REPORT

TO
TKD ARCHITECTS

ON
GEOTECHNICAL INVESTIGATION

FOR
PROPOSED SCHOOL BUILDING

AT
ALEXANDRIA PARK COMMUNITY SCHOOL
PARK ROAD, ALEXANDRIA, NSW

1 December 2017
Ref: 30907Zrpt Rev1

JK Geotechnics
GEOTECHNICAL & ENVIRONMENTAL ENGINEERS

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Date: 1 December 2017
Report No: 30907Zrpt
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Report prepared by:

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For and on behalf of
JK GEOTECHNICS
PO Box 976
NORTH RYDE BC NSW 1670

TABLE OF CONTENTS

1 INTRODUCTION

This geotechnical investigation report has been prepared, on behalf of the NSW Department of Education (the 'Applicant'). It accompanies an Environmental Impact Statement (EIS) prepared in support of State Significant Development Application SSD 17_8373 for the redevelopment of 'Alexandria Park Community School' at 7-11 Park Road, Alexandria (the 'Site'). The EIS seeks development consent for the following works.

The redevelopment of the Alexandria Park Community School (the 'School') will address issues of capacity for schools in the inner city areas of Sydney and is also driven by the population growth resulting from the large number of residential developments that are transforming the former industrial precincts of Zetland, Waterloo and Alexandria.

The new school has been briefed to accommodate up to 1,000 primary school students and up to 1,200 secondary school students on one campus in an integrated and fully connected school building.

Specifically, this project includes:

- Demolition of all existing buildings onsite, including the temporary pop-up schools.
- Remediation of specific areas of the site containing contaminated fill.
- Construction of multiple school buildings of up to five storeys, arranged along the western and southern parts of the site comprising:
  - Classroom home bases;
  - Collaborative learning spaces;
  - Specialist learning hubs;
  - Learning support spaces;
  - Office for teachers and administrative staff;
  - Library; and
  - Student canteen.
- Construction of a sports hall and multiple outdoor sports courts.
- An all-weather multipurpose synthetic sports field.
- Informal play spaces and Covered Outdoor Learning Space or COLA.
- A community centre.

- A pre-school for 39 children.
- Site landscaping including green links, community garden and open space.
- Construction of a new onsite carpark and associated vehicular access point off Belmont Street.
- Augmentation and construction of ancillary infrastructure and utilities as required.

Delivery of the project will be undertaken in sequential phases to maintain an operational school on the Park Road Campus and will involve enabling works separate to this application followed by three main construction phases for the new building and external works.

The purpose of this report is to provide an assessment of the proposal as described above and detailed within the EIS.

A site location plan is presented in Figure 2 and the architectural drawings prepared by TKD Architects (refer Appendix B) are relevant. Column loads for the proposed buildings between 500kN and 5,600kN have been indicated by Woolacotts Consulting Engineers in their geotechnical brief (Job No 161044, dated 15 September 2017).

The investigation has obtained geotechnical information on subsurface conditions at eight locations nominated by Woolacotts Consulting Engineers, as a basis for comments and recommendations on site preparation, footings and on-grade floor slabs.

Our environmental division, Environmental Investigation Services, were concurrently commissioned to carry out an acid sulphate soil assessment and asbestos control. The environmental report (E30907K) should be read in conjunction with the geotechnical report.

2 INVESTIGATION PROCEDURE

The fieldwork for the investigation was carried out over the period 3 to 6 October 2017 and included the following scope of work:

- Three boreholes (BH1, BH6 and BH7) were auger drilled/washbored to depths of 17.5m, 6m and 19.2m, respectively. No testing was carried out in BH1 as it was drilled to confirm the bedrock and as a check against the adjacent CPT test. No testing was carried out within BH6 as it was drilled primarily to install a groundwater monitoring well. BH7 included regular SPT tests within the soil profile.
- Seven CPT tests (CPT 1 to CPT6 and CPT8) were carried out to refusal depths between 16.53m and 20.29m.

The test locations, as indicated on attached Figure 2, were set out using taped measurements from existing surface features and were electromagnetically scanned for buried services prior to drilling or testing commencing. The surface Reduced Levels (RLs) at the test locations were estimated by interpolation between spot heights on the provided survey plans (Project No 44183, dated 31/01/17, Sheets 1/6 to 6/6) prepared by LTS Lockley. The survey datum is the Australian Height Datum (AHD) and survey plan 1/6 forms the basis of Figure 2.

The nature and composition of the soil and rock strata were assessed by logging the materials recovered in the boreholes. The nature and composition of the soil profile was also assessed by interpretation of the CPT test results. We note that CPT does not provide sample recovery and the assessment is based on universally accepted correlations. The density/strength of the soil profile was assessed from the Standard Penetration Test (SPT) 'N' number, augmented by hand penetrometer readings on recovered clayey samples and by interpretation of the CPT test results. Groundwater observations were made during and on completion of drilling the boreholes and on extracting the CPT rods from the ground. CPT3 included pore water pressure readings which also provide an indicative depth of the groundwater. A monitoring well was installed into BH6 to allow future groundwater monitoring, if required. The monitoring well construction is indicated on the borehole log. Long term groundwater monitoring was not carried out. For further details on the investigation procedure adopted, reference should be made to the attached Report Explanation Notes.

Our geotechnical engineers were on site full time during the fieldwork and set out the test locations, directed the electromagnetic scanning, nominated sampling and testing, logged the subsurface profile, and interpreted the CPT results. The borehole logs and CPT results (which include an

interpreted soil profile) are presented with this report together with a glossary of logging terms and symbols used.

Representative soil samples which were recovered from site were submitted to Envirolab Services Pty Ltd, a NATA registered laboratory, for soil pH, sulphate/chloride content and resistivity testing. The test results are presented on the Envirolab Services 'Certificate of Analysis' which is included in Appendix A.

3 RESULTS OF INVESTIGATION

3.1 Site Description

The site is located in relatively flat terrain. The site itself has an irregular plan shape, being between approximately 53m and 130m wide (east to west) by about 248m long (north to south), slopes down to the south at 1° to 2°, and is bounded by Buckland Street to the north and Park Road to the east.

At the time of the investigation, the southern portion of the site was occupied by several one and two storey brick school buildings and a hall which were assessed to be in good external condition based on a cursory inspection. At the north-eastern end was a raised planter with brick walls up to 0.4m to 0.6m, which were in fair condition with outward rotation and cracking evident.

Centrally was a concrete surfaced court and play equipment.

The north-eastern portion of the site was grassed and demountable buildings were being erected on brick piers. A concrete surfaced court surrounded by brick and demountable buildings, all in good external condition, was located over the north-western portion of the site.

An asphaltic concrete (AC) carpark was located adjacent to the central portion of the western site boundary and an AC surfaced driveway extended south from the carpark. The carpark was in fair condition with damage from root uplift and 'crocodile' cracking evident.

Beyond the western site boundary were brick townhouses set back between 1m and 2m. Visibility was obscured by a relatively high steel fence. However, levels appeared to be similar across the site boundary. Visibility beyond the southern site boundary was obscured, however, industrial buildings appeared to be located less than 1m beyond the site boundary.

3.2 Subsurface Conditions

The 1:100,000 geological map of Sydney indicates that the site is underlain by Quaternary Age transgressive dunes comprising medium to fine grained 'marine' sand with podsols. The investigation has revealed a generalised subsurface profile comprising surficial fill over natural sand deposits over silty clays with sandstone bedrock encountered at depth. A relatively shallow groundwater level was encountered. For detailed subsurface conditions at specific locations, reference should be made to the attached borehole logs and CPT interpreted profiles. A summary of the subsurface conditions as encountered, is presented below:

- Fill generally comprising sand (and sandy silt locally) overlies the site to depths between less than 0.5m (CPT8) and 1.75m (CPT5).
- Natural sand deposits were encountered below the fill. The sands had variable and erratic densities between very loose and very dense. However, dense and very dense sands were encountered consistently below depths between 2.7m (CPT2) and 6.65m (CPT1).
- Clays with interbedded sands were encountered at depths between 8.5m (CPT3) and 9.65m (CPT7). On first contact, the clays were often of soft to firm strength, firm to stiff strength, or stiff strength. With depth, the clays improved to stiff, very stiff and hard. The sand bands had variable densities.
- Sandstone bedrock was encountered or inferred below the clays at depths between 15.52m (CPT2) and 20.3m (CPT6). On first contact, the sandstone in BH1 was of very low strength and was consistent for 1m to the borehole termination depth of 17.5m.
- Groundwater was measured at depths of 3.8m (BH1), 3.2m (BH6) and 3.5m (BH7). The pore water pressure measurements in CPT3 indicate a groundwater level at about 3m depth. Within the remaining CPT holes, the sand collapsed to depths generally between 2.5m and 3.5m, which should be at, or close to, the groundwater level. Longer term groundwater monitoring was not carried out. However, the monitoring well in BH6 will allow further groundwater monitoring, if required.

3.3 Laboratory Test Results

The Envirolab Services test results indicate that the sampled clay was alkaline whilst the sampled sand was acidic. Both soils had relatively low sulphate and chloride contents and high resistivity levels.

4 COMMENTS AND RECOMMENDATIONS

4.1 Geotechnical Issues

The principal geotechnical issue associated with the proposed development at the subject site is associated with the high column loads which will need to be supported by pile footings. Although the dense and very dense sands present a competent founding medium for the piles, particular care is required to avoid surcharging the underlying silty clays which are of high compressibility and low strength.

This issue is dealt with in greater detail in the sections which follow.

4.2 Subgrade Preparation

Following demolition of all buildings, including their footings, and pavements within the development footprint, site preparation will require removal of a number of trees. Stripping of root affected soil will also be required to a nominal depth of about 0.1m. Following this, any obvious deleterious or contaminated existing fill should be removed. These stripped materials should be taken offsite as they are not suitable for reuse as engineered fill. The root affected soil may, however, be separately stockpiled and used for landscaping purposes. The site can then be excavated to suit the design subgrade levels for the development.

4.3 Retaining Walls

Retaining walls, if required, should be designed using the following parameters:

- Conventional free-standing cantilever walls which support areas where movement is not of concern (ie. landscape walls), may be designed using a triangular lateral earth pressure distribution and an 'active' earth pressure coefficient, K_a, of 0.33, for the soil profile, assuming a horizontal retained surface.
- Cantilever retaining walls which are propped by the main structure prior to backfill, should be designed using a triangular lateral earth pressure distribution and an 'at rest' earth pressure coefficient, K_o, of 0.55, for the soil profile, assuming a horizontal retained surface.
- A bulk unit weight of 20kN/m^3 should be adopted for the soil profile.
- All surcharge loads affecting the walls (eg. adjacent high level footings, traffic loads, construction loads, etc) should be taken into account in the wall design using the appropriate earth pressure coefficient from above.

- Retaining walls should be designed as drained and measures taken to provide permanent and effective drainage of the ground behind the walls. Subsoils drains should incorporate a non-woven geotextile fabric (eg. Bidim A34) to act as a filter against subsoil erosion.
- Lateral toe restraint can be achieved by adequate embedment of the wall footing below the ground in front of the wall. For embedment depth design, adopt a triangular lateral earth pressure distribution and a 'passive' earth pressure coefficient, K_p, of 2.8, for the soil profile, assuming horizontal ground in front of the wall. Any localised excavations in front of the wall (such as for lift overrun pits, footings, buried services, etc) should be taken into account in the wall design.

