**Soft**	L	Loose
F	**Firm**	MD	Medium Dense
St	**Stiff**	D	Dense
VSt	**Very Stiff**	VD	Very Dense
H	**Hard**		
Fb	**Friable**		

NOTE:
A scala result of 2.5 blows per 50mm is equivelent to a geotechnical ultimate bearing capacity of 300kPa in accordance with NZS 3604-2011, Section 3.3.7.

WATER:
- ◁ Water Inflow
- ▼ **Standing Water Level**
- ▽ **Estimated High Water Level**
- **N** **Nil Water Observed**

BH6

TEST PIT LOG

CO-ORDINATES: 360668 5057102
± m: 4m
ELEVATION: 349
DATUM: MSL / UTM

JOB NUMBER: G20084
PROJECT: PPG Te Awa Geotech
LOCATION: 161 Te Awa Road LAKE HAWEA

DATE: 23/08/2019
LOGGED BY: W. HAMILTON

EQUIPMENT
TYPE & MODEL: Yanmar ViO17
COMPANY: Mt Iron Geodrill
OPERATOR: G. TIPPETT

PIT DIMENSIONS:
Wide: Long:

METHOD	DEPTH (m)	BLOWS/50mm (0 5 10)	WATER	SAMPLES	GRAPHIC	DESRIPTION: Soil Name, Plasticity or Particle Characteristics, Colour, Secondary Components & Minor Components	MOSITURE	CONSISTENCY DENSITY	Structure and Additional Observations Geological / Depositional
HA	0	*No Scala undertaken*	N			TOPSOIL: dark brown, organic rich, moderate dilatancy silt.	M	S	TOPSOIL
						SILT: light brown, low to moderate dilatancy, low plasticity silt. Shear Vane @ 0.6m: 225 kPa, residual 193 kPa.		Vst	ALLUVIUM
				S V		END @ 0.6m. Limit of investigation.			
	1								
	2								
	3								
	4								

METHOD:
- **N** Natural Exposure
- **X** Existing Excavation
- **E** Excavator
- **HA** Hand Auger

SAMPLES:
- **U50** Undisturded Sample 50mm Diameter
- **D** Disturbed Sample
- **V** Vane Shear (kPa)
- **Bs** Bulk Disturded Sample
- **E** Environmental Sample
- **INF** Infiltration test

MOISTURE:
- **D** Dry
- **M** Moist
- **W** Wet
- **S** Saturated

CONSISTENCY / DENSITY:

VS	Very Soft	VL	Very Loose
S	**Soft**	L	Loose
F	**Firm**	MD	Medium Dense
St	**Stiff**	D	Dense
VSt	**Very Stiff**	VD	Very Dense
H	**Hard**		
Fb	**Friable**		

NOTE:
A scala result of 2.5 blows per 50mm is equivelent to a geotechnical ultimate bearing capacity of 300kPa in accordance with NZS 3604-2011, Section 3.3.7.

WATER:
- ◁ Water Inflow
- ▼ **Standing Water Level**
- ▽ **Estimated High Water Level**
- **N** **Nil Water Observed**

BH7

TEST PIT LOG

CO-ORDINATES: 360658 5057078
± m: 4m
ELEVATION: 349
DATUM: MSL / UTM

JOB NUMBER: G20084
PROJECT: PPG Te Awa Geotech
LOCATION: 161 Te Awa Road LAKE HAWEA

DATE: 23/08/2019
LOGGED BY: W. HAMILTON

EQUIPMENT
TYPE & MODEL: Yanmar ViO17
COMPANY: Mt Iron Geodrill
OPERATOR: G. TIPPETT

PIT DIMENSIONS:
Wide: Long:

METHOD	DEPTH (m)	BLOWS/50mm	WATER	SAMPLES	GRAPHIC	DESRIPTION: Soil Name, Plasticity or Particle Characteristics, Colour, Secondary Components & Minor Components	MOSITURE	CONSISTENCY DENSITY	Structure and Additional Observations Geological / Depositional
HA	0	*No Scala undertaken*	N			TOPSOIL: dark brown, organic rich, moderate dilatancy silt.	M	S	TOPSOIL
						Gravelly SILT: brown, moderate dilatancy silt, some fine to coarse, poorly graded, sub-rounded to sub-angular gravel.		Vst	ALLUVIUM
	1					END @ 0.5m. Limit of investigation.			
	2								
	3								
	4								

METHOD:
- **N** Natural Exposure
- **X** Existing Excavation
- **E** Excavator
- **HA** Hand Auger

SAMPLES:
- **U50** Undisturded Sample 50mm Diameter
- **D** Disturbed Sample
- **V** Vane Shear (kPa)
- **Bs** Bulk Disturded Sample
- **E** Environmental Sample
- **INF** Infiltration test

MOISTURE:
- **D** Dry
- **M** Moist
- **W** Wet
- **S** Saturated

CONSISTENCY / DENSITY:

VS	Very Soft	VL	Very Loose
S	Soft	L	Loose
F	Firm	MD	Medium Dense
St	Stiff	D	Dense
VSt	Very Stiff	VD	Very Dense
H	Hard		
Fb	Friable		

NOTE:
A scala result of 2.5 blows per 50mm is equivelent to a geotechnical ultimate bearing capacity of 300kPa in accordance with NZS 3604-2011, Section 3.3.7.

WATER:
- ◁ Water Inflow
- ▼ **Standing Water Level**
- ▽ **Estimated High Water Level**
- **N** **Nil Water Observed**

BH8

TEST PIT LOG

CO-ORDINATES: 360826 5056818
± m: 4m
ELEVATION: 340
DATUM: MSL / UTM

JOB NUMBER: G20084
PROJECT: PPG Te Awa Geotech
LOCATION: 161 Te Awa Road LAKE HAWEA

DATE: 23/08/2019
LOGGED BY: W. HAMILTON

EQUIPMENT
TYPE & MODEL: Yanmar ViO17
COMPANY: Mt Iron Geodrill
OPERATOR: G. TIPPETT

PIT DIMENSIONS:
Wide: Long:

METHOD	DEPTH (m)	BLOWS/50mm (0 5 10)	WATER	SAMPLES	GRAPHIC	DESRIPTION: Soil Name, Plasticity or Particle Characteristics, Colour, Secondary Components & Minor Components	MOSITURE	CONSISTENCY DENSITY	Structure and Additional Observations Geological / Depositional
HA	0	*No Scala undertaken*	N			TOPSOIL: dark brown, organic rich, moderate dilatancy silt.	M	S	TOPSOIL
						SILT: light brown, low to moderate dilatancy, low plasticity silt. Shear Vane @ 0.5m: 215 kPa, residual 55 kPa.		Vst	ALLUVIUM
	1					Silty GRAVEL: brown, fine to coarse, well graded, sub-rounded to angular gravel, moderate dilatancy silt.		D	
						END @ 1.1m. Refusal in Gravels			
	2								
	3								
	4								

METHOD:
- **N** Natural Exposure
- **X** Existing Excavation
- **E** Excavator
- **HA** Hand Auger

SAMPLES:
- **U50** Undisturded Sample 50mm Diameter
- **D** Disturbed Sample
- **V** Vane Shear (kPa)
- **Bs** Bulk Disturded Sample
- **E** Environmental Sample
- **INF** Infiltration test

MOISTURE:
- **D** Dry
- **M** Moist
- **W** Wet
- **S** Saturated

CONSISTENCY / DENSITY:

VS	Very Soft	VL	Very Loose
S	**Soft**	L	Loose
F	**Firm**	MD	Medium Dense
St	**Stiff**	D	Dense
VSt	**Very Stiff**	VD	Very Dense
H	**Hard**		
Fb	**Friable**		

NOTE:
A scala result of 2.5 blows per 50mm is equivelent to a geotechnical ultimate bearing capacity of 300kPa in accordance with NZS 3604-2011, Section 3.3.7.

WATER:
- ◁ Water Inflow
- ▼ **Standing Water Level**
- ▽ **Estimated High Water Level**
- **N** **Nil Water Observed**

BH9

TEST PIT LOG

CO-ORDINATES:	360840 5056837	JOB NUMBER:	G20084	EQUIPMENT TYPE & MODEL:	Yanmar ViO17
± m:	4m	PROJECT:	PPG Te Awa Geotech	COMPANY:	Mt Iron Geodrill
ELEVATION:	340	LOCATION:	161 Te Awa Road LAKE HAWEA	OPERATOR:	G. TIPPETT
DATUM:	MSL / UTM	DATE:	23/08/2019	PIT DIMENSIONS:	
		LOGGED BY:	W. HAMILTON	Wide:	Long:

METHOD	DEPTH (m)	BLOWS/50mm (0 5 10)	WATER	SAMPLES	GRAPHIC	DESRIPTION: Soil Name, Plasticity or Particle Characteristics, Colour, Secondary Components & Minor Components	MOSITURE	CONSISTENCY DENSITY	Structure and Additional Observations Geological / Depositional
HA	0	*No Scala undertaken*	N			TOPSOIL: dark brown, organic rich, moderate dilatancy silt.	M	S	TOPSOIL
						SILT: light brown, low to moderate dilatancy, low plasticity silt. Shear Vane @ 0.5m: 215 kPa, residual 55 kPa.		Vst	ALLUVIUM
	1					Silty GRAVEL: brown, fine to coarse, well graded, sub-rounded to angular gravel, moderate dilatancy silt.		D	
						END @ 1.1m. Refusal in Gravels			
	2								
	3								
	4								

METHOD:
- **N** Natural Exposure
- **X** Existing Excavation
- **E** Excavator
- **HA** Hand Auger

SAMPLES:
- **U50** Undisturded Sample 50mm Diameter
- **D** Disturbed Sample
- **V** Vane Shear (kPa)
- **Bs** Bulk Disturded Sample
- **E** Environmental Sample
- **INF** Infiltration test

MOISTURE:
- **D** Dry
- **M** Moist
- **W** Wet
- **S** Saturated

CONSISTENCY / DENSITY:

VS	Very Soft	VL	Very Loose
S	**Soft**	L	Loose
F	**Firm**	MD	Medium Dense
St	**Stiff**	D	Dense
VSt	**Very Stiff**	VD	Very Dense
H	**Hard**		
Fb	**Friable**		

NOTE:
A scala result of 2.5 blows per 50mm is equivelent to a geotechnical ultimate bearing capacity of 300kPa in accordance with NZS 3604-2011, Section 3.3.7.

WATER:
- ◁ Water Inflow
- ▼ **Standing Water Level**
- ▽ **Estimated High Water Level**
- **N** **Nil Water Observed**

TP1

TEST PIT LOG

CO-ORDINATES:	360860 5056981	JOB NUMBER:	G20084	EQUIPMENT TYPE & MODEL:	Yanmar ViO17
± m:	4m	PROJECT:	PPG Te Awa Geotech	COMPANY:	Mt Iron Geodrill
ELEVATION:	340	LOCATION:	161 Te Awa Road LAKE HAWEA	OPERATOR:	G. TIPPETT
DATUM:	MSL / UTM	DATE:	23/08/2019	PIT DIMENSIONS:	
		LOGGED BY:	W. HAMILTON	Wide: 1.0m	Long: 2.2m

METHOD	DEPTH (m)	BLOWS/50mm	WATER	SAMPLES	GRAPHIC	DESRIPTION: Soil Name, Plasticity or Particle Characteristics, Colour, Secondary Components & Minor Components	MOSITURE	CONSISTENCY DENSITY	Structure and Additional Observations Geological / Depositional
E	0		N	S V		TOPSOIL: dark brown, organic rich, moderate dilatancy silt.	M	S	TOPSOIL
	1	*Limit of investigation*				SILT: light brown, low to moderate dilatancy, low plasticity silt, some minor sub-rounded, poorly graded gravel. Shear Vane @ 0.5m: 109 kPa, residual 32 kPa.		Vst	ALLUVIUM
	2					END @ 1.8m Limit of investigation			
	3								
	4								

METHOD:
- **N** Natural Exposure
- **X** Existing Excavation
- **E** Excavator
- **HA** Hand Auger

SAMPLES:
- **U50** Undisturded Sample 50mm Diameter
- **D** Disturbed Sample
- **V** Vane Shear (kPa)
- **Bs** Bulk Disturded Sample
- **E** Environmental Sample
- **INF** Infiltration test

MOISTURE:
- **D** Dry
- **M** Moist
- **W** Wet
- **S** Saturated

CONSISTENCY / DENSITY:

VS	Very Soft	VL	Very Loose
S	**Soft**	L	Loose
F	**Firm**	MD	Medium Dense
St	**Stiff**	D	Dense
VSt	**Very Stiff**	VD	Very Dense
H	**Hard**		
Fb	**Friable**		

NOTE:
A scala result of 2.5 blows per 50mm is equivelent to a geotechnical ultimate bearing capacity of 300kPa in accordance with NZS 3604-2011, Section 3.3.7.

