Southern Testing
Environmental & Geotechnical

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Site Investigation Report

Desk Studies | Risk Assessments | Site Investigations | Geotechnical | Contamination Investigations | Remediation Design and Validation

Site: Bell Farm, Church Road, Harrietsham

Client: Crest Nicholson (Eastern)

Report Date: 11th October 2016

Project Reference: J12760

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SUMMARY

The site, which extends to about 3.7 ha, comprises two fields which are divided by a road. It is proposed to redevelop the site with two storey houses with associated private gardens.

Geological records indicate the site to be underlain by Gault Formation.

A desk study was previously completed in September 2013 by Evan and Langord LLP (report reference 12657x). The report identified that the site has a history of agriculture.

A single phase of intrusive investigation was carried out.

The soils encountered comprised Made Ground over Head deposit over Gault Clay.

Groundwater levels were not encountered.

The sulphate content of the fill and natural soil was found to fall within Class DS-1. The ACEC classification for the site is AC-1s.

Evidence of soil desiccation was apparent over most of the site. Recommendations for foundation deepening are given. Consideration should be given to piling.

An allowable bearing capacity of 100kPa is recommended. NHBC High Volume Change Potential precautions will apply.

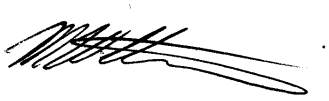
Suspended floor slabs are advised.

Deep Made Ground has been identified within trial pit number TP04. Contamination testing of the materials within TP04 has not revealed elevated contaminant concentrations, however, these materials are not suitable from a compositional viewpoint to be retained in proposed gardens/landscaping areas, and should be removed. The contamination screening values used are valid at the time of writing but may be subject to change and any such changes will have implications for the assessments based on them. Their validity should be confirmed at the time of site development.

A formal remediation strategy and verification plan should be agreed with the regulatory authorities prior to commencement of any remedial works, should unforeseen contamination come to light during construction.

The site investigation was conducted and this report has been prepared for the sole internal use and reliance of Crest Nicholson and their appointed Engineers. This report shall not be relied upon or transferred to any other parties without the express written authorization of Southern Testing Laboratories Ltd. If an unauthorised third party comes into possession of this report they rely on it at their peril and the authors owe them no duty of care and skill.

The findings and opinions conveyed via this Site Investigation Report are based on information obtained from a variety of sources as detailed within this report, and which Southern Testing Laboratories Ltd believes are reliable. Nevertheless, Southern Testing Laboratories Ltd cannot and does not guarantee the authenticity or reliability of the information it has obtained from others.



M W Stevenson MICE (Countersigned)

Amy Hulley BSc (Hons) MSc (Signed)

For and on behalf of Southern Testing Laboratories Limited

STL: J12760

11 October 2016

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A INTRODUCTION

1 Authority

Our authority for carrying out this work is contained in an email from Dean Cadby of Crest Nicholson Eastern dated the 15th August 2016.

2 Location

The site is located 0.3 km south east of the centre of the village of Harrietsham. The approximate National Grid Reference of the site is TQ 870 525.

3 Proposed Construction

It is proposed to construct two storey houses with associated private gardens. Ground loadings have not been given, but for the purpose of the report are assumed to be in the range of 50- 70 kN/m run.

4 Object

This is a geotechnical investigation. The object of the investigation was to assess foundation bearing conditions and other soil parameters relevant to the proposed development.

5 Scope

This report presents our exploratory hole logs and test results and our interpretation of these data.

As with any site there may be differences in soil conditions between exploratory hole positions.

This report is not an engineering design and the figures and calculations contained in the report should be used by the Engineer, taking note that variations will apply, according to variations in design loading, in techniques used, and in site conditions. Our figures therefore should not supersede the Engineer's design.

Contamination issues for the area around a backfilled pond are considered in this report, however other contamination issues are not considered.

The findings and opinions conveyed via this Site Investigation Report are based on information obtained from a variety of sources as detailed within this report, and which Southern Testing Laboratories Ltd believes are reliable. Nevertheless, Southern Testing Laboratories Ltd cannot and does not guarantee the authenticity or reliability of the information it has obtained from others.

The site investigation was conducted and this report has been prepared for the sole internal use and reliance of Crest Nicholson Eastern and their appointed Engineers. This report shall not be relied upon or transferred to any other parties without the express written authorization of Southern Testing Laboratories Ltd. If an unauthorised third party comes into possession of this report they rely on it at their peril and the authors owe them no duty of care and skill.

The recommendations contained in this report may not be appropriate to alternative development schemes. The contamination screening values used are valid at the time of writing but may be subject to change and any such changes will have implications for the assessments based on them. Their validity should be confirmed at the time of site development.

B DESK STUDY & WALKOVER SURVEY

6 Desk Study

A desk study was previously completed in September 2013 by Evan and Langord LLP (report reference 12657x). The report identified that the site has a history of agriculture.

6.1 Geology

The British Geological Survey Map No 288 indicates that the site geology consists of Gault Formation. Head and Terrace deposit are indicated within close proximity to the site.

Gault Formation

The Gault formation consists of dark, bluish grey to pale grey weak mudstone and silty mudstone, which weather to yellow and brown clays.

Gault Clay is commonly highly plastic, and the presence of vertical fissures caused by clay shrinkage can cause extreme instability in excavations.

6.2 Radon Risk

With reference to BRE guidance, no radon protection is required on this site.

7 Walkover Survey

A walkover survey was carried out on the 5th September 2016.

7.1 General Description and Boundaries

The site comprises two fields which are divided by Church Road. The boundaries of the site are defined by trees and hedges. Ashford road runs parallel to the northern boundary and East Street runs parallel to the southern boundary.

7.2 Topography and Drainage

The site slopes gently towards the south west (<3°). The highest points within both fields are the north east corners. Therefore the site is draining towards the south west. There is no evidence of engineered drainage on site.

7.3 Vegetation

A number of large trees (approximately 20 – 25m in height) and hedges, are located along the boundaries of the site. A number of different species are present including Ash, Oak, Holly and Ivy.

7.4 Buildings and Land Use on Site and Nearby

The site has a history of agriculture, with an oast and other associated farm buildings located within the western field. Corrugated asbestos cement roofs were identified on some of the farm buildings.

7.5 Photographs

A series of photographs showing the site is included in Appendix F.

C SITE INVESTIGATION

11 Method

The strategy adopted for the intrusive investigation comprised the following:

- A series of 24 trial pits were excavated using a hydraulic backhoe excavator.

Exploratory hole locations are shown in Figure 1 in Appendix A.

12 Weather Conditions

The fieldwork was carried out between the 5th and 9th September 2016, at which time the weather was generally dry and sunny.

13 Soils as Found

The soils encountered are described in detail in the attached exploratory hole logs (Appendix A), but in general comprised a covering of Made Ground over Head Deposit, over Gault Formation. A summary is given below.

Depth	Thickness	Soil Type	Description
0 -0.25/0.7m	0.25 – 0.7m	Made Ground	Dark brown silty CLAY with fine brick, wood and roots.
TP04 only: 2.3m	0 – 2.3m	Made Ground	Dark brown silty CLAY with fine brick, wood, metal, plastic and roots. – potential backfilled pond.
0.3/1.0 – 2/3.0m	2 – 2.7m	Head Deposit	Firm grey/brown silty CLAY with fine to medium angular flint gravel and pockets of white silt.
2.0 – 3.0m	1.0m+	Gault Formation	Grey silty thinly laminated and fissured CLAY with fine flint gravel and patches of silt.

13.1 Visual and Olfactory Evidence of Contamination

Evidence of possible contamination in the form of Made Ground containing metal, concrete, wood and plastic fragments was recorded at the location of TP04, to a depth of 2.4m.

These occurrences are discussed in Section G.

14 Groundwater Strikes

Groundwater was not encountered during the site investigation.

D FIELD TESTING AND SAMPLING

The following in-situ tests and sampling methods were employed. Descriptions are given in Appendix B together with the test results.

- Unconfined Compressive Strength (UCS) using a hand penetrometer.
- Disturbed sampling.
- Perth Penetration testing.
- Environmental samples.

E GEOTECHNICAL LABORATORY TESTS

The following tests were carried out on selected samples. Test method references and results are given in Appendix C.

- Natural moisture content.
- Four point plasticity index test.
- pH and sulphate determination of soil.

F DISCUSSION OF GEOTECHNICAL TEST RESULTS AND RECOMMENDATIONS

15 Soil Classification and Properties

Soil Type	Depth	Compressibility	VCP	Permeability	Frost Susceptible	CBR	Remarks
Made Ground	0.0 – 0.25/2.3m	High	Variable	Low	Yes	Poor	Not suitable for foundations
Head Deposit	0.25/0.8 to 0.7/3.0m	Moderate to high	Medium	Low	Yes	Poor	
Gault Formation	0.7/2.6 – 3.0m	Moderate to High	High	Low	No	Fair	Suitable for foundations.

15.1 Made Ground

All Made Ground and reworked ground should be treated as suspect due to its inherent variability and suspect materials and obstructions may occur, even where the results of targeted sampling indicate otherwise. The Made Ground at the site is typically variable and is likely to be unsuitable for use as a foundation bearing material.

16 Swelling and Shrinkage

Atterberg limits tests were undertaken on seventeen soil samples of the Head Deposits and Gault Clay. These indicated that the liquid limit varies between 40% and 84% and the modified plasticity index varies between 19% and 58% indicating a clay soil of high to very plasticity (CV to CE). Based on these results the NHBC Volume Change Potential (VCP) classification is High.

17 Desiccation

Due to the presence of high water demand trees (predominantly Ash trees) there was a risk of desiccation of the underlying soils. No single factor can be used to assess the degree of desiccation of clay soils, but some of the more commonly used criteria are listed below.

Methods used to assess desiccation included examining the relationship between hand penetrometer test results and depth and the relationship between moisture content and liquid and plastic limits as indicated below.

- If the clay soils are below a moisture content of 0.5 x liquid limit, measured by the cone method, they can be considered desiccated, but heave will not necessarily occur when the tree is removed.
- If the clay soils are below a moisture content of 0.4 x liquid limit[1] then they are strongly desiccated and heave is likely after trees are removed.
- Clay soils are usually found to have a moisture content that is close to the Plastic Limit, below a depth of about 4.0m. Above that depth softening occurs and the moisture content rises to Plastic Limit +2 to 4% where the soil is unaffected by trees. A typical profile would be a moisture content of PL + 3% at 1.0m reducing to PL + 1% at 3.0m.[2]

However, it should be noted that these criteria have been developed for London Clay. Gault Clay is more overconsolidated than London Clay. The criteria can only be used to provide some guidance. Using the criteria above many samples would be considered desiccated. Plasticity index tests were conducted within seven trial pits.

Desiccation within the trial pits has been assessed using the hand penetration vs depth plots, and the relationship between Moisture Content, Liquid Limit and Plastic Limit. The depth of apparent desiccation has then been compared to the recommended NHBC foundation depth and an advised foundation depth has been provided. This information has been provided in the table on the following page.

R Driscoll - The influence of vegetation on the swelling and shrinkage of clay in Great Britain - Geotechnique, June 1983
Samuels S.G. (1967) - The uplift of buildings on swelling clays BRS internal note IN40/67 BRE Watford

Trees and hedges of high-water demand are present along the boundaries of the two fields. Although trees of high water demand are not currently present within the centre of the western field, publically available aerial photographs show evidence for the presence of trees or large hedges within the field[3]. The trees and hedges in the centre of the western field appear to have been removed sometime between 2011 and 2013. It is unlikely that the soils would have rehydrated in the time since the removal of the trees, and so some heave is anticipated as the moisture content stabilises.

The trial pits showed desiccated soils between 1.25 to 3.0m. The south east corner of the western field showed evidence for desiccation between 2.7 – 3.0m (TP18 –TP20). The northern half of the western field also showed desiccated soils between 2.0 – 2.7m (TP04 – TP06 and TP11 – TP15). The desiccation within these areas may be due to the large trees or hedges that are present on site, and also the vegetation that has been removed. In addition, the field has an agricultural history and has been used for growing crops, which may have also contributed towards the desiccation.
Additional deepening will be required where desiccation is present, see the following table for details.

18 Lateral Pressures & Heave

Where foundations are more than 1.5m deep, and are within the zone of influence of existing or removed trees, then precautions will also need to be taken against the effects of lateral swelling of soils beneath house units due to removal of trees, or cutting tree roots. The NHBC requirements for the relief of lateral pressure are set out in Chapter 4.2 of the NHBC Standards Manual, and to which the reader is referred. The basic requirement is that compressible material or void former should be installed on the inner face of external foundation walls. With pier and beam foundations additional voids are required below ring beams.

In all cases where deep foundations are adopted, special precautions may be required to prevent damage to roots of retained trees.

19 Groundwater Levels

Groundwater was not encountered in any of the trial pits. Groundwater levels vary considerably from season to season and year to year, often rising close to the ground surface in wet or winter weather, and falling in periods of drought. Winter groundwater levels in areas of clay soils are often close to ground level. Long-term monitoring from boreholes or standpipes is required to assess the ground water regime and this was not possible during the course of this site investigation.

20 Soakaways

Due to the presence of clay, soakaways are unlikely to be a viable option for drainage.

[3] Google Earth – www.googleearth.com

21 Sulphates and Acidity

The recorded pH values are in the range of 8.1 – 8.2. Sulphate concentrations were low in the range of 38 – 240 mg/l SO_4.

The Design Sulphate Class is DS -1. Groundwater should be assumed to be static. The ACEC site classification is Ac-1s for any subsurface concrete.

22 Bearing Capacity and Foundation Type

All loads should be transferred beneath any Made Ground and bear on the natural stiff and very stiff clay below.

Allowable bearing pressures of 100kPa are recommended for strip footings between 0.45m and 1.2m wide placed in the firm and stiff clay typically found beyond 1.0m below current ground level. A bearing pressure of 150kPa is acceptable for deeper foundations penetrating the very stiff clay typically found below 1.5m.

All foundations should be designed in accordance with NHBC high volume change potential, and all foundations should be provided with nominal reinforcement to limit the effects of any differential movement.

A table of recommended foundation depths is provided in Appendix E.

Given the depth of desiccation identified we recommend that a piled solution is considered as this may be a more economic option.

23 Floor Slabs

Suspended floor slabs are advised due to the high volume change potential soils found on site.

24 Settlement

Based on the recommendations for bearing pressures given above, settlements within tolerable limits are anticipated.

25 Excavations and Trenching

The trial pits were stable in the short term whilst open during the course of the investigation. Unheralded collapse can and do occur in stiff fissured clays such as the Gault Clay.

Statutory support will be required in all excavations where personnel must work.

G LAND QUALITY

26 Analytical Framework

There is no single methodology that covers all the various aspects of the assessment of potentially contaminated land and groundwater. Therefore, the analytical framework adopted for this investigation is made up of a number of procedures, which are outlined below. All of these are based on a Risk Assessment methodology centred on the identification and analysis of Source – Pathway – Receptor linkages.

The CLEA model[4] provides a methodology for quantitative assessment of the long term risks posed to human health by exposure to contaminated soils. Toxicological data is used to calculate a Soil Guideline Value (SGV) for an individual contaminant, based on the proposed site use; these represent minimal risk concentrations and may be used as screening values.

In the absence of any published SGVs for certain substances, Southern Testing have derived or adopted Tier 1 screening values for initial assessment of the soil, based on available current UK guidance including the LQM/CIEH[5] S4UL's and CL:AIRE[6] generic assessment criteria. In addition, in March 2014, DEFRA[7] published the results of a research programme to develop screening values to assist decision making under Part 2A of the Environmental Protection Act. Category 4 screening levels were published for 6 substances, with reference to human health risk only. This guidance includes revisions of the CLEA exposure parameters, presenting parameters for public open space land use scenarios, and also of the toxicological approach. The screening levels represent a low risk scenario, based on a 'Low Level of Toxicological Concern' rather than the 'Minimal Risk' of CLEA, and the analytical results of this investigation may be considered relative to these levels.

The values used are valid at the time of writing but may be subject to change and any such changes will have implications for the assessments based upon them. Their validity should be confirmed at the time of site development.

Site-specific assessments are undertaken wherever possible and/or applicable.

CLEA requires a statistical treatment of the test results to take into account the normal variations in concentration of potential contaminants in the soil and allow comparisons to be made with published guidance.

[4] Environment Agency Publication SC050021/SR3 'Updated technical background to the CLEA Model' (2009).
[5] The LQM/CIEH S4ULs for Human Health Risk Assessment. (2014).
[6] The EIC/AGS/CL:AIRE Soil Generic Assessment Criteria for Human Health Risk Assessment (2009).
[7] SP1010 Development of Category 4 Screening Levels foe Assessment of Land Affected by Contamination. DEFRA, 2014.

27 Site Investigation – Soil

Contamination issues for the area around a backfilled pond are considered in this report, however other contamination issues are not considered.

27.1 Sampling Regime

The number of sample was partly targeted at potential sources of contamination.

27.2 Testing

The potential for contamination by Made Ground was identified within TP04 during the site investigation and the following tests were selected.

Test Suite	Number of Samples	Soil Tested
STL Key Contaminant Suite	3	Made Ground
Asbestos Identification	3	Made Ground

The test results are presented in full in Appendix D. A summary and discussion of the significance of the results and identified contamination sources is given below.

27.3 Test Results and Identified Contamination Sources

27.3.1 General Contaminants

The results of the key contaminant tests have been analysed in accordance with the CLEA methodology. The samples have been grouped into one population comprising of Made Ground from trial pit TP04. For each parameter in each population the sample mean is calculated and compared to a Tier 1 screening value. If the sample mean exceeds the screening value, the soil may be regarded as contaminated and further assessment may be required. If neither the sample mean nor any single value exceeds the screening value, the soil may be regarded as not contaminated, though further confirmatory assessment may be required. Where any single parameter value exceeds the screening value but the sample mean does not, further statistical analysis may be applied to that parameter if the available data is suitable. Such analysis would include an assessment of the Normality of the distribution of the data, consideration of the presence of outliers, and the calculation of a UCL estimate of the mean.

Summary data is presented in the tables below and the laboratory analysis is included in Appendix D. The screening values and source notes are presented in Table 1 "Tier 1 Screening Values" at the front of Appendix D.

Soil Type: Made Ground (TP04 @ 0.5m, 1.70m and 2.20m).

Contaminants	Units	No of Samples Tested	Range	Sample Mean	Residential with Homegrown Produce Consumption Tier 1 Screening Value
Arsenic (As)	mg/kg	3	8-10	9	37
Cadmium (Cd)	mg/kg	3	0.1 – 0.3	0.2	11
Total Chromium (Cr)	mg/kg	3	14 – 16	15.3	910
Hexavalent Chromium (CrVI)	mg/kg	3	1	1	6
Lead (Pb)	mg/kg	3	32 – 89	65	200
Mercury (Hg)	mg/kg	3	1	1	7.6-11
Selenium (Se)	mg/kg	3	3	3	250
Nickel (Ni)	mg/kg	3	26 – 30	28	130
Copper (Cu)	mg/kg	3	16 – 28	23	2,400
Zinc (Zn)	mg/kg	3	85 – 140	112	3,700
Phenol	mg/kg	3	1	1	120-380
Benzo[a]pyrene	mg/kg	3	0.1 – 0.4	0.26	1.7-2.4
Naphthalene	mg/kg	3	0.1	0.1	2.3-13
Total Cyanide (CN)	mg/kg	3	1	1	/
Acidity (pH value)	Units	3	7.9 – 8	7.9	8
Soil Organic Matter	%	3	4.6 – 6.4	5.3	/

When compared to the tier one screening values for a residential land use including plant uptake the samples of Made Ground taken from trial pit TP04 would be considered uncontaminated.

