GEOSOLVE
GEOTECHNICAL ENGINEERING | ENGINEERING GEOLOGY | PAVEMENTS | HYDROGEOLOGY | HYDROLOGY

ACENZ MEMBER

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.

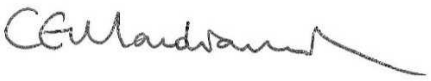
4 Applicability

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.

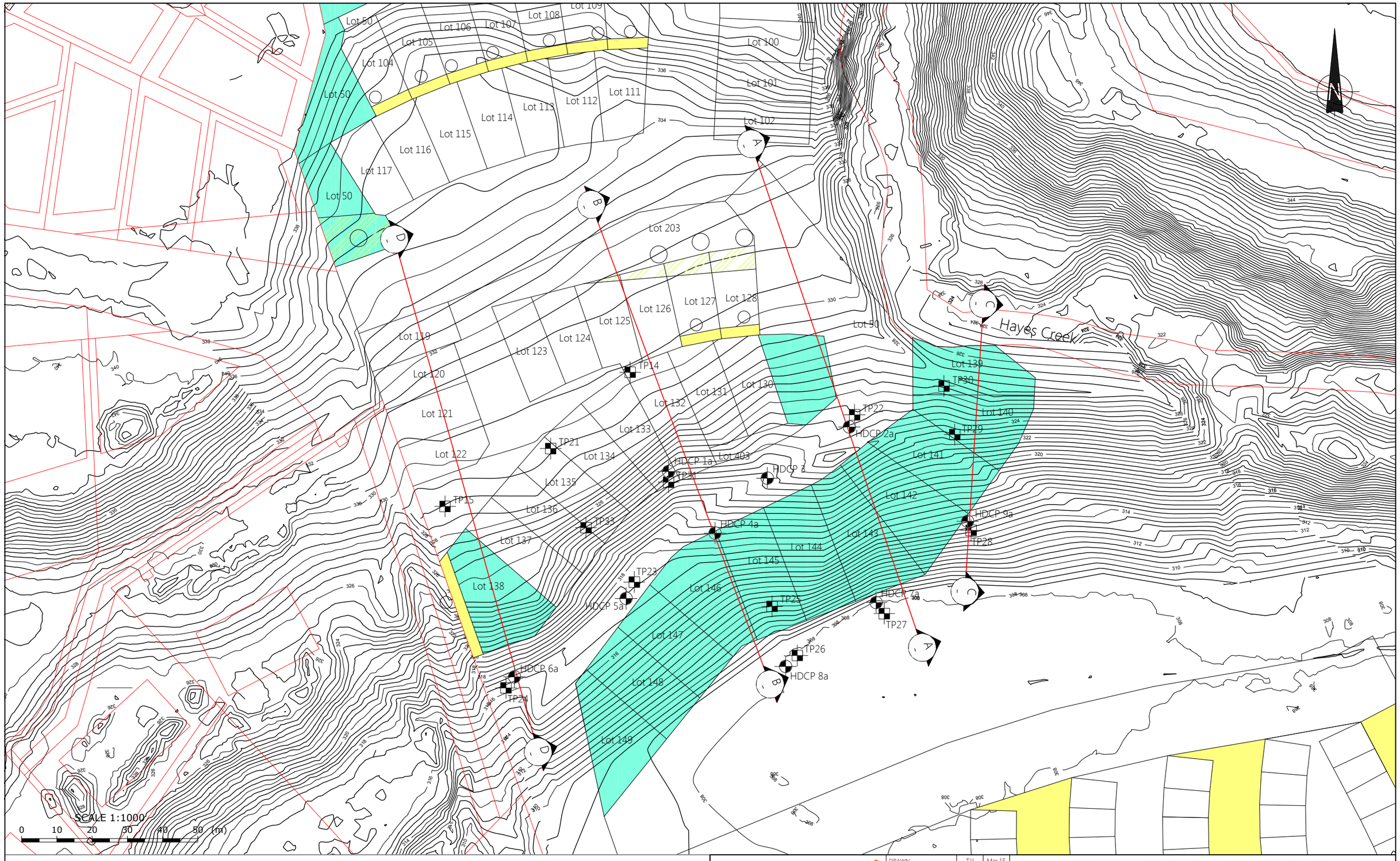
GeoSolve Ltd

Geotechnical Engineering Consultants

Report prepared by:	Reviewed for GeoSolve Ltd by:
	
.....	.....
Blair Matheson	Colin MacDiarmid
Project Engineer	Senior Geotechnical Engineer

Attachments:

- Appendix A – Site Plan
- Appendix B – Investigation Data



LEGEND

- Test Pit
- Heavy Dynamic Cone Penetrometer

GeoSolve
Level 1, 70 MacAndrew Road, South Dunedin
www.geosolve.co.nz

DRAWN	TJJ	Mar.15
DRAFTING CHECKED	BPM	Mar.15
APPROVED	BPM	Mar.15
CADFILE: 150122 - Site Plan Combined.dwg		
SCALES (AT A3 SIZE): 1:1000		
PROJECT No: 150122		

BRIDESDALE FARM DEVELOPMENTS LTD.

FOUNDATION DESIGN ADVICE

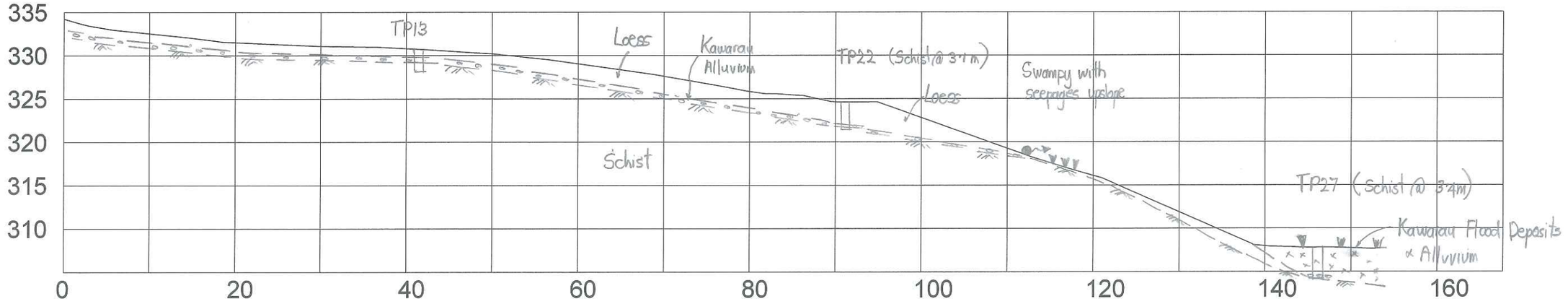
LOTS 139-149, BRIDESDALE SUBDIVISION

SITE PLAN

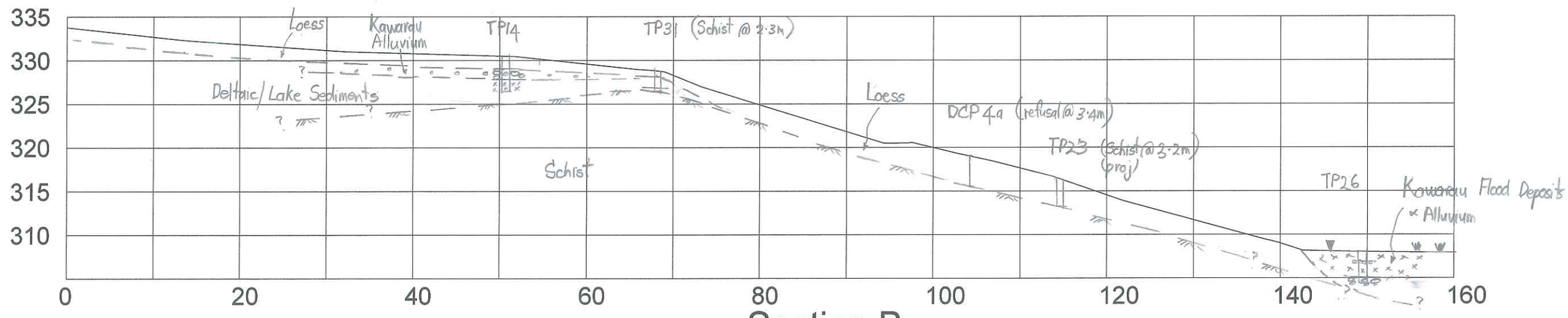
FIG No: Figure 1

REV. 0

NORTH



Section A



Section B

Shotover Design Limited trading as
Clark Fortune McDonald & Associates
Licensed Cadastral Surveyors - Land Development - Planning Consultants
309 Lower Shotover Road, P.O.Box 553 Queenstown
Tel. (03)441-6044, Fax (03)442-1066, Email admin@cfma.co.nz

Shop 2, Otago House, 475 Moray Place, P.O. Box 5960
Tel. (03)470-1582, Fax (03)470-1583, Email admin@cfma.co.nz

Rev.	Date	Revision Details	By
A	4.12.14	Add X-Sections	CRW

BRIDESDALE SUBDIVISION
DATA for GEOSOLVE

Client: WINTON PARTNERS

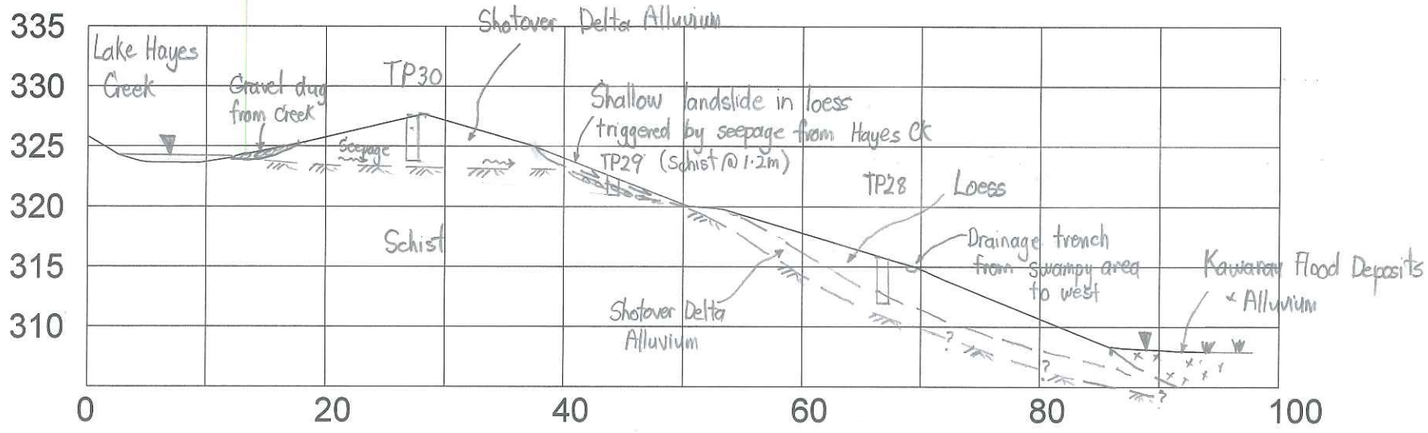
	Surveyed	Signed	Date	Job No.	Drawing No.
	FM		10.14	11670	07_2
	Drawn	Signed	Date	Scale	
	CRW		3.12.14		1:250 @ A1 1:500@ A3
	Designed	Signed	Date	Datum & Level	Rev.
	CRW		11.14	Mt Nic 2000	A

Notes:
All dimensions shown are in meters unless shown otherwise.
Any person using Clark Fortune McDonald drawings and other data accepts the risk of:
- Using the drawings and other data in electronic form without requesting and checking them for accuracy against the original hard copy versions.
- Ensuring the information is the most recent issue.