WATER:
- ◁ Water Inflow
- ▼ **Standing Water Level**
- ▽ **Estimated High Water Level**
- **N** **Nil Water Observed**

TP2

TEST PIT LOG

CO-ORDINATES: 360826 5056996
± m: 4m
ELEVATION: 340
DATUM: MSL / UTM

JOB NUMBER: G20084
PROJECT: PPG Te Awa Geotech
LOCATION: 161 Te Awa Road LAKE HAWEA

DATE: 23/08/2019
LOGGED BY: W. HAMILTON

EQUIPMENT
TYPE & MODEL: Yanmar ViO17
COMPANY: Mt Iron Geodrill
OPERATOR: G. TIPPETT

PIT DIMENSIONS:
Wide: 1.0m Long: 2.2m

METHOD	DEPTH (m)	BLOWS/50mm (0 5 10)	WATER	SAMPLES	GRAPHIC	DESRIPTION: Soil Name, Plasticity or Particle Characteristics, Colour, Secondary Components & Minor Components	MOSITURE	CONSISTENCY DENSITY	Structure and Additional Observations Geological / Depositional	DEPTH (m)
	0					TOPSOIL: dark brown, organic rich, moderate dilatancy silt.		S	TOPSOIL	0
E	1	*No Scala undertaken*	N	S V		SILT: light brown, low to moderate dilatancy, low plasticity silt, some minor sub-rounded, poorly graded gravel. Shear Vane @ 0.5m: 151 kPa, residual 32 kPa.	M	Vst	ALLUVIUM	1
						Sandy SILT: brown, low to moderate dilatancy, low plasticity silt, some fine grained sand.				
	2					END @ 1.8m Limit of investigation				2
	3									3
	4									4

METHOD:
N Natural Exposure
X Existing Excavation
E Excavator
HA Hand Auger

SAMPLES:
U50 Undisturded Sample 50mm Diameter
D Disturbed Sample
V Vane Shear (kPa)
Bs Bulk Disturded Sample
E Environmental Sample
INF Infiltration test

MOISTURE:
D Dry
M Moist
W Wet
S Saturated

CONSISTENCY / DENSITY:

VS	Very Soft	VL	Very Loose
S	Soft	L	Loose
F	Firm	MD	Medium Dense
St	Stiff	D	Dense
VSt	Very Stiff	VD	Very Dense
H	Hard		
Fb	Friable		

NOTE:
A scala result of 2.5 blows per 50mm is equivelent to a geotechnical ultimate bearing capacity of 300kPa in accordance with NZS 3604-2011, Section 3.3.7.

WATER:
◁ Water Inflow
▼ **Standing Water Level**
▽ **Estimated High Water Level**
N **Nil Water Observed**

TP3

TEST PIT LOG

CO-ORDINATES: 360687 5056863
± m: 4m
ELEVATION: 340
DATUM: MSL / UTM

JOB NUMBER: G20084
PROJECT: PPG Te Awa Geotech
LOCATION: 161 Te Awa Road LAKE HAWEA

DATE: 23/08/2019
LOGGED BY: W. HAMILTON

EQUIPMENT
TYPE & MODEL: Yanmar ViO17
COMPANY: Mt Iron Geodrill
OPERATOR: G. TIPPETT

PIT DIMENSIONS:
Wide: 1.0m Long: 2.2m

METHOD	DEPTH (m)	BLOWS/50mm (0 5 10)	WATER	SAMPLES	GRAPHIC	DESRIPTION: Soil Name, Plasticity or Particle Characteristics, Colour, Secondary Components & Minor Components	MOSITURE	CONSISTENCY DENSITY	Structure and Additional Observations Geological / Depositional
E	0	*No Scala undertaken*	N	SV		TOPSOIL: dark brown, organic rich, moderate dilatancy silt.		S	TOPSOIL
						SILT: light brown, low to moderate dilatancy, low plasticity silt. Shear Vane @ 0.5m: 215 kPa, residual 55 kPa.	M	Vst	ALLUVIUM
	1					Silty GRAVEL: brown, fine to coarse, well graded, sub-rounded to angular gravel, moderate dilatancy silt.	D-M	D	
						END @ 1.5m. Limit of investigation.			
	2								
	3								
	4								

METHOD:
- **N** Natural Exposure
- **X** Existing Excavation
- **E** Excavator
- **HA** Hand Auger

SAMPLES:
- **U50** Undisturded Sample 50mm Diameter
- **D** Disturbed Sample
- **V** Vane Shear (kPa)
- **Bs** Bulk Disturded Sample
- **E** Environmental Sample
- **INF** Infiltration test

MOISTURE:
- **D** Dry
- **M** Moist
- **W** Wet
- **S** Saturated

CONSISTENCY / DENSITY:

VS	Very Soft	VL	Very Loose
S	**Soft**	L	Loose
F	**Firm**	MD	Medium Dense
St	**Stiff**	D	Dense
VSt	**Very Stiff**	VD	Very Dense
H	**Hard**		
Fb	**Friable**		

NOTE:
A scala result of 2.5 blows per 50mm is equivelent to a geotechnical ultimate bearing capacity of 300kPa in accordance with NZS 3604-2011, Section 3.3.7.

WATER:
- ◁ Water Inflow
- ▼ **Standing Water Level**
- ▽ **Estimated High Water Level**
- **N** **Nil Water Observed**

TP4

TEST PIT LOG

CO-ORDINATES: 360698 5056887
± m: 4m
ELEVATION: 340
DATUM: MSL / UTM

JOB NUMBER: G20084
PROJECT: PPG Te Awa Geotech
LOCATION: 161 Te Awa Road LAKE HAWEA

DATE: 23/08/2019
LOGGED BY: W. HAMILTON

EQUIPMENT
TYPE & MODEL: Yanmar ViO17
COMPANY: Mt Iron Geodrill
OPERATOR: G. TIPPETT

PIT DIMENSIONS:
Wide: 1.0m Long: 2.2m

METHOD	DEPTH (m)	BLOWS/50mm (0 5 10)	WATER	SAMPLES	GRAPHIC	DESRIPTION: Soil Name, Plasticity or Particle Characteristics, Colour, Secondary Components & Minor Components	MOSITURE	CONSISTENCY DENSITY	Structure and Additional Observations Geological / Depositional
E	0	*No Scala undertaken*	N	SV		TOPSOIL: dark brown, organic rich, moderate dilatancy silt.	M	S	TOPSOIL
						SILT: light brown, low to moderate dilatancy, low plasticity silt. Shear Vane @ 0.5m: 156 kPa, residual 35 kPa.		Vst	ALLUVIUM
	1					Silty GRAVEL: brown, fine to coarse, well graded, sub-rounded to angular gravel, moderate dilatancy silt.	D-M	D	
						END @ 1.5m. Limit of investigation.			
	2								
	3								
	4								

METHOD:
- **N** Natural Exposure
- **X** Existing Excavation
- **E** Excavator
- **HA** Hand Auger

SAMPLES:
- **U50** Undisturded Sample 50mm Diameter
- **D** Disturbed Sample
- **V** Vane Shear (kPa)
- **Bs** Bulk Disturded Sample
- **E** Environmental Sample
- **INF** Infiltration test

MOISTURE:
- **D** Dry
- **M** Moist
- **W** Wet
- **S** Saturated

CONSISTENCY / DENSITY:

VS	Very Soft	VL	Very Loose
S	Soft	L	Loose
F	Firm	MD	Medium Dense
St	Stiff	D	Dense
VSt	Very Stiff	VD	Very Dense
H	Hard		
Fb	Friable		

NOTE:
A scala result of 2.5 blows per 50mm is equivelent to a geotechnical ultimate bearing capacity of 300kPa in accordance with NZS 3604-2011, Section 3.3.7.

WATER:
- ◁ Water Inflow
- ▼ **Standing Water Level**
- ▽ **Estimated High Water Level**
- **N** **Nil Water Observed**

TP5

TEST PIT LOG

CO-ORDINATES:	360680 5057088	JOB NUMBER:	G20084	EQUIPMENT TYPE & MODEL:	Yanmar ViO17
± m:	4m	PROJECT:	PPG Te Awa Geotech	COMPANY:	Mt Iron Geodrill
ELEVATION:	349	LOCATION:	161 Te Awa Road LAKE HAWEA	OPERATOR:	G. TIPPETT
DATUM:	MSL / UTM	DATE:	23/08/2019	PIT DIMENSIONS:	
		LOGGED BY:	W. HAMILTON	Wide: 1.0m	Long: 2.2m

METHOD	DEPTH (m)	BLOWS/50mm	WATER	SAMPLES	GRAPHIC	DESRIPTION: Soil Name, Plasticity or Particle Characteristics, Colour, Secondary Components & Minor Components	MOSITURE	CONSISTENCY DENSITY	Structure and Additional Observations Geological / Depositional	DEPTH (m)
E	0	No Scala undertaken	N	S V		TOPSOIL: dark brown, organic rich, moderate dilatancy silt.	M	S	TOPSOIL	0
						SILT: light brown, low to moderate dilatancy, low plasticity silt. Shear Vane @ 0.4m: 151 kPa, residual 80 kPa.		Vst		
						Gravelly SILT: brown, moderate dilatancy silt, some fine to coarse, poorly graded gravel with frequent cobbles < 200mm.		Vst		
	1					Sandy GRAVEL: grey brown, fine to coarse, well graded, rounded to sub-angular gravel, fine to coarse, well graded sand, some fines.		D	ALLUVIUM	1
	2					END @ 1.8m. Limit of investigation.				2
	3									3
	4									4

METHOD:
- **N** Natural Exposure
- **X** Existing Excavation
- **E** Excavator
- **HA** Hand Auger

SAMPLES:
- **U50** Undisturded Sample 50mm Diameter
- **D** Disturbed Sample
- **V** Vane Shear (kPa)
- **Bs** Bulk Disturded Sample
- **E** Environmental Sample
- **INF** Infiltration test

MOISTURE:
- **D** Dry
- **M** Moist
- **W** Wet
- **S** Saturated

CONSISTENCY / DENSITY:

VS	Very Soft	VL	Very Loose
S	**Soft**	L	Loose
F	**Firm**	MD	Medium Dense
St	**Stiff**	D	Dense
VSt	**Very Stiff**	VD	Very Dense
H	**Hard**		
Fb	**Friable**		

NOTE:
A scala result of 2.5 blows per 50mm is equivelent to a geotechnical ultimate bearing capacity of 300kPa in accordance with NZS 3604-2011, Section 3.3.7.