27.3.2 Asbestos

No asbestos containing materials were detected in the samples analysed and none were observed in the exploratory holes. However, it should be noted that the exploratory holes are of small diameter/the investigation was constrained by site usage and the samples obtained may not reflect the full composition of the soils on the site. Therefore, there is always the potential for pockets of asbestos or for asbestos containing materials to be present, which have not been detected in the sampling.

It is also our experience that asbestos containing materials are quite often encountered in buried pockets and beneath slabs (sometimes adhering to the concrete) on older industrial sites. It is, therefore, advised that further examination is carried out in trial pits, when suitable access is available.

27.3.3 Hydrocarbons

Two samples of made ground from within TP04 were tested for Hydrocarbons, these were both below the residential screening value.

28 Summary of Identified Contamination

The laboratory analysis undertaken to date has not identified any potential contamination on site. However, given the physical composition of the Made Ground within TP04, which contains pieces of rubber (cam belt), large pieces of wood and a strong organic odour, consideration should be given to the suitability of retaining this material within garden areas.

29 Discussion and Conclusions

As with any site, areas of contamination not identified during site investigation works may come to light in the course of redevelopment. Accordingly, a discovery strategy must be in place during the redevelopment to ensure that any hitherto unknown contamination is identified and dealt with in an appropriate manner. Depending on the nature of any such contamination, it may prove necessary to reassess the remedial strategy for the site.

A formal remediation strategy and verification plan should be agreed with the regulatory authorities prior to commencement of any remedial works.

30 General Guidance

Allowance should be made for experienced verification of any remedial works.

It may be that specific local requirements apply to this site, of which we are not aware at this time.

In general terms, the workforce and general public should be protected from contact with contaminated material. There is a range of relevant documents published by the Health and Safety Executive, and organisations such as CIRIA, and the BRE.

Some soils will require removal from site and disposal to suitably licensed landfills. Different guidelines and charges will apply to different waste classification. As waste producers, the Developer holds responsibilities under the various governing regulations. The chemical analyses appended to this report should be forwarded to tip operators for their own assessment, to confirm classification of the soils for offsite disposal, and whether they can accept the material. Waste Acceptance Criteria (WAC) testing may be requested for confirmation of the material's classification.

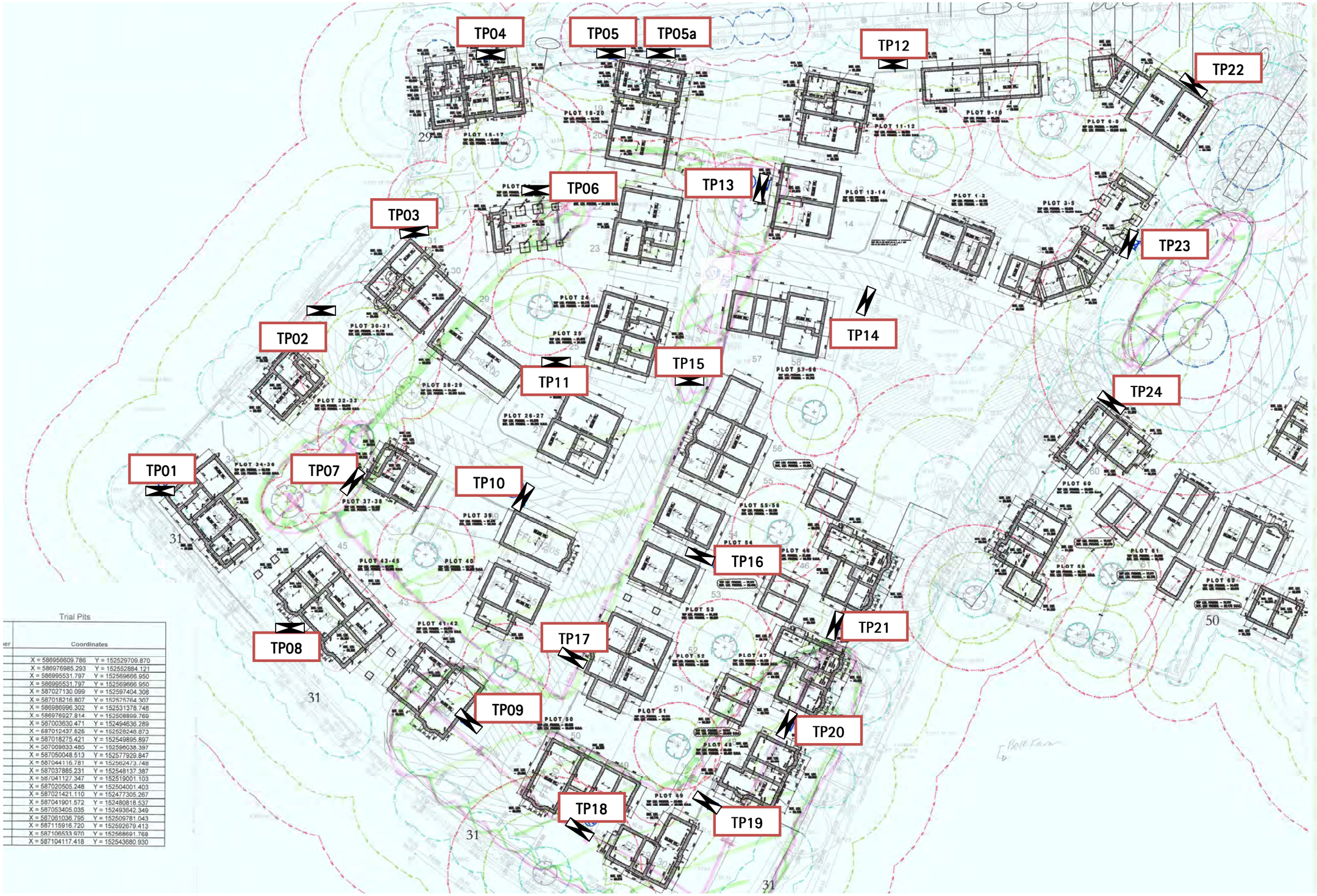
All hazardous and non-hazardous soils leaving site will need to be pre-treated. Waste minimisation by selective excavation is a recognised form of pre-treatment.

It should be noted that organic contaminants present in the soils could affect plastic underground service pipes (such as the types used by water and gas supply companies). Guidance should be sought from the relevant companies regarding any proposed plant in the affected area.

Many water supply companies now require higher specification pipe on contaminated sites, even following remediation.

APPENDIX A

Site Plans and Exploratory Hole Logs

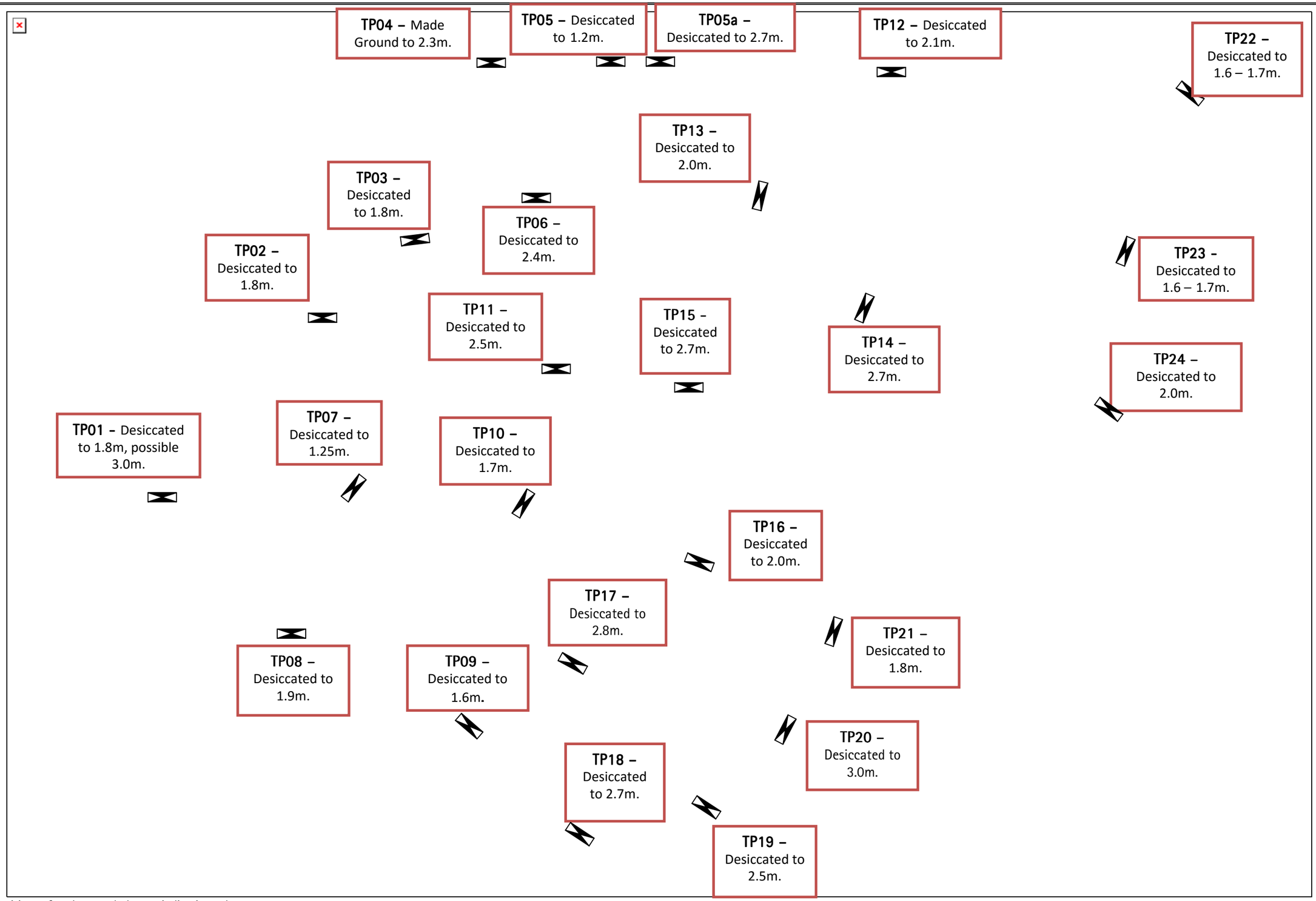


Trial Pits

	Coordinates	
	X = 586956609.786	Y = 152529709.870
	X = 586976985.293	Y = 152552884.121
	X = 586995531.797	Y = 152569666.950
	X = 586995531.797	Y = 152569666.950
	X = 587027130.099	Y = 152597404.308
	X = 587018216.807	Y = 152575764.307
	X = 586986996.302	Y = 152531378.748
	X = 586976927.814	Y = 152508899.769
	X = 587003630.471	Y = 152494636.289
	X = 587012437.525	Y = 152528246.873
	X = 587018275.421	Y = 152549895.897
	X = 587009833.485	Y = 152596038.397
	X = 587050048.513	Y = 152577929.847
	X = 587044116.781	Y = 152562473.748
	X = 587037885.231	Y = 152548137.387
	X = 587041127.347	Y = 152519001.103
	X = 587020505.248	Y = 152504001.403
	X = 587021421.110	Y = 152477305.267
	X = 587041901.572	Y = 152480818.537
	X = 587053405.035	Y = 152493642.349
	X = 587061036.755	Y = 152509781.043
	X = 587115916.720	Y = 152592679.413
	X = 587106533.970	Y = 152568691.768
	X = 587104117.418	Y = 152543680.930

NB: Positions of exploratory holes are indicative only.

Site: Bell Farm, Church Road, Harrietsham,	STL: J12760	Fig No: 1
Date: 23 September 2016	Exploratory hole location plan	
Southern Testing — Southern Testing: Keeble House, Stuart Way, East Grinstead, West Sussex RH19 4QA; ST Consult: Twigden Barns, Brixworth Road, Creaton, Northampton NN6 8NN — ST Consult	Not to scale	



NB: Positions of exploratory holes are indicative only.

Site: Bell Farm, Church Road, Harrietsham,	STL: J12760	Fig No: 2
Date: 23 September 2016	Approximate depth of desiccation.	
Southern Testing	Not to scale	

Southern Testing: Keeble House, Stuart Way, East Grinstead, West Sussex RH19 4QA
ST Consult: Twigden Barns, Brixworth Road, Creaton, Northampton NN6 8NN
ST Consult

Key to Exploratory Hole Logs

General

All soil & rock descriptions in general accordance with BS5930, BS EN ISO 14688 and BS EN ISO 14689
The Geology Code is only provided where positive identification of the sampled strata has been made.

Sampling

ES	Environmental Sample (taken in appropriate sampling container)
D	Disturbed Sample
B	Bulk Sample
LB	Large Bulk for Earthworks testing
C	Core Sample
U	Undisturbed Sample (number of blows indicated in results column)
SPTLS	SPT Liner Sampler
P	Piston Sample
W	Water Sample

Insitu Tests

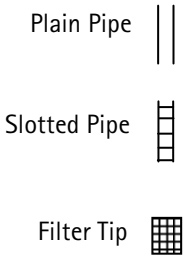
SPT	Standard Penetration Test in accordance with BS EN ISO 22476-3
SPT (C)	Cone Penetration Test in accordance with BS EN ISO 22476-3
PT	Penetration Test - STL documented equivalent SPT N Value
PPT	Perth Penetration Test - STL in house documented method (N Value)
UCS (⊥)	Unconfined Compressive Strength measure by hand penetrometer (kN/m^2)
IVN	Hand Vane (kPa)
PID	Photo Ionisation Detector Results (ppm)
MEXE	Mexecone CBR Result

Drilling Records

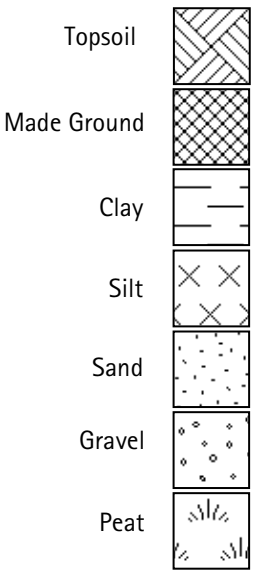
Depth to standing water level	▼
Depth to water strike	▽
TCR	Total Core Recovery (%)
SCR	Solid Core Recovery (%)
RQD	Rock Quality Index (%)
FI	Fracture Index

Backfill Symbols

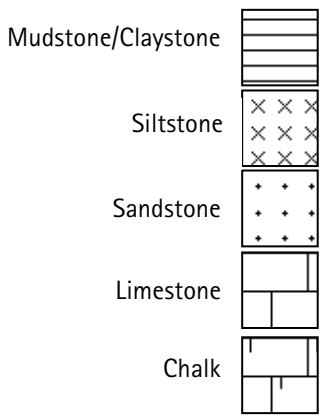
Pipe Symbols



Principal Soil Types



Principal Rock Types



Southern Testing ST Consult	Start - End Date:	Project ID:	Machine Type:	TP01
www.southerntesting.co.uk tel:01342 333100 www.stconsult.co.uk tel:01604 500020	05/09/2016	J12760	JCB 3CX	Sheet 1 of 1

Project Name:	Bell Farm	Remarks:	Co-ordinates:	Level (m AOD):	Logger:
			E 586957 - N 152530		ALH
Location:	Harrietsham	Trial pit moved my approximately 2m due to tight access.			
Client:	Crest Nicholson				

Samples and Insitu Testing			Level (m AOD)	Thickness (m)	Legend	Depth (m bgl)	Stratum Description	
Depth (m)	Type	Results						
				(0.30)			Dark brown silty CLAY with fine brick, wood and roots (MADE GROUND).	
						0.30	Very stiff grey brown silty CLAY with angular medium to coarse flint (HEAD DEPOSIT).	
				(0.50)				
0.60	D							
0.70	HP	UCS(kPa)=450						
0.80	HP	UCS(kPa)=400				0.80	Very stiff dark grey CLAY with fine to medium flint, fine fragments of chalk and occasional patches of silt (HEAD DEPOSITS).	1
1.00	D							
1.00	HP	UCS(kPa)=380					1.00m polished shear surface.	
1.00	PPT	N=20(450)						
				(1.20)				
1.50	D						1.50m Pale grey/brown	
						2.00	Very stiff grey silty laminated CLAY with fine mudstone gravel (GAULT CLAY).	2
2.50	D			(1.00)				
2.50	HP	UCS(kPa)=400					2.50m becoming slightly sandy with fine mudstone gravel.	
						3.00	Pit terminated at 3.00m.	3
3.00	D							
3.00	HP	UCS(kPa)=400						4

Pit Dimension (m)		Pit Stability:	Water Strikes:
Width:	0.60	Stable.	Dry
Length:	2.90		
Depth:	3.00		

Southern Testing ST Consult

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Start - End Date:	Project ID:	Machine Type:	TP02
05/09/2016	J12760	JCB 3CX	Sheet 1 of 1

Project Name:	Bell Farm	Remarks:	Co-ordinates:	Level (m AOD):	Logger:
			E 586977 - N 152553		ALH
Location:	Harrietsham				
Client:	Crest Nicholson				

Samples and Insitu Testing			Level (m AOD)	Thickness (m)	Legend	Depth (m bgl)	Stratum Description	
Depth (m)	Type	Results						
				(0.30)			Dark brown silty CLAY with gravel and chalk fragments. Gravel is fine to coarse flint with brick, wood and roots (MADE GROUND).	
						0.30		
				(0.40)			Orange brown sandy silty very gravelly CLAY. Gravel is fine medium to coarse flint (HEAD DEPOSIT).	
						0.70		
1.00	D						Dark grey silty CLAY mottled brown with pockets of orange sandy clay and fine sized flint (HEAD DEPOSITS).	1
				(1.30)				
1.50	D							
2.00	D					2.00	Grey silty thinly laminated and fissured CLAY with fine mudstone gravel and patches of silt (GAULT CLAY).	2
				(1.00)				
3.00	D					3.00	Pit terminated at 3.00m.	3
								4

Pit Dimension (m)		Pit Stability:	Water Strikes:
Width:	0.60	Stable.	Dry
Length:	2.80		
Depth:	3.00		

Southern Testing ST Consult	Start - End Date:	Project ID:	Machine Type:	TP03
www.southerntesting.co.uk tel:01342 333100 www.stconsult.co.uk tel:01604 500020	07/09/2016	J12760	JCB 3CX	Sheet 1 of 1

Project Name:	Bell Farm	Remarks:	Co-ordinates:	Level (m AOD):	Logger:
			E 586996 - N 152570		ALH
Location:	Harrietsham				
Client:	Crest Nicholson				

Samples and Insitu Testing			Level (m AOD)	Thickness (m)	Legend	Depth (m bgl)	Stratum Description	
Depth (m)	Type	Results						
				(0.30)		0.30	Brown silty gravelly CLAY, Gravel is fine to coarse subangular to subrounded brick, flint and occasional chalk (MADE GROUND).	
				(0.60)		0.90	Light brown silty CLAY with fine chalk and flint with occasional pockets of sandy clay (HEAD DEPOSITS).	
0.90	HP	UCS(kPa)=350						
0.90	PPT	N=14(450)					Very stiff grey mottled brown laminated silty CLAY and fine mudstone gravel. Occasional fissures and patches of white silt (GAULT CLAY).	1
1.00	D							
1.80	D							
2.00	HP	UCS(kPa)=300		(2.10)				2
2.50	D							
3.00	HP	UCS(kPa)=300				3.00	Pit terminated at 3.00m.	3
								4

Pit Dimension (m)		Pit Stability:	Water Strikes:
Width:	0.60	Stable.	Dry
Length:	2.70		
Depth:	3.00		

Southern Testing ST Consult

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Start - End Date:	Project ID:	Machine Type:	TP04
07/09/2016	J12760	JCB 3CX	Sheet 1 of 1

Project Name:	Bell Farm	Remarks:	Co-ordinates:	Level (m AOD):	Logger:
			E 587007 - N 152594		ALH
Location:	Harrietsham				
Client:	Crest Nicholson				

Samples and Insitu Testing			Level (m AOD)	Thickness (m)	Legend	Depth (m bgl)	Stratum Description	
Depth (m)	Type	Results						
0.50	ES			(1.00)			Dark brown silty CLAY with occasional brick, flint, concrete, flint and metal (MADE GROUND).	
						1.00		1
1.70	ES			(1.30)			Soft grey black organic CLAY with crisp wrapper, pieces of rubber (cam belt) and large pieces of wood and rootlets with a strong organic odor (MADE GROUND).	2
2.20	ES							
2.30	D					2.30		
2.40	HP	UCS(kPa)=250					Stiff grey CLAY with occasional iron staining and rootlets.	
2.90	D			(0.70)				
						3.00	Pit terminated at 3.00m.	3
								4

Pit Dimension (m)		Pit Stability:	Water Strikes:
Width:	0.60	Stable.	Dry
Length:	2.90		
Depth:	3.00		

Southern Testing ST Consult	Start - End Date:	Project ID:	Machine Type:	TP05
www.southerntesting.co.uk tel:01342 333100 www.stconsult.co.uk tel:01604 500020	07/09/2016	J12760	JCB 3CX	Sheet 1 of 1

Project Name:	Bell Farm	Remarks:	Co-ordinates:	Level (m AOD):	Logger:
			E 587027 - N 152597		ALH
Location:	Harrietsham	Trial pit terminated due to encountering hard strata. Trial pit relocated 2m to the east (TP05a).			
Client:	Crest Nicholson				

Samples and Insitu Testing			Level (m AOD)	Thickness (m)	Legend	Depth (m bgl)	Stratum Description
Depth (m)	Type	Results					
				(0.50)			Brown silty gravelly CLAY. Gravel is fine to coarse subangular to subrounded brick, flint and occasional tile and chalk fragments with roots and rootlets (MADE GROUND).
						0.50	
				(0.70)			Very stiff orange clayey gravelly SAND with patches of sandy CLAY. Gravel is medium to coarse angular flint (HEAD DEPOSITS).
							0.80m becoming very gravelly CLAY.
1.00	D						
1.00	HP	UCS(kPa)=600					
1.00	PPT	N=50(450)					
1.20	D					1.20	
1.20	HP	UCS(kPa)=600					Pit terminated at 1.20m.