4.4 Footings

The upper sands which are of variable density including very loose, are not considered to be a suitable founding material for the proposed relatively high column loads. The proposed building will therefore need to be supported using piled footings. Given the subsoil conditions encountered, suitable pile types include cfa (also known as grout injected auger) piles or steel screw piles. Piles founded in dense or very dense sands at a minimum depth of 5 x pile diameter may be designed for an allowable end bearing pressure of 2,000kPa. In addition, for cfa piles, an allowable friction value of 10kPa is also applicable. As previously stated, dense or denser sands were encountered consistently below depths between 2.7m (CPT2) and 6.65m (CPT1).

We note, however, that the sands are underlain from depths between 8.25m and 9.65m by silty clays, which on first contact, were of soft to firm, firm to stiff, or stiff strength. Particular care is therefore required so that the piles do not punch into the underlying clays. We recommend that the bearing pressure from the proposed pile groups be distributed through the sand foundation at 1 Horizontal (H) in 2 Vertical (V), and that the resulting pressure at the surface of the underlying clays be limited to no higher than 60kPa. On this basis, the resulting settlement will vary up to 15mm, depending on the size of pile group adopted.

The maximum founding depth which will avoid surcharging the underlying clays must be nominated and will depend on the plan dimensions of each pile group.

If the above punching and settlement criteria cannot be met, then the piles will need to be founded in the underlying sandstone bedrock which was encountered at depths between about 15.5m and 20.5m below existing surface levels. Based on the limited investigation of the bedrock, an allowable end bearing pressure of 1,000kPa may be adopted. In addition, an allowable shaft adhesion of

100kPa may be adopted for rock sockets into the sandstone. It may be feasible to increase the allowable end bearing pressure within the sandstone bedrock. However, further geotechnical investigations would be required (refer Section 4.7 below).

Based on the chemical test results, a 'moderate' and a 'mild' exposure classification applies to concrete and steel piles, respectively, in accordance with AS2159–2009.

4.5 On-Grade Floor Slab

Ground floor slabs may be designed as on-grade floor slabs, provided adequate subgrade preparation is first carried out. The subgrade preparation following stripping the site to design subgrade level should include proof-rolling with a 5 tonne minimum, smooth drum roller, together with thorough moistening of the sand. Proof-rolling should be carried out under the direction of an experienced earthworks foreman or geotechnical engineer to assist in the detection of unstable areas which were not disclosed by this investigation. Unstable areas identified during proof-rolling must be excavated down to a stable base and replaced with well compacted sand fill.

The on-grade floor slab should be separated from all walls, columns, footings, etc, to permit relative movement. Joints in the concrete on-grade floor slab should incorporate keys or dowels.

4.6 Earthquake

A 'Class D_e – deep or soft soil' applies to this site, based on AS1170.4–2007, due to the presence of very loose sands. A Hazard Factor (Z) of 0.08 is applicable for Sydney.

4.7 Further Geotechnical Investigations

If the option of founding the proposed building in the underlying sandstone bedrock is desired, then further investigations are required. At least six boreholes should be auger drilled/washbored down to the bedrock surface, after which the bedrock should be penetrated using core drilling techniques with water flush. The purpose of the further investigation is to provide details on rock strength and quality, so that pile design parameters can be optimised. Following the further geotechnical investigation, the above report should be reviewed and revised as appropriate.

5 GENERAL COMMENTS

The recommendations presented in this report include specific issues to be addressed during the construction phase of the project. In the event that any of the construction phase recommendations presented in this report are not implemented, the general recommendations may become inapplicable and JK Geotechnics accept no responsibility whatsoever for the performance of the structure where recommendations are not implemented in full and properly tested, inspected and documented.

Occasionally, the subsurface conditions between the completed test locations may be found to be different (or may be interpreted to be different) from those expected. Variation can also occur with groundwater conditions, especially after climatic changes. If such differences appear to exist, we recommend that you immediately contact this office.

This report provides advice on geotechnical aspects for the proposed civil and structural design. As part of the documentation stage of this project, Contract Documents and Specifications may be prepared based on our report. However, there may be design features we are not aware of or have not commented on for a variety of reasons. The designers should satisfy themselves that all the necessary advice has been obtained. If required, we could be commissioned to review the geotechnical aspects of contract documents to confirm the intent of our recommendations has been correctly implemented.

A waste classification will need to be assigned to any soil excavated from the site prior to offsite disposal. Subject to the appropriate testing, material can be classified as Virgin Excavated Natural Material (VENM), General Solid, Restricted Solid or Hazardous Waste. Analysis takes seven to 10 working days to complete, therefore, an adequate allowance should be included in the construction program unless testing is completed prior to construction. If contamination is encountered, then substantial further testing (and associated delays) should be expected. We strongly recommend that this issue is addressed prior to the commencement of excavation on site.

This report has been prepared for the particular project described and no responsibility is accepted for the use of any part of this report in any other context or for any other purpose. If there is any change in the proposed development described in this report then all recommendations should be reviewed. Copyright in this report is the property of JK Geotechnics. We have used a degree of care, skill and diligence normally exercised by consulting engineers in similar circumstances and locality. No other warranty expressed or implied is made or intended. Subject to payment of all fees due for the investigation, the client alone shall have a licence to use this report. The report shall not be reproduced except in full.

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Borehole No.
BH1
1 / 3

BOREHOLE LOG

Client: TKD ARCHITECTS

Project: PROPOSED SCHOOL BUILDING

Location: ALEXANDRIA PARK COMMUNITY SCHOOL, ALEXANDRIA, NSW

Job No.: 30907Z **Method:** SPIRAL AUGER **R.L. Surface:** ~13.3 m

Date: 3/10/17 **Datum:** AHD

Plant Type: JK308 **Logged/Checked By:** A.F./A.Z.

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	RL (m AHD)	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel Density	Hand Penetrometer Readings (kPa)	Remarks
						13				FILL: Silty sand, fine to medium grained, trace of fine grained igneous gravel and root fbres.				GRASS COVER
										FILL: Silty clay, medium to high plasticity, orange brown, trace of ironstone and sandstone gravel an fine to coarse grained sand.	MC>PL			
						12	1		SP	SAND: fine to medium grained, dark brown, trace of silt fines.				ALLUVIAL
						11	2							
						10	3							
						9	4							
						8	5							
						7	6			as above, but yellow brown, without silt fines.				

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Borehole No.
BH1
2 / 3

BOREHOLE LOG

Client: TKD ARCHITECTS
Project: PROPOSED SCHOOL BUILDING
Location: ALEXANDRIA PARK COMMUNITY SCHOOL, ALEXANDRIA, NSW

Job No.: 30907Z **Method:** SPIRAL AUGER **R.L. Surface:** ~13.3 m
Date: 3/10/17 **Datum:** AHD
Plant Type: JK308 **Logged/Checked By:** A.F./A.Z.

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	RL (m AHD)	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel Density	Hand Penetrometer Readings (kPa)	Remarks
	■			■		6				SAND: fine to medium grained, yellow brown.				ALLUVIAL
	■			■			8							
	■			■		5								
	■			■			9							
	■			■		4								
	■			■			10		CL	SILTY CLAY: medium plasticity, grey brown.	MC>PL	(F - St)		
	■			■		3							70	
	■			■			11						90	
						2							110	
							12							
						1								
							13							
						0								

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Borehole No.
BH1
3 / 3

BOREHOLE LOG

Client: TKD ARCHITECTS
Project: PROPOSED SCHOOL BUILDING
Location: ALEXANDRIA PARK COMMUNITY SCHOOL, ALEXANDRIA, NSW

Job No.: 30907Z **Method:** SPIRAL AUGER **R.L. Surface:** ~13.3 m
Date: 3/10/17 **Datum:** AHD
Plant Type: JK308 **Logged/Checked By:** A.F./A.Z.

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	RL (m AHD)	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel Density	Hand Penetrometer Readings (kPa)	Remarks
						-1	15		CL	SILTY CLAY: medium plasticity, grey brown. *(continued)*	MC>PL	(F - St)		ALLUVIAL
						-2	16							
						-3	17			SANDSTONE: fine to medium grained, light grey.	(DW)	(VL)		VERY LOW 'TC' BIT RESISTANCE
						-4								
						-5	18			END OF BOREHOLE AT 17.50 m				
						-6	19							
						-7	20							

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GEOTECHNICAL AND ENVIRONMENTAL ENGINEERS

Borehole No.
BH6
1 / 1

BOREHOLE LOG

Client: TKD ARCHITECTS

Project: PROPOSED SCHOOL BUILDING

Location: ALEXANDRIA PARK COMMUNITY SCHOOL, ALEXANDRIA, NSW

Job No.: 30907Z **Method:** SPIRAL AUGER **R.L. Surface:** ~13.1 m

Date: 4/10/17 **Datum:** AHD

Plant Type: JK308 **Logged/Checked By:** A.F./A.Z.

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	RL (m AHD)	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel Density	Hand Penetrometer Readings (kPa)	Remarks
						13				FILL: Silty sand, fine to coarse grained, brown, trace of fine to medium grained sandstone gravel and root fibres.				GRASS COVER
									SP	SAND: fine to medium grained, brown, trace of silt fines.				ALLUVIAL
						12	1							
						11	2			as above, but yellow brown, without silt fines.				
▼ ON COMPLETION ▼ & AFTER 48 HRS						10	3							
						9	4							
						8	5							GROUNDWATER MONITORING WELL INSTALLED TO 6.0m, MACHINE SLOTTED 50mm PVC STANDPIPE 3.0m TO 6.0m, CASING 0m TO 3.0m, 2mm SAND FILTER PACK 2.0m TO 6.0m, BENTONITE SEAL 1.5m TO 2.0m, BACKFILLED WITH SAND TO SURFACE AND COMPLETED WITH A CONCRETED GATIC COVER
						7	6			END OF BOREHOLE AT 6.00 m				

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Borehole No.
BH7
1 / 3

BOREHOLE LOG

Client: TKD ARCHITECTS

Project: PROPOSED SCHOOL BUILDING

Location: ALEXANDRIA PARK COMMUNITY SCHOOL, ALEXANDRIA, NSW

Job No.: 30907Z **Method:** SPIRAL AUGER **R.L. Surface:** ~13 m

Date: 3/10/17 **Datum:** AHD

Plant Type: JK308 **Logged/Checked By:** A.F./A.Z.

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	RL (m AHD)	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel Density	Hand Penetrometer Readings (kPa)	Remarks
										ASPHALTIC CONCRETE: 40mm.t	M			
					N = 15 4,8,7	12	1			FILL: Gravelly sand, fine to coarse grained, grey brown, fine to coarse grained igneous and sandstone gravel, trace of clay and silt.				APPEARS MODERATELY COMPACTED
					N = 6 3,3,3	11	2			FILL: Sand, fine to medium grained, orange brown, trace of fine to medium grained sandstone gravel. and silt fines.				APPEARS POORLY COMPACTED
ON COMPLETION					N = 4 2,2,2	10	3		SP	SAND: fine to medium grained, brown, trace of silty fines.	M	VL		ALLUVIAL
										as above, but orange brown.				
					N = 26 8,12,14	9	4			as above, but without silt fines.	W	MD		
					N = 39 12,18,21	8	5					D		COMMENCE WASHBORE DRILLING
						7	6							

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Borehole No.
BH7
2 / 3

BOREHOLE LOG

Client: TKD ARCHITECTS

Project: PROPOSED SCHOOL BUILDING

Location: ALEXANDRIA PARK COMMUNITY SCHOOL, ALEXANDRIA, NSW

Job No.: 30907Z **Method:** SPIRAL AUGER **R.L. Surface:** ~13 m

Date: 3/10/17 **Datum:** AHD

Plant Type: JK308 **Logged/Checked By:** A.F./A.Z.