WATER:
- ◁ Water Inflow
- ▼ **Standing Water Level**
- ▽ **Estimated High Water Level**
- **N** **Nil Water Observed**

TP6

TEST PIT LOG

CO-ORDINATES:	360648 5057088	JOB NUMBER:	G20084	EQUIPMENT TYPE & MODEL:	Yanmar ViO17
± m:	4m	PROJECT:	PPG Te Awa Geotech	COMPANY:	Mt Iron Geodrill
ELEVATION:	349	LOCATION:	161 Te Awa Road LAKE HAWEA	OPERATOR:	G. TIPPETT
DATUM:	MSL / UTM	DATE:	23/08/2019	PIT DIMENSIONS:	
		LOGGED BY:	W. HAMILTON	Wide: 1.0m	Long: 2.2m

METHOD	DEPTH (m)	BLOWS/50mm	WATER	SAMPLES	GRAPHIC	DESRIPTION: Soil Name, Plasticity or Particle Characteristics, Colour, Secondary Components & Minor Components	MOSITURE	CONSISTENCY DENSITY	Structure and Additional Observations Geological / Depositional	DEPTH (m)
	0					TOPSOIL: dark brown, organic rich, moderate dilatancy silt.		S	TOPSOIL	0
E	1	*No Scala undertaken*	N	S V		SILT: light brown, low to moderate dilatancy, low plasticity silt. Shear Vane @ 0.5m: 176 kPa, residual 109 kPa. Lense of sandy Gravel seen at Southern end of test pit < 0.5m thick.	M	Vst	ALLUVIUM	1
						Sandy GRAVEL: grey brown, fine to coarse, well graded, rounded to sub-angular gravel, fine to coarse, well graded sand, some fines. Cobbles < 300mm.	D-M	D		
	2					END @ 1.8m. Limit of investigation.				2
	3									3
	4									4

METHOD:
- **N** Natural Exposure
- **X** Existing Excavation
- **E** Excavator
- **HA** Hand Auger

SAMPLES:
- **U50** Undisturded Sample 50mm Diameter
- **D** Disturbed Sample
- **V** Vane Shear (kPa)
- **Bs** Bulk Disturded Sample
- **E** Environmental Sample
- **INF** Infiltration test

MOISTURE:
- **D** Dry
- **M** Moist
- **W** Wet
- **S** Saturated

CONSISTENCY / DENSITY:

VS	Very Soft	VL	Very Loose
S	**Soft**	L	Loose
F	**Firm**	MD	Medium Dense
St	**Stiff**	D	Dense
VSt	**Very Stiff**	VD	Very Dense
H	**Hard**		
Fb	**Friable**		

NOTE:
A scala result of 2.5 blows per 50mm is equivelent to a geotechnical ultimate bearing capacity of 300kPa in accordance with NZS 3604-2011, Section 3.3.7.

WATER:
- ◁ Water Inflow
- ▼ **Standing Water Level**
- ▽ **Estimated High Water Level**
- **N** **Nil Water Observed**

TP7

TEST PIT LOG

CO-ORDINATES: 360582 5056821
± m: 4m
ELEVATION: 349
DATUM: MSL / UTM

JOB NUMBER: G20084
PROJECT: PPG Te Awa Geotech
LOCATION: 161 Te Awa Road LAKE HAWEA

DATE: 23/08/2019
LOGGED BY: W. HAMILTON

EQUIPMENT
TYPE & MODEL: Yanmar ViO17
COMPANY: Mt Iron Geodrill
OPERATOR: G. TIPPETT

PIT DIMENSIONS:
Wide: 1.0m Long: 2.2m

METHOD	DEPTH (m)	BLOWS/50mm	WATER	SAMPLES	GRAPHIC	DESRIPTION: Soil Name, Plasticity or Particle Characteristics, Colour, Secondary Components & Minor Components	MOSITURE	CONSISTENCY DENSITY	Structure and Additional Observations Geological / Depositional
E	0		N			TOPSOIL: dark brown, organic rich, moderate dilatancy silt.	M	S	TOPSOIL
	1	*Limit of investigation*				Sandy GRAVEL: grey brown, fine to coarse, well graded, rounded to sub-angular gravel, fine to coarse, well graded sand, some fines. Frequent cobbles and boulders < 500mm.	D-M	D	ALLUVIUM
	2					END @ 1.5m. Limit of investigation.			
	3								
	4								

METHOD:
- **N** Natural Exposure
- **X** Existing Excavation
- **E** Excavator
- **HA** Hand Auger

SAMPLES:
- **U50** Undisturded Sample 50mm Diameter
- **D** Disturbed Sample
- **V** Vane Shear (kPa)
- **Bs** Bulk Disturded Sample
- **E** Environmental Sample
- **INF** Infiltration test

MOISTURE:
- **D** Dry
- **M** Moist
- **W** Wet
- **S** Saturated

CONSISTENCY / DENSITY:

VS	Very Soft	VL	Very Loose
S	Soft	L	Loose
F	Firm	MD	Medium Dense
St	Stiff	D	Dense
VSt	Very Stiff	VD	Very Dense
H	Hard		
Fb	Friable		

NOTE:
A scala result of 2.5 blows per 50mm is equivelent to a geotechnical ultimate bearing capacity of 300kPa in accordance with NZS 3604-2011, Section 3.3.7.

WATER:
- ◁ Water Inflow
- ▼ **Standing Water Level**
- ▽ **Estimated High Water Level**
- **N** **Nil Water Observed**

TP8

TEST PIT LOG

CO-ORDINATES:	360550 5056858	JOB NUMBER:	G20084	EQUIPMENT TYPE & MODEL:	Yanmar ViO17
± m:	4m	PROJECT:	PPG Te Awa Geotech	COMPANY:	Mt Iron Geodrill
ELEVATION:	349	LOCATION:	161 Te Awa Road LAKE HAWEA	OPERATOR:	G. TIPPETT
DATUM:	MSL / UTM	DATE:	23/08/2019	PIT DIMENSIONS:	
		LOGGED BY:	W. HAMILTON	Wide: 1.0m	Long: 2.2m

METHOD	DEPTH (m)	BLOWS/50mm	WATER	SAMPLES	GRAPHIC	DESRIPTION: Soil Name, Plasticity or Particle Characteristics, Colour, Secondary Components & Minor Components	MOSITURE	CONSISTENCY DENSITY	Structure and Additional Observations Geological / Depositional
E	0		N			TOPSOIL: dark brown, organic rich, moderate dilatancy silt.	M	S	TOPSOIL
						SILT: brown, low to moderate dilatancy, low plasticity silt.		St	
	1	*Limit of investigation*				Sandy GRAVEL: brown, fine to coarse, well graded, sub-rounded to sub-angular gravel, fine to coarse grained, well graded sand, some sub-rounded cobbles and boulders < 500mm	D-M	D	ALLUVIUM
	2					END @ 1.5m. Limit of investigation.			
	3								
	4								

METHOD:
- **N** Natural Exposure
- **X** Existing Excavation
- **E** Excavator
- **HA** Hand Auger

SAMPLES:
- **U50** Undisturded Sample 50mm Diameter
- **D** Disturbed Sample
- **V** Vane Shear (kPa)
- **Bs** Bulk Disturded Sample
- **E** Environmental Sample
- **INF** Infiltration test

MOISTURE:
- **D** Dry
- **M** Moist
- **W** Wet
- **S** Saturated

CONSISTENCY / DENSITY:

VS	Very Soft	VL	Very Loose
S	**Soft**	L	Loose
F	**Firm**	MD	Medium Dense
St	**Stiff**	D	Dense
VSt	**Very Stiff**	VD	Very Dense
H	**Hard**		
Fb	**Friable**		

NOTE:
A scala result of 2.5 blows per 50mm is equivelent to a geotechnical ultimate bearing capacity of 300kPa in accordance with NZS 3604-2011, Section 3.3.7.

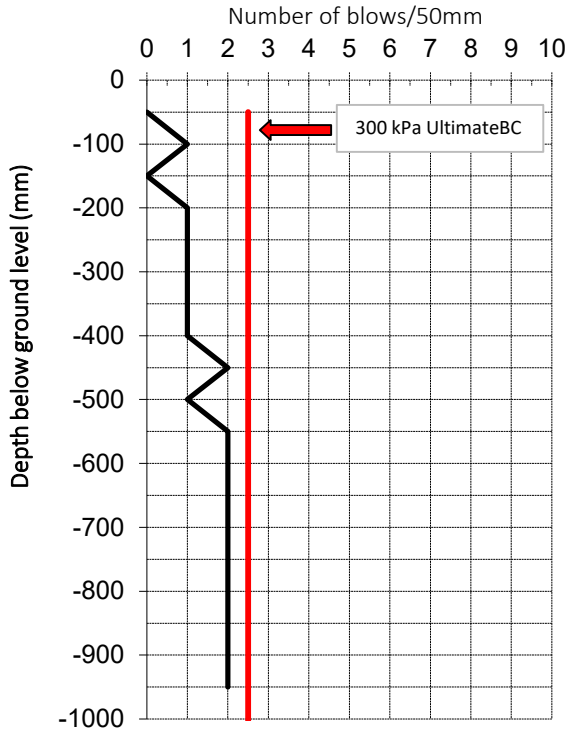
WATER:
- ◁ Water Inflow
- ▼ **Standing Water Level**
- ▽ **Estimated High Water Level**
- **N** **Nil Water Observed**

SCALA PENETROMETER RESULTS

JOB NUMBER:	G20084	PROJECT:	PPG Te Awa Geotech
		LOCATION:	161 Te Awa Road, Lake Hawea
CO-ORDINATES:	mE	DATE:	23-Aug-19
See attached plan	mN	OPERATOR:	W. Hamilton

Note: No Friction correction has been applied to the field results. 5 Blows per 100mm is considered compliance with NZS3604 3.3.7

SP1



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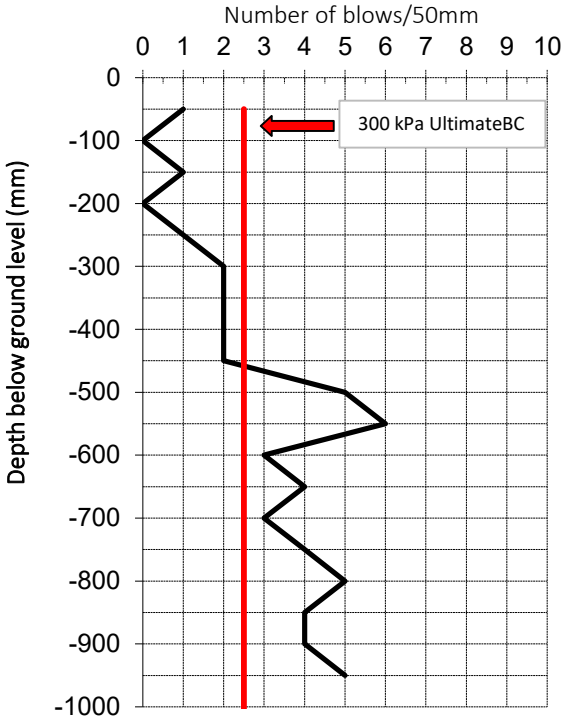

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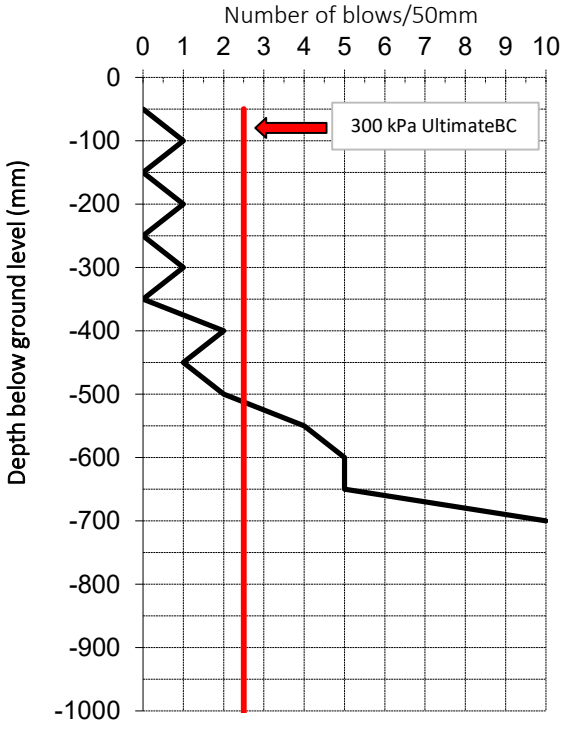

