



GeoSolve ref: 150122 31 March 2015

Bridesdale Farm Developments Ltd Level 2, 33 Shortland Street Auckland 1010

Attention Simon Ash

#### Foundation Design Advice, Lots 139-149, Bridesdale Subdivision, Frankton

### 1 Introduction

This letter presents a brief summary of foundation design options for potential purchasers of lots 139-149 of the Bridesdale Subdivision.

This letter was commissioned by Bridesdale Farm Developments Ltd and has been carried out in accordance with GeoSolve's variation dated 26 February 2015.

The purpose of this letter is to provide an assessment of geotechnical issues identified by GeoSolve during subdivision wide investigations that will need to be considered in foundation design for lots 139-149.

The information provided in this letter is suitable for concept design only and does not provide a full geotechnical assessment of each lot.

#### 2 Subsoil Conditions

#### 2.1 Stratigraphy

The generalised stratigraphy under the above lots comprises loess, overlying Kawarau or Shotover alluvium, overlying schist bedrock. The test pit locations and detailed logs can be found in the attached Appendix A and B respectively.

The loess generally extends to depths of between 0.4 and 3m and comprises a very soft to firm, SILT to sandy SILT. Organic content comprising roots or small wood fragments was identified in TP28 and TP30.

The alluvium was variable and extends to depths of between 1.2 and 3.7m. The alluvium comprised a loose to medium dense, SAND to a sandy GRAVEL. Interbedded layers of alluvial SILT up to 0.2m thickness were also identified within this layer.

The underlying schist was slightly weathered and of variable strength, ranging from weak to moderately strong.



#### 2.2 Groundwater

Although groundwater was not observed through lots 144-151 in any of the testpit investigations, it is likely that water will track over the top of the underlying impermeable schist after rainfall.

A swampy area can be observed within the surficial soils in lots 142 and 143. It is inferred that water flows through the underlying alluvium tracking over the top of the impermeable schist. Where the schist comes in a close proximity to the surface, swampy surface conditions occur. The subsurface flow of water into this swampy area is likely to be exacerbated periodically when Hayes creek is cleared of less permeable silts which constrain infiltrating flows. As discussed in the following section appropriately designed drainage will be required for lots 142 and 143.

The groundwater level within Lot 139 is likely to be controlled by the level of the adjacent Hayes Creek.

### 3 Engineering Considerations

#### 3.1 General

The recommendations and opinions contained in this report are based upon ground investigation data obtained at discrete locations and historical information held on the GeoSolve database. The nature and continuity of subsoil conditions away from the investigation locations is inferred and cannot be guaranteed.

An individual site assessment and specific design of foundations for each lot will be required during the detailed design phase of any dwelling and for building consent purposes.

#### 3.2 Foundations

#### 3.2.1 General

Shallow bearing within the loess is not recommended owing to the potential for shallow slope instability when saturated and general low bearing capacities within this strata.

Therefore for the majority of dwellings foundations should either comprise piles (e.g. driven timber piles), or following removal of any loess, concrete slab foundations. Some earthworks will be required to provide a level building platform. The most appropriate foundation for each lot will depend on the type of structure proposed, the lot specific ground conditions and the location of the building platform within the lot. Shallow (Scala penetrometers and test pits) are recommended once building locations have been finalised for each lot.

#### 3.2.2 Drainage

Cut off drains will likely need to be installed at the crest and toes of any cuts, and along the upslope site boundary to intercept any overland flows.

Where structures are keyed into the slope to form retaining walls, drainage should be considered and included in the design in accordance with good practice.

Drainage should be suitably designed to safely convey any flows associated with groundwater flows recharged from Hayes creek. Particular care will be required in the lots where swampy conditions were observed (lots 142 and 143).



#### 3.2.3 Earthworks

Any exposed cuts may be prone to seepage and instability, which will require careful observation during construction. Slope drainage may be required for any permanent cuts proposed.

Any cuts into the underlying schist will likely require excavators with rock breaking capability. The vibrational effects on neighbouring structures (if already constructed) will need to be considered.

Any fill proposed should be certified by a chartered engineer. Some soft soils may need to be removed prior to fill placement and fills should be benched into sloping ground.

#### 3.2.4 Lots 140-149

Piles or footings should extend to the underlying schist which generally ranges in depth from 2 to 3m, however. Some piles will likely need to be deeper than this, perhaps up to 5m depending on final building levels and locations.

Pile bearing within the overlying alluvium may be achieved if it is medium dense in condition, and this can be confirmed with site specific investigations at the detailed design phase.

Concrete slab foundations will need to bear on either granular alluvium, schist or engineered (certified fill).

#### 3.2.5 Lot 139

This lot straddles a ridge adjacent to Hayes Creek. It is not known if this ridge provides some degree of flood protection, however, it appears to have been constructed or modified, likely by the farmer, to provide flood protection. The use of this ridge as a flood defence should be confirmed in order to establish a minimum floor level for the dwelling and the lot, and to ensure that lot 139 and any lots downslope are not affected.

The most suitable foundation option for this building platform would likely be driven timber piles down to the underlying schist, or alternatively, a specifically designed reinforced concrete slab bearing on alluvium.

If a piled option was preferred, the depth to schist would likely be in the range of 4-6m, however, site specific investigations would be required.

It is likely that this lot will require retention or earthworks fill adjacent to the northern and southern boundary so that an elevated level platform can be constructed. Retention or earthworks may need to be designed to tolerate adjacent flood flows and include some armouring.

The ridge may contain some fill, which should be investigated at the detailed design stage for the dwelling.

#### 3.3 Slope Stability

The risk of slope instability is relatively low owing to the presence of shallow schist which prevents any deep seated instability from occurring. However, the overlying loess and alluvium materials may be prone to shallow instability if they become saturated. This has been observed onsite adjacent to an existing cut track within lots 142 and 143, where the soils have become saturated and shallow failures have occurred.

Any retention, cuts or fills should be designed by an appropriately qualified engineer to ensure that appropriate drainage is included and that their construction does not contribute to slope instability.



An inspection should be carried out following stripping to identify if any under-runners are present within the loess.

Drainage is likely to comprise cut off drains on the upslope side of the proposed dwellings as noted above, however, other drainage solutions could be applied.

### 4 Applicability

This report has been prepared for the benefit of Bridesdale Farm Developments Ltd. with respect to the particular brief given to us and it may not be relied upon in other contexts or for any other purpose without our prior review and agreement.

It is important that we be contacted if there is any variation in subsoil conditions from those described in this report.

GeoSolve Ltd

Geotechnical Engineering Consultants

Report prepared by:

Blair Matheson Project Engineer

Attachments:

- Appendix A Site Plan
- Appendix B Investigation Data

Reviewed for GeoSolve Ltd by:

CEMandram

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Colin MacDiarmid Senior Geotechnical Engineer





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	PROJECT: Project Bridesdale Subdivision								Job Number: 140407
	LC	DCATION:	Lake Ha	yes Estate		Inclination:	N/A		Direction: N/A
	F	FASTING		mF	F∩I II PMENIT∙	10 Tonne Excavator	OPERAT	<u>OR</u> .	Tony Brooks
	NORTHING: mN INFOMAP NO								Queenstown Earthworks and Drainage
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COMMENT:	Logged By: G S Halliday
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	Sheet: 1 of 1



EXCAVATION NUMBER:

**TP 15** 

	PROJECT: Project Bridesdale Subdivision								Job Number: 140407
	LC	DCATION:	Lake Ha	yes Estate		Inclination:	N/A		Direction: N/A
<b></b>	F	FASTING		mF	FOLIPMENT	10 Tonne Excavator	OPERAT	OR.	Tony Brooks
	NORTHING: mN INFOMAP NO				TO TOTILE EXcavator	COMPA	ANY:	Oueenstown Earthworks and Drainage	
	ELE	EVATION:		330 m	DIMENSIONS:		HOLE STAR	TED:	18-Jul-14
	1	METHOD:		Test Pitting	EXCAV. DATUM:	Ground Level	HOLE FINISH	HED:	18-Jul-14
				root ritting	2,10,11,1,2,11,0,11				
									GEOLOGICAL
SCALA PENETRATION	GROUNDWATER / SEEPAGE	BY CONNDATER A SOLUTION OF CONTROL OF CONTRO						WATER CONTENT	SOIL / ROCK TYPE, ORIGIN, MINERAL COMPOSITION, DEFECTS, STRUCTURE, FORMATION
		0.3	٦×]	Diack, organic STET.				Moist	
			X÷X	Grey, sandy SILT. Sa	and is fine. Massive.				LOESS
		0.9	×× ×× ××					Moist	
			0.1	Grey, cobbly GRAVE	L with some sand and m	inor boulders. Gravel is	fine to coarse.		KAWARAU ALLUVIUM
		2.5		Sand is fine to coars	e. Maximum size of boul	ders is 0.4m. Loose.		Moist	
	NO SEEPAGE	4.1	x x x x x x x x x x x x x x x x x x x	Grey, laminated SIL <sup>T</sup> sandy, fine oxidised	T and clayey SILT. Silt is gravel horizon is presen	non-plastic to slightly p t at 4.0m. Firm.	olastic. A thin,	Moist	LAKE SEDIMENTS

COMMENT: Sample TP15 at 0-0.1m Topsoil	Logged By: G S Halliday
	Checked Date:
	Sheet: 1 of 1



PROJECT: Bridesdale Subdivision									Job Number: 140407
	LC	DCATION:	See Site	e Plan		Inclination:	Vertical		Direction:
EASTING: mE EQUIPMENT: 10T exca						10T excavator	OPERAT	OR:	
NORTHING: mN INFOMAP NO.							COMPA	ANY:	
	ELE	EVATION:		m	DIMENSIONS:		HOLE STAR	FED:	5-Dec-14
		METHOD:			EXCAV. DATUM:		HOLE FINISH	IED:	5-Dec-14
									GEOLOGICAL
SCALA PENETRATION	GROUNDWATER / SEEPAGE	DEPTH (m)	GRAPHIC LOG	SOIL / ROCK CLASSIFICATION, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, WEATHERING, SECONDARY AND MINOR COMPONENTS					SOIL / ROCK TYPE, ORIGIN, MINERAL COMPOSITION, DEFECTS, STRUCTURE, FORMATION
		0.15	~~~~	Grey, organic SILT.	Soft.			Moist	TOPSOIL
		0.75	XXX XXX	Grey, SILT. Thickeni	ng downslope (0.8m) wh	Moist	LOESS		
		2.6		Grey, sandy GRAVEL subrounded to round dense (100kPa). Bec	. with some cobbles and ded, up to 0.2m diameter lded.	boulders. Cobbles and	boulders are led. Medium	Moist	KAWARAU ALLUVIUM
	NO SEEPAGE	3.1		Light grey, SAND. Sa	and is fine. Uniform. Loos	e.		Moist	SHOTOVER DELTA ALLUVIUM
				101a1 Depth = 3.1 m					

COMMENT:	Logged By: FAW
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	Sheet: 1 of 1



	F	PROJECT:	Bridesda	ale Subdivision					Job Number: 140407
	LC	DCATION:	See Site	Plan		Inclination:	Vertical		Direction:
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SCALA PENETRATION	GROUNDWATER / SEEPAGE	DEPTH (m)	GRAPHIC LOG	SC Pi WEATH	IL / ROCK CLASSIFICAT ARTICLE SIZE CHARACT HERING, SECONDARY AN	WATER CONTENT	SOIL / ROCK TYPE, ORIGIN, MINERAL COMPOSITION, DEFECTS, STRUCTURE, FORMATION		
		0.3	٤×ډ	Grey, organic SILT.	Soft.			Moist	TOPSOIL
	D SEEPAGE	2.4	ĨĨĨĨĨĨĨĨĨĨĨĨĨĨĨĨĨĨĨĨĨĨĨĨĨĨĨĨĨĨĨĨĨĨĨĨĨĨ	Grey, SILT. Very sof Grey, sandy GRAVEL 0.3m diameter. Poor	t/soft to firm. . with cobbles and bould ly graded. Loose. Mediun	ers. Boulders are subro n dense at base. Sub-t	unded, up to norizontal.	Moist	LOESS KAWARAU ALLUVIUM
	NC	3.2	///	GREYSCHIST. Slight	ly weathered. Weak beco	ming moderately stror	ng. Foliated.		SCHIST
				Total Depth = 3.2 m					

COMMENT:	Logged By: FAW
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	Sheet: 1 of 1



PROJECT: Bridesdale Subdivision									Job Number: 140407
	LC	DCATION:	See Site	e Plan		Inclination:	Vertical		Direction:
EASTING: mE EQUIPMENT:						10T excavator	OPERAT	OR:	
	NORTHING: mN INFOMAP NO.						COMPA	ANY:	
	ELE	EVATION:		m	DIMENSIONS:		HOLE STAR	TED:	5-Dec-14
		METHOD:			EXCAV. DATUM:		HOLE FINISH	HED:	5-Dec-14
									GEOLOGICAL
SCALA PENETRATION	GROUNDWATER / SEEPAGE	DEPTH (m)	GRAPHIC LOG	SOIL / ROCK CLASSIFICATION, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, WEATHERING, SECONDARY AND MINOR COMPONENTS					SOIL / ROCK TYPE, ORIGIN, MINERAL COMPOSITION, DEFECTS, STRUCTURE, FORMATION
			X,X	Grey, SILT with root	s. Soft.				TOPSOIL
		0.4	×××					Moist	
	EEPAGE	2.7	xxxxxxxxxxxxxxxx	Grey, brown at base firm, rarely stiff. Grey, SAND with min	, sandy SILT and SILT. S nor gravel. Sand is fine to	and is fine. Silt is non-	plastic. Soft to	Moist	LOESS SHOTOVER DELTA ALLUVIUM
	NO	3.3	///	GREYSCHIST. Slight	ly weathered. Weak becc	ming moderately stror	ng. Foliated.		SCHIST
	_			Total Depth = 3.3 m	*	~ /	~		<u> </u>

COMMENT:	Logged By: GSH
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	Sheet: 1 of 1



PROJECT: Bridesdale Subdivision									Job Number: 140407
	LC	DCATION:	See Site	Plan		Inclination:	Vertical		Direction:
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	NC	RTHING:		mN	INFOMAP NO.		COMPA	ANY:	
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		0.4 Black, SILT with roots. Soft.						Moist	TOPSOIL
			ХХ	Black, SILT with min	or gravel and roots. Non	-plastic. Soft to firm. M	assive.		COLLUVIUM
		0.9	$\overset{\times}{\times}$					Moist	
		1.8		Grey, SILT. Non-plas	stic. Soft to firm. Massive	ι.		Moist	LOESS
		2.0	$\times_{X}$	Grey, laminated SIL	T. Micaceous. Non-plastic	c. Firm.		Vloist	SHOTOVER DELTA ALLUVIUM
	EPAGE	2.2	Grey, SAND with some silt. Sand is fine. Loose to medium dense.					Moist I	SHOTOVER DELTA ALLUVIUM
	NO SE	2.4	$\square$	GREYSCHIST. Slight	ly weathered. Weak beco	oming moderately stror	g. Foliated.		SCHIST
				Total Depth = 2.4 m					