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	RL (m AHD)	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel Density	Hand Penetrometer Readings (kPa)	Remarks
					N = 29 5,12,17	5	8			SAND: fine to medium grained, orange brown.	W	MD		
										as above, but grey brown, with peat bands.				
					N = 28 6,13,15	4	9							
						3	10							
									CL	SILTY CLAY: medium plasticity, grey brown.	MC>PL	(F - St)		
					N = 6 2,2,4	2	11							
						1	12							
						0	13							

JK Geotechnics
GEOTECHNICAL AND ENVIRONMENTAL ENGINEERS

Borehole No.
BH7
3 / 3

BOREHOLE LOG

Client: TKD ARCHITECTS
Project: PROPOSED SCHOOL BUILDING
Location: ALEXANDRIA PARK COMMUNITY SCHOOL, ALEXANDRIA, NSW

Job No.: 30907Z **Method:** SPIRAL AUGER **R.L. Surface:** ~13 m
Date: 3/10/17 **Datum:** AHD
Plant Type: JK308 **Logged/Checked By:** A.F./A.Z.

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	RL (m AHD)	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel Density	Hand Penetrometer Readings (kPa)	Remarks
									CL	SILTY CLAY: medium plasticity, grey brown. *(continued)*	MC>PL	(F - St)		
	■			■	N = 13 4,7,6	-2	15			as above, but red brown, with fine to coarse grained ironstone gravel.	MC>PL	VSt		
						-3	16			as above, but with sand bands.				
						-4	17							
						-5	18							
						-6	19			SANDSTONE				
										END OF BOREHOLE AT 19.20 m				
						-7	20							

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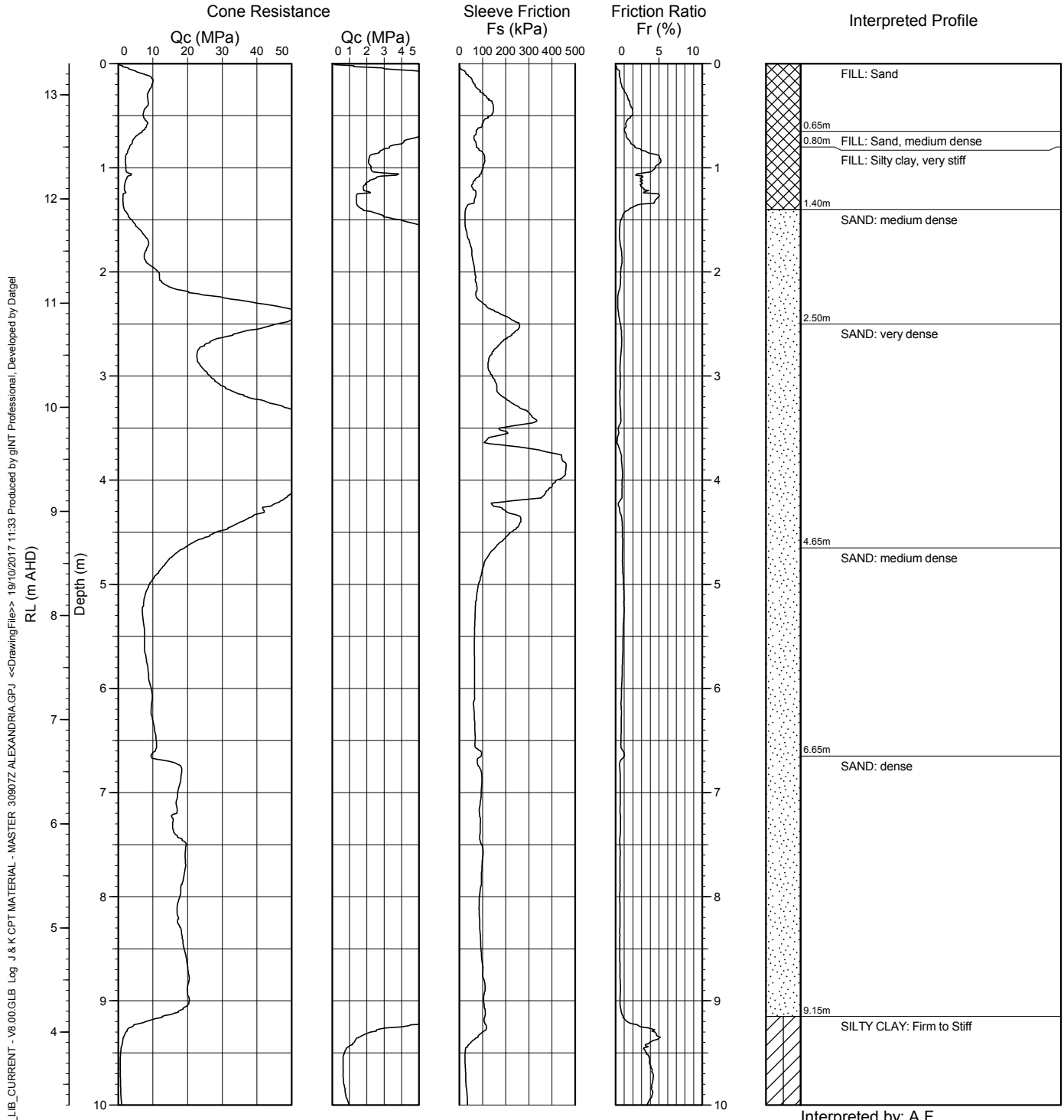
CPT No. 1

CONE PENETROMETER TEST RESULTS

Client:	TKD ARCHITECTS
Project:	PROPOSED SCHOOL BUILDING
Location:	ALEXANDRIA PARK COMMUNITY SCHOOL, ALEXANDRIA, NSW

Job No.: 30907Z	**R.L. Surface:** ~13.3 m	**Data File:** J:\30000's\30907Z
Date: 6/10/17	**Datum:** AHD	**Operator:** A.F.



Interpreted by: A.F.
Checked by: A.Z.

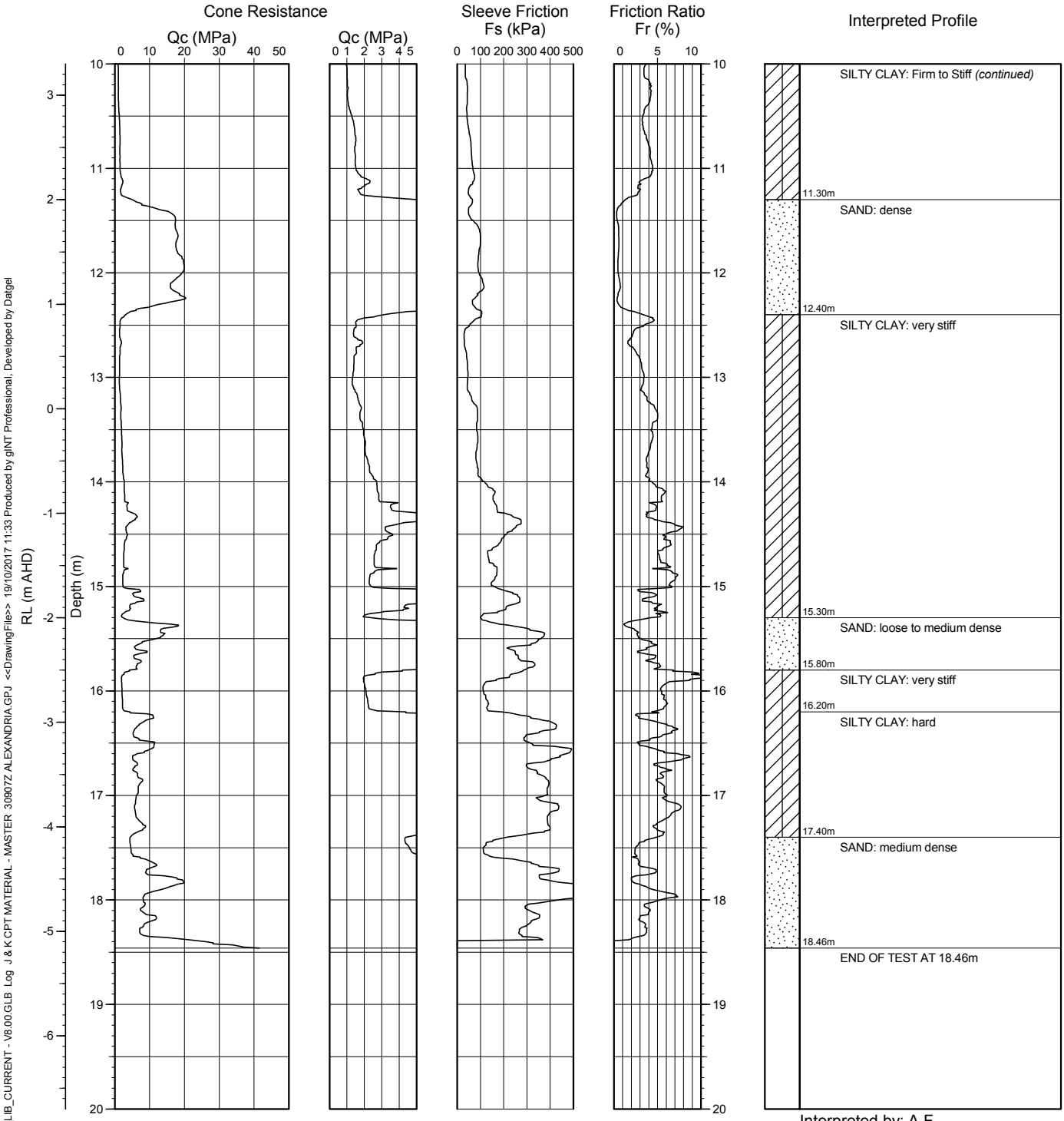
JK Geotechnics
GEOTECHNICAL AND ENVIRONMENTAL ENGINEERS

CPT No. 1
2 / 2

CONE PENETROMETER TEST RESULTS

Client:	TKD ARCHITECTS
Project:	PROPOSED SCHOOL BUILDING
Location:	ALEXANDRIA PARK COMMUNITY SCHOOL, ALEXANDRIA, NSW

Job No.: 30907Z	**R.L. Surface:** ~13.3 m	**Data File:** J:\30000's\30907Z
Date: 6/10/17	**Datum:** AHD	**Operator:** A.F.



Interpreted by: A.F.
Checked by: A.Z.