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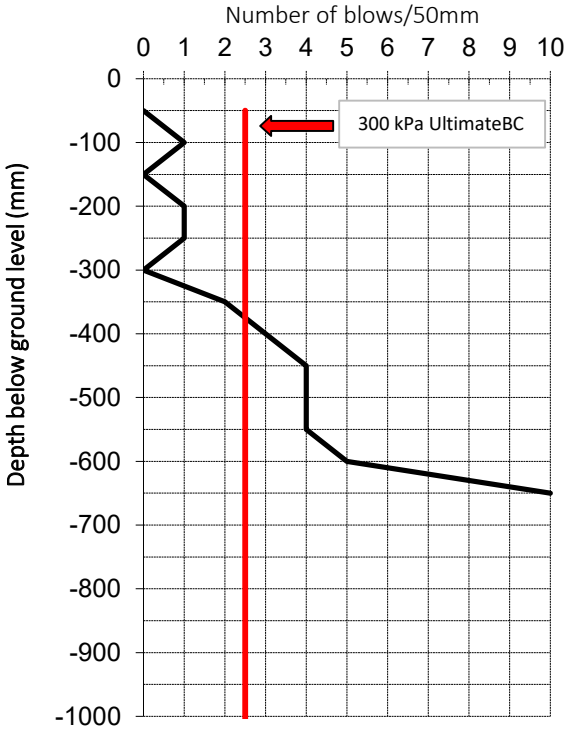
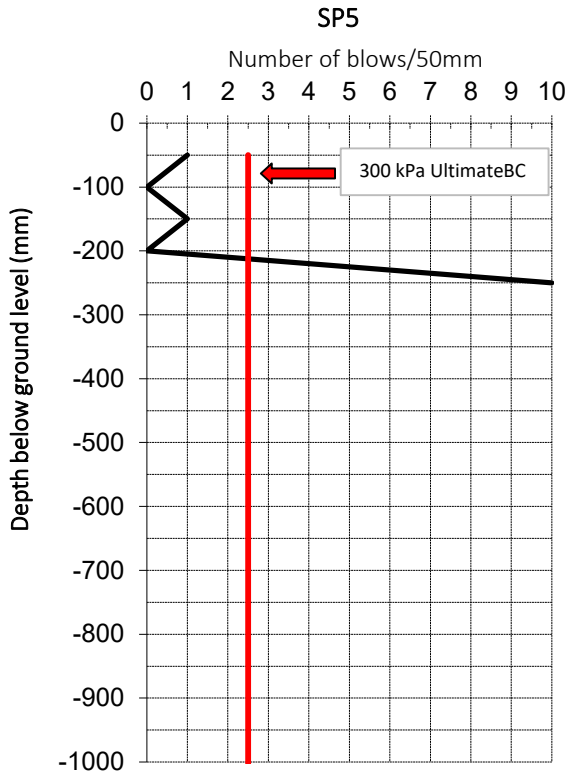


SCALA PENETROMETER RESULTS

JOB NUMBER:	G20084	PROJECT:	PPG Te Awa Geotech
		LOCATION:	161 Te Awa Road, Lake Hawea
CO-ORDINATES:	mE	DATE:	23-Aug-19
See attached plan	mN	OPERATOR:	W. Hamilton

Note: No Friction correction has been applied to the field results. 5 Blows per 100mm is considered compliance with NZS3604 3.3.7



IN THE MATTER of Lots 10-13 and Lots 16-20 DP 300251

AND

IN THE MATTER of subdivision Consent RM97308

Condition

At the time that a dwelling is erected on Lots 10, 11, 12, 13, 16, 17, 18, 19 and 20 DP 300251 Council will require evidence that each lot is supplied with 1000 litres per day of potable water that complies with the New Zealand Drinking Water Standards. Details shall be provided of any treatment required to achieve the required standard.

Dated this 5TH day of FEBRUARY 2001

.....

Authorised Officer

IN THE MATTER of Lots 10 - 13 and Lots 16 - 20 DP 300251

AND

IN THE MATTER of subdivision Consent RM97308

CONSENT NOTICE PURSUANT TO SECTION 221 OF THE RESOURCE MANAGEMENT ACT 1991

PATERSON PITTS PARTNERS LTD
REGISTERED SURVEYORS
WANAKA

AFFECTED PERSON'S APPROVAL

FORM 8A

QUEENSTOWN LAKES DISTRICT COUNCIL

Resource Management Act 1991 Section 95

RESOURCE CONSENT APPLICANT'S NAME AND/OR RM

Tony Berben & Dianne Lawson

AFFECTED PERSON'S DETAILS

I/We Colleen & John Leith

Are the owners/occupiers of

1025 Lake Hawea - Albert Town Rd
RD2 Wanaka 9382

DETAILS OF PROPOSAL

I/We hereby give written approval for the proposal to:

Undertake a 5 lot rural subdivision at 161 Te Awa Road. The subdivision includes establishing 5 residential building platforms (one being around the existing barn), rural amenity planting, a right of way and private access way to each lot.

at the following subject site(s):

161 Te Awa Road - Lot 13 DP300251

☑ PLEASE TICK I/We understand that by signing this form Council, when considering this application, will not consider any effects of the proposal upon me/us.

☐ PLEASE TICK I/We understand that if the consent authority determines the activity is a deemed permitted boundary activity under section 87BA of the Act, written approval cannot be withdrawn if this process is followed instead.

WHAT INFORMATION/PLANS HAVE YOU SIGHTED

☑ PLEASE TICK I/We have sighted and initialled ALL plans dated and approve them.

CD Leith JJ Leith

APPROVAL OF AFFECTED PERSON(S)

The written consent of all owners / occupiers who are affected. If the site that is affected is jointly owned, the written consent of all co-owners (names detailed on the title for the site) are required.

A

Name (PRINT)
Colleen & John Leith

Contact Phone / Email address
col_jon@xtra.co.nz.

Signature
Leith JG Leith

Date
6-1-2020

B

Name (PRINT)

Contact Phone / Email address

Signature

Date

C

Name (PRINT)

Contact Phone / Email address

Signature

Date

D

Name (PRINT)

Contact Phone / Email address

Signature

Date

Note to person signing written approval

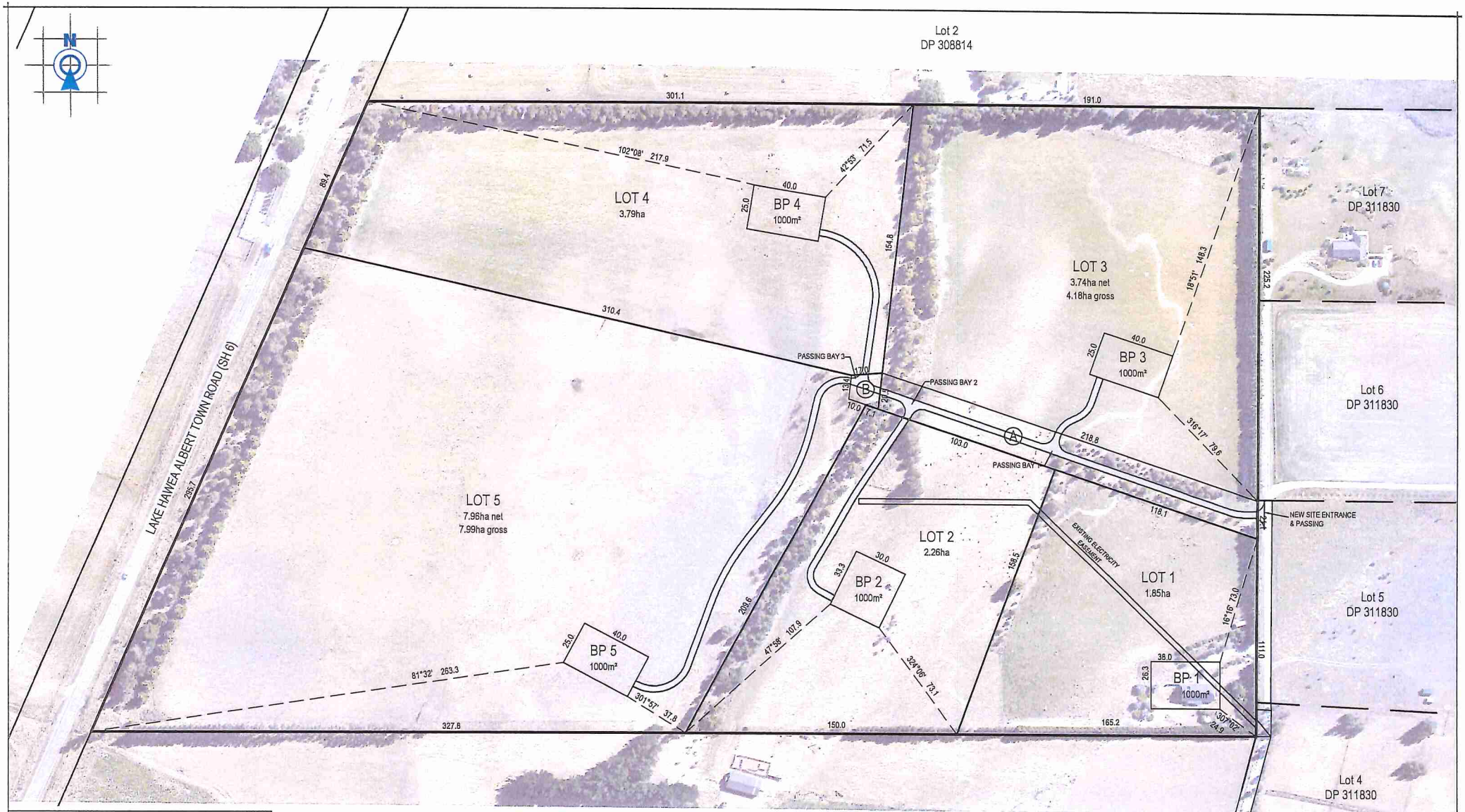
Conditional written approvals cannot be accepted.
There is no obligation to sign this form, and no reasons need to be given.
If this form is not signed, the application may be notified with an opportunity for submissions.
If signing on behalf of a trust or company, please provide additional written evidence that you have signing authority.

QUEENSTOWN LAKES DISTRICT COUNCIL
Queenstown Lakes District Council
Private Bag 50072, Queenstown 9348
Gorge Road, Queenstown 9300
P: 03 441 0499
E: resourceconsent@qldc.govt.nz
www.qldc.govt.nz

patch
landscape ■ architecture ■ planning

SCALE = 1:1000 AT A1

BERBEN — HAWEA
Masterplan
Reference PA19276 - IS05
2 December 2019



PROPOSED EASEMENTS			
PURPOSE	SHOWN	SERV TEN	DOM TEN
Right of way	A	Lot 3	Lots 2, 4, 5
	B	Lot 5	Lot 4

Note:
1. Subject to resource consent approval, engineering design and legal survey.
2. Additional service easements may be required once detailed design has been undertaken.