Pit Dimension (m)		Pit Stability:	Water Strikes:
Width:	0.60	Stable.	Dry
Length:	2.80		
Depth:	3.00		

Southern Testing ST Consult

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Start - End Date:	Project ID:	Machine Type:	TP05a
07/09/2016	J12760		Sheet 1 of 1

Project Name:	Bell Farm	Remarks:	Co-ordinates:	Level (m AOD):	Logger:
Location:	Harrietsham				
Client:	Crest Nicholson				

Samples and Insitu Testing			Level (m AOD)	Thickness (m)	Legend	Depth (m bgl)	Stratum Description	
Depth (m)	Type	Results						
				(0.50)			Brown silty gravelly CLAY with rootlets. Gravel is fine to coarse subangular to subrounded flint.	
						0.50		
				(0.20)			Brown and orange silty gravelly CLAY. Gravel is medium angular flint (HEAD DEPOSIT).	
						0.70		
							Very stiff orange mottled grey silty sandy CLAY/clayey SAND with fine chalk and flint (HEAD DEPOSITS).	
1.00	D			(0.60)				1
1.10	D							
1.10	HP	UCS(kPa)=300						
						1.30		
							Firm to stiff grey CLAY with pockets of white silt (GAULT CLAY).	
1.50	D							
1.70	HP	UCS(kPa)=200					1.70m occasional relic rootlets.	
2.00	D							2
2.00	HP	UCS(kPa)=250		(1.70)				
							2.40m becoming very stiff.	
2.50	HP	UCS(kPa)=250						
2.70	D							
						3.00		3
							Pit terminated at 3.00m.	
								4

Pit Dimension (m)		Pit Stability:	Water Strikes:
Width:			Dry
Length:			
Depth:			

Southern Testing ST Consult	Start - End Date:	Project ID:	Machine Type:	TP06
www.southerntesting.co.uk tel:01342 333100 www.stconsult.co.uk tel:01604 500020	07/09/2016	J12760	JCB 3CX	Sheet 1 of 1

Project Name:	Bell Farm	Remarks:	Co-ordinates:	Level (m AOD):	Logger:
			E 587018 - N 152576		ALH
Location:	Harrietsham				
Client:	Crest Nicholson				

Samples and Insitu Testing			Level (m AOD)	Thickness (m)	Legend	Depth (m bgl)	Stratum Description
Depth (m)	Type	Results					
				(0.40)			Dark brown very silty CLAY with flint gravel, brick, tiles and concrete fragments (MADE GROUND).
						0.40	
				(0.20)			Light brown silty CLAY with fine to medium flint gravel and fine chalk fragments (HEAD DEPOSIT).
						0.60	
							Stiff grey silty CLAY with fine to medium angular flint and pockets of white silt (HEAD DEPOSITS).
1.00	D						
1.00	HP	UCS(kPa)=250					
1.00	PPT	N=20(450)					
1.20	HP	UCS(kPa)=250					
1.50	D						
				(2.40)			1.80m becoming fissured with relic rootlets.
1.90	HP	UCS(kPa)=300					
2.00	D						
2.50	HP	UCS(kPa)=280					
							2.90 becoming laminated.
3.00	D					3.00	Pit terminated at 3.00m.

Pit Dimension (m)		Pit Stability:	Water Strikes:
Width:	0.60	Stable.	Dry
Length:	2.90		
Depth:	3.00		

Southern Testing ST Consult	Start - End Date:	Project ID:	Machine Type:	TP07
www.southerntesting.co.uk tel:01342 333100 www.stconsult.co.uk tel:01604 500020	07/09/2016	J12760	JCB 3CX	Sheet 1 of 1

Project Name:	Bell Farm	Remarks:	Co-ordinates:	Level (m AOD):	Logger:
			E 586987 - N 152531		ALH
Location:	Harrietsham				
Client:	Crest Nicholson				

Samples and Insitu Testing			Level (m AOD)	Thickness (m)	Legend	Depth (m bgl)	Stratum Description	
Depth (m)	Type	Results						
				(0.40)			Dark brown silty CLAY with brick and flint gravel with occasional rootlets (MADE GROUND).	
						0.40		
				(0.40)			Brown silty CLAY with fine chalk gravel and pockets of orange sand (HEAD DEPOSIT).	
						0.80		
1.00	D						Grey silty CLAY with fine sized mudstone gravel and laminations of orange silt (GAULT CLAY).	1
1.50	D							
				(2.20)			2.0m laminated grey mottled brown.	2
2.20	D						2.50m fissured	
3.00	D					3.00	Pit terminated at 3.00m.	3
								4

Pit Dimension (m)		Pit Stability:	Water Strikes:
Width:	0.60	Stable.	Dry
Length:	2.70		
Depth:	3.00		

Southern Testing ST Consult	Start - End Date:	Project ID:	Machine Type:	TP08
www.southerntesting.co.uk tel:01342 333100 www.stconsult.co.uk tel:01604 500020	06/09/2016	J12760	JCB 3CX	Sheet 1 of 1

Project Name:	Bell Farm	Remarks:	Co-ordinates:	Level (m AOD):	Logger:
			E 586977 - N 152509		ALH
Location:	Harrietsham				
Client:	Crest Nicholson				

Samples and Insitu Testing			Level (m AOD)	Thickness (m)	Legend	Depth (m bgl)	Stratum Description	
Depth (m)	Type	Results						
				(0.35)			Dark brown silty CLAY with fine brick and wood fragments (MADE GROUND).	
						0.35	Very stiff orange and grey silty gravelly CLAY with patches of orange fine grained sand. Gravel is medium to coarse subangular to angular flint (HEAD DEPOSITS).	
0.80	D							
1.00	PPT	N=20(450)						1
				(1.65)				
1.50	D						1.5m...with fine sized chalk fragments.	
1.50	HP	UCS(kPa)=400						
2.00	D					2.00	Stiff dark grey mottled brown silty CLAY with pockets of light grey silt (GAULT CLAY).	2
2.00	HP	UCS(kPa)=230						
				(1.00)				
3.00	D					3.00	2.95m becoming blue grey mottled brown.	3
3.00	HP	UCS(kPa)=300					Pit terminated at 3.00m.	
								4

Pit Dimension (m)		Pit Stability:	Water Strikes:
Width:	0.60	Stable	Dry
Length:	3.00		
Depth:	3.00		

Southern Testing ST Consult	Start - End Date:	Project ID:	Machine Type:	TP09
www.southerntesting.co.uk tel:01342 333100 www.stconsult.co.uk tel:01604 500020	06/09/2016	J12760	JCB 3CX	Sheet 1 of 1

Project Name:	Bell Farm	Remarks:	Co-ordinates:	Level (m AOD):	Logger:
Location:	Harrietsham				ALH
Client:	Crest Nicholson				

Samples and Insitu Testing			Level (m AOD)	Thickness (m)	Legend	Depth (m bgl)	Stratum Description	
Depth (m)	Type	Results						
				(0.40)			Dark brown silty CLAY with fine brick and wood fragments (MADE GROUND).	
						0.40		
				(0.40)			Orange brown silty gravelly CLAY. Gravel is medium to coarse angular flint. (HEAD DEPOSITS)	
						0.80		
1.00	D						Very stiff grey silty CLAY with fine to medium angular flint with pockets of fine grained sandy clay. (HEAD DEPOSITS)	1
1.00	HP	UCS(kPa)=350						
1.00	PPT	N=16(450)						
1.50	D						1.5m...with fine sized mudstone fragments.	
1.80	HP	UCS(kPa)=210						
				(2.20)				
2.00	D							2
2.00	HP	UCS(kPa)=300						
						3.00		
3.00	D						Pit terminated at 3.00m.	3
3.00	HP	UCS(kPa)=300						
								4

Pit Dimension (m)		Pit Stability:	Water Strikes:
Width:	0.60	Stable.	Dry
Length:	2.90		
Depth:	3.00		

Southern Testing ST Consult	Start - End Date:	Project ID:	Machine Type:	TP10
www.southerntesting.co.uk tel:01342 333100 www.stconsult.co.uk tel:01604 500020	06/09/2016	J12760	JCB 3CX	Sheet 1 of 1

Project Name:	Bell Farm	Remarks:	Co-ordinates:	Level (m AOD):	Logger:
Location:	Harrietsham				ALH
Client:	Crest Nicholson				

Samples and Insitu Testing			Level (m AOD)	Thickness (m)	Legend	Depth (m bgl)	Stratum Description
Depth (m)	Type	Results					
				(0.40)			Dark brown silty CLAY with fine flint and brick gravel (MADE GROUND)
						0.40	
				(0.70)			Orange sandy gravelly CLAY with fine sized chalk fragments. Gravel is abundant fine to medium flint. (HEAD DEPOSITS)
1.00	HP	UCS(kPa)=250					
1.00	PPT	N=14(450)					
1.10	D					1.10	
							Stiff grey blue silty CLAY with pockets of white silt. (GAULT CLAY)
1.50	HP	UCS(kPa)=250					
2.00	D						
2.00	HP	UCS(kPa)=250		(2.00)			2.0m becoming laminated/fissured
3.00	D						
						3.10	Pit terminated at 3.10m.

Pit Dimension (m)		Pit Stability:	Water Strikes:
Width:	0.60	Stable.	Dry
Length:	2.80		
Depth:	3.00		

Southern Testing ST Consult

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Start - End Date:	Project ID:	Machine Type:	TP11
06/09/2016	J12760	JCB 3CX	Sheet 1 of 1

Project Name:	Bell Farm	Remarks:	Co-ordinates:	Level (m AOD):	Logger:
					ALH
Location:	Harrietsham				
Client:	Crest Nicholson				

Samples and Insitu Testing			Level (m AOD)	Thickness (m)	Legend	Depth (m bgl)	Stratum Description	
Depth (m)	Type	Results						
				(0.50)			Dark brown silty CLAY with wood, brick, and medium angular flint (MADE GROUND)	
						0.50		
				(0.50)			Grey brown silty CLAY with medium to coarse angular flint and fine chalk fragments (HEAD DEPOSIT).	
1.00	D					1.00		1
1.00	PPT	N=26(450)					Very stiff blueish grey silty CLAY with patches of white silt and fine mudstone. (GAULT CLAY)	
1.30	HP	UCS(kPa)=280						
1.50	D						1.50m becoming fissured with relic roots and patches of orange silt and slightly dessicated.	
2.00	D			(2.00)			2.0m laminated	2
2.00	HP	UCS(kPa)=350						
2.80	D						2.8m...pockets of fine orange silt	
3.00	D					3.00	2.95m bands of red ironstained siltstone gravel.	3
							Pit terminated at 3.00m.	
								4

Pit Dimension (m)		Pit Stability:	Water Strikes:
Width:	0.60	Stable.	Dry
Length:	2.90		
Depth:	3.00		

Southern Testing ST Consult	Start - End Date:	Project ID:	Machine Type:	TP12
www.southerntesting.co.uk tel:01342 333100 www.stconsult.co.uk tel:01604 500020	05/09/2016	J12760	JCB 3CX	Sheet 1 of 1

Project Name:	Bell Farm	Remarks:	Co-ordinates:	Level (m AOD):	Logger:
Location:	Harrietsham				ALH
Client:	Crest Nicholson				

Samples and Insitu Testing			Level (m AOD)	Thickness (m)	Legend	Depth (m bgl)	Stratum Description	
Depth (m)	Type	Results						
				(0.50)			Dark brown silty gravelly CLAY (MADE GROUND).	
						0.50		
				(0.40)			Stiff yellow orange dry very sandy silty CLAY with fine to medium angular flint (HEAD DEPOSIT).	
0.90	HP	UCS(kPa)=200				0.90		
1.00	D						Yellow clayey very gravelly SAND with fine sized chalk fragments. Sand is fine to medium. Gravel is fine to coarse angular flint (HEAD DEPOSIT).	1
1.00	PPT	N=50(450)		(1.00)				
						1.90		
2.00	D						Stiff light brown mottled grey silty very sandy very gravelly CLAY. Fine chalk and fine to medium angular flint. (HEAD DEPOSITS)	2
2.00	HP	UCS(kPa)=200						
2.50	HP	UCS(kPa)=200		(1.10)				
3.00	D					3.00	Pit terminated at 3.00m.	3
								4

Pit Dimension (m)		Pit Stability:	Water Strikes:
Width:	0.60	Stable.	Dry
Length:	2.80		
Depth:	3.00		

Southern Testing ST Consult	Start - End Date:	Project ID:	Machine Type:	TP13
www.southerntesting.co.uk tel:01342 333100 www.stconsult.co.uk tel:01604 500020	05/09/2016	J12760	JCB 3CX	Sheet 1 of 1

Project Name:	Bell Farm	Remarks:	Co-ordinates:	Level (m AOD):	Logger:
Location:	Harrietsham				ALH
Client:	Crest Nicholson				

Samples and Insitu Testing			Level (m AOD)	Thickness (m)	Legend	Depth (m bgl)	Stratum Description
Depth (m)	Type	Results					
				(0.50)			Brown silty gravelly CLAY. Gravel is fine to coarse subangular to subrounded flint, brick with occasional chalk and tile (MADE GROUND).
						0.50	
							Very stiff light brown silty CLAY with fine chalk and fine flint with occasional sandy patches. (HEAD DEPOSITS)
1.00	D			(0.90)			
1.00	HP	UCS(kPa)=550					
						1.40	
1.50	D						Very stiff grey mottled orange silty CLAY with white silt patches and frequent black flints. (HEAD DEPOSITS)
1.50	HP	UCS(kPa)=500					
				(0.60)			
2.00	D					2.00	
2.00	HP	UCS(kPa)=280					Stiff grey laminated CLAY with pockets of white silt. (GAULT CLAY)
				(1.00)			
2.80	HP	UCS(kPa)=250					2.80m light brown clay.
3.00	D					3.00	Pit terminated at 3.00m.

Pit Dimension (m)		Pit Stability:	Water Strikes:
Width:	0.60	Stable.	Dry
Length:	2.90		
Depth:	3.00		

Southern Testing ST Consult	Start - End Date:	Project ID:	Machine Type:	TP14
www.southerntesting.co.uk tel:01342 333100 www.stconsult.co.uk tel:01604 500020	08/09/2016	J12760	JCB 3CX	Sheet 1 of 1

Project Name:	Bell Farm	Remarks:	Co-ordinates:	Level (m AOD):	Logger:
					ALH
Location:	Harrietsham	Trial pit moved to the east, due to archeologists excavations.			
Client:	Crest Nicholson				

Samples and Insitu Testing			Level (m AOD)	Thickness (m)	Legend	Depth (m bgl)	Stratum Description	
Depth (m)	Type	Results						
				(0.50)			Dark brown silty CLAY with concrete, brick and tarmac (MADE GROUND).	
						0.50		
				(0.50)			Grey mottled brown silty CLAY with fine chalk fragments and fine to medium angular flint (HEAD DEPOSIT).	
1.00	D					1.00		1
1.00	HP	UCS(kPa)=200					Stiff becoming very stiff blue grey silty CLAY with laminations of white silt and rootlets. (GAULT CLAY)	
1.00	PPT	N=17(450)						
1.50	D							
1.50	HP	UCS(kPa)=250						
				(2.00)				2
2.50	HP	UCS(kPa)=300						
							2.90m shell fragments and relic rootlets.	
3.00	D					3.00		3
3.00	HP	UCS(kPa)=300					Pit terminated at 3.00m.	
								4

Pit Dimension (m)		Pit Stability:	Water Strikes:
Width:	0.60	Stable.	Dry
Length:	3.00		
Depth:	3.00		

Southern Testing ST Consult	Start - End Date:	Project ID:	Machine Type:	TP15
www.southerntesting.co.uk tel:01342 333100 www.stconsult.co.uk tel:01604 500020	06/09/2016	J12760	JCB 3CX	Sheet 1 of 1

Project Name:	Bell Farm	Remarks:	Co-ordinates:	Level (m AOD):	Logger:
Location:	Harrietsham				ALH
Client:	Crest Nicholson				

Samples and Insitu Testing			Level (m AOD)	Thickness (m)	Legend	Depth (m bgl)	Stratum Description
Depth (m)	Type	Results					
				(0.40)			Dark brown silty CLAY/clayey SILT with wood, brick and flint gravel (MADE GROUND).
						0.40	
				(0.40)			Soft brown silty gravelly CLAY. Gravel is fine to medium angular flint and chalk (HEAD DEPOSIT).
						0.80	
1.00	D						Very stiff grey silty CLAY with pockets of orange sandy clay and fragments of fine mudstone and flint. (HEAD DEPOSITS)
1.00	HP	UCS(kPa)=350					
1.00	PPT	N=32(450)					
1.50	D						
1.50	HP	UCS(kPa)=300					
				(1.80)			
2.00	HP	UCS(kPa)=300					
2.00	PPT	N=18(450)					
2.50	HP	UCS(kPa)=300					
						2.60	Very stiff grey tightly fissured silty CLAY with relic rootlets and occasional fine sized mudstone gravel (GAULT CLAY).
				(0.40)			2.60m becoming closely spaced and tightly fissured with occasional relic rootlets.
3.00	D					3.00	Pit terminated at 3.00m.
3.00	HP	UCS(kPa)=300					

Pit Dimension (m)		Pit Stability:	Water Strikes:
Width:	0.60	Stable.	Dry
Length:	2.80		
Depth:	3.00		

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Start - End Date:	Project ID:	Machine Type:	TP16
07/09/2016	J12760	JCB 3CX	Sheet 1 of 1