JK_LIB_CURRENT - V8.00.GLB Log J & K CPT MATERIAL - MASTER 30907Z ALEXANDRIA.GPJ <<DrawingFile>> 19/10/2017 11:33 Produced by gINT Professional, Developed by Datgel

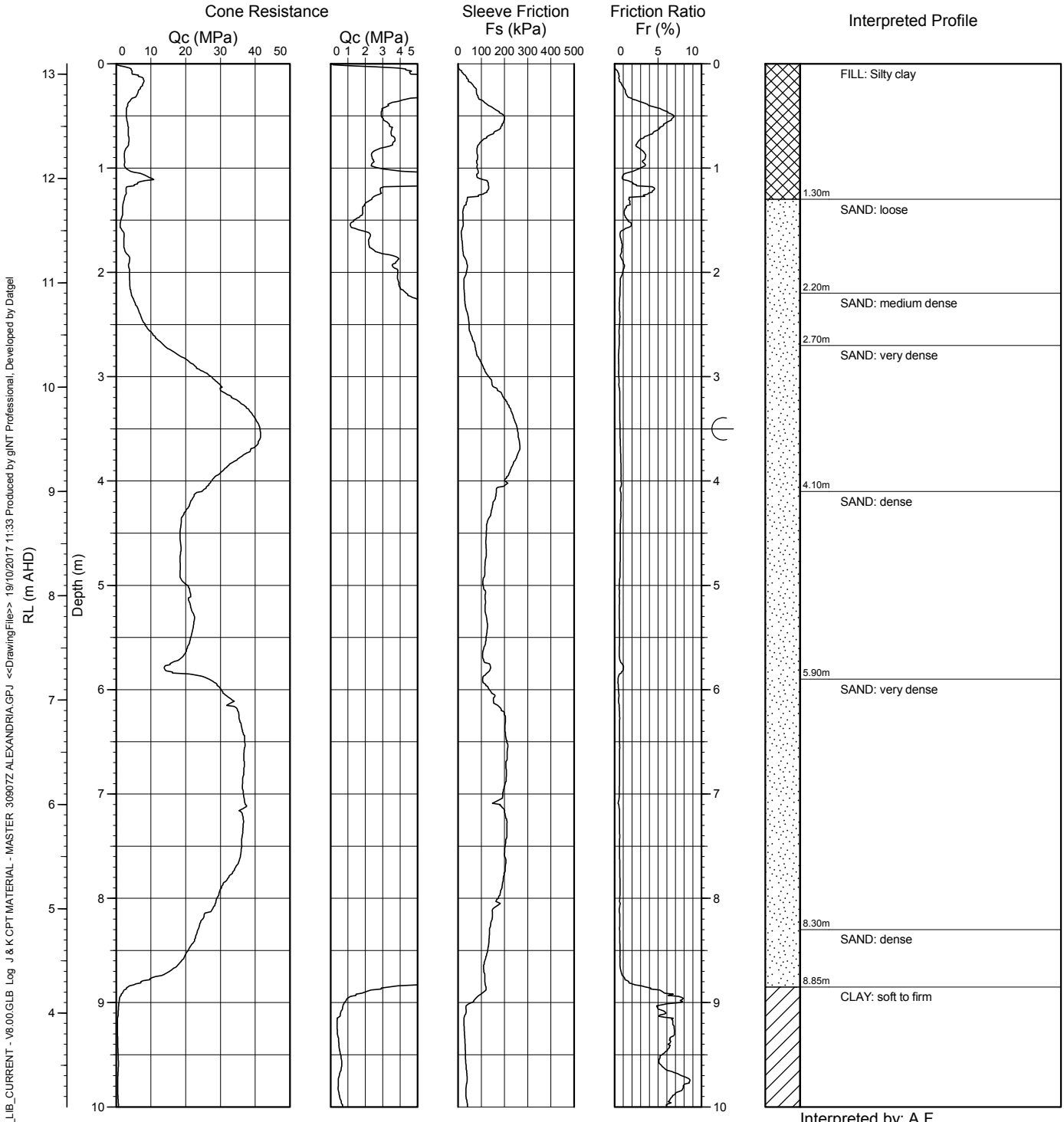
JK Geotechnics
GEOTECHNICAL AND ENVIRONMENTAL ENGINEERS

CPT No. 2

CONE PENETROMETER TEST RESULTS

Client:	TKD ARCHITECTS
Project:	PROPOSED SCHOOL BUILDING
Location:	ALEXANDRIA PARK COMMUNITY SCHOOL, ALEXANDRIA, NSW

Job No.: 30907Z	**R.L. Surface:** ~13.1 m	**Data File:** J:\30000's\30907Z
Date: 6/10/17	**Datum:** AHD	**Operator:** A.F.



Interpreted by: A.F.
Checked by: A.Z.

JK_LIB_CURRENT - V8.00.GLB Log J & K CPT MATERIAL - MASTER 30907Z ALEXANDRIA.GPJ <<DrawingFile>> 19/10/2017 11:33 Produced by gINT Professional, Developed by Datgel

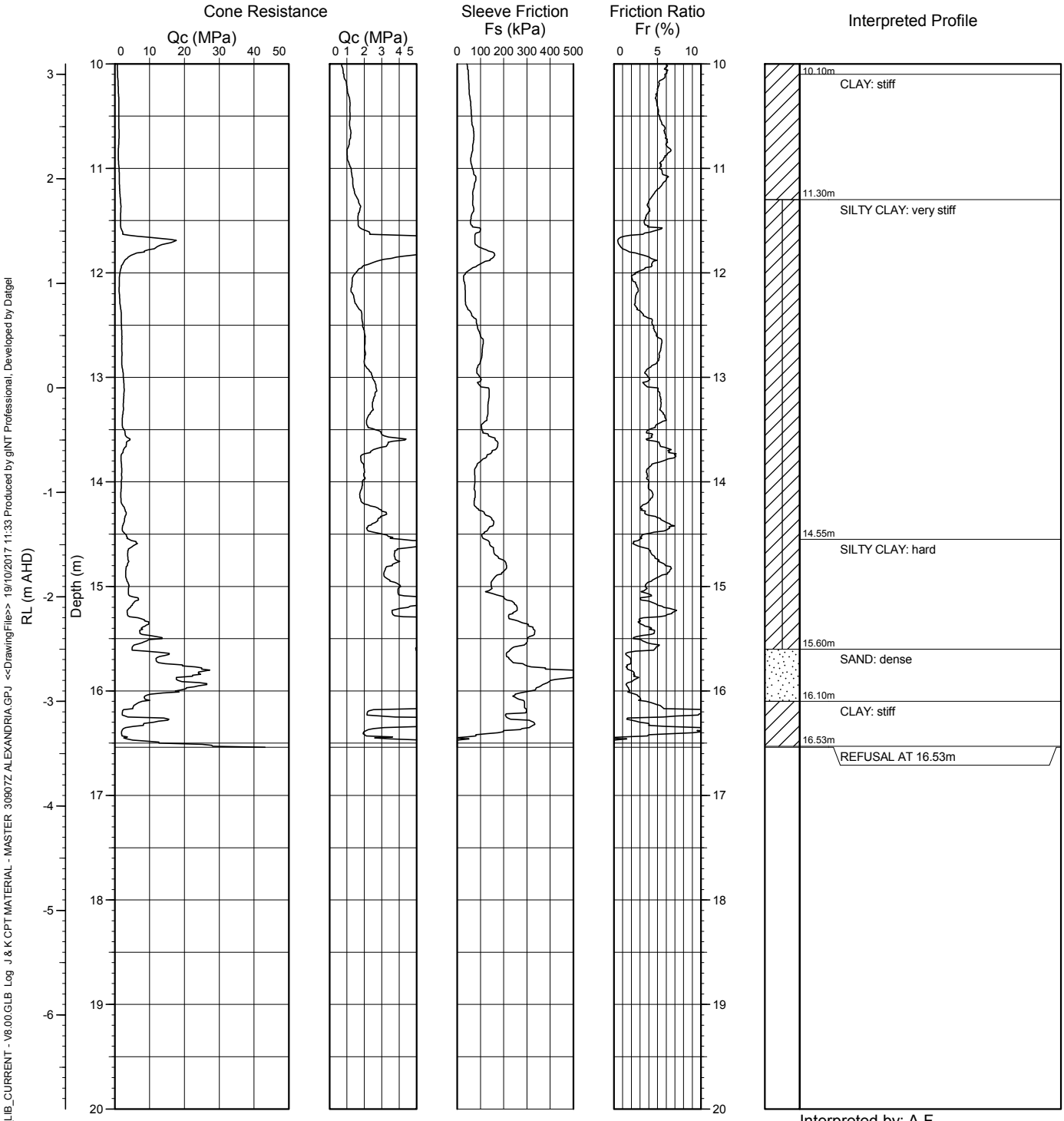
JK Geotechnics
GEOTECHNICAL AND ENVIRONMENTAL ENGINEERS

CPT No. 2
2 / 2

CONE PENETROMETER TEST RESULTS

Client: TKD ARCHITECTS
Project: PROPOSED SCHOOL BUILDING
Location: ALEXANDRIA PARK COMMUNITY SCHOOL, ALEXANDRIA, NSW

Job No.: 30907Z | **R.L. Surface:** ~13.1 m | **Data File:** J:\30000's\30907Z
Date: 6/10/17 | **Datum:** AHD | **Operator:** A.F.



Interpreted by: A.F.
Checked by: A.Z.

JK Geotechnics
GEOTECHNICAL AND ENVIRONMENTAL ENGINEERS

CPT No. 3

CONE PENETROMETER TEST RESULTS

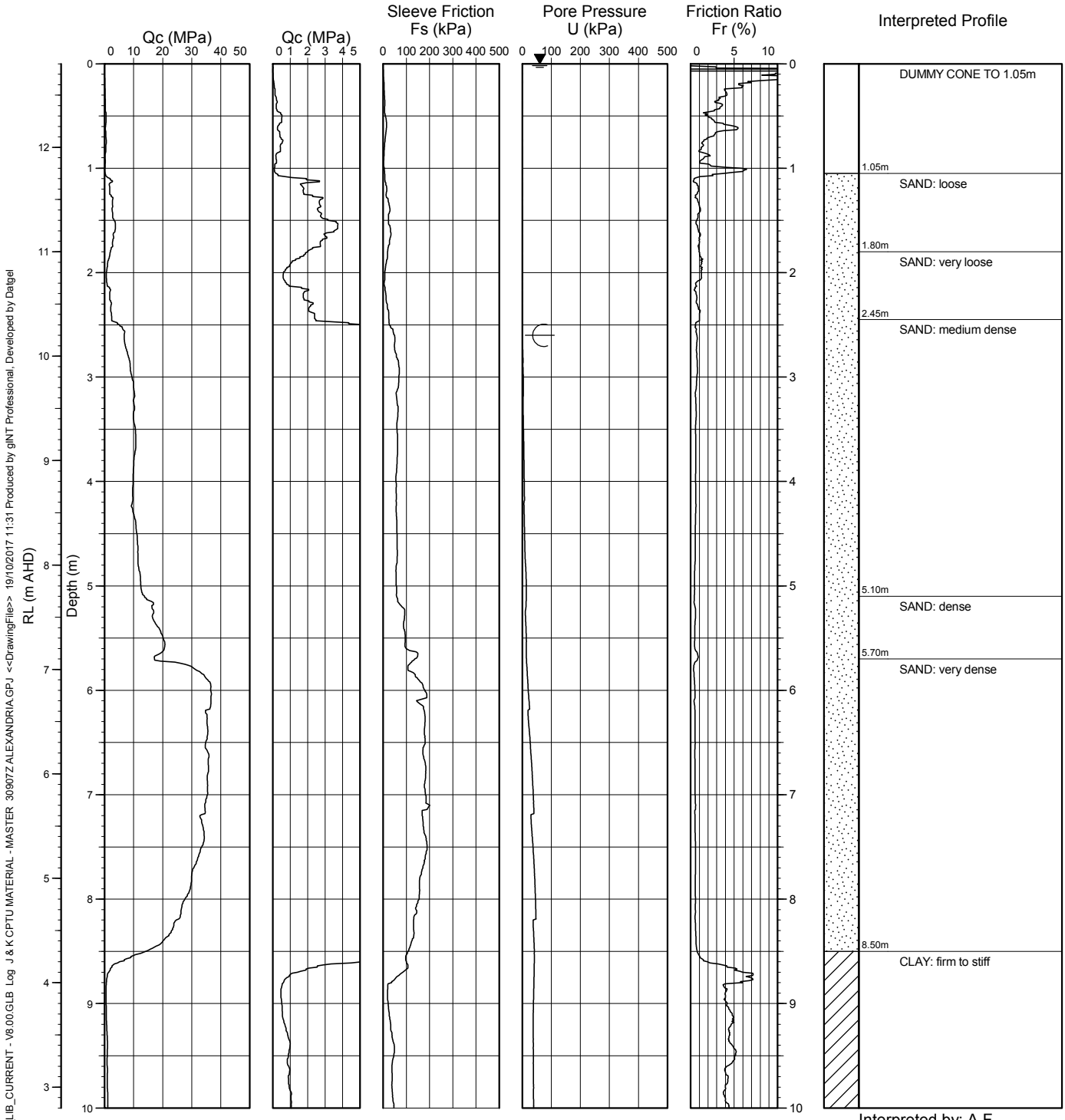
Client: TKD ARCHITECTS

Project: PROPOSED SCHOOL BUILDING

Location: ALEXANDRIA PARK COMMUNITY SCHOOL, ALEXANDRIA, NSW

Job No.: 30907Z **R.L. Surface:** ~12.8 m **Data File:** J:\30000's\30907Z

Date: 6/10/17 **Datum:** AHD **Operator:** A.F.