Lot 1
DP 303793

PATERSONPITTSGROUP
Your Land Professionals
www.ppgroup.co.nz
0800 PPGROUP

WANAKA BRANCH
19 Reece Crescent
or P.O. Box 283
Wanaka 9343
T 03 443 0110
E wanaka@ppgroup.co.nz

Client & Location:
T. Berben
Te Awa Road

Purpose & Drawing Title:
Scheme Plan
Lots 1-5 Being Subdivision
of Lot 13 DP 300251

Surveyed by:	-	Original Size:	Scale:
Designed by:	-	A3	1:2000 @ A3
Drawn by:	HBM		DO NOT SCALE
Checked by:	NJB		
Approved by:	NJB		
Job No: W5991		Sheet No. 100	Revision No: A
			Date Created: 20/08/2019

L:\ANNERH\MANSON\WTEMP PDP\W5991 SCHEME PLAN.DWG

AFFECTED PERSON'S APPROVAL

FORM 8A

QUEENSTOWN LAKES DISTRICT COUNCIL

Resource Management Act 1991 Section 95

RESOURCE CONSENT APPLICANT'S NAME AND/OR RM

Tony Berben & Dianne Lawson

AFFECTED PERSON'S DETAILS

I/We

Are the owners/occupiers of Te Awa Road Hawea

DETAILS OF PROPOSAL

I/We hereby give written approval for the proposal to:

Undertake a 5 lot rural subdivision at 161 Te Awa Road. The subdivision includes establishing 5 residential building platforms (one being around the existing barn), rural amenity planting, a right of way and private access way to each lot.

at the following subject site(s):

161 Te Awa Road - Lot 13 DP300251

☑ PLEASE TICK I/We understand that by signing this form Council, when considering this application, will not consider any effects of the proposal upon me/us.

☑ PLEASE TICK I/We understand that if the consent authority determines the activity is a deemed permitted boundary activity under section 87BA of the Act, written approval cannot be withdrawn if this process is followed instead.

WHAT INFORMATION/PLANS HAVE YOU SIGHTED

☑ PLEASE TICK I/We have sighted and initialled ALL plans dated and approve them.

BW Kennedy

APPROVAL OF AFFECTED PERSON(S)

The written consent of all owners / occupiers who are affected. If the site that is affected is jointly owned, the written consent of all co-owners (names detailed on the title for the site) are required.

A

Name (PRINT) Bernard William Kennedy

Contact Phone / Email address 027602861 4 antrimdowns@gmail

Signature BW Kennedy

Date 6 - 1 - 2020

B

Name (PRINT)

Contact Phone / Email address

Signature

Date

C

Name (PRINT)

Contact Phone / Email address

Signature

Date

D

Name (PRINT)

Contact Phone / Email address

Signature

Date

Note to person signing written approval

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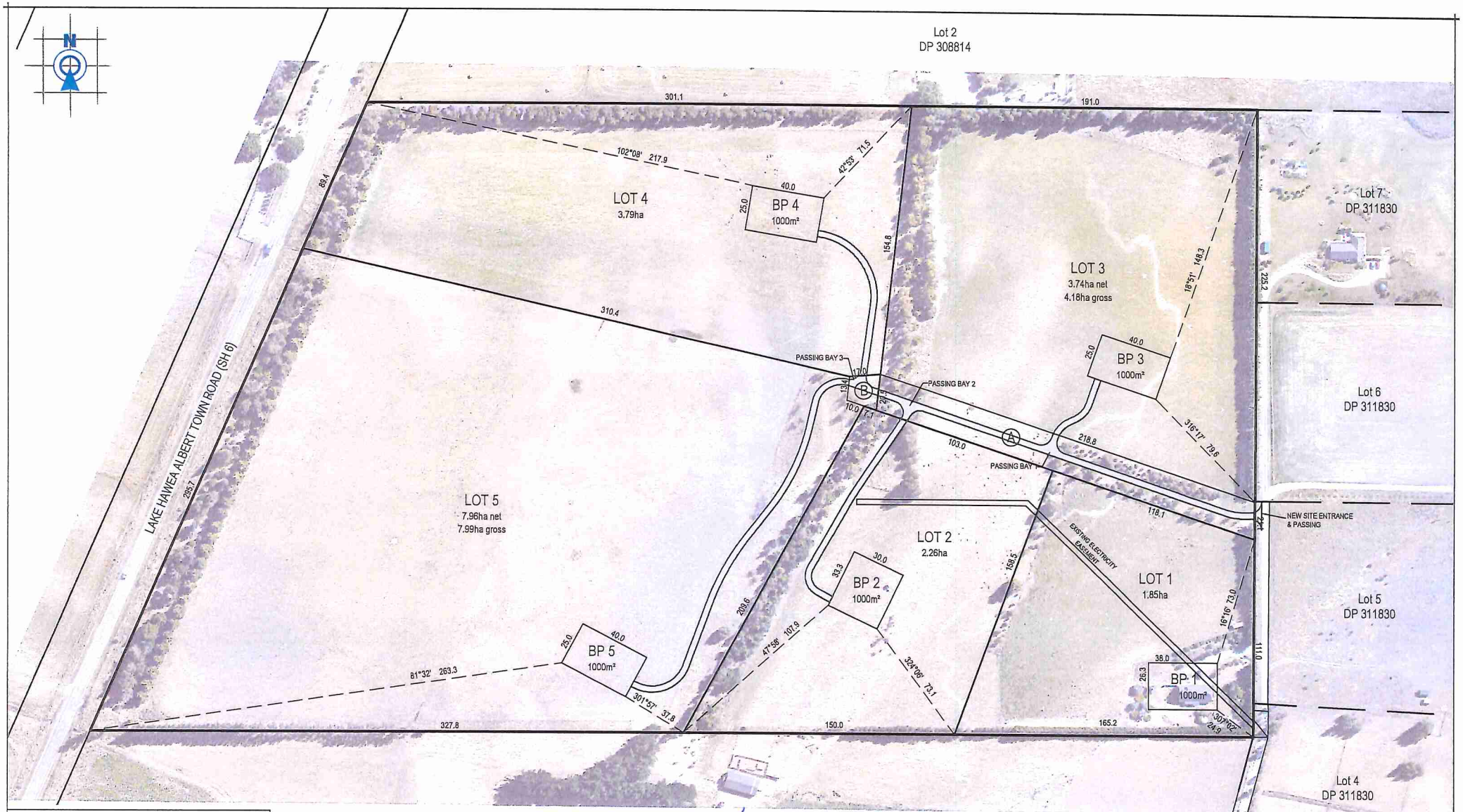
patch
landscape ■ architecture ■ planning

SCALE = 1:1000 AT A1

BERBEN — HAWEA
Masterplan
Reference PA19276 - IS05
2 December 2019



PROPOSED EASEMENTS			
PURPOSE	SHOWN	SERV TEN	DOM TEN
Right of way	A	Lot 3	Lots 2, 4, 5
	B	Lot 5	Lot 4

Note:
1. Subject to resource consent approval, engineering design and legal survey.
2. Additional service easements may be required once detailed design has been undertaken.

PATERSONPITTSGROUP
Your Land Professionals
www.ppgroup.co.nz
0800 PPGROUP

WANAKA BRANCH
19 Reece Crescent
or P.O. Box 283
Wanaka 9343
T 03 443 0110
E wanaka@ppgroup.co.nz

Client & Location:
T. Berben
Te Awa Road

Purpose & Drawing Title:
Scheme Plan
Lots 1-5 Being Subdivision
of Lot 13 DP 300251

Surveyed by:	-	Original Size: A3	Scale: 1:2000 @ A3
Designed by:	-		
Drawn by:	HBM		DO NOT SCALE
Checked by:	MJB		
Approved by:	MJB		
Job No: W5991		Sheet No: 100	Revision No: A
			Date Created: 20/08/2019

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AFFECTED PERSON'S APPROVAL

FORM 8A

QUEENSTOWN LAKES DISTRICT COUNCIL

Resource Management Act 1991 Section 95

RESOURCE CONSENT APPLICANT'S NAME AND/OR RM

Tony Berben & Dianne Lawson

AFFECTED PERSON'S DETAILS

I/We

Are the owners/occupiers of

LOT 6 TE AWA RD

DETAILS OF PROPOSAL

I/We hereby give written approval for the proposal to:

Undertake a 5 lot rural subdivision at 161 Te Awa Road. The subdivision includes establishing 5 residential building platforms (one being around the existing barn), rural amenity planting, a right of way and private access way to each lot.

at the following subject site(s):

161 Te Awa Road - Lot 13 DP300251

☑ PLEASE TICK I/We understand that by signing this form Council, when considering this application, will not consider any effects of the proposal upon me/us.

☑ PLEASE TICK I/We understand that if the consent authority determines the activity is a deemed permitted boundary activity under section 87BA of the Act, written approval cannot be withdrawn if this process is followed instead.

WHAT INFORMATION/PLANS HAVE YOU SIGHTED

☑ PLEASE TICK I/We have sighted and initialled ALL plans dated and approve them.

W.L. Capell RLL.

APPROVAL OF AFFECTED PERSON(S)

The written consent of all owners / occupiers who are affected. If the site that is affected is jointly owned, the written consent of all co-owners (names detailed on the title for the site) are required.

A

Name (PRINT) KEVIN JOHN CAPELL as trustees of the Capell
WENDY LEXIA CAPELL Bankshaw Family Trust

Contact Phone / Email address 0274 328842
wendycapellnz@gmail.com

Signature K.J. Capell W.L. Capell

Date 7-1-2020

B

Name (PRINT)
DUNMORE TRUSTEES LTD as trustee of the Capell Bankshaw F/T

Contact Phone / Email address
03 443 2255

Signature

Date 7-1-2020.

C

Name (PRINT)

Contact Phone / Email address

Signature

Date

D

Name (PRINT)

Contact Phone / Email address

Signature

Date

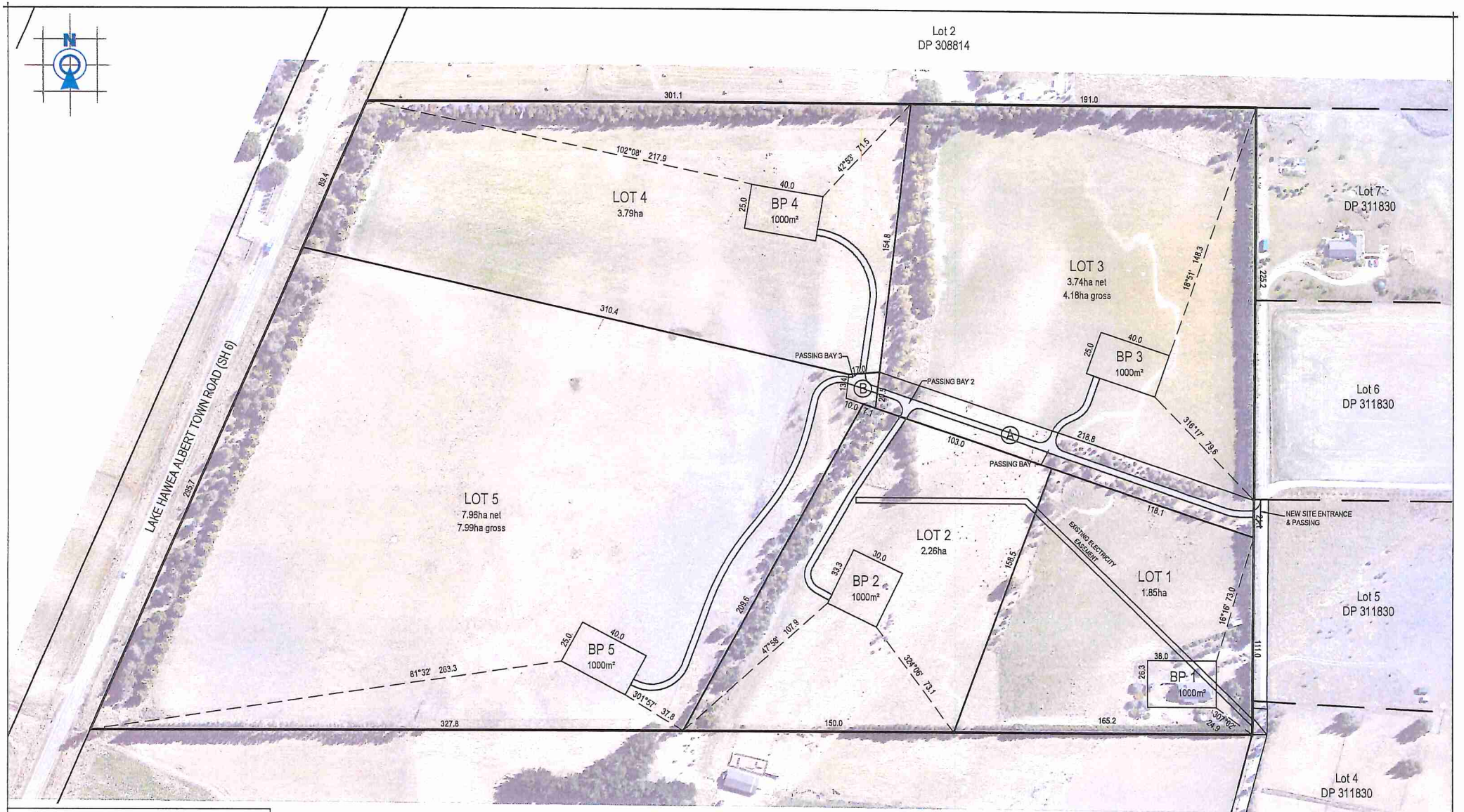
Note to person signing written approval

Conditional written approvals cannot be accepted.
There is no obligation to sign this form, and no reasons need to be given.
If this form is not signed, the application may be notified with an opportunity for submissions.
If signing on behalf of a trust or company, please provide additional written evidence that you have signing authority.

patch
landscape ■ architecture ■ planning

0 10 20 50m
SCALE = 1:1000 AT A1

BERBEN — HAWEA
Masterplan
Reference PA19276 - IS05
2 December 2019



PROPOSED EASEMENTS

PURPOSE	SHOWN	SERV TEN	DOM TEN
Right of way	A	Lot 3	Lots 2, 4, 5
	B	Lot 5	Lot 4

Note:
1. Subject to resource consent approval, engineering design and legal survey.
2. Additional service easements may be required once detailed design has been undertaken.