COMMENT:	Logged By: GSH
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	Sheet: 1 of 1



PROJECT: Bridesdale Subdivision								Job Number: 140407
LOCATION: See Site Plan Inclination: Vertical								Direction:
NIC	EASTING: ME EQUIPMENT: 10T excavator OPERATO							
EL	EVATION:		m	DIMENSIONS:		HOLE STAR	TED:	5-Dec-14
	METHOD:			EXCAV. DATUM:		HOLE FINISH	HED:	5-Dec-14
								GEOLOGICAL
SCALA PENETRATION GROUNDWATER / SEEPAGE	DEPTH (m)	GRAPHIC LOG	SO P/ WEATH	IL / ROCK CLASSIFICATI ARTICLE SIZE CHARACTI IERING, SECONDARY AN	ION, PLASTICITY OR ERISTICS, COLOUR, ID MINOR COMPONEN	TS	WATER CONTENT	SOIL / ROCK TYPE, ORIGIN, MINERAL COMPOSITION, DEFECTS, STRUCTURE, FORMATION
	0.3	XXX	Black, SILT. Soft.				Moist	TOPSOIL
	1.2	<u> </u>	Black, SILT. Non-pla	stic. Soft to firm. Massive	Э.		Moist	LOESS
SEEPAGE	2.0	0.00.000	Grey, sandy GRAVEL Very loose to loose.	Sand is fine to coarse. Bedded.	Gravel is fine to coarse	e. Well graded.	Moist	KAWARAU ALLUVIUM
NO	2.1	777	GREYSCHIST. Slight	ly weathered. Weak becc	ming moderately stror	ng. Foliated.		SCHIST
			Total Depth = 2.1 m					

COMMENT:	Logged By: GSH
	Checked Date:
	Sheet: 1 of 1



PROJECT: Bridesdale Subdivision								,	Job Number: 140407
	LC	CATION:	See Site	Plan		Inclination:	Vertical		Direction:
	EASTING: mE EQUIPMENT:				10T excavator	OPERAT	OR:		
	NORTHING: mN INFOMAP NO.					COMPA	ANY:		
	ELE	VATION:		m	DIMENSIONS:		HOLE STAR	FED:	5-Dec-14
	Ν	METHOD:			EXCAV. DATUM:		HOLE FINISH	HED:	5-Dec-14
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		0.3	XX	Black, SILT with roo	ts. Soft.			Moist to wet	TOPSOIL
		2.2	$\sim$	Dark grey, SILT with	n minor fine organic mate	rial. Very soft to soft.		Saturated	FLOOD DEPOSIT
	_	2.3	n. 1	Grey and brown, sar	ndy GRAVEL. Sand is fine	. Gravel is fine. Very lo	ose to loose.	Saturated	KAWARAU ALLUVIUM
	<ul> <li>Strong inflow</li> </ul>	2.8	×× ×× ××	Dark grey, SILT with	n wood (branch) at base.	Firm.		Saturated	FLOOD DEPOSIT
		3.3	0.00	Brown, sandy GRAV	EL. Gravel is fine to coars	se. Loose.		Saturated	KAWARAU ALLUVIUM

COMMENT:	Logged By: GSH
	Checked Date:
	Sheet: 1 of 1



PROJECT: Bridesdale Subdivision									Job Number: 140407
	LC	DCATION:	See Site	Plan		Inclination:	Vertical		Direction:
	E	EASTING:		mE	EQUIPMENT:	10T excavator	OPERAT	OR:	
	NC	ORTHING:		mN	INFOMAP NO.		COMPA	ANY:	
	ELE	EVATION:		m	DIMENSIONS:		HOLE STAR	FED:	5-Dec-14
	ſ	METHOD:			EXCAV. DATUM:		HOLE FINISH	HED:	5-Dec-14
									GEOLOGICAL
SCALA PENETRATION	GROUNDWATER / SEEPAGE	DEPTH (m)	() SOIL / ROCK CLASSIFICATION, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, WEATHERING, SECONDARY AND MINOR COMPONENTS						SOIL / ROCK TYPE, ORIGIN, MINERAL COMPOSITION, DEFECTS, STRUCTURE, FORMATION
		0.3	$\langle \times \rangle$	Brown, SILT with roo	ots. Soft.			loist to we	TOPSOIL
		2.1		Grey, SILT with mine wood fragment (0.3) Massive.	or colluvial cobbles and c m diameter) at base. Mic	rganic material. Browr aceous. Non-plastic. V	h iron stained ery soft to soft.	sd Saturated Mc	FLOOD DEPOSIT
	flow	2.3	X	Brown, silty SAND w	ith wood fragments. San	d is fine. Non-plastic. \	/ery loose.	Saturated	FLOOD DEPOSIT
	Strong in:	3.0	$\sim$	Dark grey, SILT with	n wood (branches). Soft t	o firm. Hard at base.		Saturated	FLOOD DEPOSIT
		3.3	0.00	Brown, sandy GRAVEL. Gravel is fine. Very dense.					KAWARAU ALLUVIUM
		3.4	777	GREYSCHIST. Slight	ly weathered. Weak becc	ming moderately stror	ng. Foliated.		SCHIST
				Total Depth = 3.4 m					

COMMENT: Strong inflow also noted at 3.3m.	Logged By: GSH/GS
	Checked Date:
	Sheet: 1 of 1



PROJECT: Bridesdale Subdivision									Job Number: 140407
	LC	DCATION:	See Site	Plan		Inclination:	Vertical		Direction:
	F	EASTING:		mF	FOUIPMENT:	10T excavator	OPERAT	OR:	
	NORTHING: mN INFOMAP NO.					ion oncorrection	COMP	ANY:	
	ELE	VATION:		m	DIMENSIONS:		HOLE STAR	TED:	5-Dec-14
	ſ	METHOD:			EXCAV. DATUM:		HOLE FINISH	HED:	5-Dec-14
			1 1					r	GEOLOGICAL
SCALA PENETRATION	GROUNDWATER / SEEPAGE	DEPTH (m)	GRAPHIC LOG	SO P/ WEATH	IL / ROCK CLASSIFICATI ARTICLE SIZE CHARACTE IERING, SECONDARY AN	WATER CONTENT	SOIL / ROCK TYPE, ORIGIN, MINERAL COMPOSITION, DEFECTS, STRUCTURE, FORMATION		
		0.2	$\times_{\times}$	Brown, SILT with ro	ots. Soft.			Moist	TOPSOIL
		0.5		Grey, SAND with sor	ne silt. Sand is fine. Very	loose to loose.		Moist	COLLUVIUM
		0.5	$\chi \chi $	Dark grey, SILT with plastic. Very soft/sof	n small wood fragments. I	Brown staining at 2.5m Ided below 2.5m.	. Micaceous. Non-	Moist	LOESS
		3.3		Brown and grey, SA	ND with some silt. Sand is	s fine. Loose to mediur	n dense.	Moist	SHOTOVER DELTA ALLUVIUM
	GE	3.4	K X	Grey brown, SILT. S	tiff.			Moist	SHOTOVER DELTA ALLUVIUM
	EPA	3.5		Grey, SAND with a trace of	gravel. Sand is fine to medium.	Gravel is fine to medium. Med	ium dense.	Moist	SHOTOVER DELTA ALLUVIUM
	SEI		n •/	Grey, sandy GRAVEL	. Sand is fine to coarse.	Gravel is fine to mediu	m, slabby schist	st	SHOTOVER DELTA ALLUVIUM
	9	3.7	P 7 F	clasts. Medium dens	e to dense.		-	Moi	
				Total Depth = 3.7 m					•