Interpreted by: A.F.
Checked by: A.Z.

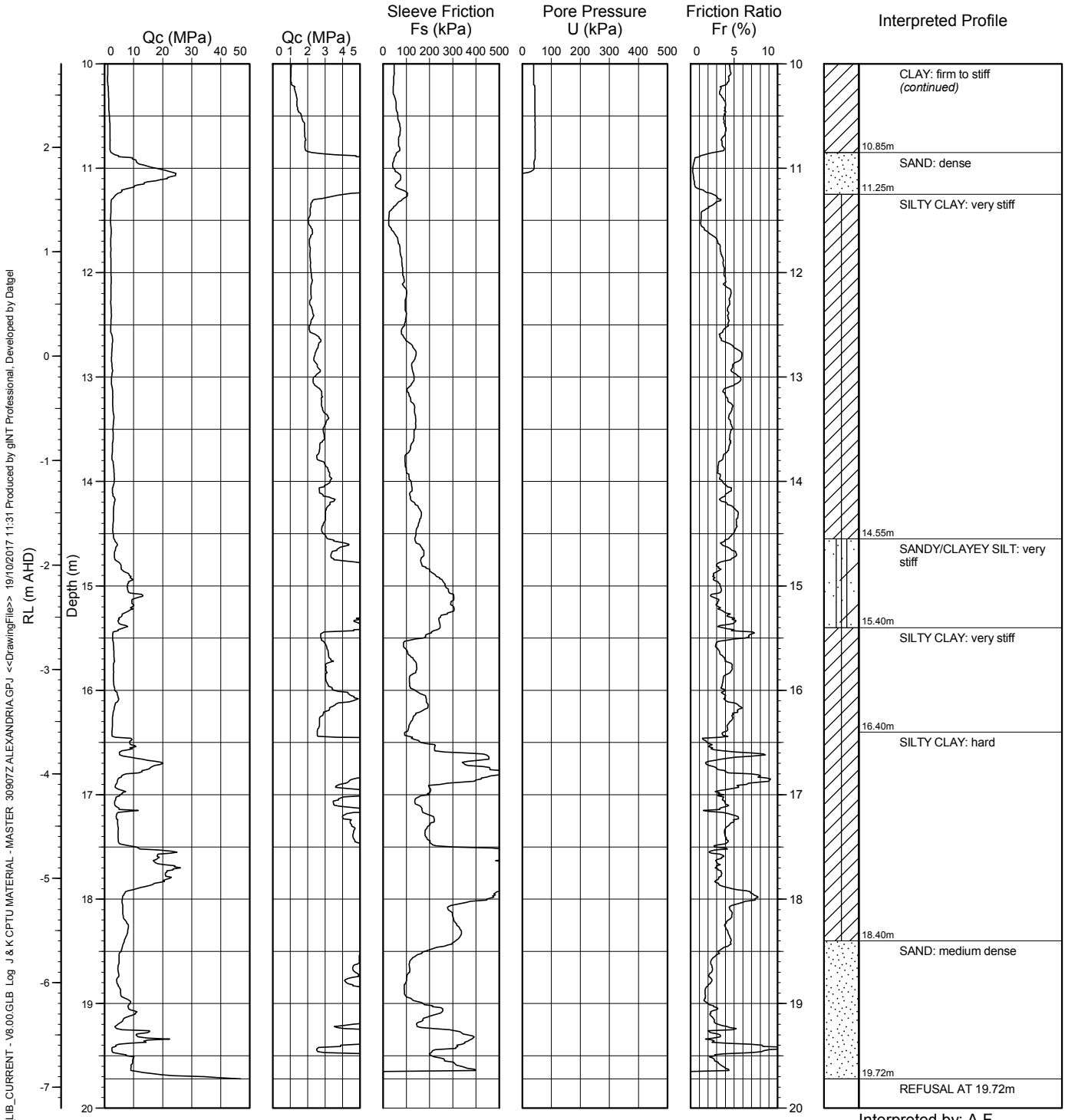
JK Geotechnics
GEOTECHNICAL AND ENVIRONMENTAL ENGINEERS

CPT No. 3 **2 / 2**

CONE PENETROMETER TEST RESULTS

Client:	TKD ARCHITECTS
Project:	PROPOSED SCHOOL BUILDING
Location:	ALEXANDRIA PARK COMMUNITY SCHOOL, ALEXANDRIA, NSW

Job No.: 30907Z	**R.L. Surface:** ~12.8 m	**Data File:** J:\30000's\30907Z
Date: 6/10/17	**Datum:** AHD	**Operator:** A.F.



Interpreted by: A.F.
Checked by: A.Z.

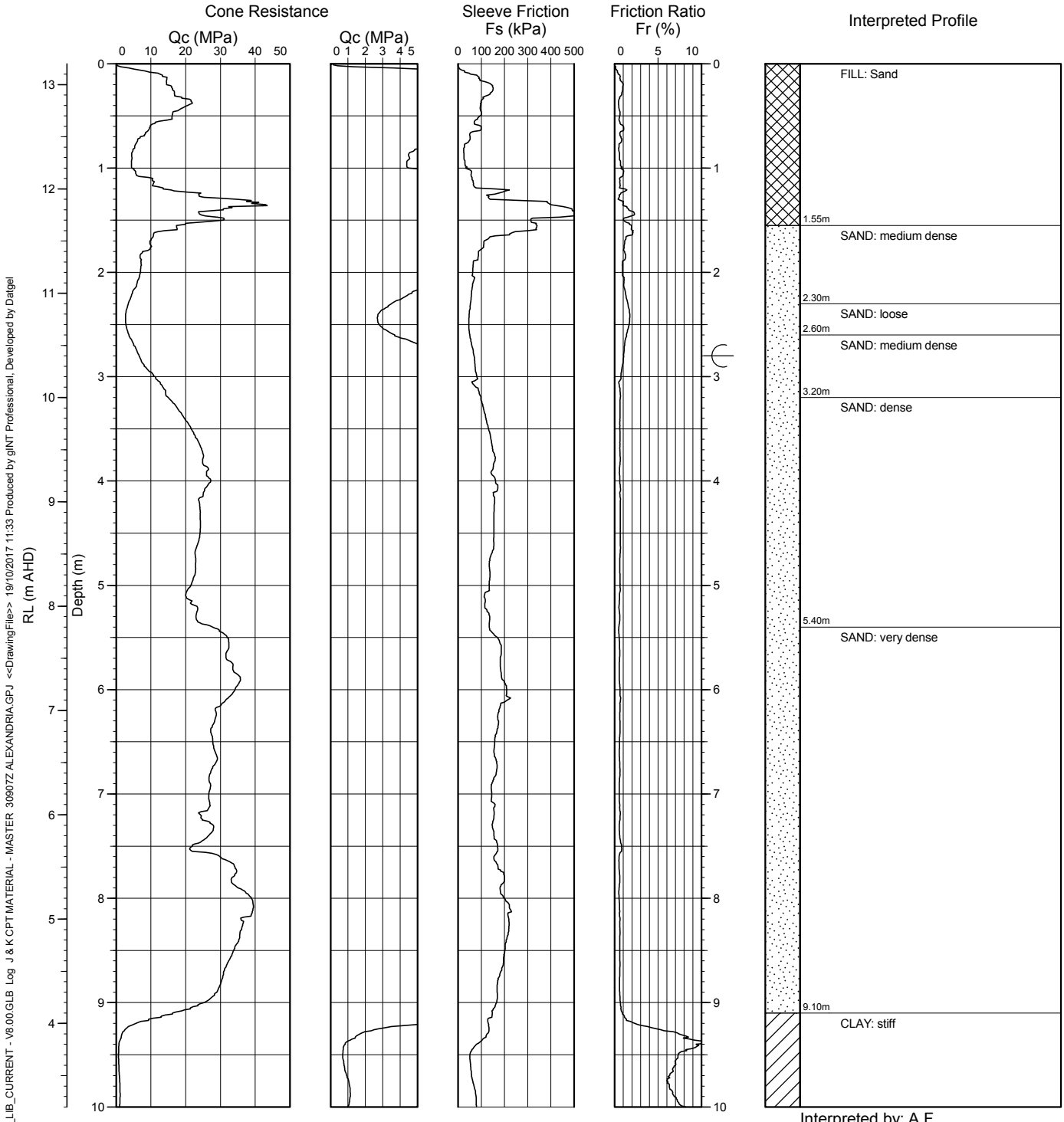
JK Geotechnics
GEOTECHNICAL AND ENVIRONMENTAL ENGINEERS

CPT No. 4
1 / 2

CONE PENETROMETER TEST RESULTS

Client:	TKD ARCHITECTS
Project:	PROPOSED SCHOOL BUILDING
Location:	ALEXANDRIA PARK COMMUNITY SCHOOL, ALEXANDRIA, NSW

Job No.: 30907Z	**R.L. Surface:** ~13.2 m	**Data File:** J:\30000's\30907Z
Date: 5/10/17	**Datum:** AHD	**Operator:** A.F.



Interpreted by: A.F.
Checked by: A.Z.