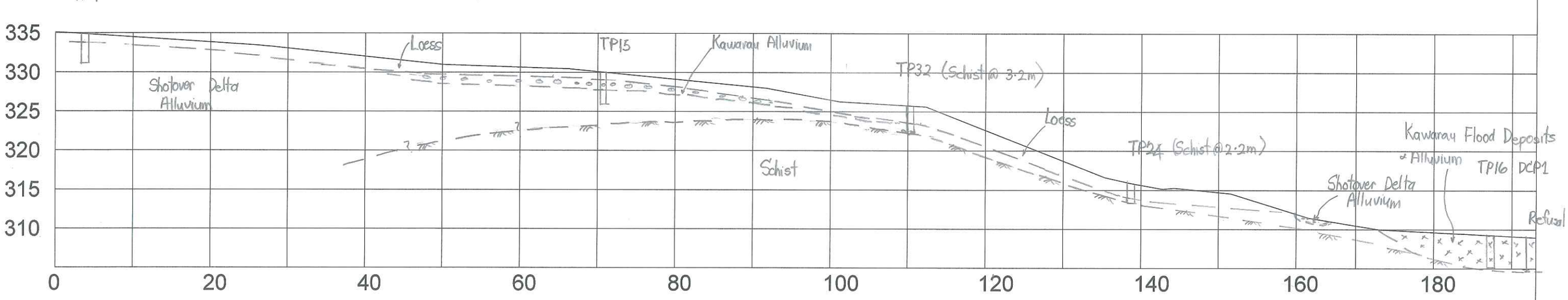
S:\JOBS\11600\11670\acad\11670_7A_Geosolve.dwg Plotted: 04.12.2014

NORTH

Transition between surveyed and Lidar data



Section C



Section D

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Shop 2, Otago House, 475 Moray Place, P.O. Box 5960
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Rev.	Date	Revision Details	By
A	4.12.14	Add X-Sections	CRW
B	9.12.14	Add X-Sections	CRW

BRIDESDALE SUBDIVISION
DATA for GEOSOLVE

Client: WINTON PARTNERS

Notes:
All dimensions shown are in meters unless shown otherwise.
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- Using the drawings and other data in electronic form without requesting and checking them for accuracy against the original hard copy versions.
- Ensuring the information is the most recent issue.

Surveyed	Signed	Date	Job No.	Drawing No.
FM		10.14	11670	07_3
Drawn	**Signed**	**Date**	**Scale**	
CRW		3.12.14		1:250 @ A1 1:500@ A3
Designed	**Signed**	**Date**	**Datum & Level**	**Rev.**
CRW		11.14	Mt Nic 2000	B

S:\JOBS\11600\11670\acad\11670_7B_Geosolve.dwg Plotted: 09.12.2014

GeoSolve Ltd
EXCAVATION LOG

EXCAVATION NUMBER:
TP 14

PROJECT: Project Bridesdale Subdivision		Job Number: 140407
LOCATION: Lake Hayes Estate	Inclination: N/A	Direction: N/A

EASTING: mE	EQUIPMENT: 10 Tonne Excavator	OPERATOR: Tony Brooks	
NORTHING: mN	INFOMAP NO.	COMPANY: Queenstown Earthworks and Drainage	
ELEVATION: 329.5 m	DIMENSIONS:	HOLE STARTED: 18-Jul-14	
METHOD: Test Pitting	EXCAV. DATUM: Ground Level	HOLE FINISHED: 18-Jul-14	

SCALA PENETRATION	GROUNDWATER / SEEPAGE	DEPTH (m)	GRAPHIC LOG	SOIL / ROCK CLASSIFICATION, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, WEATHERING, SECONDARY AND MINOR COMPONENTS	WATER CONTENT	GEOLOGICAL: SOIL / ROCK TYPE, ORIGIN, MINERAL COMPOSITION, DEFECTS, STRUCTURE, FORMATION
		0.3		Black, organic SILT.	Moist	TOPSOIL
		1.2		Grey, sandy SILT. Sand is fine. Silt is non-plastic. Firm. Massive.	Moist	LOESS
		1.5		Grey SAND with some silt. Fine sand. Loose.	Moist	KAWARAU ALLUVIUM
		2.5		Grey, cobbly GRAVEL with some sand and minor boulders. Gravel is fine to coarse. Loose. Bedded.	Moist	KAWARAU ALLUVIUM
		2.6		Grey SILT with minor boulders. Silt is non-plastic. Very stiff.	Moist	LAKE SEDIMENTS
		2.7		Grey SAND. Fine sand. Loose.	Moist	LAKE SEDIMENTS
		3.1		Grey, laminated SILT. Silt is non-plastic. Very stiff.	Moist	LAKE SEDIMENTS
		3.4		Grey SAND with some silt. Fine sand. Loose.	Moist	LAKE SEDIMENTS
		3.7		Grey SILT. Silt is non-plastic. Very stiff.	Moist	LAKE SEDIMENTS
		3.9		Grey SAND. Loose. Massive.	Moist	LAKE SEDIMENTS
	NO SEEPAGE	4.1		Grey, laminated SILT. Silt is non-plastic. Very stiff.	Moist	LAKE SEDIMENTS

Total Depth = 4.1 m

COMMENT:	Logged By: G S Halliday
	Checked Date:
	Sheet: 1 of 1

GeoSolve Ltd
EXCAVATION LOG

EXCAVATION NUMBER:
TP 15

PROJECT: Project Bridesdale Subdivision		Job Number: 140407
LOCATION: Lake Hayes Estate	Inclination: N/A	Direction: N/A

EASTING: mE	EQUIPMENT: 10 Tonne Excavator	OPERATOR: Tony Brooks	
NORTHING: mN	INFOMAP NO.	COMPANY: Queenstown Earthworks and Drainage	
ELEVATION: 330 m	DIMENSIONS:	HOLE STARTED: 18-Jul-14	
METHOD: Test Pitting	EXCAV. DATUM: Ground Level	HOLE FINISHED: 18-Jul-14	

SCALA PENETRATION	GROUNDWATER / SEEPAGE	DEPTH (m)	GRAPHIC LOG	SOIL / ROCK CLASSIFICATION, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, WEATHERING, SECONDARY AND MINOR COMPONENTS	WATER CONTENT	GEOLOGICAL: SOIL / ROCK TYPE, ORIGIN, MINERAL COMPOSITION, DEFECTS, STRUCTURE, FORMATION
		0.3		Black, organic SILT.	Moist	TOPSOIL
		0.9		Grey, sandy SILT. Sand is fine. Massive.	Moist	LOESS
		2.5		Grey, cobbly GRAVEL with some sand and minor boulders. Gravel is fine to coarse. Sand is fine to coarse. Maximum size of boulders is 0.4m. Loose.	Moist	KAWARAU ALLUVIUM
	NO SEEPAGE	4.1		Grey, laminated SILT and clayey SILT. Silt is non-plastic to slightly plastic. A thin, sandy, fine oxidised gravel horizon is present at 4.0m. Firm.	Moist	LAKE SEDIMENTS

Total Depth = 4.1 m

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

GeoSolve Ltd

EXCAVATION LOG

EXCAVATION NUMBER: **TP 21**

PROJECT: Bridesdale Subdivision			Job Number: 140407
LOCATION: See Site Plan	Inclination:	Vertical	Direction:

EASTING:	mE	EQUIPMENT: 10T excavator		OPERATOR:	
NORTHING:	mN	INFOMAP NO.		COMPANY:	
ELEVATION:	m	DIMENSIONS:		HOLE STARTED:	5-Dec-14
METHOD:		EXCAV. DATUM:		HOLE FINISHED:	5-Dec-14

SCALA PENETRATION	GROUNDWATER / SEEPAGE	DEPTH (m)	GRAPHIC LOG	SOIL / ROCK CLASSIFICATION, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, WEATHERING, SECONDARY AND MINOR COMPONENTS	WATER CONTENT	GEOLOGICAL: SOIL / ROCK TYPE, ORIGIN, MINERAL COMPOSITION, DEFECTS, STRUCTURE, FORMATION
		0.15		Grey, organic SILT. Soft.	Moist	TOPSOIL
		0.75		Grey, SILT. Thickening downslope (0.8m) whereas 0.5m upslope. Soft to firm.	Moist	LOESS
		2.6		Grey, sandy GRAVEL with some cobbles and boulders. Cobbles and boulders are subrounded to rounded, up to 0.2m diameter. Moderately well graded. Medium dense (100kPa). Bedded.	Moist	KAWARAU ALLUVIUM
	NO SEEPAGE	3.1		Light grey, SAND. Sand is fine. Uniform. Loose.	Moist	SHOTOVER DELTA ALLUVIUM

Total Depth = 3.1 m

COMMENT:

Logged By: FAW

Checked Date:

GeoSolve Ltd

EXCAVATION LOG

EXCAVATION NUMBER: **TP 22**

PROJECT: Bridesdale Subdivision			Job Number: 140407
LOCATION: See Site Plan	Inclination:	Vertical	Direction:

EASTING:	mE	EQUIPMENT: 10T excavator		OPERATOR:	
NORTHING:	mN	INFOMAP NO.		COMPANY:	
ELEVATION:	m	DIMENSIONS:		HOLE STARTED:	5-Dec-14
METHOD:		EXCAV. DATUM:		HOLE FINISHED:	5-Dec-14

SCALA PENETRATION	GROUNDWATER / SEEPAGE	DEPTH (m)	GRAPHIC LOG	SOIL / ROCK CLASSIFICATION, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, WEATHERING, SECONDARY AND MINOR COMPONENTS	WATER CONTENT	GEOLOGICAL: SOIL / ROCK TYPE, ORIGIN, MINERAL COMPOSITION, DEFECTS, STRUCTURE, FORMATION
		0.3		Grey, organic SILT. Soft.	Moist	TOPSOIL
		2.4		Grey, SILT. Very soft/soft to firm.	Moist	LOESS
		3.1		Grey, sandy GRAVEL with cobbles and boulders. Boulders are subrounded, up to 0.3m diameter. Poorly graded. Loose. Medium dense at base. Sub-horizontal.	Moist	KAWARAU ALLUVIUM
	NO SEEPAGE	3.2		GREYSCHIST. Slightly weathered. Weak becoming moderately strong. Foliated.		SCHIST

Total Depth = 3.2 m

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

GeoSolve Ltd

EXCAVATION LOG

EXCAVATION NUMBER: **TP 23**

PROJECT: Bridesdale Subdivision			Job Number: 140407
LOCATION: See Site Plan	Inclination:	Vertical	Direction:

EASTING:	mE	EQUIPMENT: 10T excavator		OPERATOR:	
NORTHING:	mN	INFOMAP NO.		COMPANY:	
ELEVATION:	m	DIMENSIONS:		HOLE STARTED:	5-Dec-14
METHOD:		EXCAV. DATUM:		HOLE FINISHED:	5-Dec-14