COMMENT:	Logged By: GSH/GS
	Checked Date:
	Sheet: 1 of 1



PROJECT: Bridesdale Subdivision									Job Number: 140407
	LOCATION: See Site Plan Inclination: Vertical							Direction:	
	EASTING: mE FOUIPMENT: 10T excavator OPERAT						OR:		
	NC	ORTHING:		mN	INFOMAP NO.		COMP	ANY:	
	ELI	EVATION:		m	DIMENSIONS:		HOLE STAR	TED:	5-Dec-14
		METHOD:			EXCAV. DATUM:		HOLE FINISH	HED:	5-Dec-14
									GEOLOGICAL
SCALA PENETRATION	SCALA PENETRATION BARTICIC LOCK CLASSIFICATION, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, WEATHERING, SECONDARY AND MINOR COMPONENTS					WATER CONTENT	SOIL / ROCK TYPE, ORIGIN, MINERAL COMPOSITION, DEFECTS, STRUCTURE, FORMATION		
	0.1 🗙 🔰 Brown, SILT with roots. Soft.							Moist	TOPSOIL
		0.4	XXX	Dark grey, SILT. Nor	n-plastic. Soft to firm.			Moist	LOESS
	) SEEPAGE	Grey and brown, gravelly COBBLES with some sand. Sand is fine to medium. Gravel is fine to coarse. Cobbles to 150mm diameter. Gravel and cobbles are subrounded to subangular. Loose. Bedded.						Moist	KAWARAU ALLUVIUM
	NO	1.3	///	GREYSCHIST. Slight	ly weathered. Weak becc	ming moderately stror	ng. Foliated.		SCHIST
				Total Depth = 1.3 m					

COMMENT:	Logged By: GSH/GS
	Checked Date:
	Sheet: 1 of 1



EXCAVATION NUMBER:

TP 30

PROJECT: Bridesdale Subdivision									Job Number: 140407
	LO	CATION:	See Site	Plan		Inclination:	Vertical		Direction:
	E	ASTING		mF	EOUIPMENT.	10T excavator	OPERAT	OR	
	NOF	RTHING:		mN	INFOMAP NO.		COMPA	ANY:	
	ELE	VATION:		m	DIMENSIONS:		HOLE STAR	TED:	5-Dec-14
	N	ETHOD:			EXCAV. DATUM:		HOLE FINISH	IED:	5-Dec-14
ſ									
<u> </u>								r	GEOLOGICAL
SCALA PENETRATION	GROUNDWATER / SEEPAGE	DEPTH (m)	GRAPHIC LOG	SO P/ WEATH	IL / ROCK CLASSIFICAT ARTICLE SIZE CHARACTI IERING, SECONDARY AN	ION, PLASTICITY OR ERISTICS, COLOUR, ID MINOR COMPONEN	TS	WATER CONTENT	SOIL / ROCK TYPE, ORIGIN, MINERAL COMPOSITION, DEFECTS, STRUCTURE, FORMATION
		0.2	$\sim$	Brown, SILT with roo	ots. Soft.			Vloist	TOPSOIL
		1.0	XXX XXX XXX	Grey, SILT with root Soft to firm. Horizon	s. 10mm horizons of silty tally bedded.	v SAND. Fine organic m	naterial at 1.0m.	Moist	LOESS
		13	X X X	Brown, silty SAND. S	Sand is fine. Loose.			Moist	SHOTOVER DELTA ALLUVIUM
		2.0		Brown, SAND with n	ninor silt. Sand is fine. Lo	ose.		Moist	SHOTOVER DELTA ALLUVIUM
	NO SEEPAGE	3.5		Brown and grey, sar fine to medium. Loos	ndy GRAVEL. Oxidised 2.7	7-3.0m. Sand is fine to	coarse. Gravel is	Moist	SHOTOVER DELTA ALLUVIUM

COMMENT:	Logged By: GSH/GS
	Checked Date:
	Sheet: 1 of 1



	F	PROJECT:	Bridesda			Job Number: 140407			
	LC	DCATION:	See Site	e Plan		Inclination:	Vertical		Direction:
		EASTING:		mE	EQUIPMENT:	10T excavator	OPERA	OR:	
	NC	ORTHING:		mN	INFOMAP NO.		COMP	ANY:	
	ELE	EVATION:		m	DIMENSIONS:		HOLE STAR	TED:	8-Dec-14
		METHOD:			EXCAV. DATUM:		HOLE FINISH	HED:	8-Dec-14
			1						GEOLOGICAL
SCALA PENETRATION	GROUNDWATER / SEEPAGE	DEPTH (m)	GRAPHIC LOG	SC P, WEATH	DIL / ROCK CLASSIFICAT ARTICLE SIZE CHARACT HERING, SECONDARY AN	ION, PLASTICITY OR ERISTICS, COLOUR, ID MINOR COMPONEN	TS	WATER CONTENT	SOIL / ROCK TYPE, ORIGIN, MINERAL COMPOSITION, DEFECTS, STRUCTURE, FORMATION
		0.2	××′	Grey, SILT. Soft.				Moist	TOPSOIL
	1		ХУ	Grey, SILT. Firm.				ist	LOESS
		0.4	ΓX Ι					Mo	
		1.0		Grey, SAND. Sand is	fine to medium. Very lo	ose to loose.		Moist	SHOTOVER DELTA ALLUVIUM
		1.5	×× ××	Grey, silty SAND. Sa	nd is fine. Silt is non-pla	stic. Very loose to loose	9.	Moist	SHOTOVER DELTA ALLUVIUM
		2.0		Grey, SAND. Sand is	fine to medium. Loose.			Moist	SHOTOVER DELTA ALLUVIUM
	SEEPAGE	2.3	0,1	Grey, silty sandy GR coarse. Well graded	AVEL with minor cobbles . Medium dense to dense	. Sand is fine to coarse a.	e. Gravel is fine to	Moist	GLACIAL TILL
	NO		SCHIST						
	-	-		Total Depth = 2.4 m					

COMMENT:	Logged By: GSH
	Checked Date:
	Sheet: 1 of 1



	F LC	PROJECT: DCATION:	Bridesda See Site	ale Subdivision		Inclination:	Vertical		Job Number: 140407 Direction:
	ELE	EASTING: DRTHING: EVATION: METHOD:		mE mN m	EQUIPMENT: INFOMAP NO. DIMENSIONS: EXCAV. DATUM:	10T excavator	OPERAT Compa Hole Start Hole Finish	TOR: ANY: TED: HED:	08/12/204 8-Dec-14
									GEOLOGICAL
SCALA PENETRATION	GROUNDWATER / SEEPAGE	DEPTH (m)	GRAPHIC LOG	SO P/ WEATH	IL / ROCK CLASSIFICATI ARTICLE SIZE CHARACTI HERING, SECONDARY AN	ΓS	WATER CONTENT	SOIL / ROCK TYPE, ORIGIN, MINERAL COMPOSITION, DEFECTS, STRUCTURE, FORMATION	
		0.3	XXX	Grey, SILT. Soft.				Moist	TOPSOIL
		1.7	xxxxxxx	Grey, SILT. Soft/firm	n to stiff.			Moist	LOESS
		2.3		Grey, SAND. Sand is	fine to medium. Loose t	o medium dense.		Moist	SHOTOVER DELTA ALLUVIUM
	AGE	2.5	$\mathcal{O}$ , 1	Grey, sandy GRAVEL Loose to medium de	Sand is fine to coarse.	Gravel is fine to mediu	m. Well graded.	Moist	SHOTOVER DELTA ALLUVIUM
	) SEEP4	2.7	$\mathcal{O}_{2}$	Grey, cobbley GRAV graded. Medium der	EL. Gravel is fine to coars	se. Cobbles to 0.2m dia	meter. Poorly	Moist	KAWARAU ALLUVIUM
	NC	2.8	///	GREYSCHIST. Slight Total Depth = 2.8 m	ly weathered. Weak becc	ming moderately stron	g. Foliated.		SCHIST