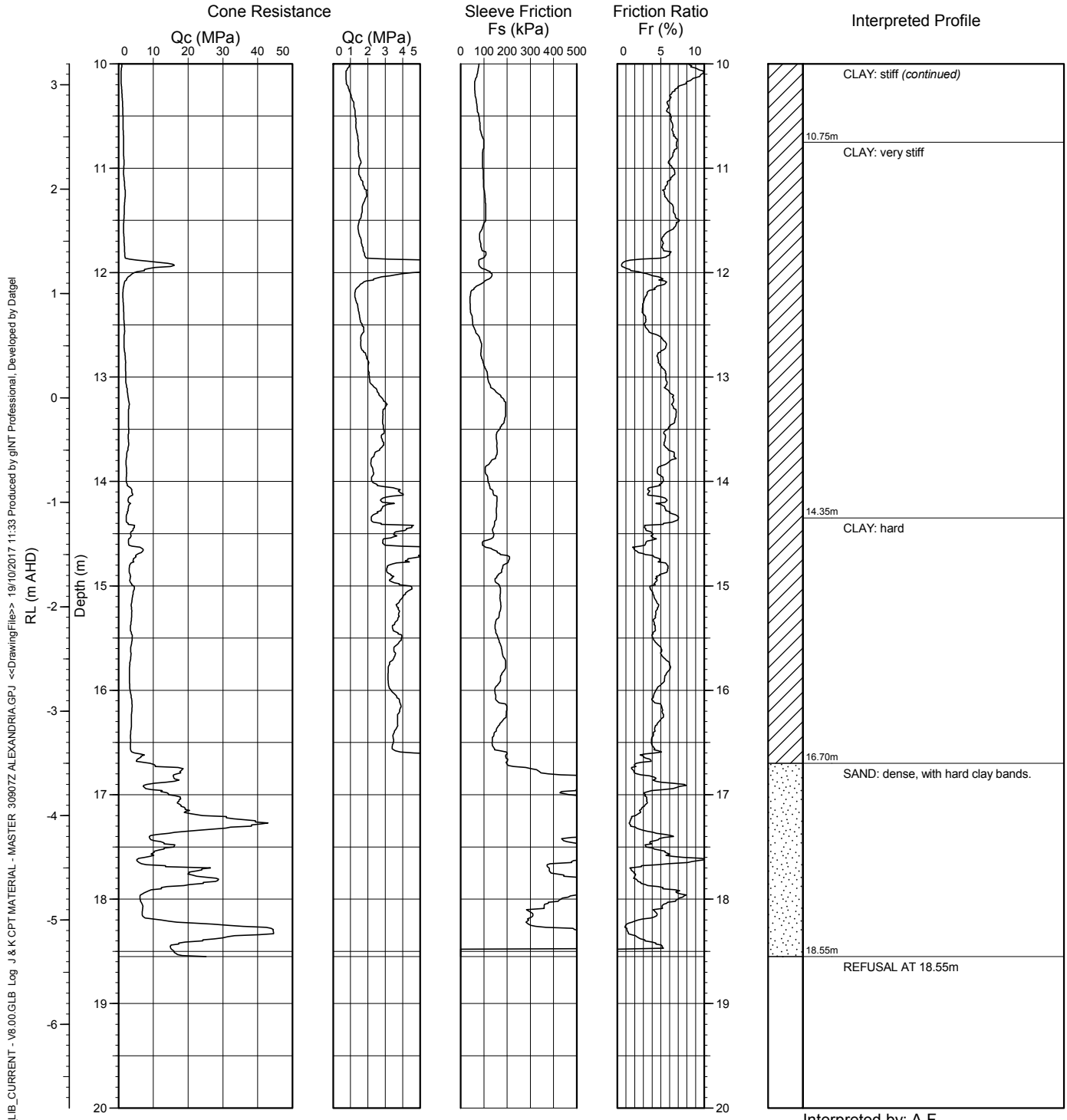
JK Geotechnics
GEOTECHNICAL AND ENVIRONMENTAL ENGINEERS

CPT No. 4 2 / 2

CONE PENETROMETER TEST RESULTS

Client:	TKD ARCHITECTS
Project:	PROPOSED SCHOOL BUILDING
Location:	ALEXANDRIA PARK COMMUNITY SCHOOL, ALEXANDRIA, NSW

Job No.: 30907Z	**R.L. Surface:** ~13.2 m	**Data File:** J:\30000's\30907Z
Date: 5/10/17	**Datum:** AHD	**Operator:** A.F.



Interpreted by: A.F.
Checked by: A.Z.

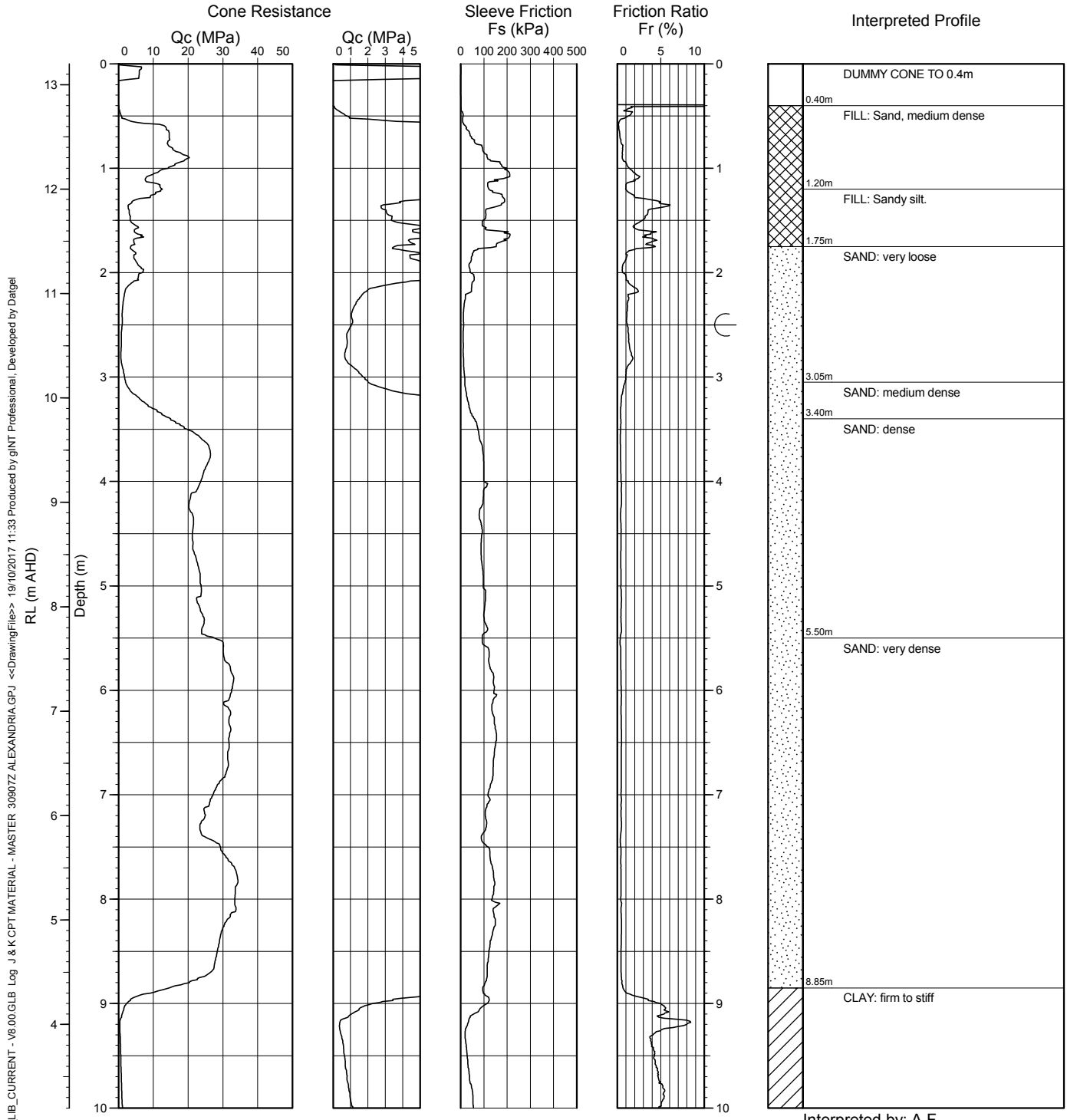
JK Geotechnics
GEOTECHNICAL AND ENVIRONMENTAL ENGINEERS

CPT No. 5
1 / 2

CONE PENETROMETER TEST RESULTS

Client:	TKD ARCHITECTS
Project:	PROPOSED SCHOOL BUILDING
Location:	ALEXANDRIA PARK COMMUNITY SCHOOL, ALEXANDRIA, NSW

Job No.: 30907Z	**R.L. Surface:** ~13.2 m	**Data File:** J:\30000's\30907Z
Date: 6/10/17	**Datum:** AHD	**Operator:** A.F.



Interpreted by: A.F.
Checked by: A.Z.

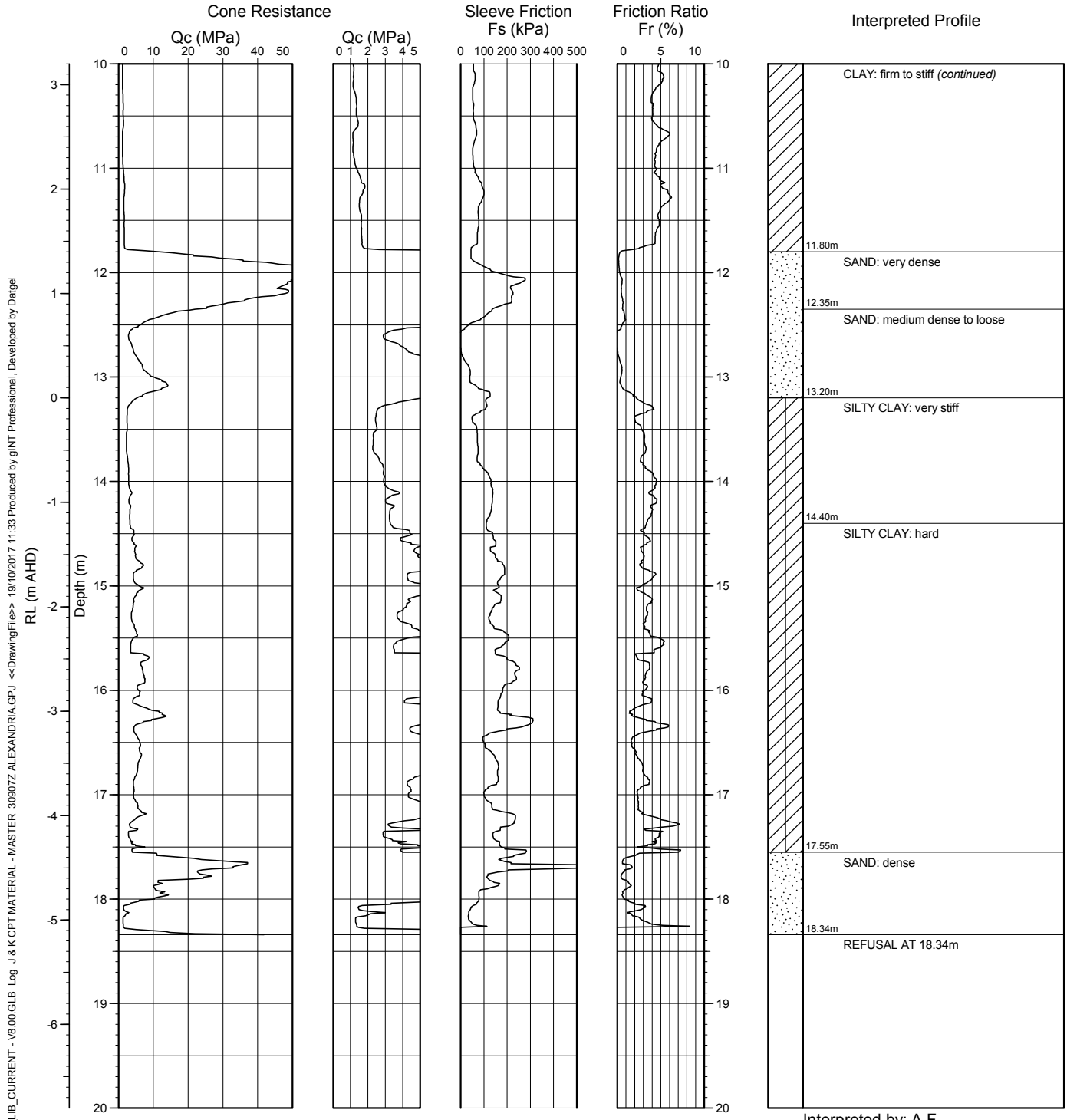
JK Geotechnics
GEOTECHNICAL AND ENVIRONMENTAL ENGINEERS

CPT No. 5 2 / 2

CONE PENETROMETER TEST RESULTS

Client:	TKD ARCHITECTS
Project:	PROPOSED SCHOOL BUILDING
Location:	ALEXANDRIA PARK COMMUNITY SCHOOL, ALEXANDRIA, NSW

Job No.: 30907Z	**R.L. Surface:** ~13.2 m	**Data File:** J:\30000's\30907Z
Date: 6/10/17	**Datum:** AHD	**Operator:** A.F.