SCALA PENETRATION	GROUNDWATER / SEEPAGE	DEPTH (m)	GRAPHIC LOG	SOIL / ROCK CLASSIFICATION, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, WEATHERING, SECONDARY AND MINOR COMPONENTS	WATER CONTENT	GEOLOGICAL: SOIL / ROCK TYPE, ORIGIN, MINERAL COMPOSITION, DEFECTS, STRUCTURE, FORMATION
		0.4		Grey, SILT with roots. Soft.	Moist	TOPSOIL
		2.7		Grey, brown at base, sandy SILT and SILT. Sand is fine. Silt is non-plastic. Soft to firm, rarely stiff.	Moist	LOESS
		3.2		Grey, SAND with minor gravel. Sand is fine to coarse. Gravel is fine. Loose.	Moist	SHOTOVER DELTA ALLUVIUM
	NO SEEPAGE	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

GeoSolve Ltd
EXCAVATION LOG

EXCAVATION NUMBER: **TP 24**

PROJECT: Bridesdale Subdivision			Job Number: 140407
LOCATION: See Site Plan	Inclination:	Vertical	Direction:

EASTING:	mE	EQUIPMENT: 10T excavator		OPERATOR:	
NORTHING:	mN	INFOMAP NO.		COMPANY:	
ELEVATION:	m	DIMENSIONS:		HOLE STARTED:	5-Dec-14
METHOD:		EXCAV. DATUM:		HOLE FINISHED:	5-Dec-14

SCALA PENETRATION	GROUNDWATER / SEEPAGE	DEPTH (m)	GRAPHIC LOG	SOIL / ROCK CLASSIFICATION, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, WEATHERING, SECONDARY AND MINOR COMPONENTS	WATER CONTENT	GEOLOGICAL: SOIL / ROCK TYPE, ORIGIN, MINERAL COMPOSITION, DEFECTS, STRUCTURE, FORMATION
	NO SEEPAGE	0.4		Black, SILT with roots. Soft.	Moist	TOPSOIL
		0.9		Black, SILT with minor gravel and roots. Non-plastic. Soft to firm. Massive.	Moist	COLLUVIUM
		1.8		Grey, SILT. Non-plastic. Soft to firm. Massive.	Moist	LOESS
		2.0		Grey, laminated SILT. Micaceous. Non-plastic. Firm.	Moist	SHOTOVER DELTA ALLUVIUM
		2.2		Grey, SAND with some silt. Sand is fine. Loose to medium dense.	Moist	SHOTOVER DELTA ALLUVIUM
		2.4		GREYSCHIST. Slightly weathered. Weak becoming moderately strong. Foliated.		SCHIST

Total Depth = 2.4 m

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

GeoSolve Ltd

EXCAVATION LOG

EXCAVATION NUMBER: **TP 25**

PROJECT: Bridesdale Subdivision			Job Number: 140407
LOCATION: See Site Plan	Inclination:	Vertical	Direction:

EASTING:	mE	EQUIPMENT: 10T excavator		OPERATOR:	
NORTHING:	mN	INFOMAP NO.		COMPANY:	
ELEVATION:	m	DIMENSIONS:		HOLE STARTED:	5-Dec-14
METHOD:		EXCAV. DATUM:		HOLE FINISHED:	5-Dec-14

SCALA PENETRATION	GROUNDWATER / SEEPAGE	DEPTH (m)	GRAPHIC LOG	SOIL / ROCK CLASSIFICATION, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, WEATHERING, SECONDARY AND MINOR COMPONENTS	WATER CONTENT	GEOLOGICAL: SOIL / ROCK TYPE, ORIGIN, MINERAL COMPOSITION, DEFECTS, STRUCTURE, FORMATION
		0.3		Black, SILT. Soft.	Moist	TOPSOIL
		1.2		Black, SILT. Non-plastic. Soft to firm. Massive.	Moist	LOESS
	NO SEEPAGE	2.0		Grey, sandy GRAVEL. Sand is fine to coarse. Gravel is fine to coarse. Well graded. Very loose to loose. Bedded.	Moist	KAWARAU ALLUVIUM
		2.1		GREYSCHIST. Slightly weathered. Weak becoming moderately strong. Foliated.		SCHIST

Total Depth = 2.1 m

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

GeoSolve Ltd

EXCAVATION LOG

EXCAVATION NUMBER: **TP 26**

PROJECT: Bridesdale Subdivision			Job Number: 140407
LOCATION: See Site Plan	Inclination:	Vertical	Direction:

EASTING:	mE	EQUIPMENT: 10T excavator		OPERATOR:	
NORTHING:	mN	INFOMAP NO.		COMPANY:	
ELEVATION:	m	DIMENSIONS:		HOLE STARTED:	5-Dec-14
METHOD:		EXCAV. DATUM:		HOLE FINISHED:	5-Dec-14

SCALA PENETRATION	GROUNDWATER / SEEPAGE	DEPTH (m)	GRAPHIC LOG	SOIL / ROCK CLASSIFICATION, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, WEATHERING, SECONDARY AND MINOR COMPONENTS	WATER CONTENT	GEOLOGICAL: SOIL / ROCK TYPE, ORIGIN, MINERAL COMPOSITION, DEFECTS, STRUCTURE, FORMATION
		0.3		Black, SILT with roots. Soft.	Moist to wet	TOPSOIL
		2.2		Dark grey, SILT with minor fine organic material. Very soft to soft.	Saturated	FLOOD DEPOSIT
		2.3		Grey and brown, sandy GRAVEL. Sand is fine. Gravel is fine. Very loose to loose.	Saturated	KAWARAU ALLUVIUM
	Strong inflow ▽	2.8		Dark grey, SILT with wood (branch) at base. Firm.	Saturated	FLOOD DEPOSIT
		3.3		Brown, sandy GRAVEL. Gravel is fine to coarse. Loose.	Saturated	KAWARAU ALLUVIUM

Total Depth = 3.3 m

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

GeoSolve Ltd

EXCAVATION LOG

EXCAVATION NUMBER: **TP 27**

PROJECT: Bridesdale Subdivision			Job Number: 140407
LOCATION: See Site Plan	Inclination:	Vertical	Direction:

EASTING:	mE	EQUIPMENT: 10T excavator		OPERATOR:	
NORTHING:	mN	INFOMAP NO.		COMPANY:	
ELEVATION:	m	DIMENSIONS:		HOLE STARTED:	5-Dec-14
METHOD:		EXCAV. DATUM:		HOLE FINISHED:	5-Dec-14

SCALA PENETRATION	GROUNDWATER / SEEPAGE	DEPTH (m)	GRAPHIC LOG	SOIL / ROCK CLASSIFICATION, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, WEATHERING, SECONDARY AND MINOR COMPONENTS	WATER CONTENT	GEOLOGICAL: SOIL / ROCK TYPE, ORIGIN, MINERAL COMPOSITION, DEFECTS, STRUCTURE, FORMATION
		0.3		Brown, SILT with roots. Soft.	Moist to wet	TOPSOIL
		2.1		Grey, SILT with minor colluvial cobbles and organic material. Brown iron stained wood fragment (0.3m diameter) at base. Micaceous. Non-plastic. Very soft to soft. Massive.	Saturated	FLOOD DEPOSIT
		2.3		Brown, silty SAND with wood fragments. Sand is fine. Non-plastic. Very loose.	Saturated	FLOOD DEPOSIT
	Strong inflow	3.0		Dark grey, SILT with wood (branches). Soft to firm. Hard at base.	Saturated	FLOOD DEPOSIT
		3.3		Brown, sandy GRAVEL. Gravel is fine. Very dense.	Saturated	KAWARAU ALLUVIUM
		3.4		GREYSCHIST. Slightly weathered. Weak becoming moderately strong. Foliated.		SCHIST

Total Depth = 3.4 m

COMMENT: Strong inflow also noted at 3.3m.

Logged By: GSH/GS

Checked Date:

GeoSolve Ltd

EXCAVATION LOG

EXCAVATION NUMBER: **TP 28**

PROJECT: Bridesdale Subdivision		Job Number: 140407
LOCATION: See Site Plan	Inclination: Vertical	Direction:

EASTING:	mE	EQUIPMENT: 10T excavator		OPERATOR:	
NORTHING:	mN	INFOMAP NO.		COMPANY:	
ELEVATION:	m	DIMENSIONS:		HOLE STARTED:	5-Dec-14
METHOD:		EXCAV. DATUM:		HOLE FINISHED:	5-Dec-14

SCALA PENETRATION	GROUNDWATER / SEEPAGE	DEPTH (m)	GRAPHIC LOG	SOIL / ROCK CLASSIFICATION, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, WEATHERING, SECONDARY AND MINOR COMPONENTS	WATER CONTENT	GEOLOGICAL: SOIL / ROCK TYPE, ORIGIN, MINERAL COMPOSITION, DEFECTS, STRUCTURE, FORMATION
		0.2		Brown, SILT with roots. Soft.	Moist	TOPSOIL
		0.5		Grey, SAND with some silt. Sand is fine. Very loose to loose.	Moist	COLLUVIUM
		3.0		Dark grey, SILT with small wood fragments. Brown staining at 2.5m. Micaceous. Non-plastic. Very soft/soft to firm. Horizontally bedded below 2.5m.	Moist	LOESS
		3.3		Brown and grey, SAND with some silt. Sand is fine. Loose to medium dense.	Moist	SHOTOVER DELTA ALLUVIUM
	NO SEEPAGE	3.4		Grey brown, SILT. Stiff.	Moist	SHOTOVER DELTA ALLUVIUM
		3.5		Grey, SAND with a trace of gravel. Sand is fine to medium. Gravel is fine to medium. Medium dense.	Moist	SHOTOVER DELTA ALLUVIUM
		3.7		Grey, sandy GRAVEL. Sand is fine to coarse. Gravel is fine to medium, slabby schist clasts. Medium dense to dense.	Moist	SHOTOVER DELTA ALLUVIUM

Total Depth = 3.7 m

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

GeoSolve Ltd

EXCAVATION LOG

EXCAVATION NUMBER: **TP 29**

PROJECT: Bridesdale Subdivision			Job Number: 140407
LOCATION: See Site Plan	Inclination:	Vertical	Direction:

EASTING:	mE	EQUIPMENT: 10T excavator		OPERATOR:	
NORTHING:	mN	INFOMAP NO.		COMPANY:	
ELEVATION:	m	DIMENSIONS:		HOLE STARTED:	5-Dec-14
METHOD:		EXCAV. DATUM:		HOLE FINISHED:	5-Dec-14

SCALA PENETRATION	GROUNDWATER / SEEPAGE	DEPTH (m)	GRAPHIC LOG	SOIL / ROCK CLASSIFICATION, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, WEATHERING, SECONDARY AND MINOR COMPONENTS	WATER CONTENT	GEOLOGICAL: SOIL / ROCK TYPE, ORIGIN, MINERAL COMPOSITION, DEFECTS, STRUCTURE, FORMATION
	NO SEEPAGE	0.1		Brown, SILT with roots. Soft.	Moist	TOPSOIL
		0.4		Dark grey, SILT. Non-plastic. Soft to firm.	Moist	LOESS
		1.2		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
		1.3		GREYSCHIST. Slightly weathered. Weak becoming moderately strong. Foliated.		SCHIST