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www.ppgroup.co.nz
0800 PPGROUP

WANAKA BRANCH
19 Reece Crescent
or P.O. Box 283
Wanaka 9343
T 03 443 0110
E wanaka@ppgroup.co.nz

Client & Location:
T. Berben
Te Awa Road

Purpose & Drawing Title:
Scheme Plan
Lots 1-5 Being Subdivision
of Lot 13 DP 300251

Surveyed by:	-	Original Size:	Scale:
Designed by:	-	A3	1:2000 @ A3
Drawn by:	HBM		
Checked by:	MJB		DO NOT SCALE
Approved by:	MJB		
Job No: W5991		Sheet No. 100	Revision No: A
			Date Created: 20/08/2019

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W/C NRE RW

AFFECTED PERSON'S APPROVAL

FORM 8A

QUEENSTOWN LAKES DISTRICT COUNCIL

Resource Management Act 1991 Section 95

RESOURCE CONSENT APPLICANT'S NAME AND/OR RM

Tony Berben & Dianne Lawson

AFFECTED PERSON'S DETAILS

I/We MARTIN + JO ROBERTS

Are the owners/occupiers of 94 TE AWA ROAD
LAKE HAWEA
9282

DETAILS OF PROPOSAL

I/We hereby give written approval for the proposal to:
Undertake a 5 lot rural subdivision at 161 Te Awa Road. The subdivision includes establishing 5 residential building platforms (one being around the existing barn), rural amenity planting, a right of way and private access way to each lot.

at the following subject site(s):
161 Te Awa Road - Lot 13 DP300251

☑ PLEASE TICK I/We understand that by signing this form Council, when considering this application, will not consider any effects of the proposal upon me/us.

☐ PLEASE TICK I/We understand that if the consent authority determines the activity is a deemed permitted boundary activity under section 87BA of the Act, written approval cannot be withdrawn if this process is followed instead.

WHAT INFORMATION/PLANS HAVE YOU SIGHTED

☑ PLEASE TICK I/We have sighted and initialled ALL plans dated and approve them.

APPROVAL OF AFFECTED PERSON(S)

The written consent of all owners / occupiers who are affected. If the site that is affected is jointly owned, the written consent of all co-owners (names detailed on the title for the site) are required.

A

Name (PRINT) JOANNE ROBERTS

Contact Phone / Email address 0210 2971217

Signature [signature]

Date 8.1.20

B

Name (PRINT) MARTIN ROBERTS

Contact Phone / Email address 0210 257 6201

Signature [signature]

Date 8.1.20

C

Name (PRINT)

Contact Phone / Email address

Signature

Date

D

Name (PRINT)

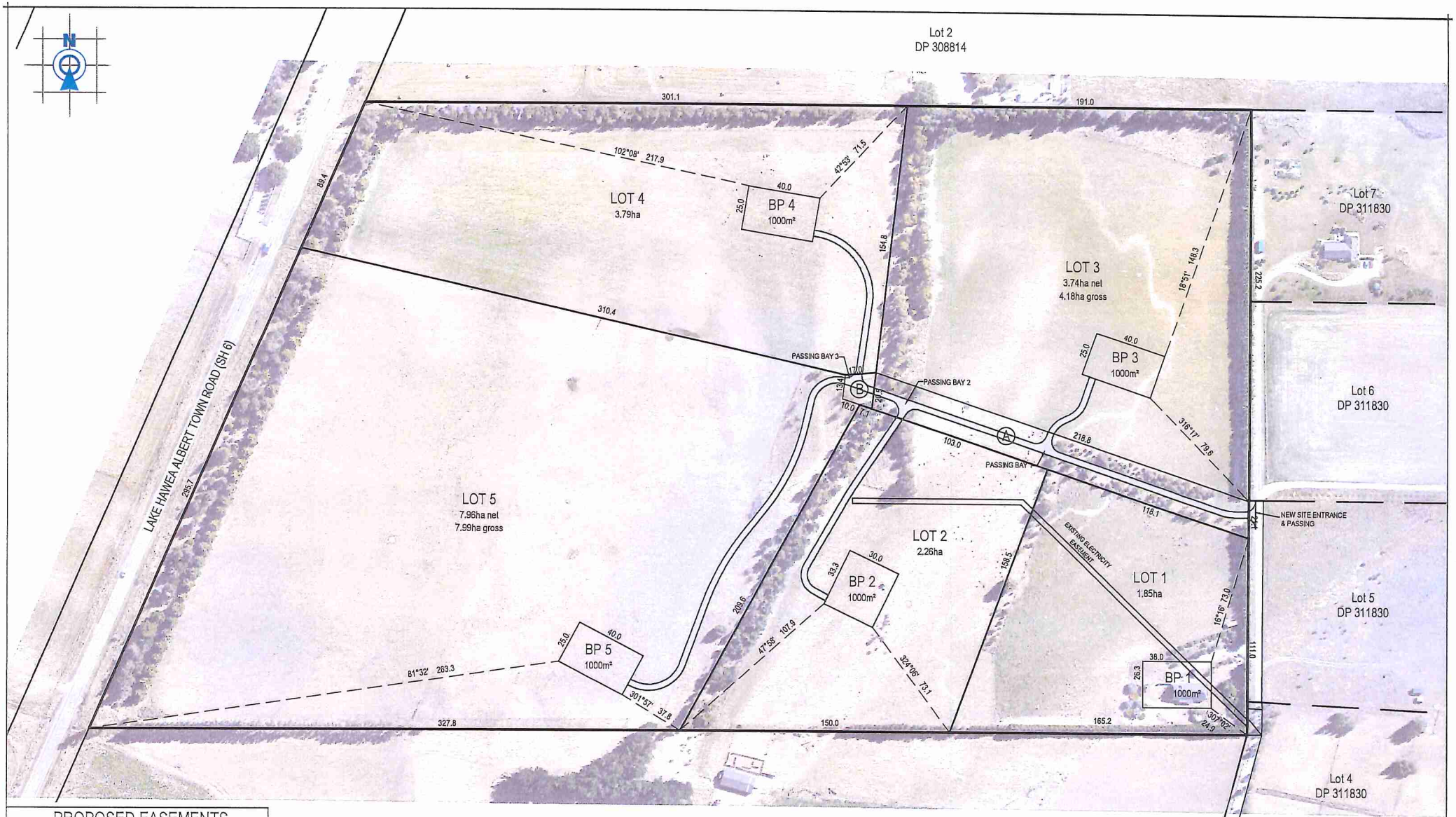
Contact Phone / Email address

Signature

Date

Note to person signing written approval

Conditional written approvals cannot be accepted.
There is no obligation to sign this form, and no reasons need to be given.
If this form is not signed, the application may be notified with an opportunity for submissions.
If signing on behalf of a trust or company, please provide additional written evidence that you have signing authority.



PROPOSED EASEMENTS			
PURPOSE	SHOWN	SERV TEN	DOM TEN
Right of way	A	Lot 3	Lots 2, 4, 5
	B	Lot 5	Lot 4

Note:
1. Subject to resource consent approval, engineering design and legal survey.
2. Additional service easements may be required once detailed design has been undertaken.

PATERSONPITTSGROUP
Your Land Professionals
www.ppgroup.co.nz
0800 PPGROUP

WANAKA BRANCH
19 Reece Crescent
or P.O. Box 283
Wanaka 9343
T 03 443 0110
E wanaka@ppgroup.co.nz

Client & Location:
T. Berben
Te Awa Road

Purpose & Drawing Title:
Scheme Plan
Lots 1-5 Being Subdivision
of Lot 13 DP 300251

Surveyed by:	-	Original Size:	Scale:	
Designed by:	-	A3	1:2000 @ A3	
Drawn by:	HBM		DO NOT SCALE	
Checked by:	MJB			
Approved by:	MJB			
Job No: W5991		Sheet No: 100	Revision No: A	Date Created: 20/08/2019

L:CANNERHMANSONWTEMP PDFW5991 SCHEME PLAN.DWG

MCR JR

patch
landscape ■ architecture ■ planning

MCK JK

0 10 20 50m
SCALE = 1:1000 AT A1

BERBEN — HAWEA
Masterplan
Reference PA19276 - IS05
2 December 2019

AFFECTED PERSON'S APPROVAL

FORM 8A

QUEENSTOWN LAKES DISTRICT COUNCIL

Resource Management Act 1991 Section 95

RESOURCE CONSENT APPLICANT'S NAME AND/OR RM

Tony Berben & Dianne Lawson

AFFECTED PERSON'S DETAILS

I/We Grant Barron, Jackie Barron and Timothy Ward

Are the owners/occupiers of Lot 5 DP 311830

DETAILS OF PROPOSAL

I/We hereby give written approval for the proposal to:

Undertake a 5 lot rural subdivision at 161 Te Awa Road. The subdivision includes establishing 5 residential building platforms (one being around the existing barn), rural amenity planting, a right of way and private access way to each lot.

at the following subject site(s):

161 Te Awa Road - Lot 13 DP300251

☑ PLEASE TICK I/We understand that by signing this form Council, when considering this application, will not consider any effects of the proposal upon me/us.

☐ PLEASE TICK I/We understand that if the consent authority determines the activity is a deemed permitted boundary activity under section 87BA of the Act, written approval cannot be withdrawn if this process is followed instead.

WHAT INFORMATION/PLANS HAVE YOU SIGHTED

☑ PLEASE TICK I/We have sighted and initialled ALL plans dated and approve them.

GRB JB TW

APPROVAL OF AFFECTED PERSON(S)

The written consent of all owners / occupiers who are affected. If the site that is affected is jointly owned, the written consent of all co-owners (names detailed on the title for the site) are required.

A

Name (PRINT): Grant Barron

Contact Phone / Email address: 0272 789663 gr8barron@gmail.com.

Signature: [signature]

Date: 09/01/2020

B

Name (PRINT): Jackie Barron.

Contact Phone / Email address: 027 669 9869 jbarron@shcs.school.nz

Signature: [signature]

Date: 09/01/2020.