Project Name:	Bell Farm	Remarks:	Co-ordinates:	Level (m AOD):	Logger:
					ALH
Location:	Harrietsham				
Client:	Crest Nicholson				

Samples and Insitu Testing			Level (m AOD)	Thickness (m)	Legend	Depth (m bgl)	Stratum Description	
Depth (m)	Type	Results						
				(0.50)			Dark brown silty CLAY with brick and flint. (MADE GROUND)	
						0.50		
				(0.20)			Brown silty CLAY with fine chalk gravel and fine to medium flint (HEAD DEPOSIT).	
						0.70		
							Stiff blue grey silty CLAY with patches of white silt. (GAULT CLAY)	
1.00	D							1
1.00	HP	UCS(kPa)=280						
							1.50m grey mottled orange.	
1.80	D			(2.30)				
							2.0 fissured and laminated	2
2.50	D							
3.00	D					3.00	Pit terminated at 3.00m.	3
								4

Pit Dimension (m)		Pit Stability:	Water Strikes:
Width:	0.60	Stable.	Dry
Length:	2.80		
Depth:	3.00		

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Start - End Date:	Project ID:	Machine Type:	TP17
05/09/2016	J12760	JCB 3CX	Sheet 1 of 1

Project Name:	Bell Farm	**Remarks:**	**Co-ordinates:**	**Level (m AOD):**	**Logger:** ALH
Location:	Harrietsham				
Client:	Crest Nicholson				

Samples and Insitu Testing: Depth (m)	Type	Results	Level (m AOD)	Thickness (m)	Legend	Depth (m bgl)	Stratum Description
				(0.70)		0.70	Dark brown silty CLAY with wood, brick, and flint gravel. Possible asbestos (MADE GROUND)
0.80	HP	UCS(kPa)=200					Stiff becoming very stiff blue grey silty CLAY. (HEAD DEPOSITS)
1.00	D						
1.00	HP	UCS(kPa)=250					
1.00	PPT	N=13(450)					
							1.20m abundant flint cobbles.
1.50	HP	UCS(kPa)=300					
1.60	D						
							1.70m patches of white silt and becoming fissured.
				(2.30)			
2.00	D						2.0m relict roots and fissured.
2.00	HP	UCS(kPa)=350					
3.00	D					3.00	Pit terminated at 3.00m.
3.00	HP	UCS(kPa)=300					

Depth scale: 1, 2, 3, 4

Pit Dimension (m)		Pit Stability:	Water Strikes:
Width:	0.60	Stable.	Dry
Length:	3.00		
Depth:	3.00		

Southern Testing ST Consult	Start - End Date:	Project ID:	Machine Type:	TP18
www.southerntesting.co.uk tel:01342 333100 www.stconsult.co.uk tel:01604 500020	05/09/2016	J12760	JCB 3CX	Sheet 1 of 1

Project Name:	Bell Farm	Remarks:	Co-ordinates:	Level (m AOD):	Logger:
Location:	Harrietsham				ALH
Client:	Crest Nicholson				

Samples and Insitu Testing			Level (m AOD)	Thickness (m)	Legend	Depth (m bgl)	Stratum Description	
Depth (m)	Type	Results						
				(0.40)			Dark brown clayey SILT with patches of silty clay and abundant chalk and wood gravel. (MADE GROUND)	
						0.40		
				(0.50)			Orange brown silty gravelly CLAY with flint gravel and occasional sandy patches (HEAD DEPOSIT).	
						0.90		
1.00	D						Stiff grey silty gravelly CLAY with fine chalk fragments. Gravel is fine to coarse angular flint. (HEAD DEPOSITS)	1
1.00	HP	UCS(kPa)=250						
1.00	PPT	N=18(450)						
				(1.10)				
1.50	D							
1.50	HP	UCS(kPa)=250						
							1.80m large pockets of orange sandy clay.	
2.00	D					2.00		
2.00	HP	UCS(kPa)=300					Very stiff grey silty CLAY with closely spaced tight fissures. (GAULT CLAY)	2
				(1.00)				
3.00	D					3.00		3
3.00	HP	UCS(kPa)=300					Pit terminated at 3.00m.	
								4

Pit Dimension (m)		Pit Stability:	Water Strikes:
Width:	0.60	Stable.	Dry
Length:	2.85		
Depth:	3.00		

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Start - End Date:	Project ID:	Machine Type:	TP19
05/09/2016	J12760	JCB 3CX	Sheet 1 of 1

Project Name:	Bell Farm	Remarks:	Co-ordinates:	Level (m AOD):	Logger:
					ALH
Location:	Harrietsham				
Client:	Crest Nicholson				

Samples and Insitu Testing			Level (m AOD)	Thickness (m)	Legend	Depth (m bgl)	Stratum Description
Depth (m)	Type	Results					
				(0.25)			Brown silty CLay with roots and rootlets (MADE GROUND).
				(0.10)		0.25	Chalk, brick and flint rubble (MADE GROUND).
				(0.25)		0.35	Orange brown silty gravelly CLAY with flint gravel and occasional sandy patches (HEAD DEPOSIT).
						0.60	Very stiff grey mottled brown silty gravelly CLAY. Gravel is fine to coarse flint. (HEAD DEPOSITS)
1.00	D						
1.00	HP	UCS(kPa)=400					
1.00	PPT	N=33(450)		(1.10)			
1.70	D					1.70	Very stiff blue grey silty CLAY with laminations (GAULT CLAY)
1.70	HP	UCS(kPa)=350					2.0m becoming stiff and fissured.
				(1.30)			
2.50	D						
2.50	HP	UCS(kPa)=300				3.00	Pit terminated at 3.00m.

Pit Dimension (m)		Pit Stability:	Water Strikes:
Width:	0.60	Stable.	Dry
Length:	2.90		
Depth:	3.00		

Southern Testing ST Consult	Start - End Date:	Project ID:	Machine Type:	TP20
www.southerntesting.co.uk tel:01342 333100 www.stconsult.co.uk tel:01604 500020	05/09/2016	J12760	JCB 3CX	Sheet 1 of 1

Project Name:	Bell Farm	Remarks:	Co-ordinates:	Level (m AOD):	Logger:
Location:	Harrietsham				ALH
Client:	Crest Nicholson				

Samples and Insitu Testing			Level (m AOD)	Thickness (m)	Legend	Depth (m bgl)	Stratum Description	
Depth (m)	Type	Results						
				(0.40)			Dark brown silty CLAY with gravel and chalk fragments. Gravel is fine to coarse flint with brick, wood fragments and abundant roots (MADE GROUND).	
						0.40		
				(0.10)			Orange brown silty sandy CLAY (HEAD DEPOSIT).	
						0.50		
							Firm to stiff grey silty CLAY with fine chalk fragments and fine to medium angular flint with pockets of white silt. (HEAD DEPOSITS)	
1.00	D							1
1.00	HP	UCS(kPa)=400		(1.30)				
1.50	HP	UCS(kPa)=210						
1.80	D					1.80		
							Very stiff grey mottled brown silty fissured CLAY with pockets of white silt. (GAULT CLAY)	
2.00	D							2
2.00	HP	UCS(kPa)=350		(1.20)				
3.00	D					3.00		3
3.00	HP	UCS(kPa)=370					Pit terminated at 3.00m.	
								4

Pit Dimension (m)		Pit Stability:	Water Strikes:
Width:	0.60	Stable.	Dry
Length:	2.80		
Depth:	3.00		

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Start - End Date:	Project ID:	Machine Type:	TP21
07/09/2016	J12760	JCB 3CX	Sheet 1 of 1

Project Name:	Bell Farm	Remarks:	Co-ordinates:	Level (m AOD):	Logger:
					ALH
Location:	Harrietsham				
Client:	Crest Nicholson				

Samples and Insitu Testing			Level (m AOD)	Thickness (m)	Legend	Depth (m bgl)	Stratum Description	
Depth (m)	Type	Results						
				(0.30)			Dark brown silty CLAY (MADE GROUND).	
						0.30		
				(0.30)			Brown silty CLAY with fine chalk and fine to medium angular flint with relic rootlets (HEAD DEPOSIT).	
						0.60		
1.00	D						Stiff blue grey silty CLAY with patches of white silt and occasional flint. (HEAD DEPOSITS)	1
1.00	HP	UCS(kPa)=250						
1.00	PPT	N=25(450)						
				(1.40)				
2.00	D					2.00	Stiff brown mottled light grey silty CLAY with associated laminations and fine sized mudstone gravel. (GAULT CLAY)	2
2.00	HP	UCS(kPa)=250						
2.50	D			(1.00)				
3.00	D					3.00	Pit terminated at 3.00m.	3
								4

Pit Dimension (m)		Pit Stability:	Water Strikes:
Width:	3.00	Stable.	Dry
Length:	2.80		
Depth:	3.00		

Southern Testing ST Consult	Start - End Date:	Project ID:	Machine Type:	TP22
www.southerntesting.co.uk tel:01342 333100 www.stconsult.co.uk tel:01604 500020	08/09/2016	J12760	JCB 3CX	Sheet 1 of 1

Project Name:	Bell Farm	Remarks:	Co-ordinates:	Level (m AOD):	Logger:
Location:	Harrietsham				ALH
Client:	Crest Nicholson				

Samples and Insitu Testing			Level (m AOD)	Thickness (m)	Legend	Depth (m bgl)	Stratum Description
Depth (m)	Type	Results					
				(0.60)			Brown silty sandy gravelly CLAY. Gravel is fine to coarse subangular to subrounded brick, concrete, rubber, metal and ceramic. (MADE GROUND)
						0.60	
1.00	D			(1.40)			Orange brown silty sandy gravelly CLAY. Sand is fine to medium grained. Gravel is medium to coarse angular flint. (HEAD DEPOSITS)
1.00	HP	UCS(kPa)=200					
2.00	D					2.00	
2.00	HP	UCS(kPa)=220		(1.00)			Light brown silty CLAY with fine sized chalk and fine to medium flint. (HEAD DEPOSITS)
3.00	D					3.00	Pit terminated at 3.00m.

Pit Dimension (m)		Pit Stability:	Water Strikes:
Width:	0.60	Stable.	Dry
Length:	2.70		
Depth:	3.00		

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Start - End Date:	Project ID:	Machine Type:	TP23
08/09/2016	J12760	JCB 3CX	Sheet 1 of 1

Project Name:	Bell Farm	Remarks:	Co-ordinates:	Level (m AOD):	Logger:
					ALH
Location:	Harrietsham				
Client:	Crest Nicholson				

Samples and Insitu Testing			Level (m AOD)	Thickness (m)	Legend	Depth (m bgl)	Stratum Description	
Depth (m)	Type	Results						
				(0.80)			Dark brown silty sandy gravelly CLAY. Gravel is fine to coarse subangular to subrounded flint, brick and chalk (MADE GROUND).	
						0.80		
1.10	D						Grey and orange silty CLAY with chalk and flint fragments. (HEAD DEPOSITS)	1
1.50	HP	UCS(kPa)=280						
1.80	D							
1.80	HP	UCS(kPa)=280		(2.20)			1.80m becoming fissured.	2
3.00	D					3.00	Pit terminated at 3.00m.	3
								4

Pit Dimension (m)		Pit Stability:	Water Strikes:
Width:	0.60	Stable.	Dry
Length:	2.70		
Depth:	3.00		

Southern Testing ST Consult	Start - End Date:	Project ID:	Machine Type:	TP24
www.southerntesting.co.uk tel:01342 333100 www.stconsult.co.uk tel:01604 500020	08/09/2016	J12760	JCB 3CX	Sheet 1 of 1

Project Name:	Bell Farm	Remarks:	Co-ordinates:	Level (m AOD):	Logger:
Location:	Harrietsham				ALH
Client:	Crest Nicholson				

Samples and Insitu Testing			Level (m AOD)	Thickness (m)	Legend	Depth (m bgl)	Stratum Description
Depth (m)	Type	Results					
				(0.25)			Dark brown silty CLAY with roots and rootlets.
						0.25	
				(0.25)			Brown sandy silty gravelly CLAY. Gravel is fine to medium flint.
						0.50	
				(0.20)			Brown clayey sandy GRAVEL. Gravel is fine to coarse flint with occasional cobbles.
						0.70	
1.00	D						Very stiff becoming stiff light grey silty CLAY with patches of white silt and fine chalk fragments. Clay is tightly fissured. (HEAD DEPOSITS)
1.00	HP	UCS(kPa)=350					
1.00	PPT	N=18(450)					
							1.50m becoming mottled orange.
				(2.30)			
2.00	D						
2.10	HP	UCS(kPa)=250					
2.80	D						
2.80	HP	UCS(kPa)=200					
						3.00	Pit terminated at 3.00m.

Pit Dimension (m)		Pit Stability:	Water Strikes:
Width:	0.60	Stable.	Dry
Length:	2.80		
Depth:	3.00		

APPENDIX B

Field Sampling and in-situ Test Methods & Results

Field Sampling and in-situ Test Methods

Disturbed Samples

Disturbed samples were taken from the trial holes at intervals and stored in sealed glass jars and polythene bags, as appropriate.

Undisturbed U100 Samples

Undisturbed U100 samples were taken in the clay soils at appropriate intervals. These samples are taken in a 100 mm diameter, 450 mm long, thin-walled steel tube, and are sealed with paraffin wax and tightly fitting end caps for transporting to the laboratory.

Standard Penetration Test

The Standard Penetration (SPT) Test is specified in BS EN ISO 22476-3:2005+A1:2011. In this test, a 51mm diameter open-ended tube is driven into the ground by a 63.5 kg hammer falling freely through 760 mm. The tube is seated by driving to a penetration of 150mm, or by 25 standard blows, whichever occurs first. It is then driven for a maximum of a further 300mm and the number of blows is termed the penetration resistance (N). If 300mm penetration cannot be achieved in 50 blows (100 blows in soft rock), the test drive is terminated.

When testing in gravels, a conical end piece is attached to the tube. The test is then called an SPT(C).

This test provides an indirect method of assessing the properties of cohesionless soils, and the following table (after Terzaghi and Peck) gives the approximate condition:-

Number Blows (N)	Density
0 - 4	Very Loose
4 – 10	Loose
10 – 30	Medium Dense
30 – 50	Dense
Over 50	Very Dense

Clay

An approximate value for the shear strength of clay may be obtained using Stroud (1974), which paper indicates that the cohesive strength is a function of plasticity and SPT 'N' value. The relation is:

C_u = f_i x N kPa

C_u = undrained shear strength

f_i = factor related to plasticity index and ranging from 4 to more than 6

The SPT test is not generally accepted as giving a reliable indication of the strength of cohesive soils but it does give a guide; often the following table:-

Number Blows (N)	Soil Strength
Less than 2	Very Soft (Very Low Strength)
2 – 5	Soft (Low Strength)
5 – 10	Firm (Medium Strength)
10 – 15	Stiff (High Strength)
15 – 30	Very Stiff (Very High Strength)

Perth Penetrometer Test

Perth Penetrometer tests were carried out. The Perth Penetrometer is a device used for measuring the relative density of sands. It consists of a 16 mm diameter hardened steel probe, which is driven into the soil by successive blows of a 9 kg weight, which freely falls over a distance of 600 mm. The number of blows required for each 50 mm of penetration is recorded, and the test is continued for a depth of 450 mm, according to soil type. Useful information can be obtained by carrying the test past the standard depth, and 2,000 mm and 3,000 mm extensions are used to probe the depth of loose fill or other soil, or to make an estimate of the strength of soils or rock in an auger hole or in the base of an unsupported test pit.

The energy input per square metre is roughly the same as the energy input from the Standard Penetration Test (SPT), and the blow counts recorded in sand are roughly the same as SPT blow counts (but this relationship does not hold for coarse soils). The SPT test is a similar type of test except that much heavier driving weights (63.5 kg) are used. The relative density relationship given for the SPT test is:

Number of Blows (N)	Density
0 - 4	Very Loose
4 - 10	Loose
10 - 30	Medium Dense
30 - 50	Dense
Over 50	Very Dense

APPENDIX C

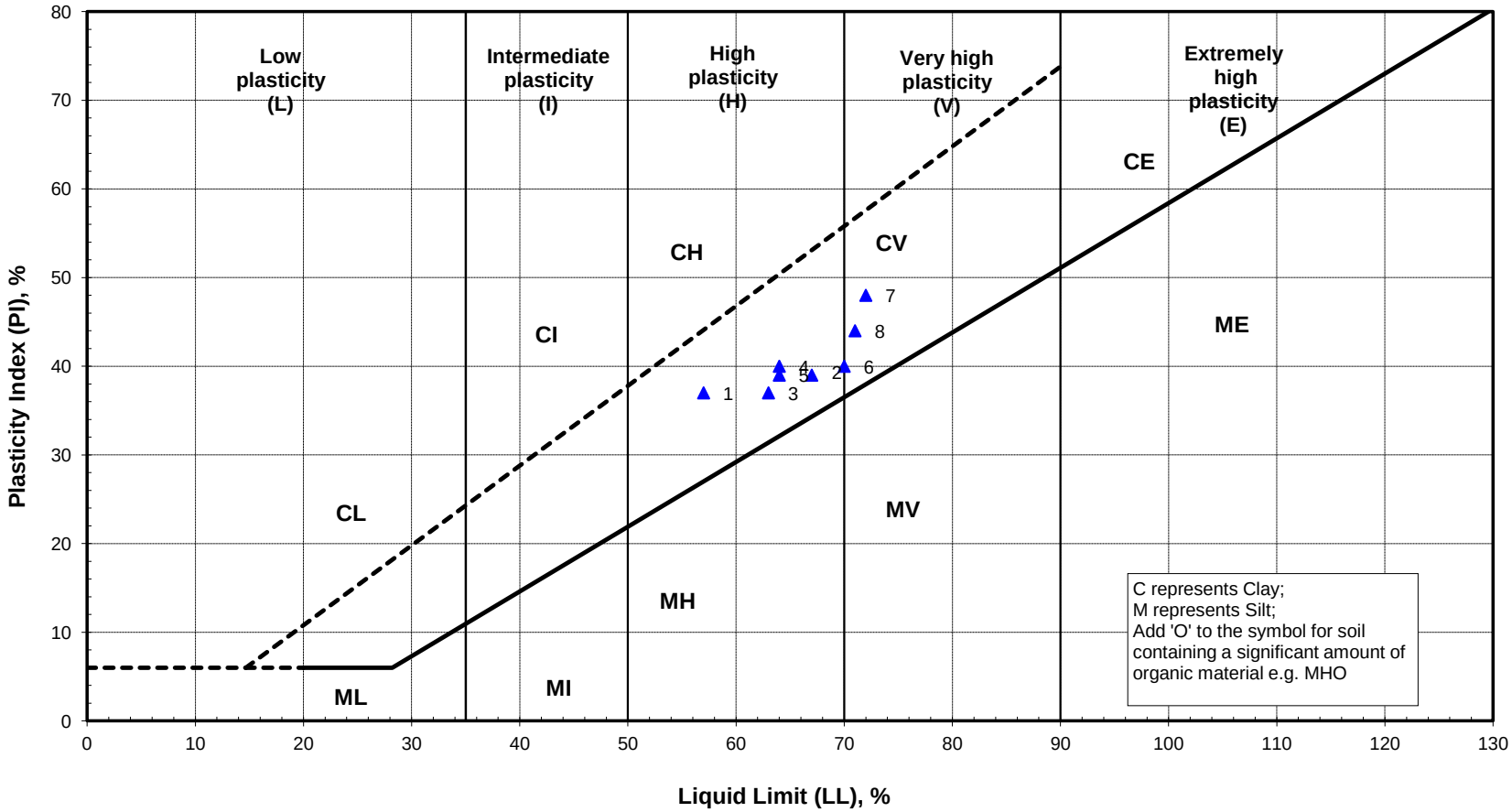
Geotechnical Laboratory Test References & Results