Total Depth = 1.3 m

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

GeoSolve Ltd

EXCAVATION LOG

EXCAVATION NUMBER: **TP 30**

PROJECT: Bridesdale Subdivision			Job Number: 140407
LOCATION: See Site Plan	Inclination:	Vertical	Direction:

EASTING:	mE	EQUIPMENT: 10T excavator		OPERATOR:	
NORTHING:	mN	INFOMAP NO.		COMPANY:	
ELEVATION:	m	DIMENSIONS:		HOLE STARTED:	5-Dec-14
METHOD:		EXCAV. DATUM:		HOLE FINISHED:	5-Dec-14

SCALA PENETRATION	GROUNDWATER / SEEPAGE	DEPTH (m)	GRAPHIC LOG	SOIL / ROCK CLASSIFICATION, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, WEATHERING, SECONDARY AND MINOR COMPONENTS	WATER CONTENT	GEOLOGICAL: SOIL / ROCK TYPE, ORIGIN, MINERAL COMPOSITION, DEFECTS, STRUCTURE, FORMATION
		0.2		Brown, SILT with roots. Soft.	Moist	TOPSOIL
		1.0		Grey, SILT with roots. 10mm horizons of silty SAND. Fine organic material at 1.0m. Soft to firm. Horizontally bedded.	Moist	LOESS
		1.3		Brown, silty SAND. Sand is fine. Loose.	Moist	SHOTOVER DELTA ALLUVIUM
		2.0		Brown, SAND with minor silt. Sand is fine. Loose.	Moist	SHOTOVER DELTA ALLUVIUM
	NO SEEPAGE	3.5		Brown and grey, sandy GRAVEL. Oxidised 2.7-3.0m. Sand is fine to coarse. Gravel is fine to medium. Loose.	Moist	SHOTOVER DELTA ALLUVIUM

Total Depth = 3.5 m

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

GeoSolve Ltd

EXCAVATION LOG

EXCAVATION NUMBER: **TP 31**

PROJECT: Bridesdale Subdivision			Job Number: 140407
LOCATION: See Site Plan	Inclination:	Vertical	Direction:

EASTING:	mE	EQUIPMENT: 10T excavator		OPERATOR:	
NORTHING:	mN	INFOMAP NO.		COMPANY:	
ELEVATION:	m	DIMENSIONS:		HOLE STARTED:	8-Dec-14
METHOD:		EXCAV. DATUM:		HOLE FINISHED:	8-Dec-14

SCALA PENETRATION	GROUNDWATER / SEEPAGE	DEPTH (m)	GRAPHIC LOG	SOIL / ROCK CLASSIFICATION, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, WEATHERING, SECONDARY AND MINOR COMPONENTS	WATER CONTENT	GEOLOGICAL: SOIL / ROCK TYPE, ORIGIN, MINERAL COMPOSITION, DEFECTS, STRUCTURE, FORMATION
		0.2		Grey, SILT. Soft.	Moist	TOPSOIL
		0.4		Grey, SILT. Firm.	Moist	LOESS
		1.0		Grey, SAND. Sand is fine to medium. Very loose to loose.	Moist	SHOTOVER DELTA ALLUVIUM
		1.5		Grey, silty SAND. Sand is fine. Silt is non-plastic. Very loose to loose.	Moist	SHOTOVER DELTA ALLUVIUM
		2.0		Grey, SAND. Sand is fine to medium. Loose.	Moist	SHOTOVER DELTA ALLUVIUM
		2.3		Grey, silty sandy GRAVEL with minor cobbles. Sand is fine to coarse. Gravel is fine to coarse. Well graded. Medium dense to dense.	Moist	GLACIAL TILL
	NO SEEPAGE	2.4		GREYSCHIST. Slightly weathered. Weak becoming moderately strong. Foliated.		SCHIST

Total Depth = 2.4 m

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

GeoSolve Ltd

EXCAVATION LOG

EXCAVATION NUMBER: **TP 32**

PROJECT: Bridesdale Subdivision			Job Number: 140407
LOCATION: See Site Plan	Inclination:	Vertical	Direction:

EASTING:	mE	EQUIPMENT: 10T excavator		OPERATOR:	
NORTHING:	mN	INFOMAP NO.		COMPANY:	
ELEVATION:	m	DIMENSIONS:		HOLE STARTED:	08/12/204
METHOD:		EXCAV. DATUM:		HOLE FINISHED:	8-Dec-14

SCALA PENETRATION	GROUNDWATER / SEEPAGE	DEPTH (m)	GRAPHIC LOG	SOIL / ROCK CLASSIFICATION, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, WEATHERING, SECONDARY AND MINOR COMPONENTS	WATER CONTENT	GEOLOGICAL: SOIL / ROCK TYPE, ORIGIN, MINERAL COMPOSITION, DEFECTS, STRUCTURE, FORMATION
	NO SEEPAGE	0.3		Grey, SILT. Soft.	Moist	TOPSOIL
		1.7		Grey, SILT. Soft/firm to stiff.	Moist	LOESS
		2.3		Grey, SAND. Sand is fine to medium. Loose to medium dense.	Moist	SHOTOVER DELTA ALLUVIUM
		2.5		Grey, sandy GRAVEL. Sand is fine to coarse. Gravel is fine to medium. Well graded. Loose to medium dense.	Moist	SHOTOVER DELTA ALLUVIUM
		2.7		Grey, cobbley GRAVEL. Gravel is fine to coarse. Cobbles to 0.2m diameter. Poorly graded. Medium dense.	Moist	KAWARAU ALLUVIUM
		2.8		GREYSCHIST. Slightly weathered. Weak becoming moderately strong. Foliated.		SCHIST

Total Depth = 2.8 m

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

GeoSolve Ltd

EXCAVATION LOG

EXCAVATION NUMBER: **TP 33**

PROJECT: Bridesdale Subdivision			Job Number: 140407
LOCATION: See Site Plan	Inclination:	Vertical	Direction:

EASTING:	mE	EQUIPMENT: 10T excavator		OPERATOR:	
NORTHING:	mN	INFOMAP NO.		COMPANY:	
ELEVATION:	m	DIMENSIONS:		HOLE STARTED:	8-Dec-14
METHOD:		EXCAV. DATUM:		HOLE FINISHED:	8-Dec-14

SCALA PENETRATION	GROUNDWATER / SEEPAGE	DEPTH (m)	GRAPHIC LOG	SOIL / ROCK CLASSIFICATION, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, WEATHERING, SECONDARY AND MINOR COMPONENTS	WATER CONTENT	GEOLOGICAL: SOIL / ROCK TYPE, ORIGIN, MINERAL COMPOSITION, DEFECTS, STRUCTURE, FORMATION
		0.3		Grey, SILT. Soft.	Moist	TOPSOIL
		1.6		Grey, sandy GRAVEL. Sand is fine to coarse. Gravel is fine to medium. Well graded. Very loose to loose/medium dense.	Moist	KAWARAU ALLUVIUM
		2.8		Grey, gravelly cobbley BOULDERS. Gravel is fine to coarse, subrounded to subangular. Boulders to 0.5m diameter. Medium dense.	Moist	KAWARAU ALLUVIUM
	NO SEEPAGE	3.2		Grey, SAND with minor gravel. Medium dense to dense.	Moist	KAWARAU ALLUVIUM
		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

Depth (m)	DPN_{100}	Corrected Equiv. SPT N	Torque
0.1	**1.00**	4.0	0
0.2	**3.00**	4.0	
0.3	**2.00**	4.6	
0.4	**2.00**	3.9	
0.5	**2.00**	3.9	
0.6	**2.00**	3.9	
0.7	**2.00**	2.9	
0.8	**0.50**	1.7	
0.9	**0.25**	0.5	
1.0	**0.25**	0.5	1
1.1	**0.50**	0.7	
1.2	**0.50**	1.2	
1.3	**1.00**	2.2	
1.4	**2.00**	2.5	
1.5	**1.00**	3.2	
1.6	**2.00**	3.2	
1.7	**2.00**	4.5	
1.8	**3.00**	5.2	
1.9	**3.00**	7.8	
2.0	**6.00**	18.5	1
2.1	**19.00**	35.2	
2.2	**28.00**	58.5	
2.3	**41.00**	68.8	1
2.4			
2.5			
2.6			
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2.9			
3.0			
3.1			
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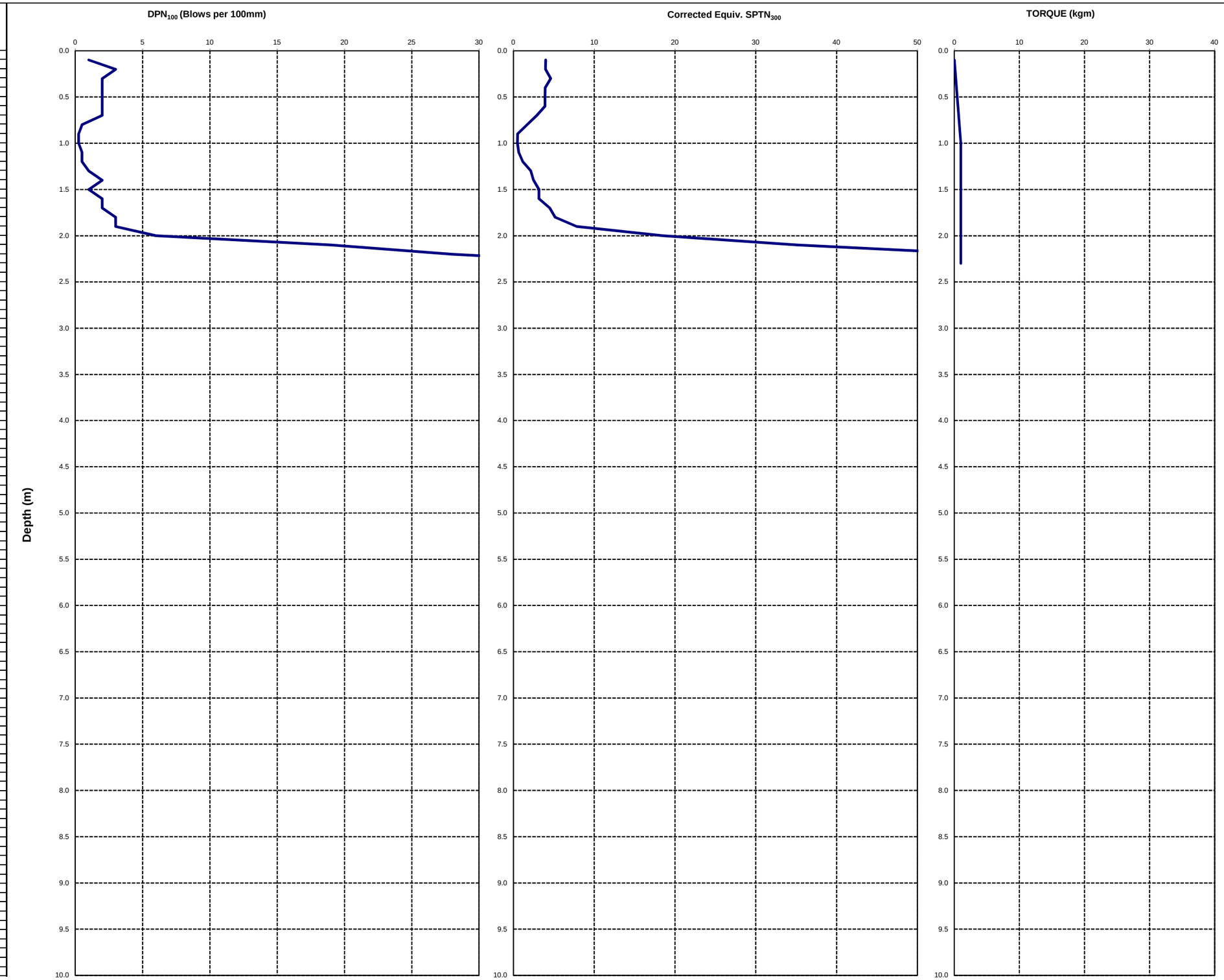