Interpreted by: A.F.
Checked by: A.Z.

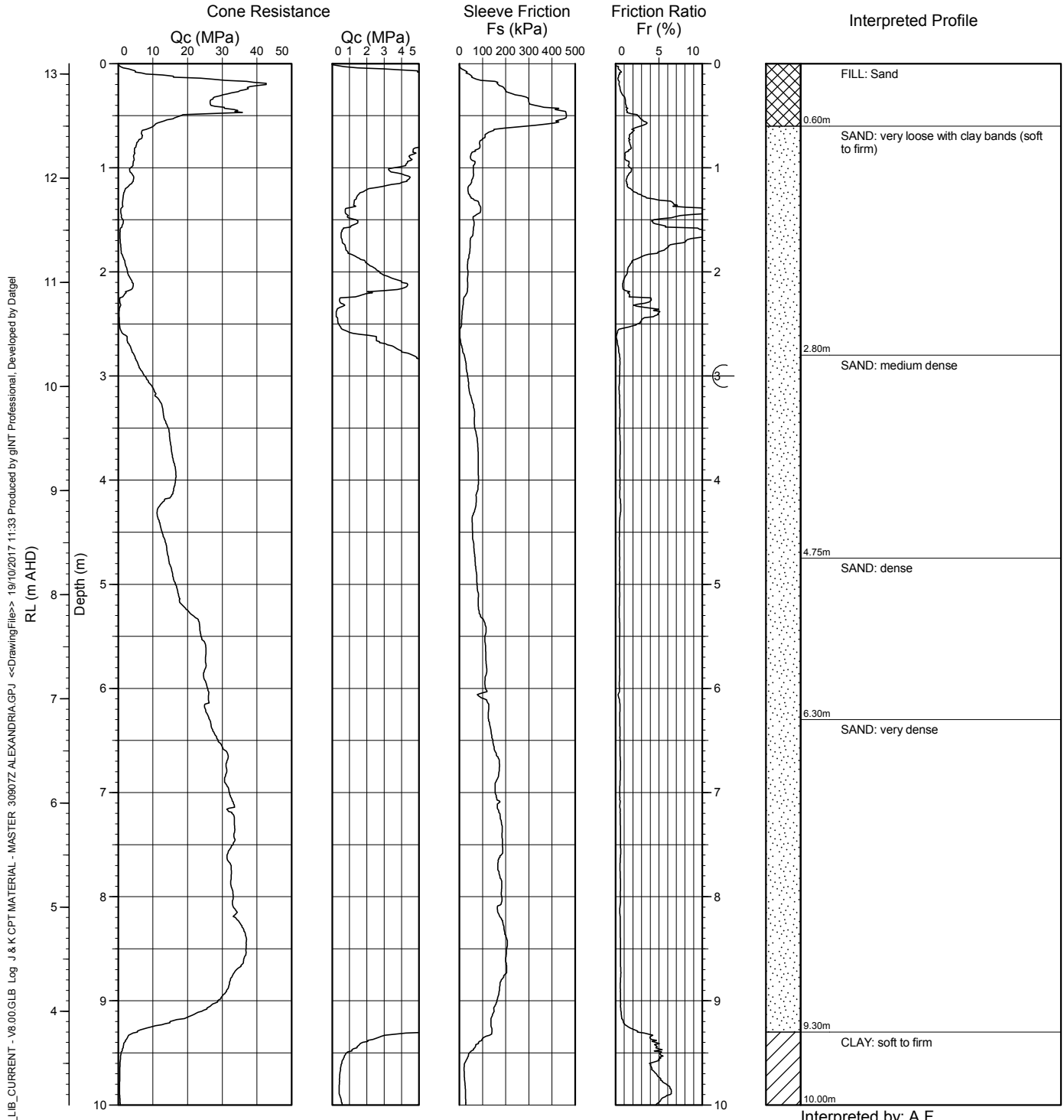
JK Geotechnics
GEOTECHNICAL AND ENVIRONMENTAL ENGINEERS

CPT No. 6

CONE PENETROMETER TEST RESULTS

Client: TKD ARCHITECTS
Project: PROPOSED SCHOOL BUILDING
Location: ALEXANDRIA PARK COMMUNITY SCHOOL, ALEXANDRIA, NSW

Job No.: 30907Z | **R.L. Surface:** ~13.1 m | **Data File:** J:\30000's\30907Z
Date: 6/10/17 | **Datum:** AHD | **Operator:** A.F.



Interpreted by: A.F.
Checked by: A.Z.

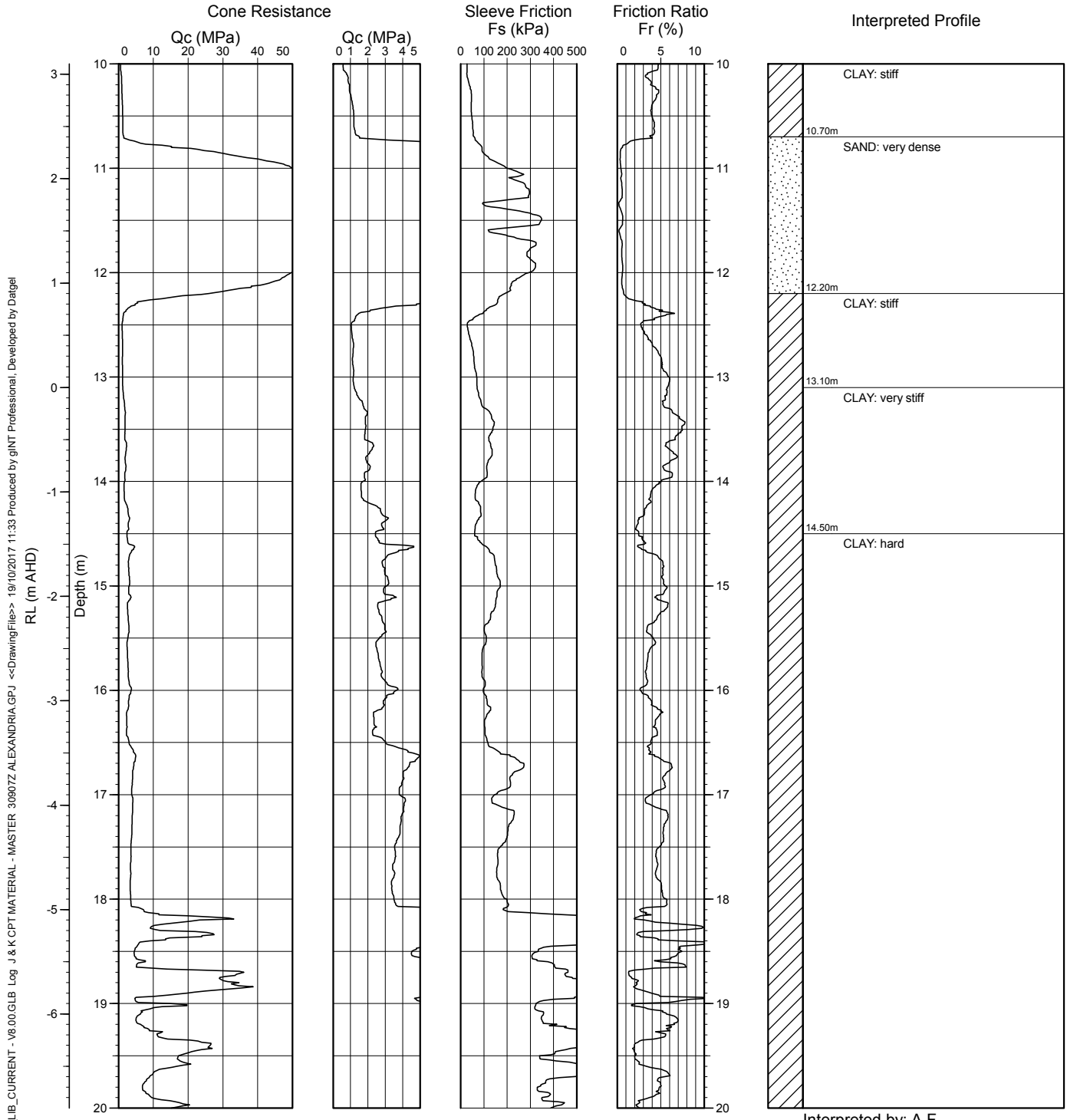
JK Geotechnics
GEOTECHNICAL AND ENVIRONMENTAL ENGINEERS

CPT No. 6
2 / 3

CONE PENETROMETER TEST RESULTS

Client:	TKD ARCHITECTS
Project:	PROPOSED SCHOOL BUILDING
Location:	ALEXANDRIA PARK COMMUNITY SCHOOL, ALEXANDRIA, NSW

Job No.: 30907Z	**R.L. Surface:** ~13.1 m	**Data File:** J:\30000's\30907Z
Date: 6/10/17	**Datum:** AHD	**Operator:** A.F.



Interpreted by: A.F.
Checked by: A.Z.