Plasticity Chart for Atterberg Limit Tests

Project Name	*Bell Farm, Church Road (Harrietsham)*			**Project Number**	*J12760*
Client Name	*Crest Nicholson (Eastern)*	**PE**	*ALH*	**Date Issued**	*20-Sep-16*

Key

No.	TH No.	Depth
1	TP01	0.60
2	TP01	1.50
3	TP01	2.50
4	TP03	1.00
5	TP03	1.80
6	TP03	2.50
7	TP05	1.00
8	TP05	1.20



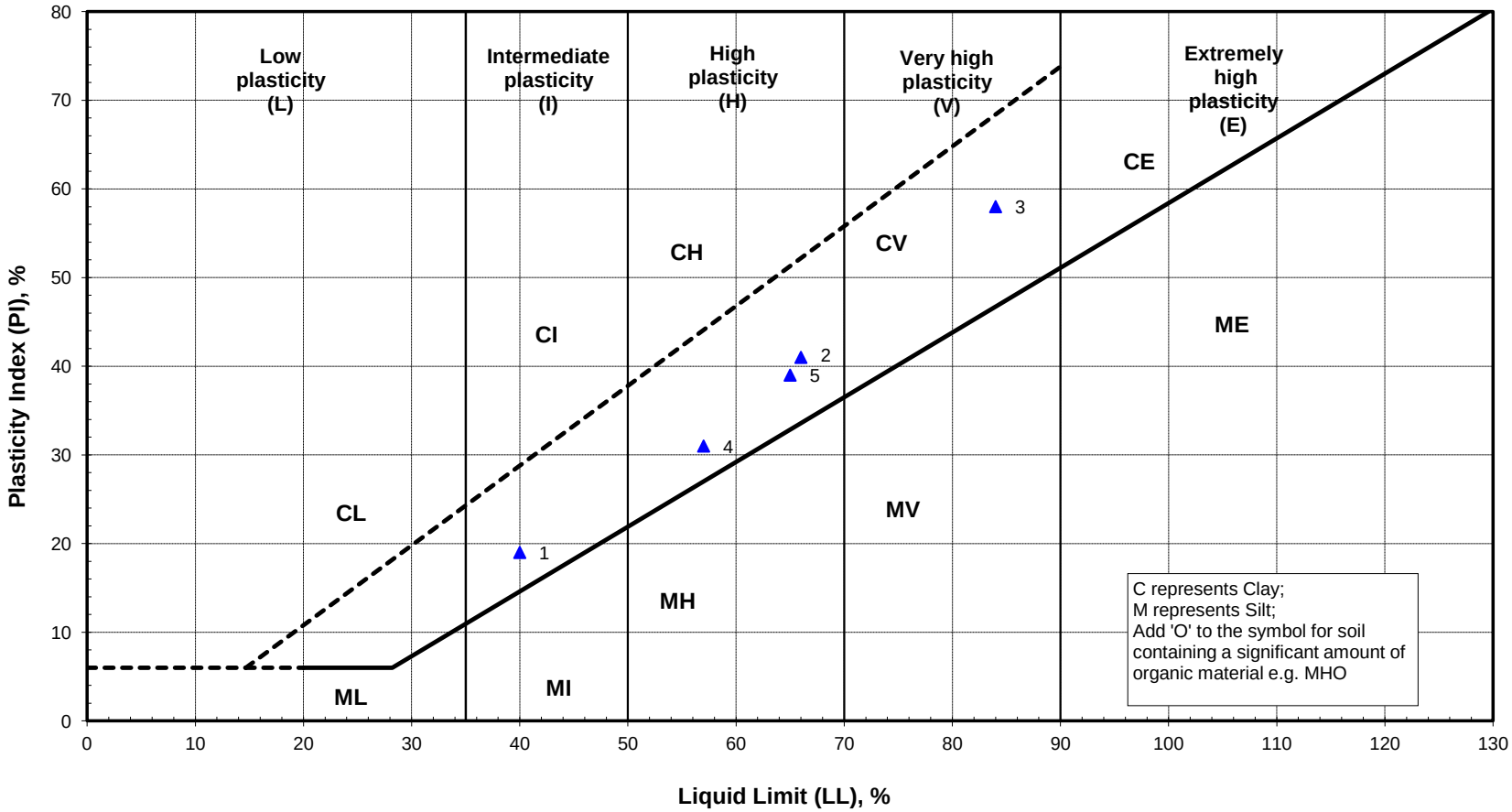
Liquid Limit		**Plastic Limit**		**Plasticity Index**	
Maximum Value	72	Maximum Value	30	Maximum Value	48
Minimum Value	57	Minimum Value	20	Minimum Value	37
Average Value	66	Average Value	26	Average Value	41

Plasticity Chart for Atterberg Limit Tests

Project Name	*Bell Farm, Church Road (Harrietsham)*			**Project Number**	*J12760*
Client Name	*Crest Nicholson (Eastern)*	**PE**	*ALH*	**Date Issued**	*20-Sep-16*

Key

No.	TH No.	Depth
1	TP12	1.00
2	TP12	2.00
3	TP12	3.00
4	TP19	1.00
5	TP19	1.70



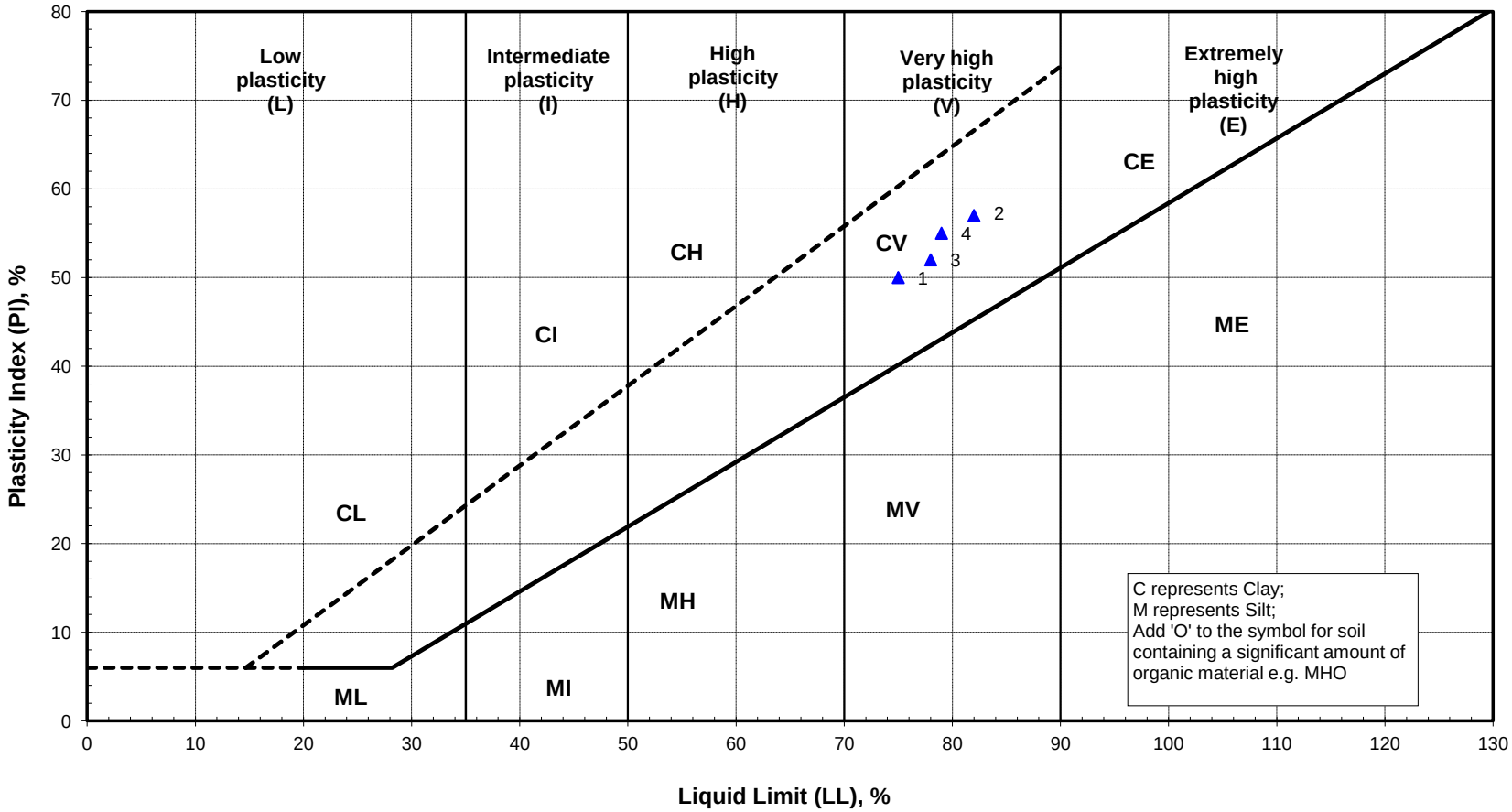
Liquid Limit		**Plastic Limit**		**Plasticity Index**	
Maximum Value	84	Maximum Value	26	Maximum Value	58
Minimum Value	40	Minimum Value	21	Minimum Value	19
Average Value	62	Average Value	25	Average Value	38

Plasticity Chart for Atterberg Limit Tests

Project Name	*Bell Farm, Church Road (Harrietsham)*			**Project Number**	*J12760*
Client Name	*Crest Nicholson (Eastern)*	**PE**	*ALH*	**Date Issued**	*20-Sep-16*

Key

No.	TH No.	Depth
1	TP23	1.10
2	TP23	1.80
3	TP24	1.00
4	TP24	2.00



Liquid Limit		**Plastic Limit**		**Plasticity Index**	
Maximum Value	82	Maximum Value	26	Maximum Value	57
Minimum Value	75	Minimum Value	24	Minimum Value	50
Average Value	79	Average Value	25	Average Value	54

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Atterberg and Moisture Content Summary

To BS1377-2:1990(2003) cl.3.2, 3.3, 4.2, 4.3

Project Name	*Bell Farm, Church Road (Harrietsham)*			Project Number	*J12760*
Client	*Crest Nicholson (Eastern)*	PE	*ALH*	Date Issued	*20-Sep-16*

Location	Depth m	Sample Type	Visual Description	Comments	Natural MC %	Liquid Limit %	Plastic Limit %	Plasticity Index	Classi-fication	Passing 425 micron %
TP01	0.60	D	*Stiff light brown mottled white calcareous CLAY.*		*19*	*57*	*20*	*37*	*CH*	*100*
TP01	1.50	D	*Very stiff grey calcareous CLAY.*		*26*	*67*	*28*	*39*	*CH*	*100*
TP01	2.50	D	*Very stiff fissured grey mottled yellow grey slightly gravelly calcareous CLAY. Gravel consists of fine subangular flint.*		*27*	*63*	*26*	*37*	*CH*	*98*
TP01	3.00	D			*29*					
TP02	1.00	D			*22*					
TP02	2.00	D			*29*					
TP02	3.00	D			*30*					
TP03	1.00	D	*Very stiff dark grey calcareous CLAY with occasional fine calcrete.*		*25*	*64*	*24*	*40*	*CH*	*98*
TP03	1.80	D	*Very stiff fissured dark grey slightly gravelly calcareous CLAY. Gravel consists of fine subangular flint.*		*26*	*64*	*25*	*39*	*CH*	*98*
TP03	2.50	D	*Hard fissured grey calcareous CLAY.*		*31*	*70*	*30*	*40*	*CH/CV*	*100*

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Atterberg and Moisture Content Summary

To BS1377-2:1990(2003) cl.3.2, 3.3, 4.2, 4.3

Project Name	*Bell Farm, Church Road (Harrietsham)*			Project Number	*J12760*
Client	*Crest Nicholson (Eastern)*	PE	*ALH*	Date Issued	*20-Sep-16*

Location	Depth m	Sample Type	Visual Description	Comments	Natural MC %	Liquid Limit %	Plastic Limit %	Plasticity Index	Classi-fication	Passing 425 micron %
TP05	1.00	D	*Very stiff fissured grey patched grey brown slightly gravelly calcareous CLAY. Gravel consists of fine subangular flint.*		*18*	*72*	*24*	*48*	*CV*	*98*
TP05	1.20	D	*Hard light grey green calcareous CLAY.*		*21*	*71*	*27*	*44*	*CV*	*100*
TP05a	1.00	D			*20*					
TP05a	1.50	D			*13*					
TP05a	2.70	D			*32*					
TP06	1.00	D			*23*					
TP06	2.00	D			*27*					
TP06	3.00	D			*30*					
TP07	1.00	D			*27*					
TP07	2.20	D			*32*					

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Atterberg and Moisture Content Summary

To BS1377-2:1990(2003) cl.3.2, 3.3, 4.2, 4.3

Project Name	*Bell Farm, Church Road (Harrietsham)*				**Project Number**	*J12760*		
Client	*Crest Nicholson (Eastern)*		**PE**	*ALH*	**Date Issued**	*20-Sep-16*		

Location	Depth m	Sample Type	Visual Description	Comments	Natural MC %	Liquid Limit %	Plastic Limit %	Plasticity Index	Classi-fication	Passing 425 micron %
TP07	3.00	D			*29*					
TP08	0.80	D			*21*					
TP08	1.50	D			*24*					
TP09	1.00	D			*22*					
TP09	1.50	D			*22*					

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Atterberg and Moisture Content Summary

To BS1377-2:1990(2003) cl.3.2, 3.3, 4.2, 4.3

AGS

Project Name	*Bell Farm, Church Road (Harrietsham)*					Project Number		*J12760*	
Client	*Crest Nicholson (Eastern)*			PE	*ALH*	Date Issued		*20-Sep-16*	

Location	Depth m	Sample Type	Visual Description	Comments	Natural MC %	Liquid Limit %	Plastic Limit %	Plasticity Index	Classi-fication	Passing 425 micron %
TP11	1.00	D			*26*					
TP11	2.00	D			*30*					
TP11	3.00	D			*24*					
TP12	1.00	D	*Orange brown slightly sandy slightly gravelly CLAY. Gravel consists of fine to coarse subangular and subrounded flint.*	*Sample passed through 425µm sieve*	*11*	*40*	*21*	*19*	*CI*	*75*
TP12	2.00	D	*Very stiff light brown slightly sandy slightly gravelly CLAY. Gravel consists of fine subangular and subrounded chalk and flint.*	*Sample passed through 425µm sieve*	*26*	*66*	*25*	*41*	*CH*	*81*
TP12	3.00	D	*Stiff grey patched yellow grey calcareous CLAY.*		*36*	*84*	*26*	*58*	*CV*	*100*
TP13	1.50	D			*27*					
TP13	2.00	D			*23*					
TP14	1.00	D			*28*					
TP14	1.50	D			*29*					

Southern Testing | ST Consult

Atterberg and Moisture Content Summary

To BS1377-2:1990(2003) cl.3.2, 3.3, 4.2, 4.3

Project Name	*Bell Farm, Church Road (Harrietsham)*			Project Number	*J12760*
Client	*Crest Nicholson (Eastern)*	PE	*ALH*	Date Issued	*20-Sep-16*

Location	Depth m	Sample Type	Visual Description	Comments	Natural MC %	Liquid Limit %	Plastic Limit %	Plasticity Index	Classi-fication	Passing 425 micron %
TP14	3.00	D			*28*					
TP15	1.00	D			*26*					
TP15	1.50	D			*26*					
TP15	3.00	D			*27*					
TP16	1.00	D			*25*					
TP16	1.80	D			*29*					
TP17	1.00	D			*23*					
TP17	1.60	D			*24*					
TP18	1.00	D			*24*					
TP18	2.00	D			*26*					

Southern Testing | ST Consult

Atterberg and Moisture Content Summary

To BS1377-2:1990(2003) cl.3.2, 3.3, 4.2, 4.3

AGS

Project Name	*Bell Farm, Church Road (Harrietsham)*					**Project Number**		*J12760*	
Client	*Crest Nicholson (Eastern)*			**PE**	*ALH*	**Date Issued**		*20-Sep-16*	

Location	Depth m	Sample Type	Visual Description	Comments	Natural MC %	Liquid Limit %	Plastic Limit %	Plasticity Index	Classi-fication	Passing 425 micron %
TP18	3.00	D			*29*					
TP19	1.00	D	*Very stiff dark grey brown calcareous CLAY.*		*23*	*57*	*26*	*31*	*CH*	*100*
TP19	1.70	D	*Stiff dark grey brown CLAY.*		*28*	*65*	*26*	*39*	*CH*	*100*
TP19	2.50	D			*29*					
TP20	1.00	D			*23*					

Jun 13

Southern Testing | ST Consult

Atterberg and Moisture Content Summary

To BS1377-2:1990(2003) cl.3.2, 3.3, 4.2, 4.3

AGS

Project Name	*Bell Farm, Church Road (Harrietsham)*			Project Number	*J12760*
Client	*Crest Nicholson (Eastern)*	PE	*ALH*	Date Issued	*20-Sep-16*

Location	Depth m	Sample Type	Visual Description	Comments	Natural MC %	Liquid Limit %	Plastic Limit %	Plasticity Index	Classi-fication	Passing 425 micron %
TP20	2.00	D			*31*					
TP20	3.00	D			*26*					
TP21	1.00	D			*27*					
TP21	2.00	D			*26*					
TP21	2.50	D			*24*					
TP22	1.00	D			*16*					
TP22	2.00	D			*31*					
TP22	3.00	D			*32*					
TP23	1.10	D	*Yellow grey slightly gravelly CLAY. Gravel consists of fine and medium subrounded chalk and flint.*	*Sample passed through 425µm sieve*	*19*	*75*	*25*	*50*	*CV*	*69*
TP23	1.80	D	*Stiff yellow grey mottled yellow brown slightly gravelly CLAY. Gravel consists of fine subrounded flint.*		*30*	*82*	*25*	*57*	*CV*	*98*

Southern Testing | ST Consult

Atterberg and Moisture Content Summary

To BS1377-2:1990(2003) cl.3.2, 3.3, 4.2, 4.3

Project Name	*Bell Farm, Church Road (Harrietsham)*					**Project Number**		*J12760*	
Client	*Crest Nicholson (Eastern)*			**PE**	*ALH*	**Date Issued**		*20-Sep-16*	

Location	Depth m	Sample Type	Visual Description	Comments	Natural MC %	Liquid Limit %	Plastic Limit %	Plasticity Index	Classi-fication	Passing 425 micron %
TP23	3.00	D			*29*					
TP24	1.00	D	*Very stiff yellow grey calcareous CLAY.*		*26*	*78*	*26*	*52*	*CV*	*100*
TP24	2.00	D	*Firm green grey calcareous CLAY.*		*32*	*79*	*24*	*55*	*CV*	*100*
TP24	2.80	D			*34*					