GEOSOLVE

CLIENT	Bridesdale Farm Developments Ltd
PROJECT	Bridesdale Subdivision
DESCRIPTION	HDCP results 0-10m
LOCATION	HDCP1A-2
JOB NUMBER	140407
DATE	30/03/2015
LOGGED BY	RC
ANALYSED BY	SAM
CHECKED BY	BPM

Depth (m)	DPN_{100}	Corrected Equiv. SPT N	Torque
0.1	**2.00**	4.0	0
0.2	**2.00**	4.0	
0.3	**2.00**	4.6	
0.4	**3.00**	4.6	
0.5	**2.00**	4.6	
0.6	**2.00**	3.9	
0.7	**2.00**	3.2	
0.8	**1.00**	2.5	
0.9	**1.00**	1.4	
1.0	**0.30**	0.9	1
1.1	**0.30**	0.4	
1.2	**0.30**	0.6	
1.3	**0.50**	0.7	
1.4	**0.50**	1.2	
1.5	**1.00**	1.5	
1.6	**1.00**	2.5	
1.7	**2.00**	2.5	
1.8	**1.00**	3.2	
1.9	**2.00**	3.2	
2.0	**2.00**	3.8	1
2.1	**2.00**	4.5	
2.2	**3.00**	4.5	
2.3	**2.00**	4.5	
2.4	**2.00**	3.8	
2.5	**2.00**	3.8	
2.6	**2.00**	4.5	
2.7	**3.00**	5.1	
2.8	**3.00**	5.1	
2.9	**2.00**	5.1	
3.0	**3.00**	10.5	1.2
3.1	**11.00**	18.5	
3.2	**14.00**	27.1	
3.3	**16.00**	27.1	
3.4	**11.00**	25.8	
3.5	**12.00**	25.8	
3.6	**16.00**	29.8	
3.7	**17.00**	39.8	
3.8	**27.00**	49.8	
3.9	**31.00**	57.8	1.2
4.0			
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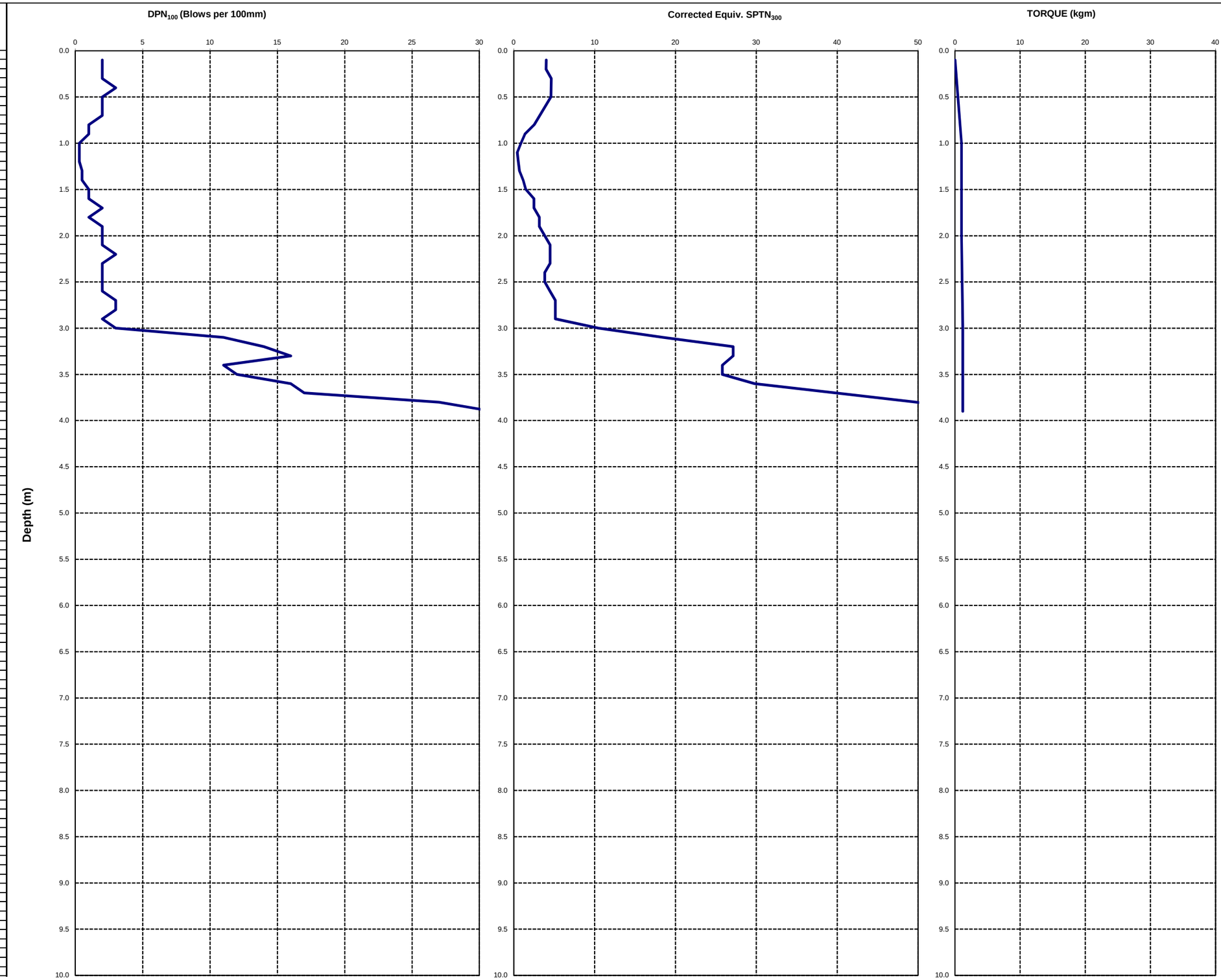

GEOSOLVE

CLIENT	Bridesdale Farm Developments Ltd
PROJECT	Bridesdale Subdivision
DESCRIPTION	HDCP results 0-10m
LOCATION	HDCP2A-2
JOB NUMBER	140407
DATE	30/03/2015
LOGGED BY	RC
ANALYSED BY	SAM
CHECKED BY	BPM

Depth (m)	DPN_{100}	Corrected Equiv. SPT N	Torque
0.1	**1.00**	3.0	0
0.2	**2.00**	3.3	
0.3	**2.00**	4.0	
0.4	**2.00**	3.3	
0.5	**1.00**	2.6	
0.6	**1.00**	1.9	
0.7	**1.00**	1.6	
0.8	**0.50**	1.2	
0.9	**0.50**	0.8	
1.0	**0.50**	0.8	1
1.1	**0.50**	1.2	
1.2	**1.00**	1.5	
1.3	**1.00**	1.8	
1.4	**1.00**	2.5	
1.5	**2.00**	4.4	
1.6	**4.00**	8.4	
1.7	**7.00**	13.8	
1.8	**10.00**	18.4	
1.9	**11.00**	20.7	1.6
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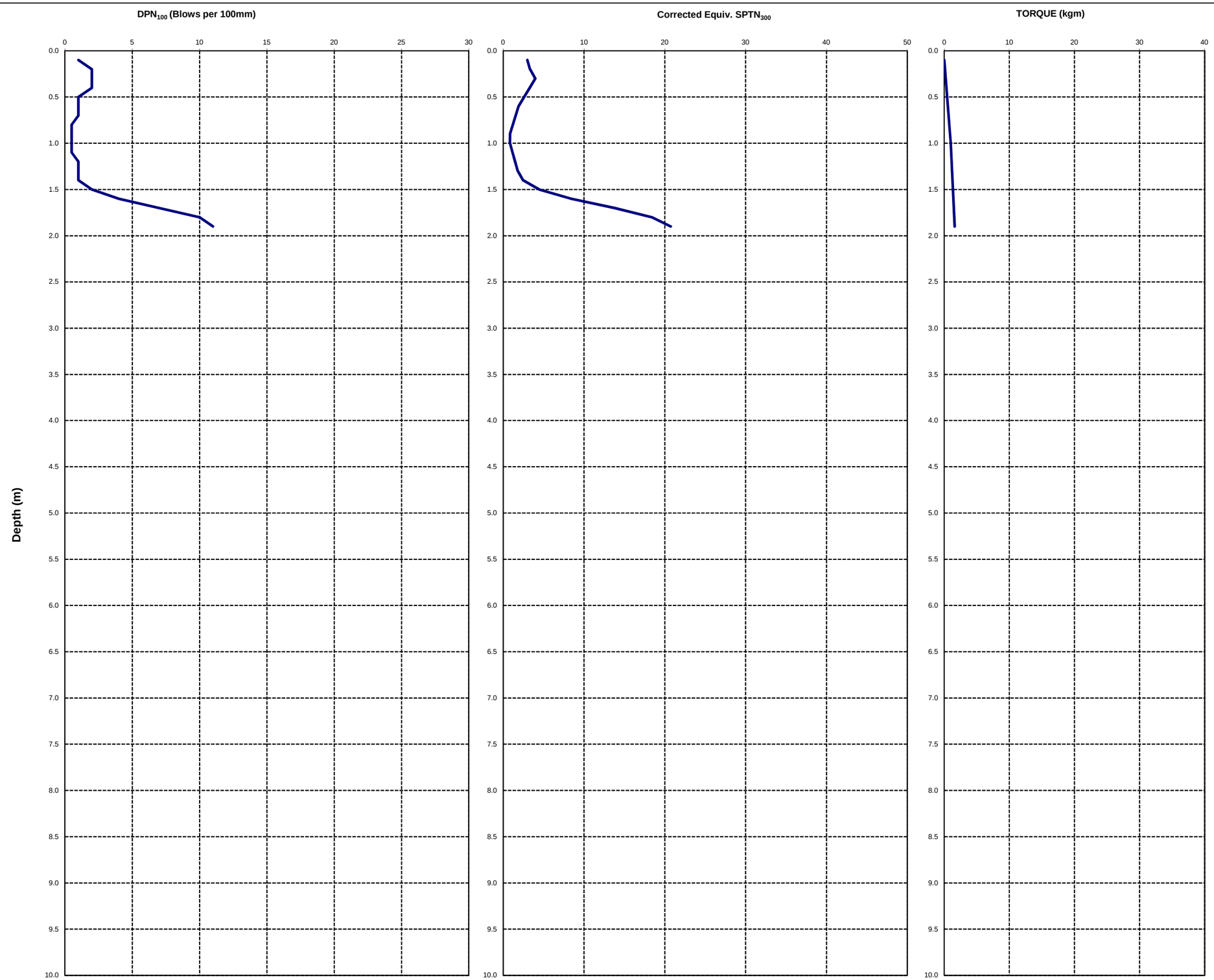