C

Name (PRINT): Timothy Ward

Contact Phone / Email address: 027 451 6202 / tim.ward@bdo.co.nz

Signature: [signature]

Date: 14/01/2020

D

Name (PRINT):

Contact Phone / Email address:

Signature:

Date:

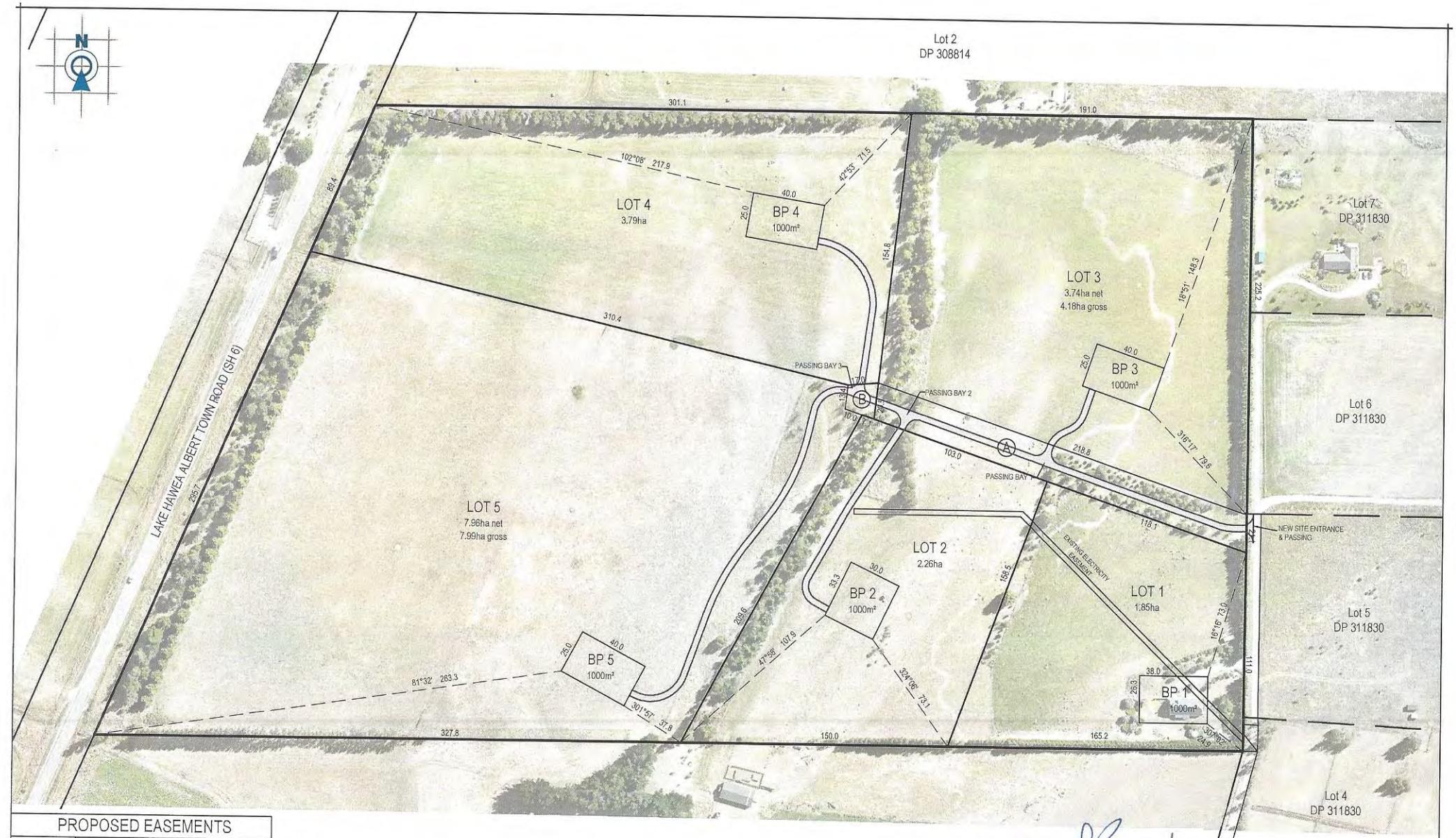
Note to person signing written approval

Conditional written approvals cannot be accepted.

There is no obligation to sign this form, and no reasons need to be given.

If this form is not signed, the application may be notified with an opportunity for submissions.

If signing on behalf of a trust or company, please provide additional written evidence that you have signing authority.



PROPOSED EASEMENTS			
PURPOSE	SHOWN	SERV TEN	DOM TEN
Right of way	A	Lot 3	Lots 2, 4, 5
	B	Lot 5	Lot 4

Note:
1. Subject to resource consent approval, engineering design and legal survey.
2. Additional service easements may be required once detailed design has been undertaken.

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WANAKA BRANCH
19 Reece Crescent
or P.O. Box 283
Wanaka 9343
T 03 443 0110
E wanaka@ppgroup.co.nz

Client & Location:
T. Berben
Te Awa Road

Purpose & Drawing Title:
Scheme Plan
Lots 1-5 Being Subdivision
of Lot 13 DP 300251

Surveyed by:	-	Original Size:	Scale:
Designed by:	-	A3	1:2000 @ A3
Drawn by:	HBM		DO NOT SCALE
Checked by:	MJB		
Approved by:	MJB		
Job No: W5991	Sheet No: 100	Revision No: A	Date Created: 20/08/2019

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patch
landscape ■ architecture ■ planning

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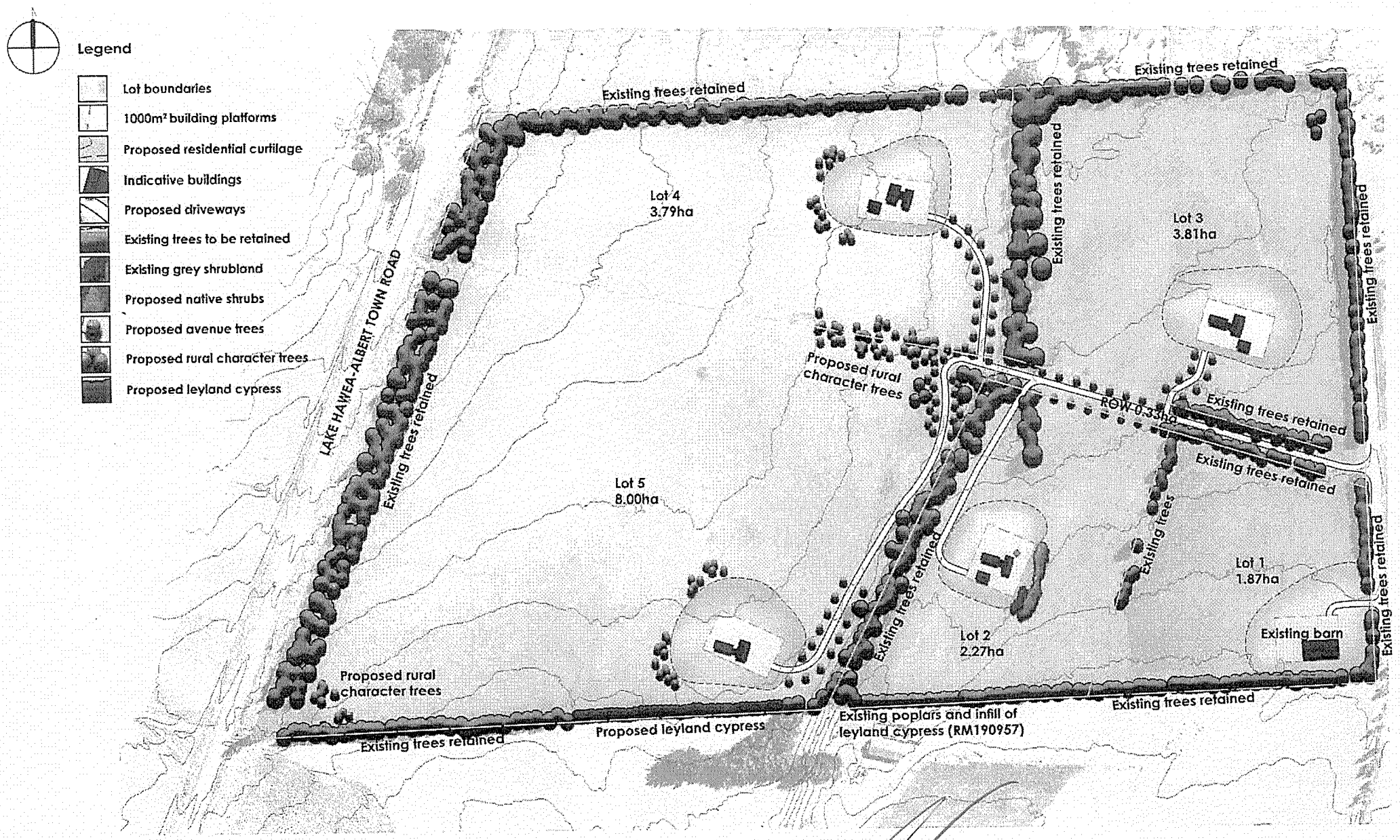
SCALE = 1:1000 AT A1

BERBEN — HAWEA
Masterplan
Reference PA19276 - IS05
2 December 2019



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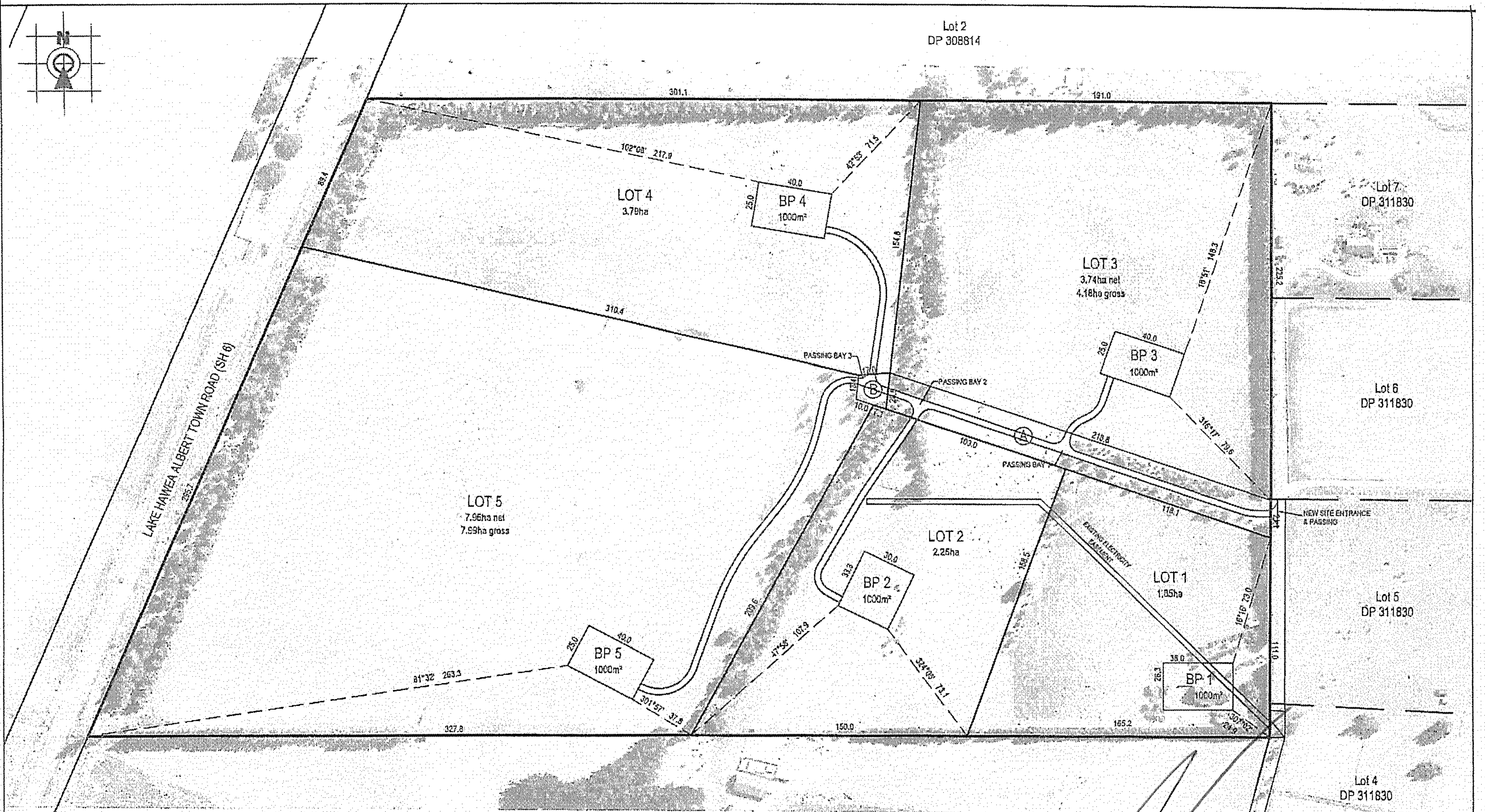
SCALE = 1:1000 AT A1