COMMENT:	Logged By: GSH
	Checked Date:
	Sheet: 1 of 1



PROJECT: Bridesdale Subdivision Job Number: 140407												
	LC	DCATION:	See Site	Plan		Inclination:	Vertical		Direction:			
	E	EASTING:		mE	EOUIPMENT:	10T excavator	OPERAT	OR:				
	NC	RTHING:		mN	INFOMAP NO.		COMPA	ANY:				
	ELE	EVATION:		m	DIMENSIONS:		HOLE STAR	TED:	8-Dec-14			
	1	METHOD:			EXCAV. DATUM:		HOLE FINISH	HED:	8-Dec-14			
	ш								GEOEOGICAE			
SCALA PENETRATION	GROUNDWATER / SEEPAGE	DEPTH (m)	GRAPHIC LOG	SO PJ WEATH	IL / ROCK CLASSIFICAT ARTICLE SIZE CHARACTI IERING, SECONDARY AN	ION, PLASTICITY OR ERISTICS, COLOUR, D MINOR COMPONEN	TS	WATER CONTENT	SOIL / ROCK TYPE, ORIGIN, MINERAL COMPOSITION, DEFECTS, STRUCTURE, FORMATION			
		0.3	××	Grey, SILT. Soft.				Moist	TOPSOIL			
		1.6		Grey, sandy GRAVEL Very loose to loose/n Grey, gravelly cobble subangular. Boulder	Sand is fine to coarse. medium dense. ey BOULDERS. Gravel is f s to 0.5m diameter. Medi	Gravel is fine to mediu	nded to	Moist	KAWARAU ALLUVIUM			
	IO SEEPAGE	2.8 3.2	0.000	Grey, SAND with min	nor gravel. Medium dense	e to dense.	ag Foliated	Moist	KAWARAU ALLUVIUM			
Z     3.3     GREYSCHIST. Slightly weathered. Weak becoming moderately strong. Foliated.     SCHIST												
		Total Depth = 3.3 m										

COMMENT:	Logged By: GSH
	Checked Date:
	Sheet: 1 of 1

(ɯ) Ⴗ	N100	ected SPT N	anb			DPN <sub>100</sub> (Blows	s per 100mm)						c	Corrected Equiv. S	PTN <sub>300</sub>	
Dept	DPI	Corre Equiv.	Tor	0	0	5	10 1	5 2	20 2	25 3	0 0	0 ·	10 :	20 :	30 4	40 50
0.1 0.2 0.3	1.00 3.00 2.00	4.0 4.0 4.6	0								0.0	L L				
0.4 0.5	2.00 2.00	3.9 3.9		0	ε <b>Γ</b>						0.5	<u> </u>				
0.6 0.7	2.00 2.00	3.9 2.9		0							0.5	7				
0.9	0.25	0.5 0.5	1		ſ											
1.1 1.2	0.50 0.50	0.7 1.2		1	0	     	     				1.0	T.		     		
1.3 1.4 1.5	1.00 2.00 1.00	2.2 2.5 3.2														
1.6 1.7	2.00	3.2 4.5		1	5		<b></b>	+   	     		1.5		• <b>• • • • • • • • • • • • • • • • • • </b>			
1.8 1.9	3.00 3.00 6.00	5.2 7.8	1													
2.0	19.00 28.00	35.2 58.5		2	0						2.0					
2.3 2.4	41.00	68.8	1													
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				10	-						.5.0					



Bridesdale Farm Developments Ltd Bridesdale Subdivision DESCRIPTION HDCP results 0-10m

CLIENT

PROJECT

HDCP1A-2 LOCATION JOB NUMBER 140407



m) 4 m)	ected SPT N	anb			DPN <sub>100</sub> (Blows	s per 100mm)						C	Corrected Equiv. S	PTN <sub>300</sub>	
Dept	Corre Equiv.	Tor	0.0	0	5 1	10 1	15 2	20 2	5 30	0 0	)	10	20 :	30 4	0 50
0.1 2.00 0.2 2.00	4.0	0	0.0							0.0	l				
0.3 2.00 0.4 3.00 0.5 2.00	4.6			5											
0.6 <b>2.00</b> 0.7 <b>2.00</b>	3.9 3.2		0.5							0.5	/				
0.8 1.00 0.9 1.00 1.0 0.30	2.5	1		5											
1.1 0.30 1.2 0.30	0.4		1.0	f				 		1.0	(	     	· 		
1.3 0.50 1.4 0.50	0.7			N											
1.5 1.00 1.6 1.00 1.7 2.00	2.5		1.5	- <del>\</del>						1.5	- <b>\</b>				
1.8 <b>1.00</b> 1.9 <b>2.00</b>	3.2			2							1				
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2.5 2.00 2.6 2.00	3.8 4.5		2.5	<b>-</b>			i 			2.5	{	i 		i 	
2.7 <b>3.00</b> 2.8 <b>3.00</b>	5.1														
2.9         2.00           3.0         3.00           3.1         11.00	10.5	1.2	3.0				¦ 	¦ }		3.0					
3.2 <b>14.00</b> 3.3 <b>16.00</b>	27.1 27.1														
3.4 <b>11.00</b> 3.5 <b>12.00</b>	25.8 25.8 20.8		3.5		¦ 	$\leq$		 		3.5		     	<b>(</b>		
3.7 <b>17.00</b> 3.8 <b>27.00</b>	39.8														
3.9 <b>31.00</b> 4.0	57.8	1.2	4.0							4.0					
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6.3 6.4															
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6.7 6.8															
7.0 7.1			7.0							7.0		 			
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Bridesdale Farm Developments Ltd Bridesdale Subdivision DESCRIPTION HDCP results 0-10m

CLIENT

PROJECT

HDCP2A-2 LOCATION JOB NUMBER 140407



(L)	100	cted SPT N	ent			DPN <sub>100</sub> (Blow	s per 100mm)						(	Corrected Equiv. S	PTN <sub>300</sub>	
Depth	NHO	Corre Equiv. 5	Torc		0	5	10	15 2	20 2	5 3	30 C	D	10	20	30 4	40 50
0.1	1.00	3.0	0		0.0						0.0	1		1		
0.3	2.00 2.00	4.0 3.3										<b>)</b>				
0.5	1.00 1.00	2.6 1.9			0.5			+			0.5	/	+		+	
0.7 0.8	1.00 0.50	1.6 1.2										/				
0.9 1.0	0.50	0.8 0.8	1		10						10	(				
1.1 1.2	0.50	1.2 1.5									1.0	N				
1.3 1.4	1.00 1.00	1.8 2.5														
1.5 1.6	2.00 4.00	4.4 8.4			1.5				 		1.5			+		
1.7 1.8	7.00	13.8 18.4														
1.9 2.0	11.00	20.7	1.6		2.0			 	 		2.0		ļ	<u>}</u>		
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GEOSOLVE

Bridesdale Farm Developments Ltd Bridesdale Subdivision DESCRIPTION HDCP results 0-10m