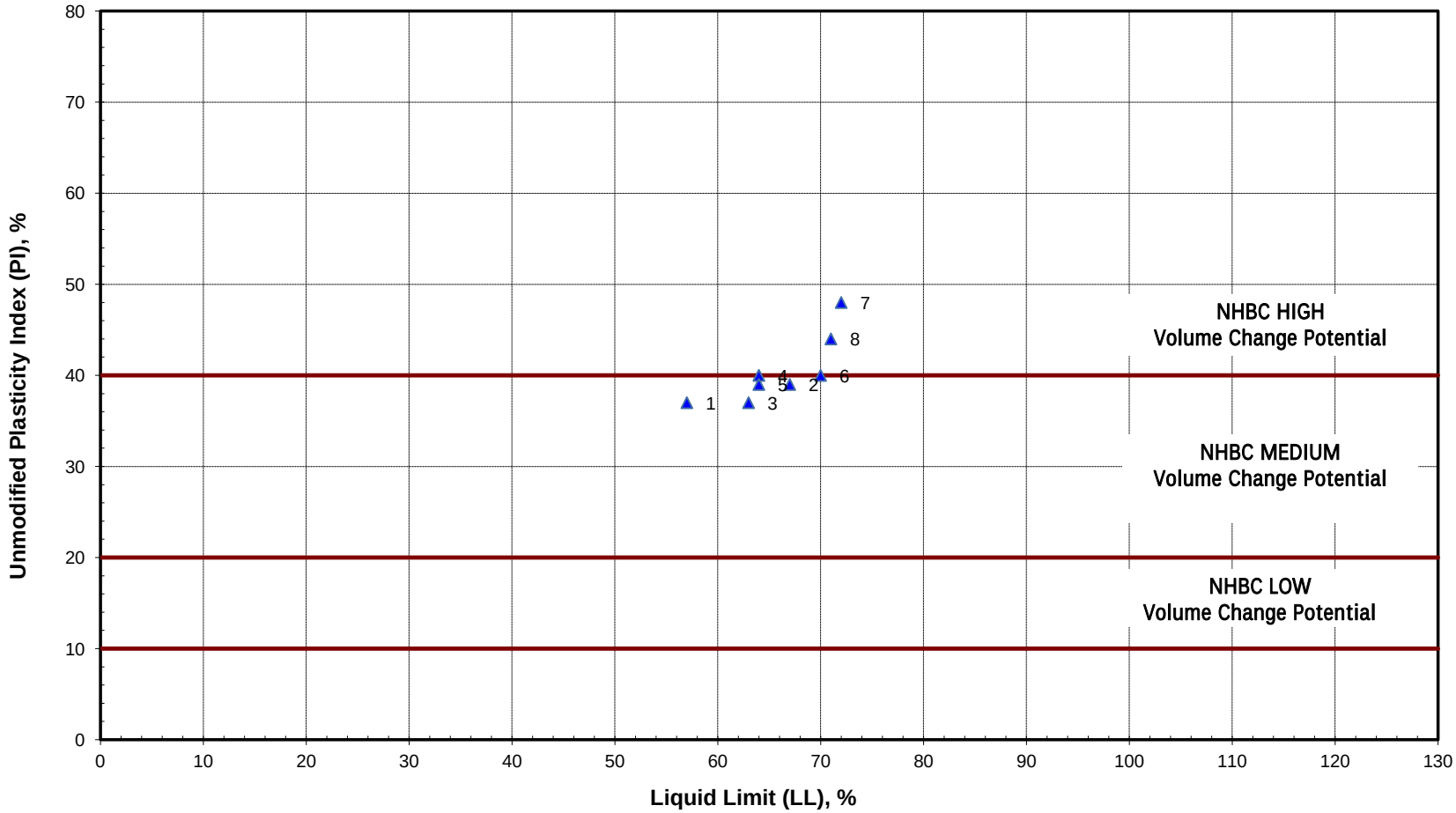
Jun 13

NHBC Classification for Volume Change Potential

Project Name	*Bell Farm, Church Road (Harrietsham)*			**Project Number**	*J12760*
Client Name	*Crest Nicholson (Eastern)*	**PE**	*ALH*	**Date Issued**	*20-Sep-16*

Key

No.	TH No.	Depth
1	TP01	0.60
2	TP01	1.50
3	TP01	2.50
4	TP03	1.00
5	TP03	1.80
6	TP03	2.50
7	TP05	1.00
8	TP05	1.20



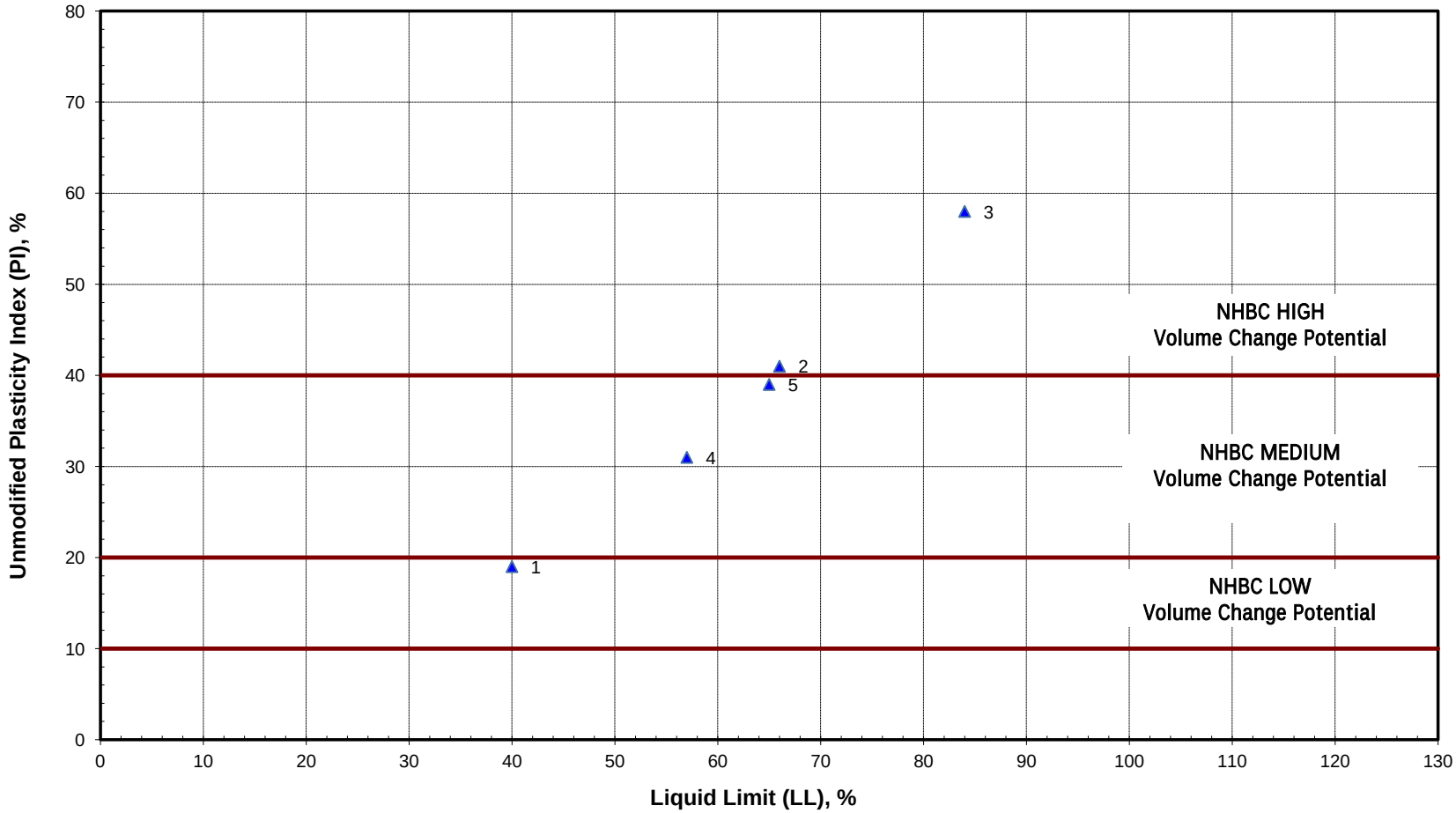
Liquid Limit		**Plastic Limit**		**Unmodified Plasticity Index**	
Maximum Value	72	Maximum Value	30	Maximum Value	48
Minimum Value	57	Minimum Value	20	Minimum Value	37
Average Value	66	Average Value	26	Average Value	41

NHBC Classification for Volume Change Potential

Project Name	*Bell Farm, Church Road (Harrietsham)*			**Project Number**	*J12760*
Client Name	*Crest Nicholson (Eastern)*	**PE**	*ALH*	**Date Issued**	*20-Sep-16*

Key

No.	TH No.	Depth
1	TP12	1.00
2	TP12	2.00
3	TP12	3.00
4	TP19	1.00
5	TP19	1.70



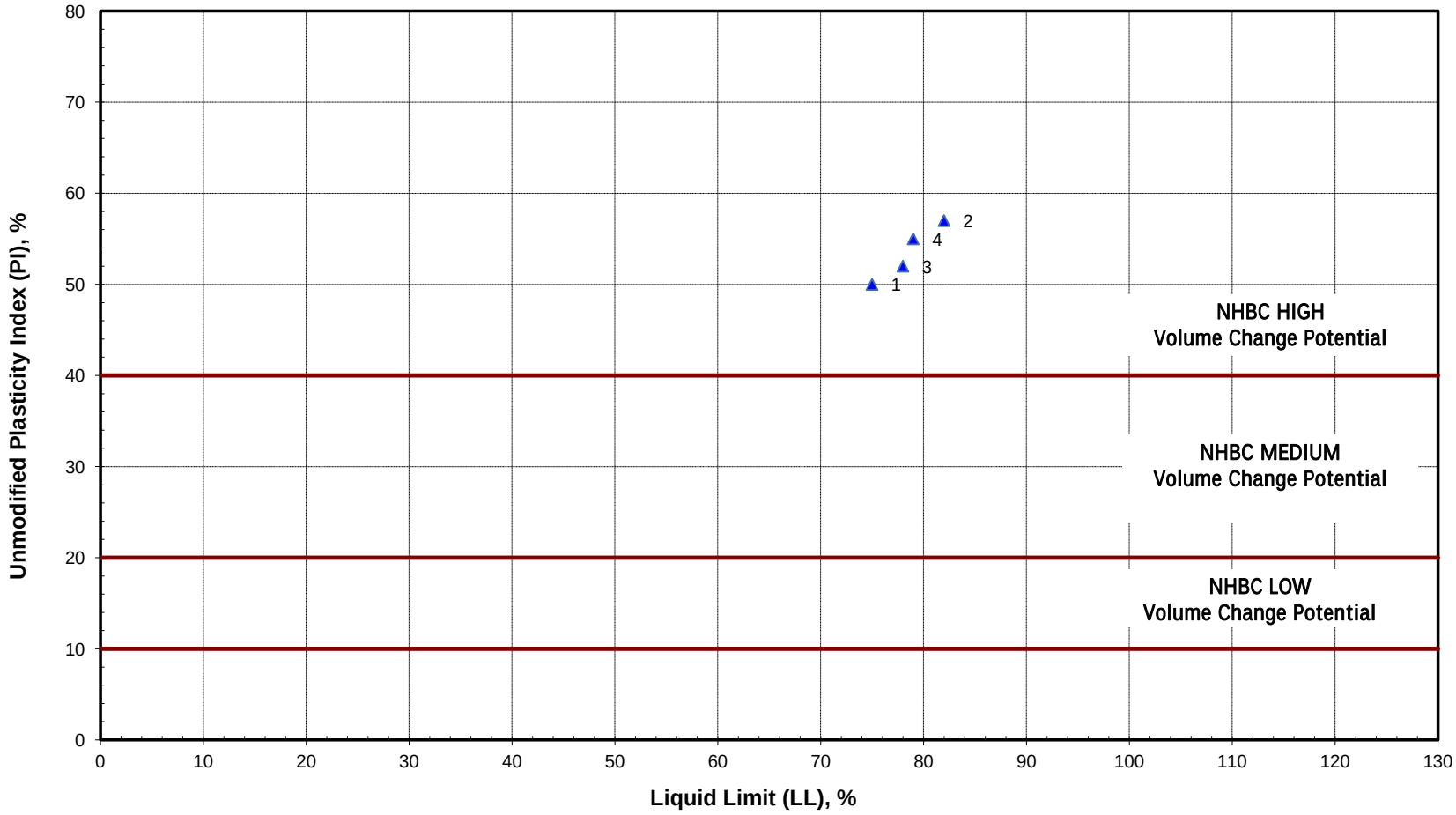
Liquid Limit		**Plastic Limit**		**Unmodified Plasticity Index**	
Maximum Value	84	Maximum Value	26	Maximum Value	58
Minimum Value	40	Minimum Value	21	Minimum Value	19
Average Value	62	Average Value	25	Average Value	38

NHBC Classification for Volume Change Potential

Project Name	*Bell Farm, Church Road (Harrietsham)*			**Project Number**	*J12760*
Client Name	*Crest Nicholson (Eastern)*	**PE**	*ALH*	**Date Issued**	*20-Sep-16*

Key

No.	TH No.	Depth
1	TP23	1.10
2	TP23	1.80
3	TP24	1.00
4	TP24	2.00



Liquid Limit		**Plastic Limit**		**Unmodified Plasticity Index**	
Maximum Value	82	Maximum Value	26	Maximum Value	57
Minimum Value	75	Minimum Value	24	Minimum Value	50
Average Value	79	Average Value	25	Average Value	54

APPENDIX D

Contamination Laboratory Test Results

Table 1 - Tier 1 Screening Values

Contaminant	Units	Proposed Land Use					
		Residential with homegrown produce consumption	Residential without homegrown produce consumption	Open Space* (Residential)	Open Space* (Park)	Allotments	Commercial / Industrial
Arsenic (As) [2]	mg/kg	37	40	79	170	43	640
Cadmium (Cd) [2]	mg/kg	11	85	120	555	1.9	190
Trivalent Chromium (CrIII) [2]	mg/kg	910	910	1,500	33,000	18,000	8600
Hexavalent Chromium (CrVI) [2]	mg/kg	6	6	7.7	220	1.8	33
Lead (Pb) [3]	mg/kg	200	310	630	1300	80	2330
Mercury (Hg) [1,2,7]	mg/kg	7.6-11	9.2-15	40	68-71	6.0	29-320
Selenium (Se) [2]	mg/kg	250	430	1,100	1,800	88	12,000
Nickel (Ni) [2,4]	mg/kg	130	180	230	800	53	980
Copper (Cu) [2,4]	mg/kg	2,400	7,100	12,000	44,000	520	68,000
Zinc (Zn) [2,4]	mg/kg	3,700	40,000	81,000	170,000	620	730,000
Phenol [1,2]	mg/kg	120-380	440-1200	440-1300	440-1300	23-83	440-1300
Benzo[a]pyrene [1,5]	mg/kg	1.7-2.4	2.6	4.9	10	0.67-2.7	36
Naphthalene [1,2]	mg/kg	2.3-13	2.3-13	77-430^{+}	77-430^{+}	4.1-24	77-430^{+}
Total Cyanide (CN) [6]	mg/kg	/	/	/	/	/	/
Free Cyanide [6]	mg/kg	/	/	/	/	/	/
Complex Cyanides [6]	mg/kg	/	/	/	/	/	/
Thiocyanate [6]	mg/kg	/	/	/	/	/	/

Notes:

***** Open Space levels calculated on the basis of the exposure modelling developed in the C4SL research.

+ Screening values constrained to saturation limit. Higher values may be acceptable on a site specific basis.

[1] Where ranges of values are given for organic contaminants the screening value is dependant on the Soil $^{+}$Organic Matter.

[2] LQM/CIEH S4UL (2014). Copyright Land Quality Management Ltd reproduced with permission; Publication Number S4UL 3116. All rights reserved.

[3] C4SL (DEFRA 2014).

[4] Copper, Zinc and Nickel may have phototoxic effects at the given concentrations. Alternative criteria should be adopted for importation of Topsoil or other soils for cultivation. BS3882:2015 and BS8601:2013 suggest values of 200 to 300mg/kg for Zn, 100 to 200mg/kg for Cu, and 60 to 110mg/kg for Ni, for topsoil and subsoil, depending on pH.

[5] Based on the Surrogate Marker approach and modelled using the modified exposure parameters of C4SL but retaining 'minimal risk' HCV.

[6] Screening criteria derived on a site specific basis if test results indicate.

[7] S4UL for Methyl Mercury, higher concentrations may be tolerable if inorganic mercury is the only species present. Lower concentrations apply for elemental Mercury.

These screening values are valid at the time of writing but may be subject to change and any such changes will have implications for the assessments based on them. Their validity should be confirmed at the time of site development.

SCIENTIFIC ANALYSIS LABORATORIES
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Certificate of Analysis

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Report Number: 599249-1

Date of Report: 20-Sep-2016

Customer: Southern Testing Laboratories
Keeble House
Stuart Way
East Grinstead
West Sussex
RH19 4QA

Customer Contact: Ms Amy Hulley

Customer Job Reference: J12760_1
Customer Purchase Order: J12760_1Amy
Customer Site Reference: Bell Farm, Church Road (Harrietsham)
Date Job Received at SAL: 12-Sep-2016
Date Analysis Started: 16-Sep-2016
Date Analysis Completed: 20-Sep-2016

The results reported relate to samples received in the laboratory and may not be representative of a whole batch.
Opinions and interpretations expressed herein are outside the scope of UKAS accreditation
This report should not be reproduced except in full without the written approval of the laboratory
Tests covered by this certificate were conducted in accordance with SAL SOPs
All results have been reviewed in accordance with Section 25 of the SAL Quality Manual

UKAS TESTING
1549

mCERTS
THE ENVIRONMENT AGENCY'S MONITORING CERTIFICATION SCHEME

Report checked and authorised by :
Claire Brown Crociquia
Customer Service Manager

Issued by :
Claire Brown Crociquia
Customer Service Manager

SAL Reference: 599249
Project Site: Bell Farm, Church Road (Harrietsham)
Customer Reference: J12760_1

Soil Analysed as Soil
STL Key Contamintion Suite

				SAL Reference	**599249 001**	**599249 002**	**599249 003**
				Customer Sample Reference	**TP04 @ 0.50m**	**TP04 @ 1.70m**	**TP04 @ 2.20m**
				Date Sampled	**08-SEP-2016**	**08-SEP-2016**	**08-SEP-2016**
				Type	**Clay**	**Clay**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**			
Arsenic	T257	A40	2	mg/kg	**8**	**10**	**9**
Cadmium	T257	A40	0.1	mg/kg	**0.2**	**0.3**	**0.1**
Chromium	T257	A40	0.5	mg/kg	**16**	**16**	**14**
Copper	T257	A40	2	mg/kg	**25**	**28**	**16**
Lead	T257	A40	2	mg/kg	**74**	**89**	**32**
Mercury	T245	A40	1.0	mg/kg	<1.0	<1.0	<1.0
Nickel	T257	A40	0.5	mg/kg	**30**	**27**	**26**
Selenium	T257	A40	3	mg/kg	<3	<3	<3
Zinc	T257	A40	2	mg/kg	**110**	**140**	**85**
Asbestos ID	T27	A40			Asbestos not detected	Asbestos not detected	Asbestos not detected
Chromium VI	T6	A40	1	mg/kg	<1	<1	<1
Fraction Organic Carbon - F(oc)	T917	A40	0.001	%	**0.029**	**0.037**	**0.027**
pH	T7	A40			**8.0**	**7.9**	**7.9**
Soil Organic Matter	T287	A40	0.1	%	**4.9**	**6.4**	**4.6**
(Water Soluble) SO4-- expressed as SO4	T242	A40	0.01	g/l	**0.33**	**0.48**	**0.38**
Sulphide	T4	A40	10	mg/kg	<10	**75**	**88**
Cyanide(Total)	T921	AR	1	mg/kg	<1	<1	<1
Phenols(Mono)	T921	AR	1	mg/kg	<1	<1	<1
Moisture @105C	T162	AR	0.1	%	**35**	**38**	**36**
Retained on 2mm	T2	A40	0.1	%	<0.1	<0.1	<0.1

SAL Reference: 599249
Project Site: Bell Farm, Church Road (Harrietsham)
Customer Reference: J12760_1

Soil Analysed as Soil
Total and Speciated USEPA16 PAH (SE) (MCERTS)