BERBEN — HAWEA
Masterplan
Reference PA19276 - ISO5
2 December 2019



PROPOSED EASEMENTS

PURPOSE	SHOWN	SERV TEN	DOM TEN
Right of way	A	Lot 3	Lots 2, 4, 5
	B	Lot 5	Lot 4

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Te Awa Road

Purpose & Drawing Title:
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Lots 1-5 Being Subdivision
of Lot 13 DP 300251

Surveyed by:	-	Original Size:	Scale:
Designed by:	-	A3	1:2000 @ A3
Drawn by:	HBM		
Checked by:	MJB		DO NOT SCALE
Approved by:	MJB		
Job No: W5991		Sheet No. 100	Revision No: A / Date Created: 20/08/2019

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APPROVAL OF AFFECTED PERSON(S)

The written consent of all owners / occupiers who are affected. If the site that is affected is jointly owned, the written consent of all co-owners (names detailed on the title for the site) are required.

A

Name (PRINT) Bernard William Kennedy

Contact Phone / Email address 0276028614 antrimdowns@gmail.com

Signature BW Kennedy

Date 6-1-2020

B

Name (PRINT) GRANT ARTHUR RUDDENKLAU.

Contact Phone / Email address 0274435093 gruddenklaud@gmail.com

Signature

Date 30-1-2020

C

Name (PRINT) Zita Mary Clough.

Contact Phone / Email address 027 22 33 180 zita@allenbyfarms.co.nz.

Signature

Date 30.1.2020

D

Name (PRINT)

Contact Phone / Email address

Signature

Date

Note to person signing written approval

Conditional written approvals cannot be accepted.

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AFFECTED PERSON'S APPROVAL

FORM 8A

QUEENSTOWN LAKES DISTRICT COUNCIL

Resource Management Act 1991 Section 95

RESOURCE CONSENT APPLICANT'S NAME AND/OR RM

Tony Berben & Dianne Lawson

AFFECTED PERSON'S DETAILS

I/We

Are the owners/occupiers of Te Awa Road Hawea

DETAILS OF PROPOSAL

I/We hereby give written approval for the proposal to:

Undertake a 5 lot rural subdivision at 161 Te Awa Road. The subdivision includes establishing 5 residential building platforms (one being around the existing barn), rural amenity planting, a right of way and private access way to each lot.

at the following subject site(s):

161 Te Awa Road - Lot 13 DP300251

☑ PLEASE TICK I/We understand that by signing this form Council, when considering this application, will not consider any effects of the proposal upon me/us.

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WHAT INFORMATION/PLANS HAVE YOU SIGHTED

☑ PLEASE TICK I/We have sighted and initialled ALL plans dated and approve them.

BW Kennedy

AFFECTED PERSON'S APPROVAL

FORM 8A

QUEENSTOWN LAKES DISTRICT COUNCIL

Resource Management Act 1991 Section 95

RESOURCE CONSENT APPLICANT'S NAME AND/OR RM

Tony Berben & Dianne Lawson

AFFECTED PERSON'S DETAILS

I/We John Cossens Patricia Cossens

Are the owners/occupiers of

964 Lake Hawea-Albert Town Rd.
RD2, Wanaka.

DETAILS OF PROPOSAL

I/We hereby give written approval for the proposal to:

Undertake a 5 lot rural subdivision at 161 Te Awa Road. The subdivision includes establishing 5 residential building platforms (one being around the existing barn), rural amenity planting, a right of way and private access way to each lot.

at the following subject site(s):

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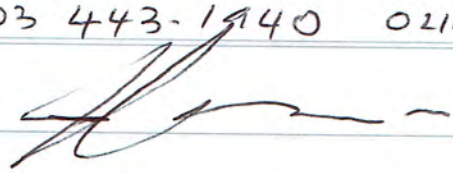
APPROVAL OF AFFECTED PERSON(S)

The written consent of all owners / occupiers who are affected. If the site that is affected is jointly owned, the written consent of all co-owners (names detailed on the title for the site) are required.

A

Name (PRINT): John Cossens

Contact Phone / Email address: 03 443-1940 021062471 John@xlearning.NZ

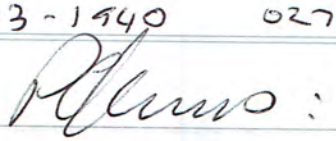
Signature: 

Date: 3/2/20

B

Name (PRINT): Trish Cossens

Contact Phone / Email address: 03 443-1940 027430130 trish.cossens@xtra.co.NZ

Signature: 

Date: 3/2/20

C

Name (PRINT):

Contact Phone / Email address:

Signature:

Date:

D

Name (PRINT):

Contact Phone / Email address:

Signature:

Date:

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patch
landscape ■ architecture ■ planning

SCALE = 1:1000 AT A1

BERBEN — HAWEA
Masterplan
Reference PA19276 - IS05
2 December 2019

PROPOSED EASEMENTS			
PURPOSE	SHOWN	SERV TEN	DOM TEN
Right of way	A	Lot 3	Lots 2, 4, 5
	B	Lot 5	Lot 4

Note:
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E wanaka@ppgroup.co.nz

Client & Location:
T. Berben
Te Awa Road

Purpose & Drawing Title:
Scheme Plan
Lots 1-5 Being Subdivision
of Lot 13 DP 300251

Surveyed by:	-	Original Size: A3	Scale: 1:2000 @ A3
Designed by:	-		
Drawn by:	HBM		DO NOT SCALE
Checked by:	MJB		
Approved by:	MJB		
Job No: W5991		Sheet No: 100	Revision No: A
			Date Created: 20/08/2019

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AFFECTED PERSON'S APPROVAL

FORM 8A

QUEENSTOWN LAKES DISTRICT COUNCIL

Resource Management Act 1991 Section 95

RESOURCE CONSENT APPLICANT'S NAME AND/OR RM

Tony Berben & Dianne Lawson

AFFECTED PERSON'S DETAILS

I/We Richard John and Michele Ann Hemingway

Are the owners/occupiers of

1044 Lake Hawea - Albert Town Rd, Hawea

DETAILS OF PROPOSAL

I/We hereby give written approval for the proposal to:

Undertake a 5 lot rural subdivision at 161 Te Awa Road. The subdivision includes establishing 5 residential building platforms (one being around the existing barn), rural amenity planting, a right of way and private access way to each lot.

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W5991 Scheme Plan230819, ApaLandscape

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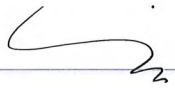
A

Name (PRINT)
RICHARD JOHN HEMINGWAY

Contact Phone / Email address
richard.hemingway@arcticservices.co.nz

Signature 

Date
27th Jan 20

B

Name (PRINT)
MICHELE ANN HEMINGWAY

Contact Phone / Email address
hemingway.michele@gmail.com

Signature 

Date
27th Jan 2020

C

Name (PRINT)

Contact Phone / Email address

Signature

Date

D

Name (PRINT)

Contact Phone / Email address

Signature

Date

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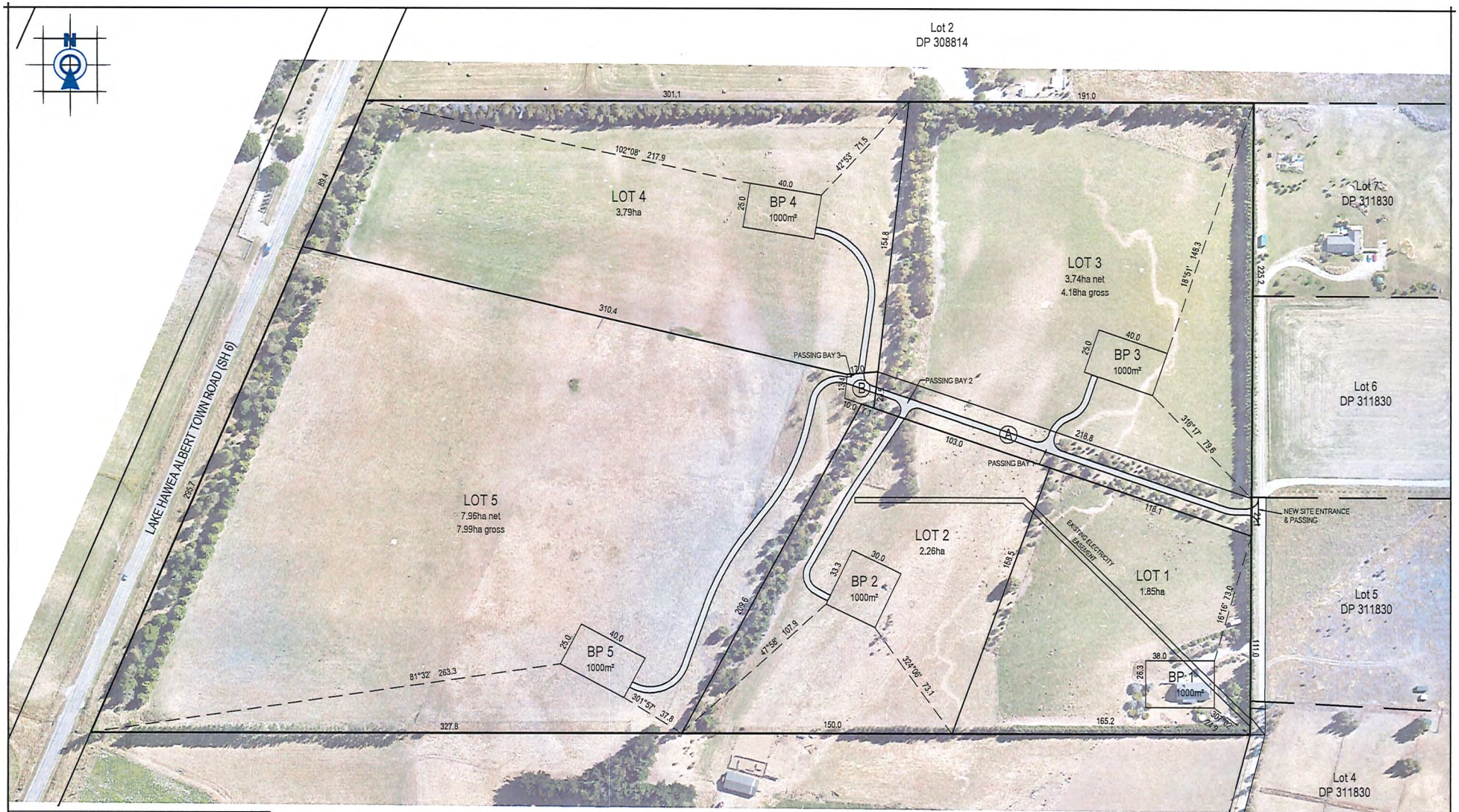

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Designed by:	-
Drawn by:	HBM
Checked by:	MJB
Approved by:	MJB
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	DO NOT SCALE
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Date Created:	20/08/2019

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0 10 20 50m
SCALE = 1:1000 AT A1

BERBEN — HAWEA
Masterplan
Reference PA19276 - IS05
2 December 2019