GEOSOLVE

CLIENT	Bridesdale Farm Developments Ltd
PROJECT	Bridesdale Subdivision
DESCRIPTION	HDCP results 0-10m
LOCATION	HDCP3A
JOB NUMBER	140407
DATE	30/03/2015
LOGGED BY	RC
ANALYSED BY	SAM
CHECKED BY	BPM

Depth (m)	DPN_{100}	Corrected Equiv. SPT N	Torque
0.1	**1.00**	2.0	0
0.2	**1.00**	2.6	
0.3	**2.00**	2.6	
0.4	**1.00**	3.2	
0.5	**2.00**	2.5	
0.6	**1.00**	3.2	
0.7	**2.00**	2.5	
0.8	**1.00**	3.1	
0.9	**2.00**	2.4	
1.0	**1.00**	2.1	1.5
1.1	**0.50**	1.1	
1.2	**0.50**	1.1	
1.3	**1.00**	1.4	
1.4	**1.00**	1.8	
1.5	**1.00**	1.8	
1.6	**1.00**	1.8	
1.7	**1.00**	1.4	
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	
2.2	**1.00**	2.1	
2.3	**2.00**	2.5	
2.4	**1.00**	3.1	
2.5	**2.00**	3.1	
2.6	**2.00**	3.1	
2.7	**1.00**	3.1	
2.8	**2.00**	3.1	
2.9	**2.00**	3.8	
3.0	**2.00**	7.1	1.2
3.1	**7.00**	9.8	
3.2	**6.00**	16.5	
3.3	**12.00**	29.8	
3.4	**27.00**	38.8	1.2
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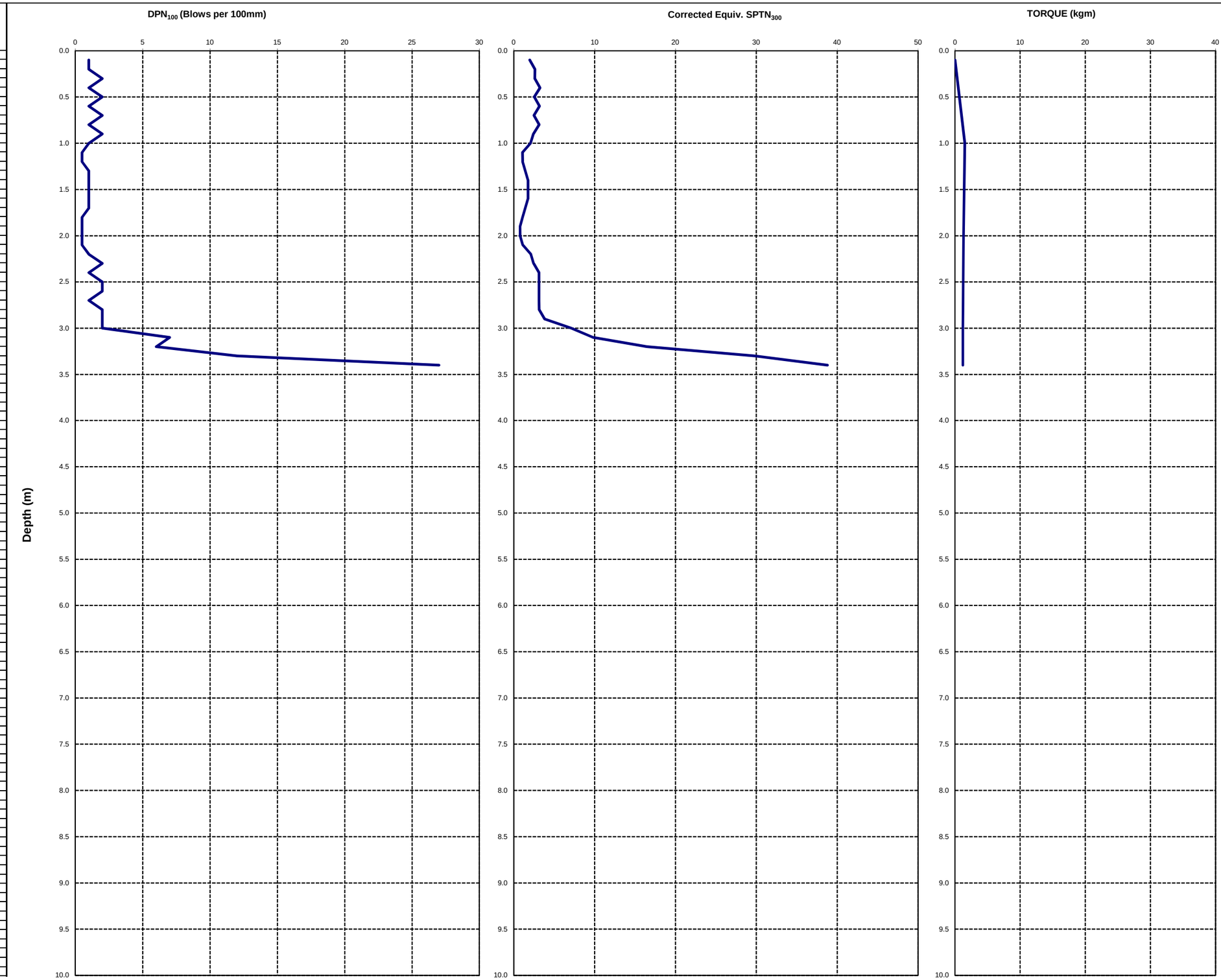

GEOSOLVE

CLIENT	Bridesdale Farm Developments Ltd
PROJECT	Bridesdale Subdivision
DESCRIPTION	HDCP results 0-10m
LOCATION	HDCP4A
JOB NUMBER	140407
DATE	30/03/2015
LOGGED BY	RC
ANALYSED BY	SAM
CHECKED BY	BPM

Depth (m)	DPN_{100}	Corrected Equiv. SPT N	Torque
0.1	**2.00**	6.0	0
0.2	**4.00**	6.0	
0.3	**3.00**	6.6	
0.4	**3.00**	5.9	
0.5	**3.00**	5.8	
0.6	**3.00**	5.8	
0.7	**3.00**	6.4	
0.8	**4.00**	7.0	
0.9	**4.00**	7.7	
1.0	**4.00**	6.9	2.3
1.1	**3.00**	5.6	
1.2	**2.00**	3.6	
1.3	**1.00**	3.0	
1.4	**2.00**	3.0	
1.5	**2.00**	3.0	
1.6	**1.00**	3.1	
1.7	**2.00**	3.1	
1.8	**2.00**	3.8	
1.9	**2.00**	3.8	
2.0	**2.00**	4.5	1.2
2.1	**3.00**	4.5	
2.2	**2.00**	5.1	
2.3	**3.00**	5.1	
2.4	**3.00**	5.1	
2.5	**2.00**	4.4	
2.6	**2.00**	3.8	
2.7	**2.00**	4.4	
2.8	**3.00**	5.1	
2.9	**3.00**	5.8	
3.0	**3.00**	5.7	1.5
3.1	**3.00**	5.1	
3.2	**2.00**	4.4	
3.3	**2.00**	5.1	
3.4	**4.00**	9.7	
3.5	**9.00**	23.7	
3.6	**23.00**	31.7	1.5
3.7			
3.8			
3.9			
4.0			
4.1			
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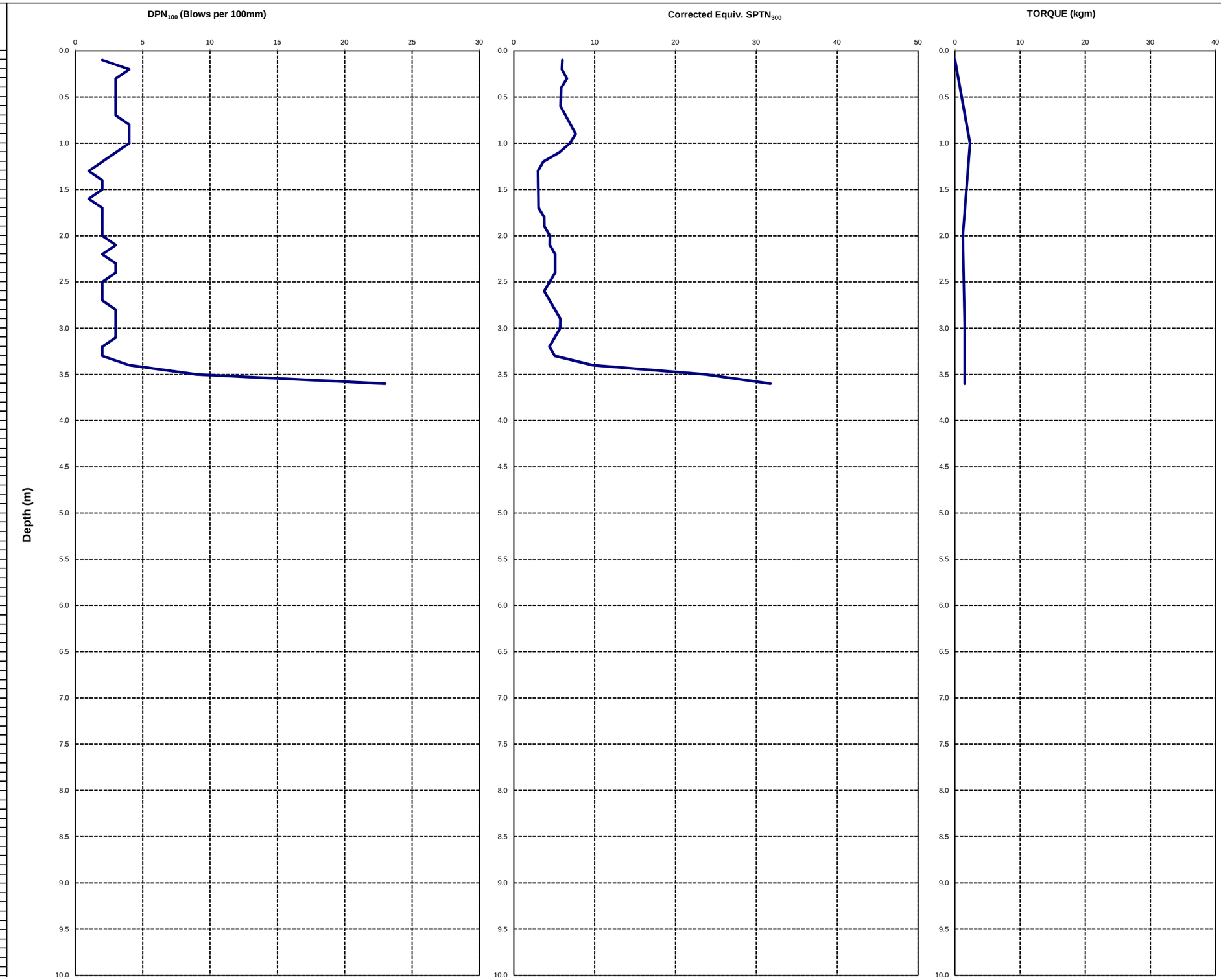

GEOSOLVE

CLIENT	Bridesdale Farm Developments Ltd
PROJECT	Bridesdale Subdivision
DESCRIPTION	HDCP results 0-10m
LOCATION	HDCP5A
JOB NUMBER	140407
DATE	30/03/2015
LOGGED BY	RC
ANALYSED BY	SAM
CHECKED BY	BPM