CLIENT

PROJECT

HDCP3A LOCATION JOB NUMBER 140407



	N(m) (m) (m) (m) (m) (m) (m) (m) (m) (m)	DPN <sub>100</sub> (Blows per 100mm)	Corrected Equiv. SPTN <sub>300</sub>
	Dept DPP Equiv.	0 5 10 15 20 25 30	0 10 20 30 40 50
	0.1 <b>1.00</b> 2.0 0 0.2 <b>1.00</b> 2.6		
	0.3 <b>2.00</b> 2.6 0.4 <b>1.00</b> 3.2		
	0.5 2.00 2.5 0.6 1.00 3.2	0.5	0.5
	0.7 2.00 2.5 0.8 1.00 3.1		<b>\$</b>
	1.0 <b>1.00</b> 2.1 1.5	1.0	1.0
	1.2 0.50 1.1 1.3 1.00 1.4		
	1.4 <b>1.00</b> 1.8 <b></b> 1.5 <b>1.00</b> 1.8		
	1.6         1.00         1.8           1.7         1.00         1.4	1.5	1.5
	1.8         0.50         1.1           1.9         0.50         0.8		
	2.0         0.50         0.8         1.3           2.1         0.50         1.1         1.1	2.0	2.0
	2.2 <b>1.00</b> 2.1 2.3 <b>2.00</b> 2.5		
	2.5 <b>2.00</b> 3.1	2.5	25
	2.7 <b>1.00</b> 3.1 2.8 <b>2.00</b> 3.1		
	2.9 <b>2.00</b> 3.8 3.0 <b>2.00</b> 7.1 1.2		
	3.1         7.00         9.8           3.2         6.00         16.5	3.0	3.0
	3.3         12.00         29.8           3.4         27.00         38.8         1.2		
	3.5	3.5	3.5
	3.7		
	4.0	4.0	4.0
	4.1		
	4.4		
1     1     1     1     1     1     1     1       1     1     1     1     1     1     1       1     1     1     1     1     1     1       1     1     1     1     1     1     1       1     1     1     1     1     1     1       1     1     1     1     1     1     1       1     1     1     1     1     1     1       1     1     1     1     1     1     1       1     1     1     1     1     1     1       1     1     1     1     1     1     1       1     1     1     1     1     1     1       1     1     1     1     1     1     1       1     1     1     1     1     1     1       1     1     1     1     1     1     1       1     1     1     1     1     1     1       1     1     1     1     1     1     1       1     1     1     1     1     1     1 <td>4.6</td> <td>4.5</td> <td>4.5</td>	4.6	4.5	4.5
	4.8		
	5.0	5.0	5.0
	5.2		
	5.4 5.5	5.5	5.5
	5.6		
	5.9		
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65	6.3		
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9.4	9.3		
9.5 9.6 9.5	9.5	9.5	9.5
9.7 9.8	9.7		
	9.9	10.0	10.0
	1		Ι



Bridesdale Farm Developments Ltd Bridesdale Subdivision DESCRIPTION HDCP results 0-10m

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HDCP4A LOCATION JOB NUMBER 140407



PN 100	. SPT N	orque			DPN <sub>100</sub> (Blows	s per 100mm)						c	orrected Equiv. S	PTN <sub>300</sub>	
0.1 2.00	E duix 0.0	0	0.0	0	5 1	10 1	5 2	20 2	5 30	0 0	1	0 :	20 :	30 4	0 50
0.2 <b>4.00</b> 0.3 <b>3.00</b> 0.4 <b>3.00</b>	6.0 6.6										5				
0.5 <b>3.00</b> 0.6 <b>3.00</b>	5.8		0.5		 	 	 	 		0.5	{	 	 	 	
0.7 <b>3.00</b> 0.8 <b>4.00</b> 0.9 <b>4.00</b>	6.4 7.0 7.7			5											
1.0         4.00           1.1         3.00           1.2         2.00	6.9 5.6 3.6	2.3	1.0		     	 	i  ! !	 		1.0		     			
1.3 <b>1.00</b> 1.4 <b>2.00</b> 1.5 <b>2.00</b>	3.0 3.0 3.0			<							(				
1.6         1.00           1.7         2.00	3.1 3.1		1.5	ζ	   	   	     	     		1.5			+	+	
1.8         2.00           1.9         2.00           2.0         2.00	3.8 3.8 4.5	1.2	20							2.0	<u>\</u>				
2.1 3.00 2.2 2.00 2.3 3.00	4.5 5.1 5.1		2.0	<b>&gt;</b>						2.0	- <u>{</u>				
2.4 <b>3.00</b> 2.5 <b>2.00</b>	5.1		2.5	<u> </u>	     	 	     			2.5			ļ 		
2.0         2.00           2.7         2.00           2.8         3.00	4.4 5.1										$\langle$				
2.9 3.00 3.0 3.00 3.1 3.00	5.8 5.7 5.1	1.5	3.0		 	i 		 		3.0	)		¦ }	; {	
3.2 2.00 3.3 2.00 3.4 4.00	4.4 5.1 9.7														
3.5 9.00 3.6 23.00	23.7 31.7	1.5	3.5							3.5					
3.7 3.8 3.9	]														
4.0 4.1 4.2	1  =		4.0		i  ! !	   	i  I I	i  i		4.0		     			
4.3															
4.5 4.6 4.7			4.5		   	   	     			4.5					
4.8 4.9 5.0	1  =		E .							5.0					
5.1 5.2			epth 		     		       			5.0		     			
5.4 5.5			<b>L</b> 5.5							5.5					
5.6 5.7 5.8	1  =														
5.9 6.0	1 E		6.0		 	 	   	 		6.0		 	 		
6.2 6.3															
6.4 6.5 6.6	]		6.5				 			6.5					
6.7 6.8 6.9															
7.0			7.0		 	   !	   !	 		7.0		 			
7.2 7.3 7.4															
7.5 7.6 7.7	1  =		7.5		   	   	   	 		7.5			 	   	
7.8 7.9 8.0	1 E														
8.1 8.2			8.0		+   					8.0			+	+	
8.4 8.5			9 F		   	 	   	   		85					
8.6 8.7 8.8	1		0.0							0.0					
8.9 9.0	1 E		9.0							9.0					
9.2 9.3	1 E														
9.4 9.5 9.6	1  =		9.5							9.5					
9.7 9.8 9.9	] [														
10.0	1 🗠		10.0	L	<u>i</u>	<u> </u>	<u>i</u>	<u>i</u>	i]	10.0		İ	<u> </u>	<u> </u>	<u> </u>



Bridesdale Farm Developments Ltd Bridesdale Subdivision DESCRIPTION HDCP results 0-10m

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HDCP5A LOCATION JOB NUMBER 140407