				SAL Reference	**599249 001**	**599249 002**	**599249 003**
				Customer Sample Reference	**TP04 @ 0.50m**	**TP04 @ 1.70m**	**TP04 @ 2.20m**
				Date Sampled	**08-SEP-2016**	**08-SEP-2016**	**08-SEP-2016**
				Type	**Clay**	**Clay**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**			
Naphthalene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1
Acenaphthylene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1
Acenaphthene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1
Fluorene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1
Phenanthrene	T16	AR	0.1	mg/kg	**0.5**	**0.4**	<0.1
Anthracene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1
Fluoranthene	T16	AR	0.1	mg/kg	**1.3**	**1.0**	**0.3**
Pyrene	T16	AR	0.1	mg/kg	**1.2**	**0.9**	**0.2**
Benzo(a)Anthracene	T16	AR	0.1	mg/kg	**0.6**	**0.5**	<0.1
Chrysene	T16	AR	0.1	mg/kg	**0.7**	**0.5**	<0.1
Benzo(b)fluoranthene	T16	AR	0.1	mg/kg	**0.5**	**0.4**	<0.1
Benzo(k)fluoranthene	T16	AR	0.1	mg/kg	**0.4**	**0.3**	<0.1
Benzo(a)Pyrene	T16	AR	0.1	mg/kg	**0.4**	**0.3**	<0.1
Indeno(123-cd)Pyrene	T16	AR	0.1	mg/kg	**0.2**	**0.2**	<0.1
Dibenzo(ah)Anthracene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1
Benzo(ghi)Perylene	T16	AR	0.1	mg/kg	**0.2**	**0.2**	<0.1
PAH(total)	T16	AR	0.1	mg/kg	**6.1**	**4.4**	**0.5**

SAL Reference: 599249
Project Site: Bell Farm, Church Road (Harrietsham)
Customer Reference: J12760_1

Soil Analysed as Soil
Southern Testing TPH c5-c40 Banded

				SAL Reference	**599249 001**	**599249 002**
				Customer Sample Reference	**TP04 @ 0.50m**	**TP04 @ 1.70m**
				Date Sampled	**08-SEP-2016**	**08-SEP-2016**
				Type	**Clay**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**		
TPH (C5-C6)	T54	AR	0.10	mg/kg	<0.10	<0.10
TPH (C6-C8)	T54	AR	0.10	mg/kg	<0.10	<0.10
TPH (C8-C10)	T54	AR	0.10	mg/kg	<0.10	<0.10
TPH (C10-C12)	T219	AR	2	mg/kg	<2	<2
TPH (C12-C16)	T219	AR	2	mg/kg	<2	<2
TPH (C16-C21)	T219	AR	2	mg/kg	<2	<2
TPH (C21-C35)	T219	AR	2	mg/kg	**22**	**7**
TPH (C35-C40)	T219	AR	2	mg/kg	**15**	**9**

Index to symbols used in 599249-1

Value	Description
A40	Assisted dried < 40C
AR	As Received
S	Analysis was subcontracted
M	Analysis is MCERTS accredited
U	Analysis is UKAS accredited
N	Analysis is not UKAS accredited

Notes

Retained on 2mm is removed before analysis
Reported results on as received samples are corrected to a 105 degree centigrade dry weight basis except TPH Banded
Asbestos subcontracted to REC Limited

Method Index

Value	Description
T4	Colorimetry
T16	GC/MS
T921	Colorimetry (CF) (MCERT)
T242	2:1 Extraction/ICP/OES (TRL 447 T1)
T917	OX/IR (SE)
T54	GC/MS (Headspace)
T6	ICP/OES
T287	Calc TOC/0.58
T162	Grav (1 Dec) (105 C)
T219	GC/FID (SE)
T245	ICP/OES (Aqua Regia Extraction)
T27	PLM
T257	ICP/OES (SIM) (Aqua Regia Extraction)
T2	Grav
T7	Probe

Accreditation Summary

Determinand	Method	Test Sample	LOD	Units	Symbol	SAL References
Arsenic	T257	A40	2	mg/kg	M	001-003
Cadmium	T257	A40	0.1	mg/kg	M	001-003
Chromium	T257	A40	0.5	mg/kg	M	001-003
Copper	T257	A40	2	mg/kg	M	001-003
Lead	T257	A40	2	mg/kg	M	001-003
Mercury	T245	A40	1.0	mg/kg	U	001-003
Nickel	T257	A40	0.5	mg/kg	M	001-003

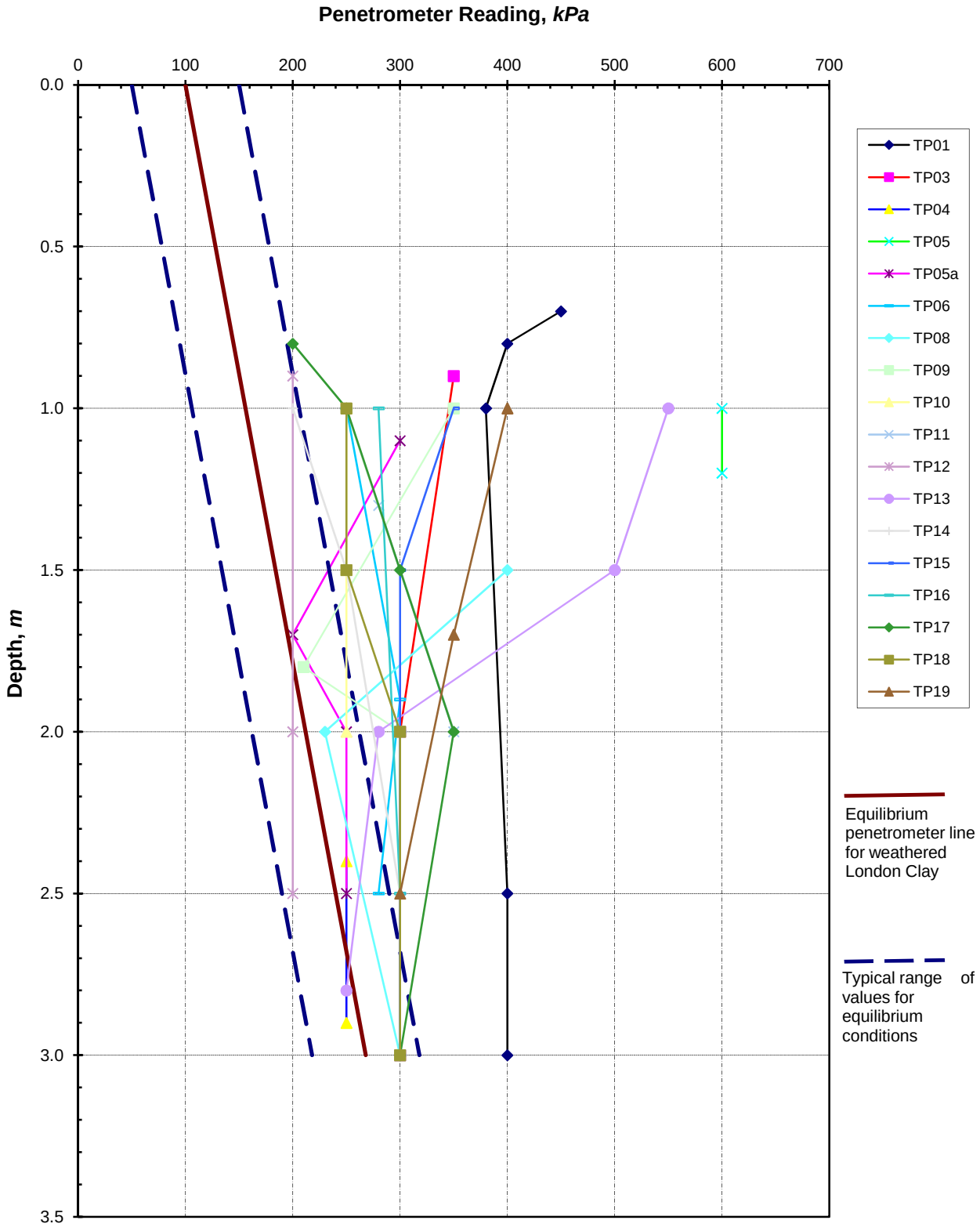
Determinand	Method	Test Sample	LOD	Units	Symbol	SAL References
Selenium	T257	A40	3	mg/kg	U	001-003
Zinc	T257	A40	2	mg/kg	M	001-003
Asbestos ID	T27	A40			SU	001-003
Chromium VI	T6	A40	1	mg/kg	N	001-003
Fraction Organic Carbon - F(oc)	T917	A40	0.001	%	N	001-003
pH	T7	A40			M	001-003
Soil Organic Matter	T287	A40	0.1	%	N	001-003
(Water Soluble) SO4-- expressed as SO4	T242	A40	0.01	g/l	M	001-003
Sulphide	T4	A40	10	mg/kg	N	001-003
Cyanide(Total)	T921	AR	1	mg/kg	M	001-003
Phenols(Mono)	T921	AR	1	mg/kg	M	001-003
Moisture @105C	T162	AR	0.1	%	N	001-003
Retained on 2mm	T2	A40	0.1	%	N	001-003
Naphthalene	T16	AR	0.1	mg/kg	U	001-003
Acenaphthylene	T16	AR	0.1	mg/kg	U	001-003
Acenaphthene	T16	AR	0.1	mg/kg	M	001-003
Fluorene	T16	AR	0.1	mg/kg	M	001-003
Phenanthrene	T16	AR	0.1	mg/kg	U	001-003
Anthracene	T16	AR	0.1	mg/kg	M	001-003
Fluoranthene	T16	AR	0.1	mg/kg	N	001-003
Pyrene	T16	AR	0.1	mg/kg	N	001-003
Benzo(a)Anthracene	T16	AR	0.1	mg/kg	M	001-003
Chrysene	T16	AR	0.1	mg/kg	M	001-003
Benzo(b)fluoranthene	T16	AR	0.1	mg/kg	U	001-003
Benzo(k)fluoranthene	T16	AR	0.1	mg/kg	N	001-003
Benzo(a)Pyrene	T16	AR	0.1	mg/kg	M	001-003
Indeno(123-cd)Pyrene	T16	AR	0.1	mg/kg	M	001-003
Dibenzo(ah)Anthracene	T16	AR	0.1	mg/kg	M	001-003
Benzo(ghi)Perylene	T16	AR	0.1	mg/kg	M	001-003
PAH(total)	T16	AR	0.1	mg/kg	U	001-003
TPH (C5-C6)	T54	AR	0.10	mg/kg	N	001-002
TPH (C6-C8)	T54	AR	0.10	mg/kg	N	001-002
TPH (C8-C10)	T54	AR	0.10	mg/kg	N	001-002
TPH (C10-C12)	T219	AR	2	mg/kg	U	001-002
TPH (C12-C16)	T219	AR	2	mg/kg	U	001-002
TPH (C16-C21)	T219	AR	2	mg/kg	U	001-002
TPH (C21-C35)	T219	AR	2	mg/kg	U	001-002
TPH (C35-C40)	T219	AR	2	mg/kg	N	001-002

APPENDIX E

Desiccation Analysis

Pocket Penetrometer Reading *vs* Depth

Test Hole Nos:

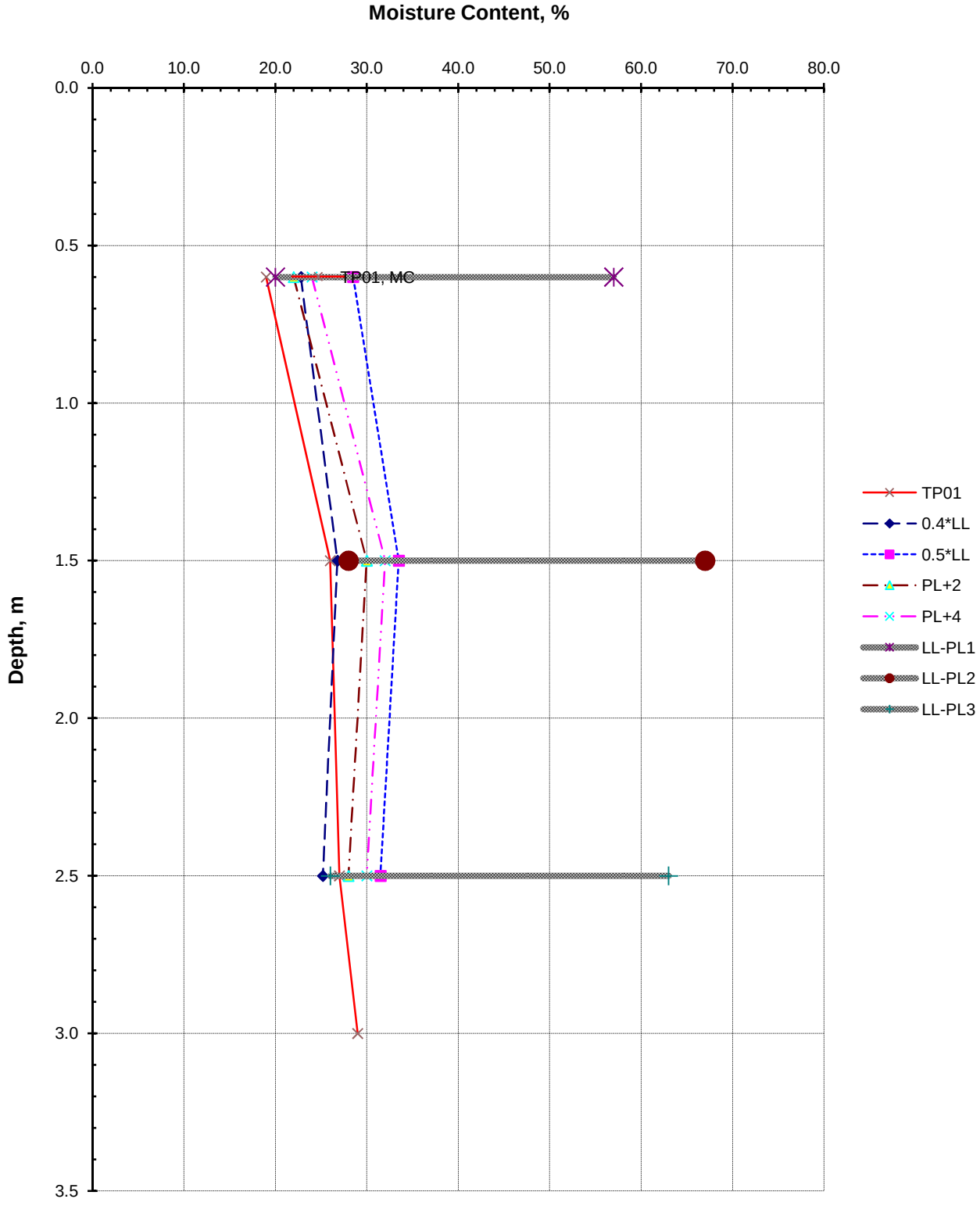


* *Reference made to "A rapid and reliable on-site method of assessing desiccation in clay soils", by R S Pugh, P G Parnell, and R D Parkes, Proc. Instn Civ. Engrs. Geotech. Engng. 1995, 113 pp. 25-30*

Client:	**Crest Nicholson**	**Job No:**	J12760	
Site:	**Bell Farm, Harrietsham**	**Date:**	30/09/2016	**Fig.**

Moisture Content and Atterberg Limit Tests *vs* Depth

In Accordance with BS 1377 : Part 2 : 1990 : Clause 3

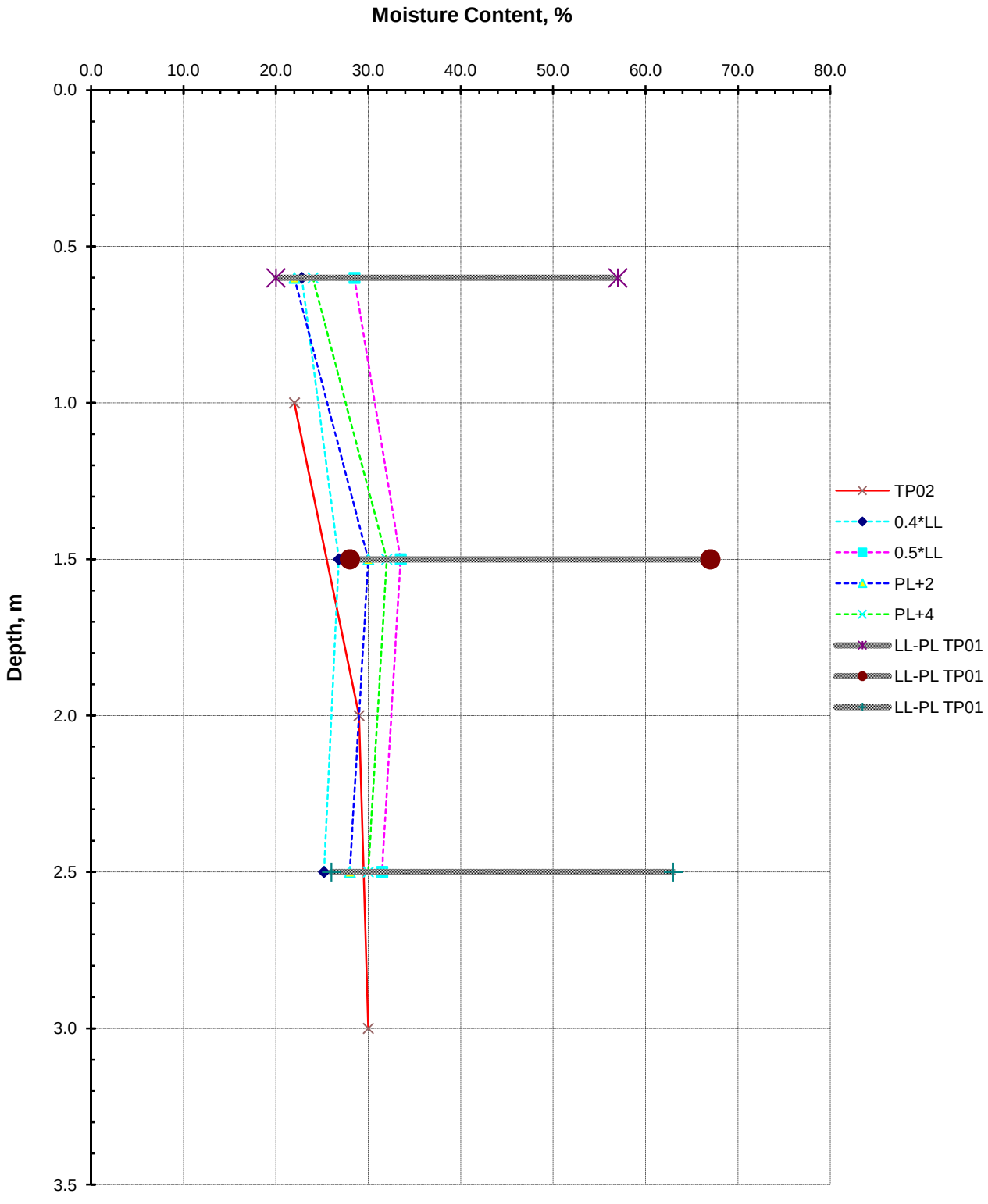


Note:

Client:	**Bell Farm**	**Site:**	**Crest Nicholson (Eastern)**		
Job No:	J12760	**Date:**	23/09/2016	**Figure:**	MC2