Depth (m)	DPN_{100}	Corrected Equiv. SPT N	Torque
0.1	**1.00**	5.0	0
0.2	**4.00**	4.6	
0.3	**2.00**	5.2	
0.4	**2.00**	3.8	
0.5	**2.00**	3.8	
0.6	**2.00**	3.1	
0.7	**1.00**	3.0	
0.8	**2.00**	2.9	
0.9	**2.00**	3.6	
1.0	**2.00**	3.5	2.9
1.1	**2.00**	2.8	
1.2	**1.00**	2.9	
1.3	**2.00**	2.9	
1.4	**2.00**	3.5	
1.5	**2.00**	3.5	
1.6	**2.00**	3.5	
1.7	**2.00**	3.6	
1.8	**2.00**	3.6	
1.9	**2.00**	3.6	
2.0	**2.00**	5.6	2.5
2.1	**5.00**	8.9	
2.2	**7.00**	14.9	
2.3	**11.00**	22.9	
2.4	**17.00**	30.9	
2.5	**19.00**	48.2	
2.6	**37.00**	55.6	2.5
2.7			
2.8			
2.9			
3.0			
3.1			
3.2			
3.3			
3.4			
3.5			
3.6			
3.7			
3.8			
3.9			
4.0			
4.1			
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6.0			
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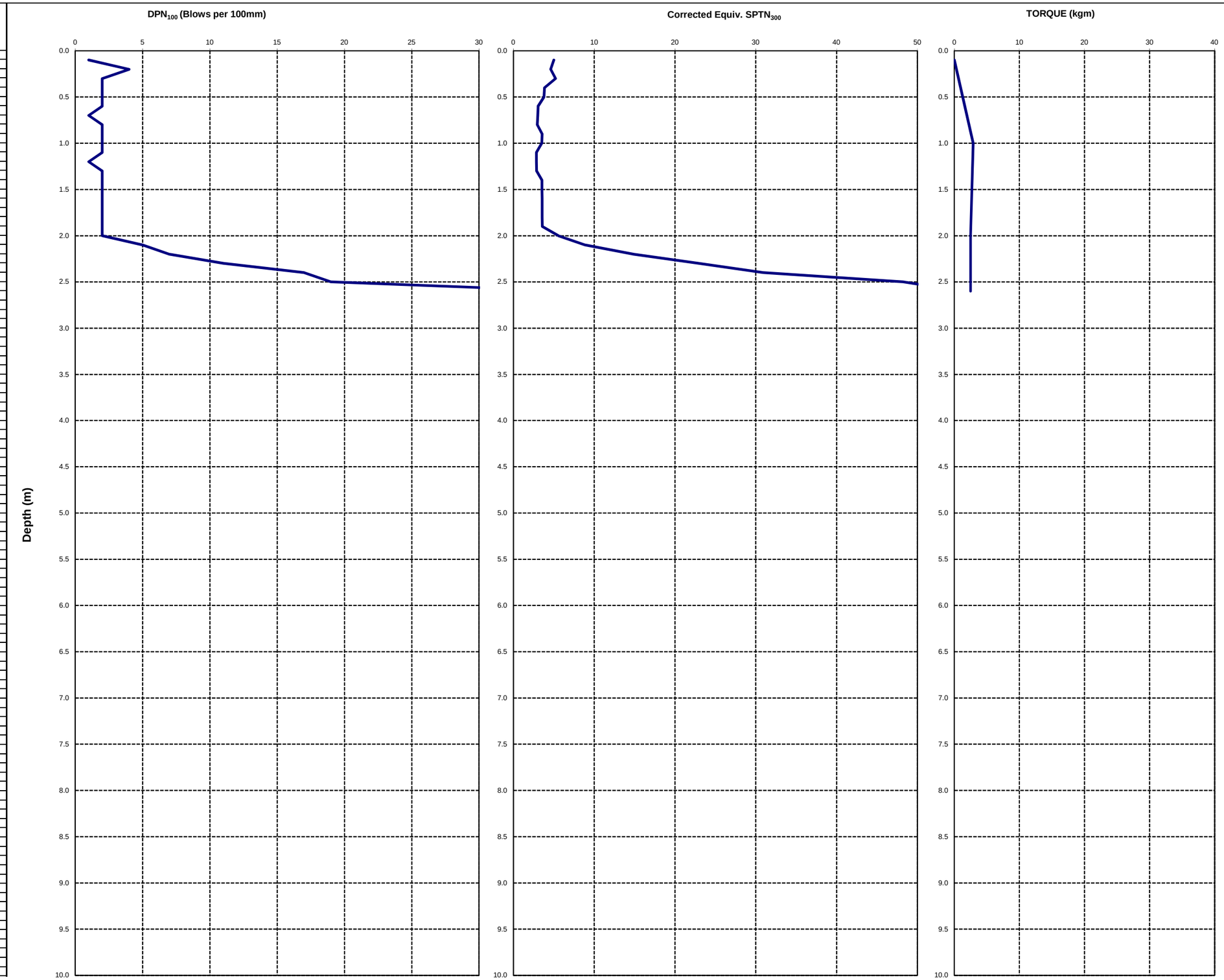

GEOSOLVE

CLIENT	Bridesdale Farm Developments Ltd
PROJECT	Bridesdale Subdivision
DESCRIPTION	HDCP results 0-10m
LOCATION	HDCP6A
JOB NUMBER	140407
DATE	30/03/2015
LOGGED BY	RC
ANALYSED BY	SAM
CHECKED BY	BPM

Depth (m)	DPN_{100}	Corrected Equiv. SPT N	Torque
0.1	**1.00**	1.5	0
0.2	**0.50**	1.3	
0.3	**0.50**	1.0	
0.4	**0.50**	0.9	
0.5	**0.50**	0.9	
0.6	**0.50**	0.9	
0.7	**0.50**	1.2	
0.8	**1.00**	1.5	
0.9	**1.00**	1.5	
1.0	**0.50**	1.1	1.1
1.1	**0.50**	0.7	
1.2	**0.30**	0.5	
1.3	**0.30**	0.4	
1.4	**0.30**	0.5	
1.5	**0.50**	0.6	
1.6	**0.50**	1.1	
1.7	**1.00**	1.4	
1.8	**1.00**	1.7	
1.9	**1.00**	1.7	
2.0	**1.00**	1.7	1.8
2.1	**1.00**	1.7	
2.2	**1.00**	1.6	
2.3	**1.00**	2.3	
2.4	**2.00**	2.3	
2.5	**1.00**	2.9	
2.6	**2.00**	2.9	
2.7	**2.00**	4.2	
2.8	**3.00**	6.8	
2.9	**6.00**	19.5	
3.0	**21.00**	26.5	3.2
3.1			
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3.7			
3.8			
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4.0			
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4.7			
4.8			
4.9			
5.0			
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5.9			
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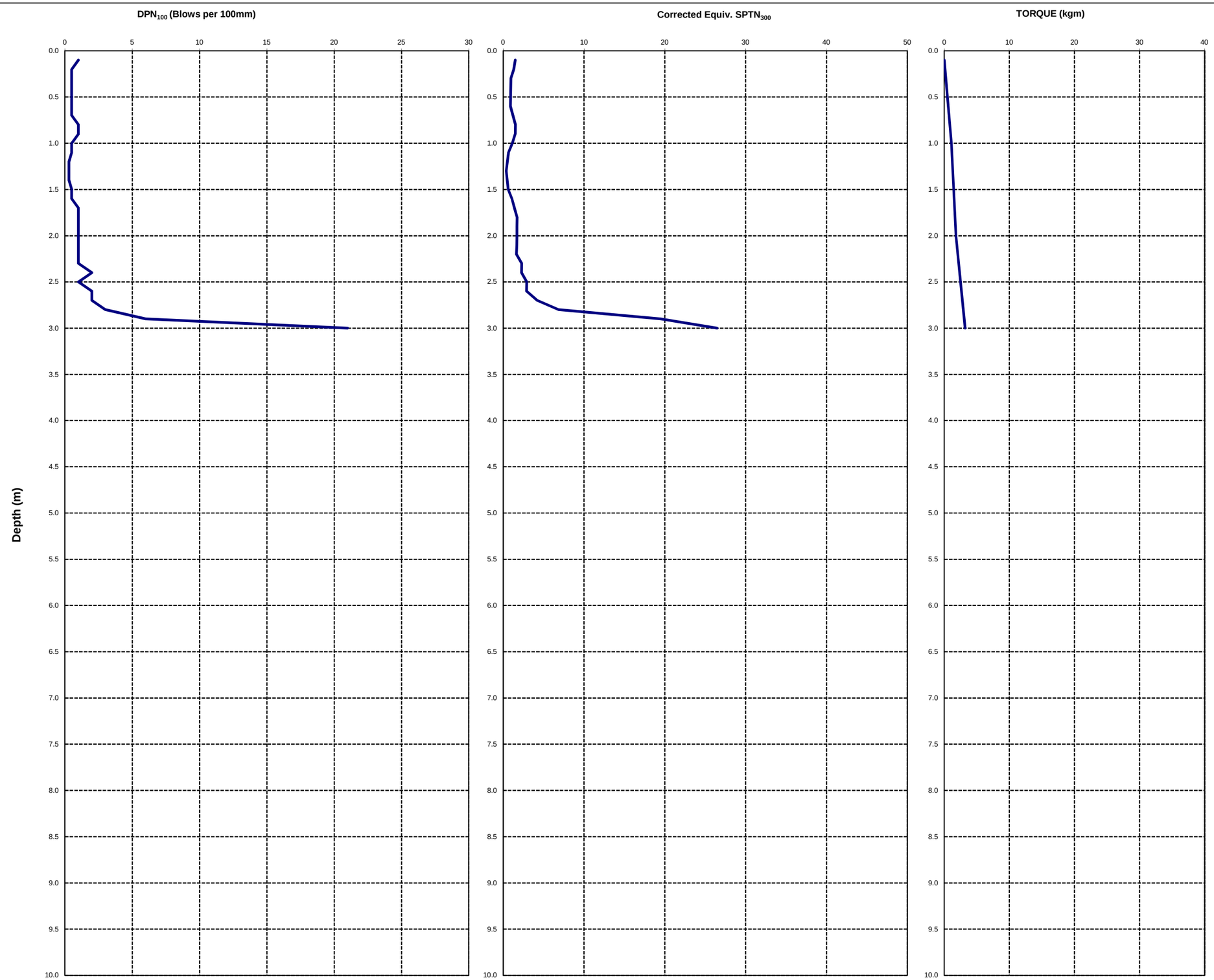

GeoSolve

CLIENT	Bridesdale Farm Developments Ltd
PROJECT	Bridesdale Subdivision
DESCRIPTION	HDCP results 0-10m
LOCATION	HDCP7A
JOB NUMBER	140407
DATE	30/03/2015
LOGGED BY	RC
ANALYSED BY	SAM
CHECKED BY	BPM