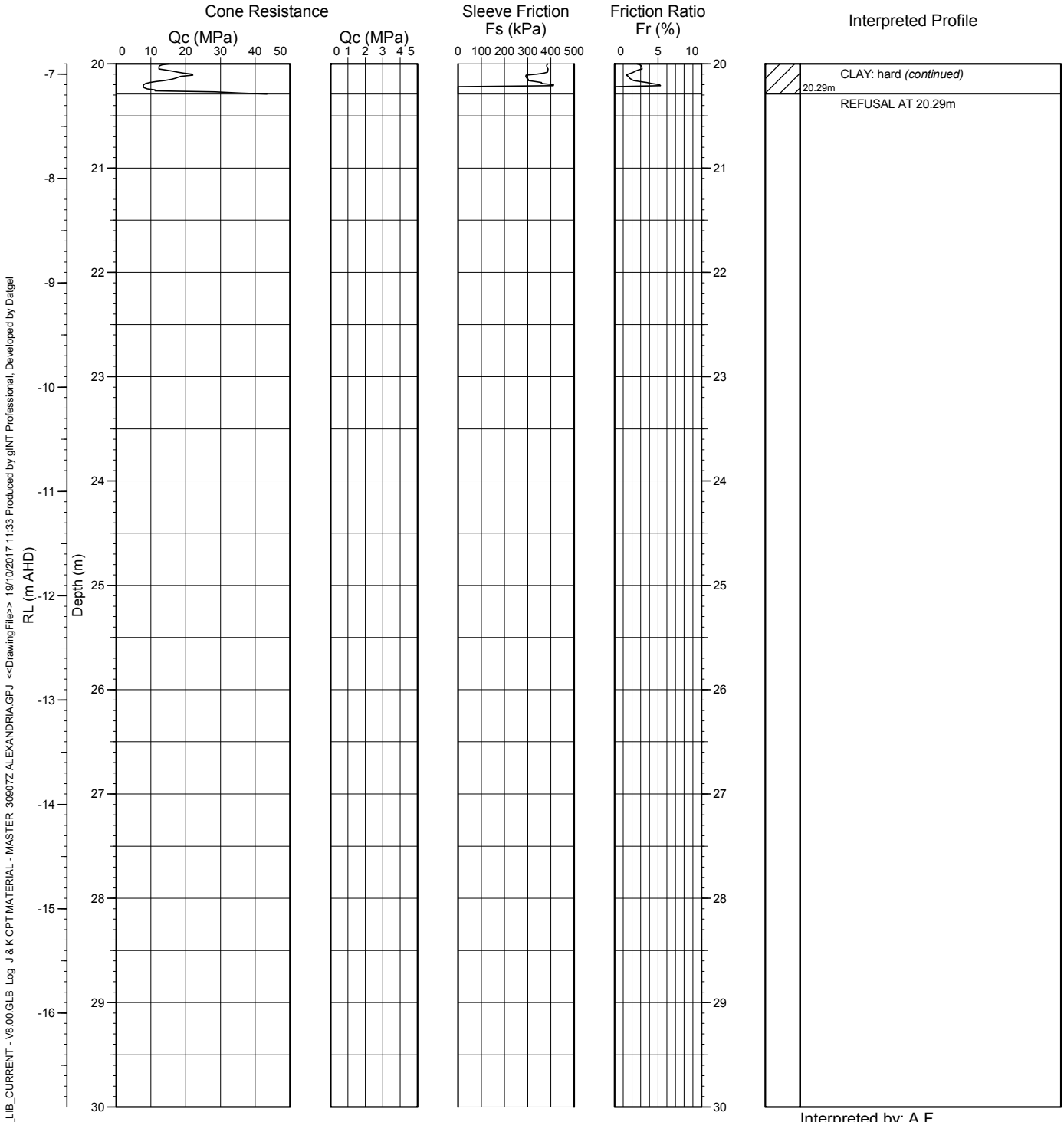
JK Geotechnics
GEOTECHNICAL AND ENVIRONMENTAL ENGINEERS

CPT No. 6
3 / 3

CONE PENETROMETER TEST RESULTS

Client:	TKD ARCHITECTS
Project:	PROPOSED SCHOOL BUILDING
Location:	ALEXANDRIA PARK COMMUNITY SCHOOL, ALEXANDRIA, NSW

Job No.: 30907Z	**R.L. Surface:** ~13.1 m	**Data File:** J:\30000's\30907Z
Date: 6/10/17	**Datum:** AHD	**Operator:** A.F.



Interpreted by: A.F.
Checked by: A.Z.

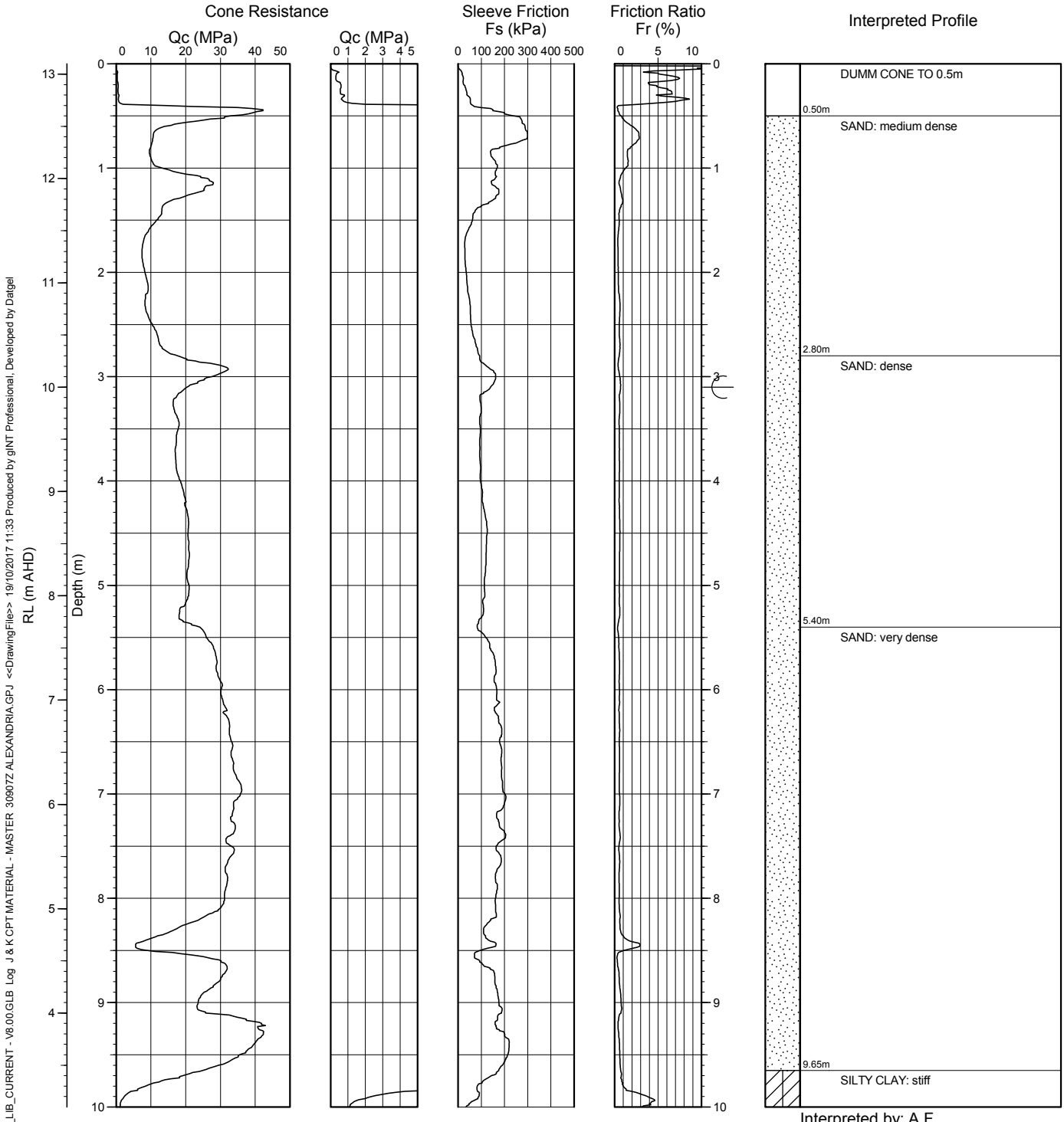
JK Geotechnics
GEOTECHNICAL AND ENVIRONMENTAL ENGINEERS

CPT No. 8
1 / 2

CONE PENETROMETER TEST RESULTS

Client:	TKD ARCHITECTS
Project:	PROPOSED SCHOOL BUILDING
Location:	ALEXANDRIA PARK COMMUNITY SCHOOL, ALEXANDRIA, NSW

Job No.: 30907Z	**R.L. Surface:** ~13.1 m	**Data File:** J:\30000's\30907Z
Date: 6/10/17	**Datum:** AHD	**Operator:** A.F.



Interpreted by: A.F.
Checked by: A.Z.

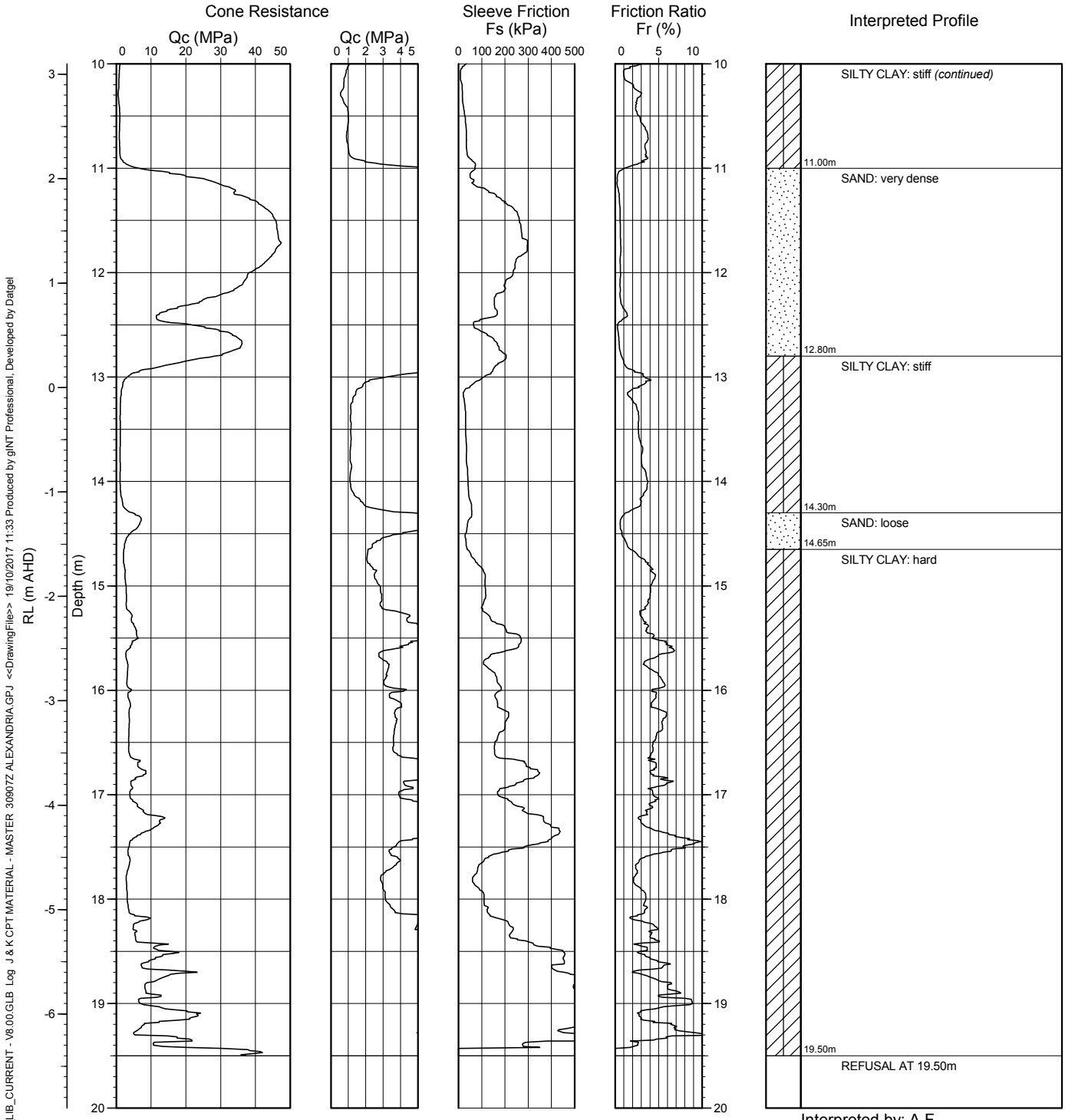
JK Geotechnics
GEOTECHNICAL AND ENVIRONMENTAL ENGINEERS

CPT No. 8 2 / 2

CONE PENETROMETER TEST RESULTS

Client:	TKD ARCHITECTS
Project:	PROPOSED SCHOOL BUILDING
Location:	ALEXANDRIA PARK COMMUNITY SCHOOL, ALEXANDRIA, NSW

Job No.: 30907Z	**R.L. Surface:** ~13.1 m	**Data File:** J:\30000's\30907Z
Date: 6/10/17	**Datum:** AHD	**Operator:** A.F.



Interpreted by: A.F.
Checked by: A.Z.