(m) c	4100	sPT N	ənt			DPN <sub>100</sub> (Blows	s per 100mm)						c	orrected Equiv. Sl	PTN <sub>300</sub>	
Depth	A4 D	Corre Equiv. 1	Torc		0	5	10 1	15 2	10 2	5 3	30 C	)	10 2	20 3	30 4	0 50
0.1 0.2	1.00 4.00	5.0 4.6	0		0.0						0.0	1				
0.3 0.4	2.00 2.00	5.2 3.8														
0.5	2.00 2.00	3.8 3.1			0.5		<u> </u>				0.5			<u> </u>		
0.7	1.00 2.00	3.0 2.9														
0.9	2.00	3.6 3.5	2.9		1.0						1.0	)				
1.1	2.00	2.8 2.9 2.9														
1.4	2.00	2.9 3.5 3.5										1				
1.6	2.00	3.5 3.6			1.5	-+	1				1.5			+	•	
1.8 1.9	2.00 2.00	3.6 3.6														
2.0 2.1	2.00 5.00	5.6 8.9	2.5		2.0	+					2.0					
2.2 2.3	7.00 11.00	14.9 22.9														
2.4 2.5	17.00 19.00	30.9 48.2			2.5						2.5					
2.6	37.00	55.6	2.5								1					
2.9																
3.1 3.2					3.0		<b></b>	<u></u>	} !		3.0		 !	+ !	<b>∤</b> !	
3.3 3.4																
3.5 3.6					3.5			i 			3.5		i 		i 	
3.7 3.8																
3.9 4.0					4.0						4.0					
4.1									     							
4.3 4.4 4.5																
4.6					4.5						4.5					
4.8 4.9				Ê												
5.0 5.1				ţt (	5.0	+	+	<u> </u>	¦		5.0			<u> </u>		
5.2 5.3				Dep												
5.4 5.5					5.5						5.5					
5.6 5.7																
5.8 5.9																
6.1 6.2					6.0		1	<u> </u>	<u> </u>		6.0		   !	+ !	   	
6.3 6.4																
6.5 6.6					6.5		+				6.5					
6.7 6.8																
6.9 7.0					7.0			 			7.0					
7.1 7.2 7.3																
7.4																
7.6 7.7					(.5		   	     	 I I		7.5		 I I I		 I I	
7.8 7.9																
8.0 8.1					8.0						8.0				 !	
8.2 8.3																
8.4 8.5					8.5		ļ		i 		8.5		i 	i 	i 	
8.6 8.7																
0.0 8.9 0.0																
9.1 9.2					9.0	-+		<u>+</u>	     		9.0			<u>+</u>		
9.3 9.4																
9.5 9.6					9.5						9.5					
9.7 9.8																
9.9 10.0				1	0.0						10.0					
											. 5.0					

GEOSOLVE

Bridesdale Farm Developments Ltd Bridesdale Subdivision DESCRIPTION HDCP results 0-10m

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HDCP6A LOCATION JOB NUMBER 140407



	(E) c	A100	ected SPT N	anb	DPN <sub>100</sub> (Blows per 100mm)								Corrected Equiv. SPTN <sub>300</sub>							
	Dept	É Ó	Corre Equiv.	Tor		0	5	10 1	5 2	0 2	25 3	ю о		10	20 :	30 4	0 50			
	0.1	1.00	1.5	0	0.							0.0	1							
	0.3 0.4	0.50	1.0										1							
	0.5	0.50 0.50	0.9 0.9		0.	5						0.5			<b></b>	<b> </b>				
	0.7 0.8	0.50	1.2 1.5			IL I							1							
	0.9 1.0	1.00 0.50	1.5 1.1	1.1									)							
	1.1 1.2	0.50 0.30	0.7 0.5		1.	•						1.0	/			 !				
	1.3 1.4	0.30	0.4 0.5										(							
	1.5 1.6	0.50 0.50	0.6 1.1		1.	5						1.5	<b>\</b>							
	1.7 1.8	1.00 1.00	1.4 1.7										1							
	1.9 2.0	1.00 1.00	1.7 1.7	1.8																
	2.1 2.2	1.00 1.00	1.7 1.6		2.	0		<b>1</b>	+     			2.0		F	+     	* ! !				
	2.3 2.4	1.00 2.00	2.3 2.3										<u>}</u>							
	2.5 2.6	1.00 2.00	2.9 2.9		2.	5 <b></b>	+					2.5				<u> </u>				
	2.7 2.8	2.00 3.00	4.2 6.8																	
	2.9 3.0	6.00 21.00	19.5 26.5	3.2																
	3.1 3.2				3.		1   	1   				3.0				†   				
	3.3 3.4					1														
	3.5 3.6				3.	5		 				3.5								
	3.7 3.8																			
	3.9 4.0				4							10								
	4.1 4.2				4.	「 「						4.0								
	4.3 4.4																			
	4.5 4.6				4.	5						4.5								
	4.7 4.8				ê															
	4.9 5.0				<u>ב</u>			     				5.0								
	5.1 5.2				eptł			1 1 1 1				5.0								
	5.3 5.4				ă															
	5.5 5.6				5.	5	+					5.5		<u> </u>	+	<u>+</u>				
	5.7 5.8																			
	5.9 6.0				6			   				6.0								
	6.1 6.2				0.							0.0								
	6.3 6.4																			
	6.5 6.6				6.	5	+					6.5								
	6.7 6.8																			
	6.9 7.0				7.	0		   				7.0								
	7.1					1														
1/2     7/5     7/5     7/5       7/7     7/7     7/5     7/5       80     80     80       81     80       83     90       90     90       91     90       91     90       91     90       91     90       91     90       91     90       91     90       91     90       91     90       91     90       91     90       91     90       91     90       92     90       93     90       94     95       95     95       96     95       97     95       98     95       99     90       90     95       91     95       92     95       93     95	7.3					1														
	7.5				7.	5		<b></b>				7.5		}	 !	+				
1/9     80     80     80       81     81     80       83     85       86     85       87     90       90     90       91     90       92     90       93     90       94     95       95     90       90     90	7.7					1														
	7.9 8.0				8.	。	¦	¦ {	 	 		8.0		 	¦ +	¦ +				
8-3     8-5     8-5     8-5     8-5     8-5     8-5     8-5     8-5     8-5     8-5     9-0 <td>8.1 8.2</td> <td></td> <td></td> <td></td> <td></td> <td>1</td> <td></td> <td></td> <td></td> <td></td> <td>   </td> <td>   </td> <td></td> <td></td> <td></td> <td></td> <td></td>	8.1 8.2					1														
8.5       8.5       8.6       8.7       8.8       8.8       8.8       8.8       8.8       9.0       9	8.3 8.4																			
8.7       1	8.5 8.6				8.	5		<u> </u>				8.5			<u>+</u>					
8.9     9.0     9.1     9.0     9.0     9.0     9.0       9.1     9.2     9.3     9.0     9.0     9.0     9.0       9.3     9.4     9.5     9.5     9.5     9.5       9.6     9.5     9.5     9.5     9.5       9.7     9.0     9.0     9.5     9.5       9.7     9.5     9.5     9.5       9.9     9.5     9.5     9.5       9.9     9.5     9.5     9.5	8.7 8.8					1														
9.1     9.1 <td>8.9 9.0</td> <td></td> <td></td> <td></td> <td>9.</td> <td>。</td> <td>ļ</td> <td></td> <td></td> <td></td> <td></td> <td>9.0</td> <td></td> <td></td> <td>ļ</td> <td>ļ</td> <td></td>	8.9 9.0				9.	。	ļ					9.0			ļ	ļ				
9.3     9.4     9.4       9.5     9.6       9.7     9.6       9.8     9.9       9.9     9.0       10.0     10.0	9.1 9.2				0.	1														
9.5     9.6     9.7 <td>9.3 9.4</td> <td></td>	9.3 9.4																			
	9.5 9.6				9.	5						9.5				<u></u>				
	9.7 9.8																			
	9.9 10.0				10	<sub>0</sub> لـــــ						10.0								
		-																		



CLIENTBridesdale Farm Developments LtdPROJECTBridesdale SubdivisionDESCRIPTIONHDCP results 0-10m