Depth (m)	DPN_{100}	Corrected Equiv. SPT N	Torque
0.1	**1.00**	2.0	0
0.2	**1.00**	1.6	
0.3	**0.50**	1.3	
0.4	**0.50**	1.9	
0.5	**2.00**	2.3	
0.6	**1.00**	3.2	
0.7	**2.00**	3.2	
0.8	**2.00**	3.2	
0.9	**1.00**	3.2	
1.0	**2.00**	2.5	1.1
1.1	**1.00**	2.5	
1.2	**1.00**	1.3	
1.3	**0.30**	0.8	
1.4	**0.30**	0.3	
1.5	**0.30**	0.5	
1.6	**0.50**	0.6	
1.7	**0.50**	1.0	
1.8	**1.00**	2.0	
1.9	**2.00**	2.3	
2.0	**1.00**	3.0	2.2
2.1	**2.00**	2.3	
2.2	**1.00**	2.9	
2.3	**2.00**	3.5	
2.4	**3.00**	4.2	
2.5	**2.00**	4.1	
2.6	**2.00**	4.1	
2.7	**3.00**	4.1	
2.8	**2.00**	4.7	
2.9	**3.00**	4.0	
3.0	**2.00**	4.7	4
3.1	**3.00**	4.7	
3.2	**3.00**	6.0	
3.3	**4.00**	8.0	
3.4	**6.00**	13.3	
3.5	**11.00**	22.7	
3.6	**18.00**	32.7	
3.7	**21.00**	44.0	
3.8	**28.00**	59.3	
3.9	**41.00**	68.3	4
4.0			
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4.6			
4.7			
4.8			
4.9			
5.0			
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5.6			
5.7			
5.8			
5.9			
6.0			
6.1			
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6.9			
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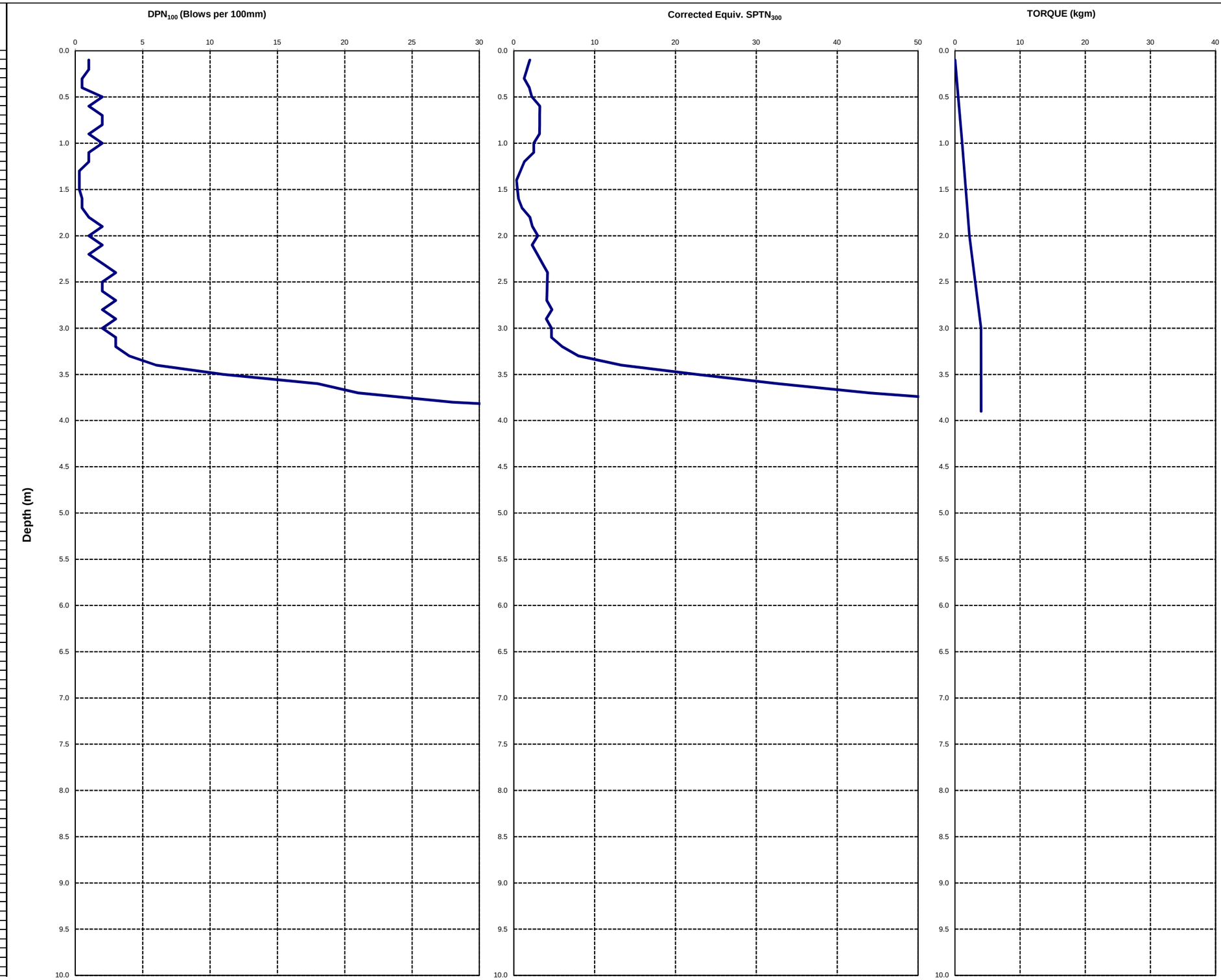

GEOSOLVE

CLIENT	Bridesdale Farm Developments Ltd
PROJECT	Bridesdale Subdivision
DESCRIPTION	HDCP results 0-10m
LOCATION	HDCP8A
JOB NUMBER	140407
DATE	30/03/2015
LOGGED BY	RC
ANALYSED BY	SAM
CHECKED BY	BPM

Depth (m)	DPN_{100}	Corrected Equiv. SPT N	Torque
0.1	**1.00**	2.0	0
0.2	**1.00**	2.6	
0.3	**2.00**	2.6	
0.4	**1.00**	2.6	
0.5	**1.00**	1.9	
0.6	**1.00**	1.9	
0.7	**1.00**	1.9	
0.8	**1.00**	1.8	
0.9	**1.00**	1.8	
1.0	**1.00**	1.4	1.3
1.1	**0.50**	1.1	
1.2	**0.50**	0.8	
1.3	**0.50**	0.8	
1.4	**0.50**	0.8	
1.5	**0.50**	0.8	
1.6	**0.50**	1.1	
1.7	**1.00**	1.4	
1.8	**1.00**	1.8	
1.9	**1.00**	1.4	
2.0	**0.50**	1.1	1.5
2.1	**0.50**	1.1	
2.2	**1.00**	1.4	
2.3	**1.00**	1.4	
2.4	**0.50**	1.1	
2.5	**0.50**	0.8	
2.6	**0.50**	0.8	
2.7	**0.50**	1.1	
2.8	**1.00**	2.1	
2.9	**2.00**	3.1	
3.0	**2.00**	4.4	1.4
3.1	**3.00**	5.8	
3.2	**4.00**	8.4	
3.3	**6.00**	11.1	
3.4	**7.00**	13.8	
3.5	**8.00**	21.8	
3.6	**18.00**	25.8	1.4
3.7			
3.8			
3.9			
4.0			
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4.3			
4.4			
4.5			
4.6			
4.7			
4.8			
4.9			
5.0			
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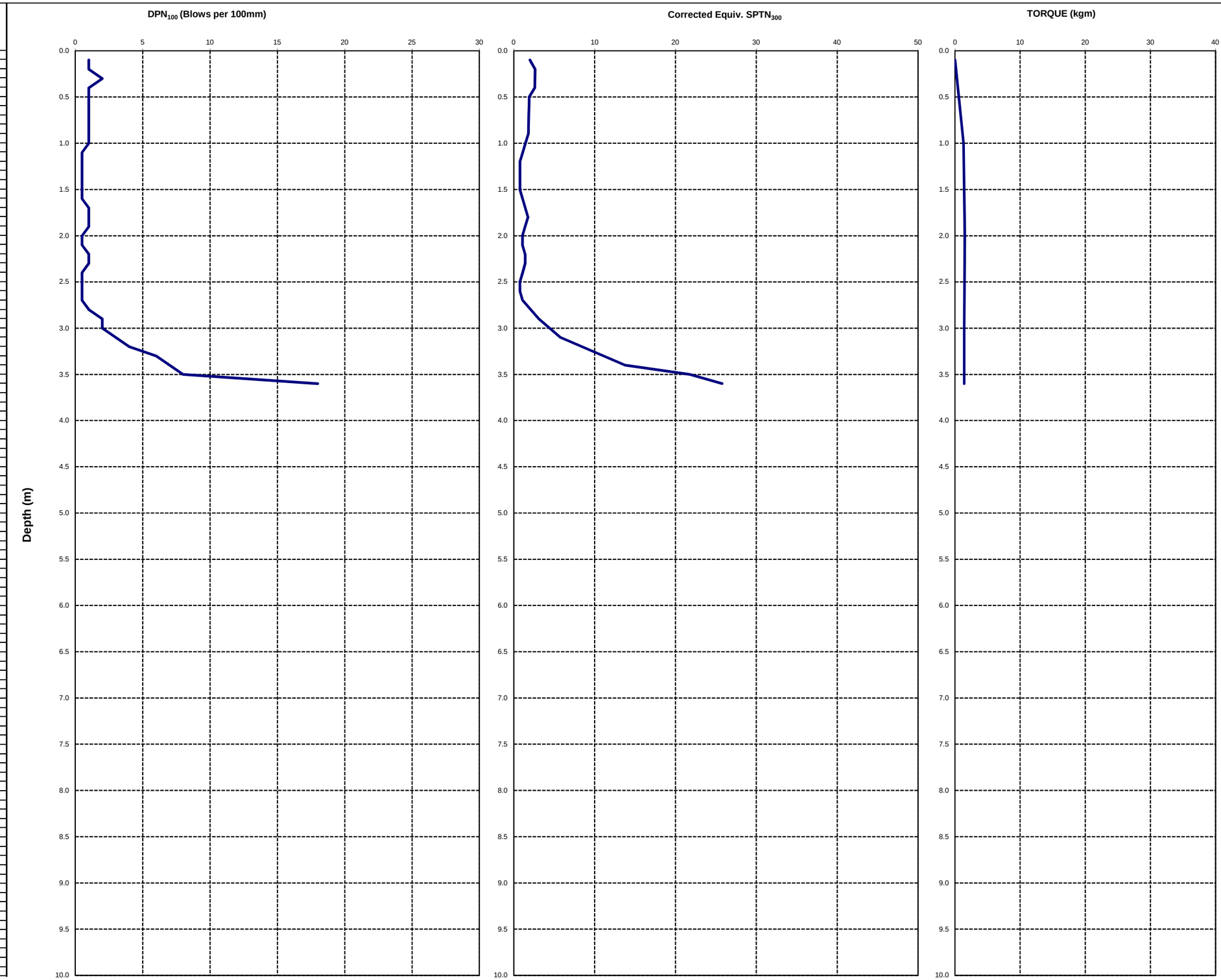

GEOSOLVE

CLIENT	Bridesdale Farm Development Ltd
PROJECT	Bridesdale Subdivision
DESCRIPTION	HDCP results 0-10m
LOCATION	HDCP9A
JOB NUMBER	140407
DATE	30/03/2015
LOGGED BY	RC
ANALYSED BY	SAM
CHECKED BY	BPM