LOCATION HDCP7A JOB NUMBER 140407



	(m)	Z 100	scted SPT N	anb			DPN <sub>100</sub> (Blows	s per 100mm)						c	Corrected Equiv. S	PTN <sub>300</sub>	
	Deptl	1 0	Corre Equiv.	Tor		0	5 1	0 1	5 2	0 2	5 30	0 0	D 1	0 2	20	30 4	40 50
	0.1 0.2	1.00	2.0 1.6	0	0.	, 						0.0	1				
	0.4	0.50 2.00	1.9 2.3										$\langle \langle \rangle$				
	0.6 0.7	1.00 2.00	3.2 3.2		0.:	Ĩ						0.5					
	0.8	2.00 1.00 2.00	3.2 3.2 2.5	1.1													
	1.1 1.2	1.00	2.5 1.3		1.	, 						1.0	7				
	1.3 1.4 1.5	0.30 0.30 0.30	0.8 0.3 0.5														
	1.6 1.7	0.50	0.6 1.0		1.:	, <b>T</b>						1.5		+       			
	1.8 1.9 2.0	1.00 2.00 1.00	2.0 2.3 3.0	2.2													
	2.1 2.2	2.00	2.3 2.9		2.0	, <b>       </b>	·•					2.0	<u> </u>	+     	+	· • • • • • • • • • • • • • • • • • • •	
	2.3 2.4 2.5	2.00 3.00 2.00	3.5 4.2 4.1														
	2.6	2.00 3.00	4.1 4.1		2.3	Ì	· <del>;</del>					2.5		r     	· • • • • • • • • • • • • • • • • • • •		
	2.8 2.9 3.0	2.00 3.00 2.00	4.7 4.0 4.7	4		5							<b>)</b>				
	3.1 3.2	3.00 3.00	4.7 6.0		3.0	, <b>11</b>	·†					3.0		 ! !	+		
	3.3 3.4 3.5	4.00 6.00 11.00	8.0 13.3 22.7														
	3.6 3.7	18.00 21.00	32.7 44.0		3.		1					3.5					
	3.8 3.9 4.0	28.00 41.00	59.3 68.3	4													
	4.1 4.2		E		4.0	)	-+		     			4.0		+       	+     		
	4.3 4.4 4.5		-														
	4.6 4.7		E		4.		·•					4.5		     		·•	
	4.8 4.9 5.0		F		<u>س</u>												
	5.1 5.2		E		epth	)	· · · · · · · · · · · · · · · · · · ·					5.0		   			
	5.3 5.4 5.5		F														
	5.6 5.7		E		5.		+					5.5		 		· †	
	5.8 5.9 6.0		F														
	6.1 6.2				6.0	)						6.0		     			
	6.3 6.4 6.5		F														
	6.6 6.7				6.		·•					6.5		+     			
	6.8 6.9 7.0		F														
	7.1 7.2		E		7.0	)	·*		     			7.0		+       	+   	· • • • • • • • • • • • • • • • • • • •	
	7.3 7.4 7.5		-														
73	7.6		Ē		7.	, <b>[</b>						1.5	[	     	T	T	
81     0.0     0.0     0.0     0.0     0.0       83     0.0     0.0     0.0     0.0     0.0       85     0.0     0.0     0.0     0.0       90     0.0     0.0     0.0     0.0       91     0.0     0.0     0.0       93     0.0     0.0     0.0       94     0.0     0.0     0.0       97     0.0     0.0     0.0       99     0.0     0.0     0.0	7.8 7.9 8.0		F		-												
0-3     0-3 <td>8.1 8.2</td> <td></td> <td>E</td> <td></td> <td>8.0</td> <td>, <b>[</b></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>8.0</td> <td>[</td> <td>r      </td> <td>T</td> <td></td> <td> </td>	8.1 8.2		E		8.0	, <b>[</b>						8.0	[	r     	T		
86	8.3 8.4 8.5		F														
8.9     9.0     9.0     9.0     9.0     9.0       9.1     9.0     9.0     9.0     9.0       9.2     9.0     9.0     9.0       9.3     9.0     9.0     9.0       9.4     9.5     9.0       9.5     9.0     9.0       9.6     9.0     9.0       9.7     9.0     9.0       9.8     9.0     9.0       9.9     9.0     9.0	8.6 8.7		E		8.9	, <b></b>						8.5		     			
9.1     9.2     9.3     9.4     9.5 <td>8.8 8.9 9.0</td> <td></td> <td>F</td> <td></td> <td>-</td> <td></td>	8.8 8.9 9.0		F		-												
9.4         9.5 <td>9.1 9.2</td> <td></td> <td>Ē</td> <td></td> <td>9.0</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>9.0</td> <td></td> <td></td> <td></td> <td></td> <td></td>	9.1 9.2		Ē		9.0							9.0					
9.6         9.7         9.8         9.9         9.9         9.9         10.0<	9.3 9.4 9.5		F			. L	i   					0.5		i I I			
	9.6 9.7		Ē		9.	, [						9.5					
	9.8 9.9 10.0		F		10.0							10.0					
					10.1							10.0					

**GEO**SOLVE

Bridesdale Farm Developments Ltd Bridesdale Subdivision DESCRIPTION HDCP results 0-10m

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PROJECT

HDCP8A LOCATION JOB NUMBER 140407



(ш) ц	N 100	ected SPT N	enb				DPN <sub>100</sub> (Blows	s per 100mm)			Corrected Equiv. SPTN <sub>300</sub>							
Dept	D	Corr Equiv.	Tor		0	5	i 1	0 1	5 2	0 2	5 30	0 0	) 1	0 2	20 3	30 4	0 50	
0.1 0.2	1.00 1.00 2.00	2.0 2.6	0	,		L						0.0	<u>\</u>					
0.4 0.5	1.00 1.00	2.6 1.9				~												
0.6 0.7	1.00 1.00	1.9 1.9			0.5							0.5						
0.8 0.9	1.00 1.00 1.00	1.8 1.8 1.4	13															
1.1 1.2	0.50	1.1	1.0		1.0	<b></b>						1.0	/	L				
1.3 1.4	0.50 0.50	0.8 0.8																
1.5 1.6 1.7	0.50	0.8 1.1 1.4			1.5							1.5	·{				·	
1.8	1.00	1.8 1.4											)					
2.0	0.50	1.1 1.1	1.5	:	2.0							2.0	·{	 				
2.2 2.3 2.4	1.00	1.4 1.4 1.1											)					
2.5 2.6	0.50 0.50	0.8 0.8		:	2.5							2.5	·	i 				
2.7 2.8	0.50	1.1 2.1																
3.0 3.1	2.00 2.00 3.00	4.4 5.8	1.4	:	3.0	- <b>\</b>						3.0		 	¦ ¦		·	
3.2 3.3	4.00 6.00	8.4 11.1																
3.4 3.5	7.00 8.00 18.00	13.8 21.8 25.8	1.4	:	3.5							3.5						
3.7 3.8	10.00	20.0	1.4															
3.9 4.0					4.0							4.0						
4.1 4.2 4.3																		
4.4 4.5					15							45						
4.6 4.7					4.5							4.5						
4.8 4.9 5.0				۲ س														
5.1 5.2				epth	5.0							5.0		     				
5.3 5.4				Ō														
5.6 5.7				:	5.5							5.5		}   	+ 	+		
5.8 5.9																		
6.0 6.1 6.2					6.0							6.0		 	<u></u>		[]	
6.3 6.4																		
6.5 6.6					6.5							6.5		     				
6.8 6.9																		
7.0					7.0							7.0					·	
7.2 7.3																		
7.5					7.5							7.5						
7.7 7.8																		
7.9 8.0 8.1				;	B.0							8.0			 			
8.2 8.3																		
8.4 8.5				;	B.5							8.5		   	¦ +			
8.7 8.8																		
8.9 9.0					9.0							9.0						
9.1 9.2 9.3												2.0						
9.4 9.5												0.5		l l				
9.6 9.7					9.0							9.5		     	     			
9.8 9.9 10.0																		
10.0	·	·	I	1	U.O <b>L</b>	!		·				10.0		i	<u></u>		J	
1			1															



Bridesdale Farm Development Ltd Bridesdale Subdivision DESCRIPTION HDCP results 0-10m

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PROJECT

HDCP9A LOCATION JOB NUMBER 140407