Moisture Content and Atterberg Limit Tests *vs* Depth

In Accordance with BS 1377 : Part 2 : 1990 : Clause 3

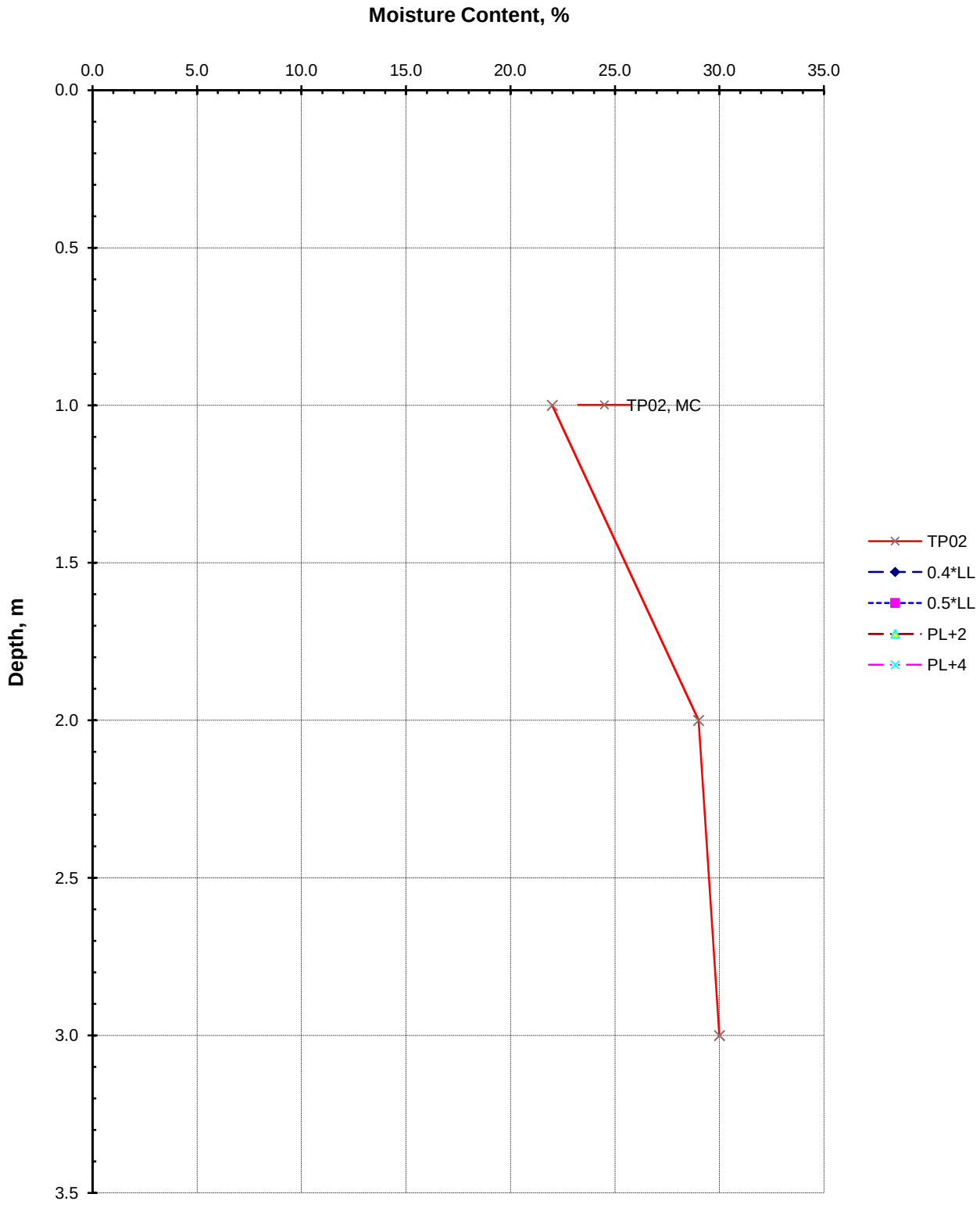


Note:

Client:	**Bell Farm**	**Site:**	**Crest Nicholson (Eastern)**		
Job No:	J12760	**Date:**	30/09/2016	**Figure:**	MC3

Moisture Content and Atterberg Limit Tests *vs* Depth

In Accordance with BS 1377 : Part 2 : 1990 : Clause 3

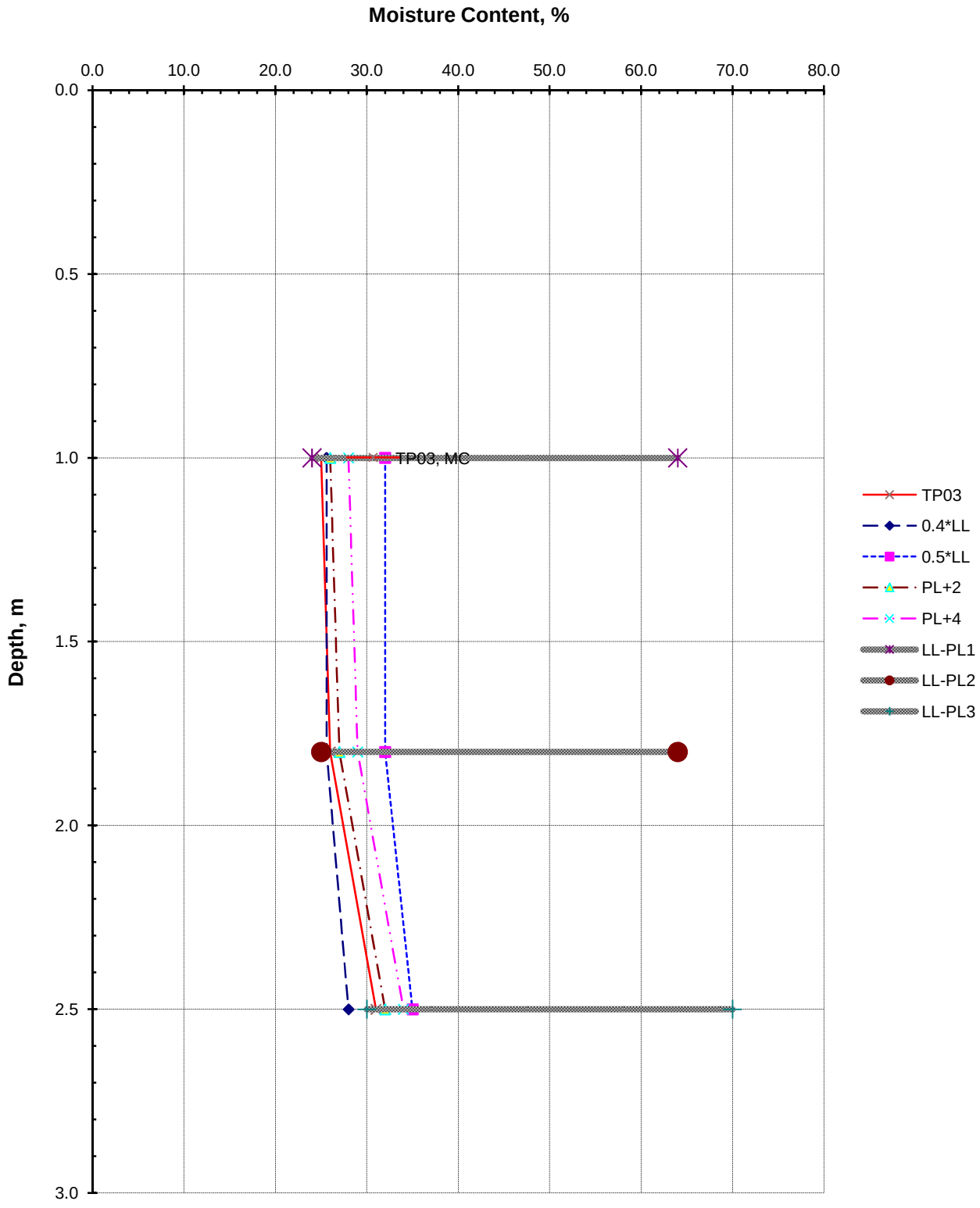


Note:

Client:	**Bell Farm**	**Site:**	**Crest Nicholson (Eastern)**		
Job No:	J12760	**Date:**	23/09/2016	**Figure:**	MC2

Moisture Content and Atterberg Limit Tests *vs* Depth

In Accordance with BS 1377 : Part 2 : 1990 : Clause 3

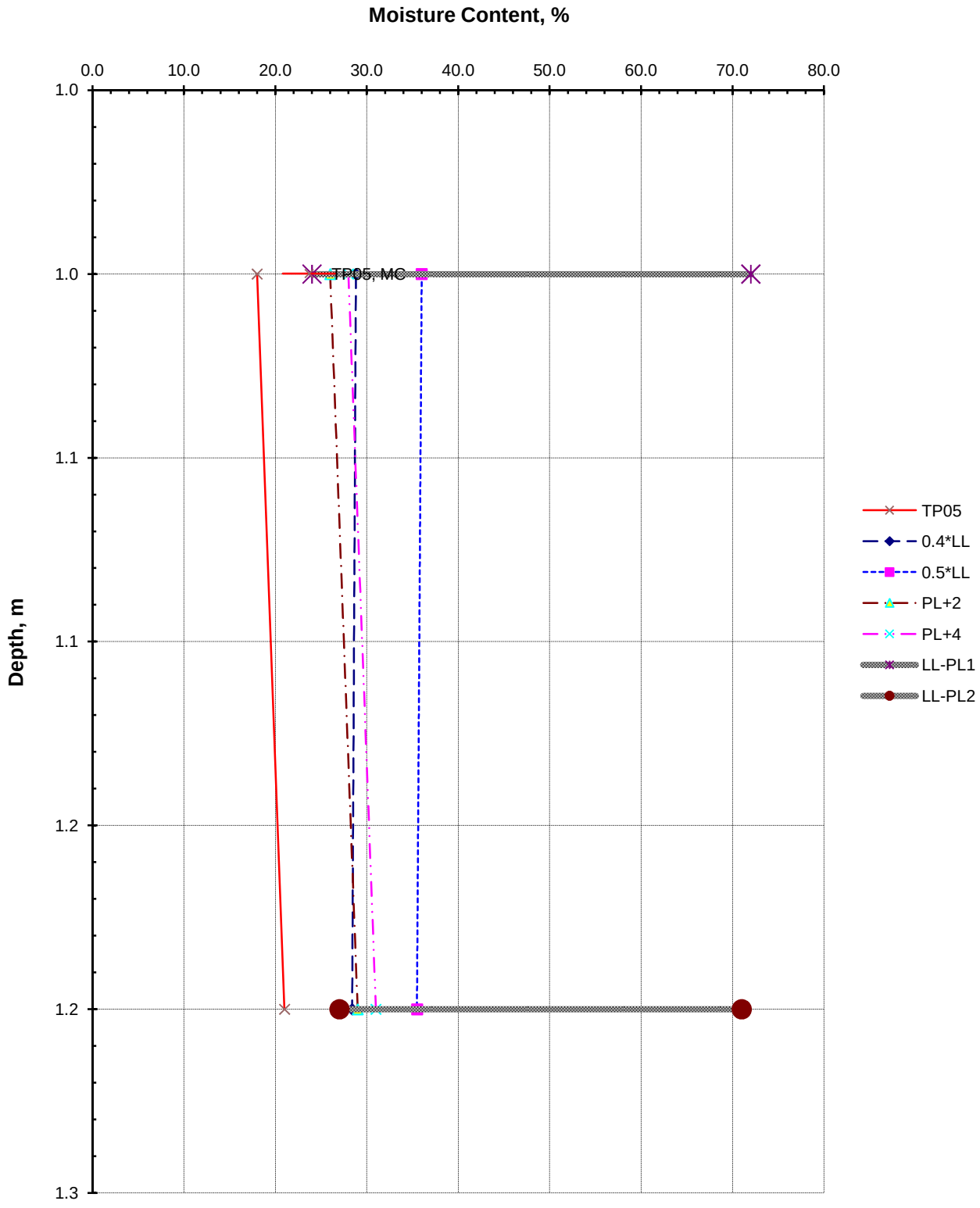


Note:

Client: Bell Farm		**Site:** Crest Nicholson (Eastern)	
Job No: J12760	**Date:** 23/09/2016		**Figure:** MC2

Moisture Content and Atterberg Limit Tests *vs* Depth

In Accordance with BS 1377 : Part 2 : 1990 : Clause 3

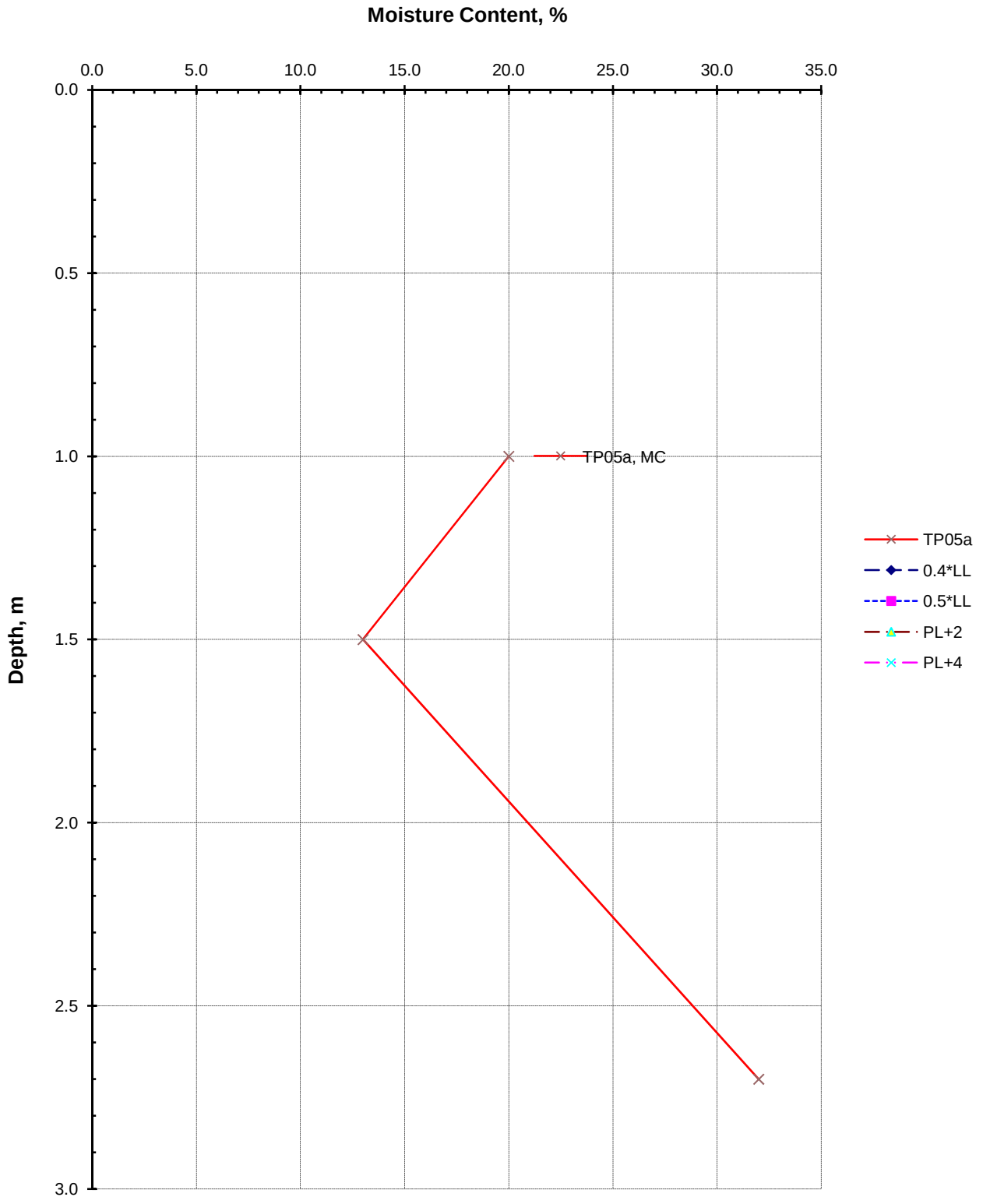


Note:

Client:	**Bell Farm**	**Site:**	**Crest Nicholson (Eastern)**		
Job No:	J12760	**Date:**	23/09/2016	**Figure:**	MC2

Moisture Content and Atterberg Limit Tests *vs* Depth

In Accordance with BS 1377 : Part 2 : 1990 : Clause 3

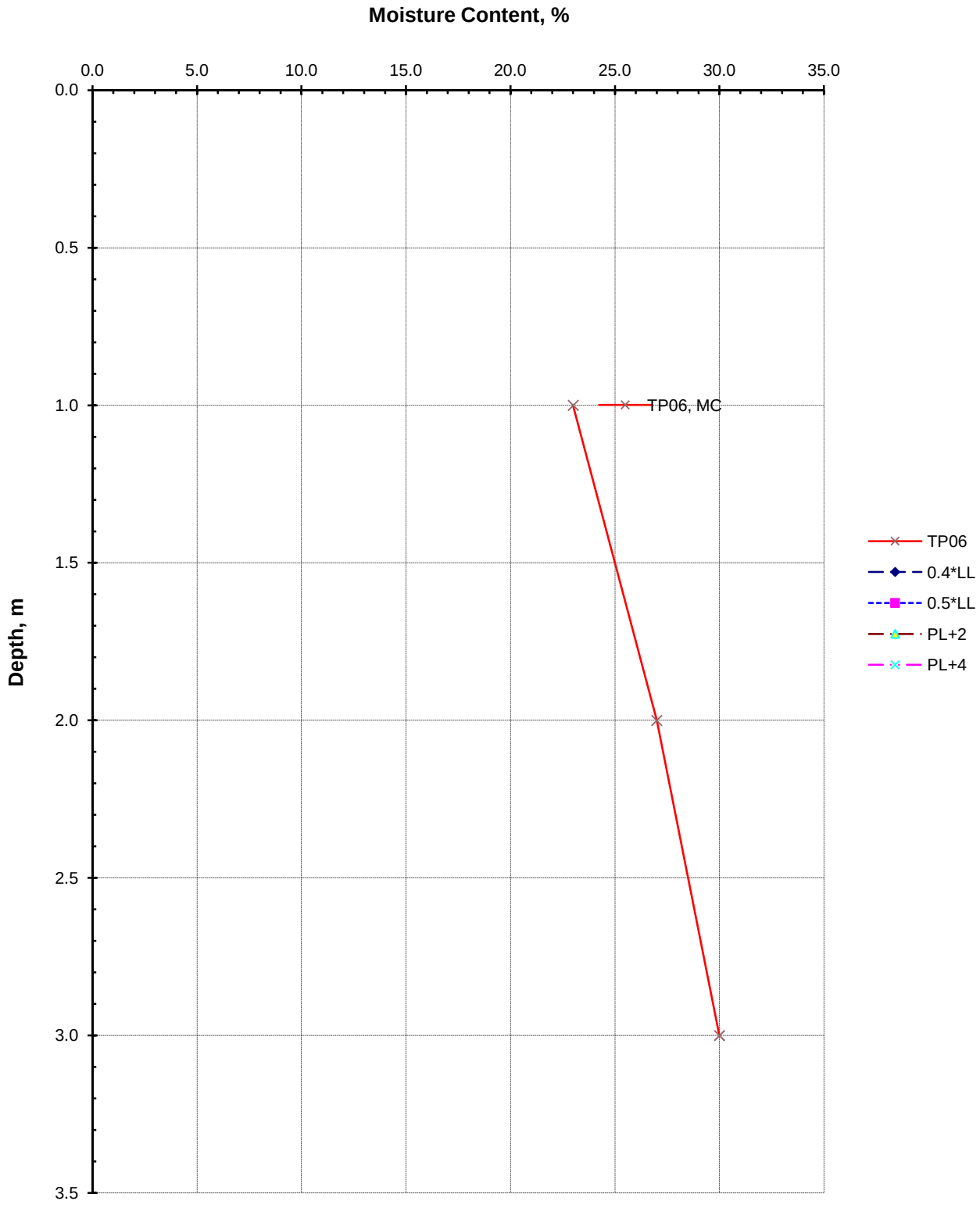


Note:

Client: Bell Farm		**Site:** Crest Nicholson (Eastern)	
Job No: J12760	**Date:** 23/09/2016		**Figure:** MC2

Moisture Content and Atterberg Limit Tests *vs* Depth

In Accordance with BS 1377 : Part 2 : 1990 : Clause 3

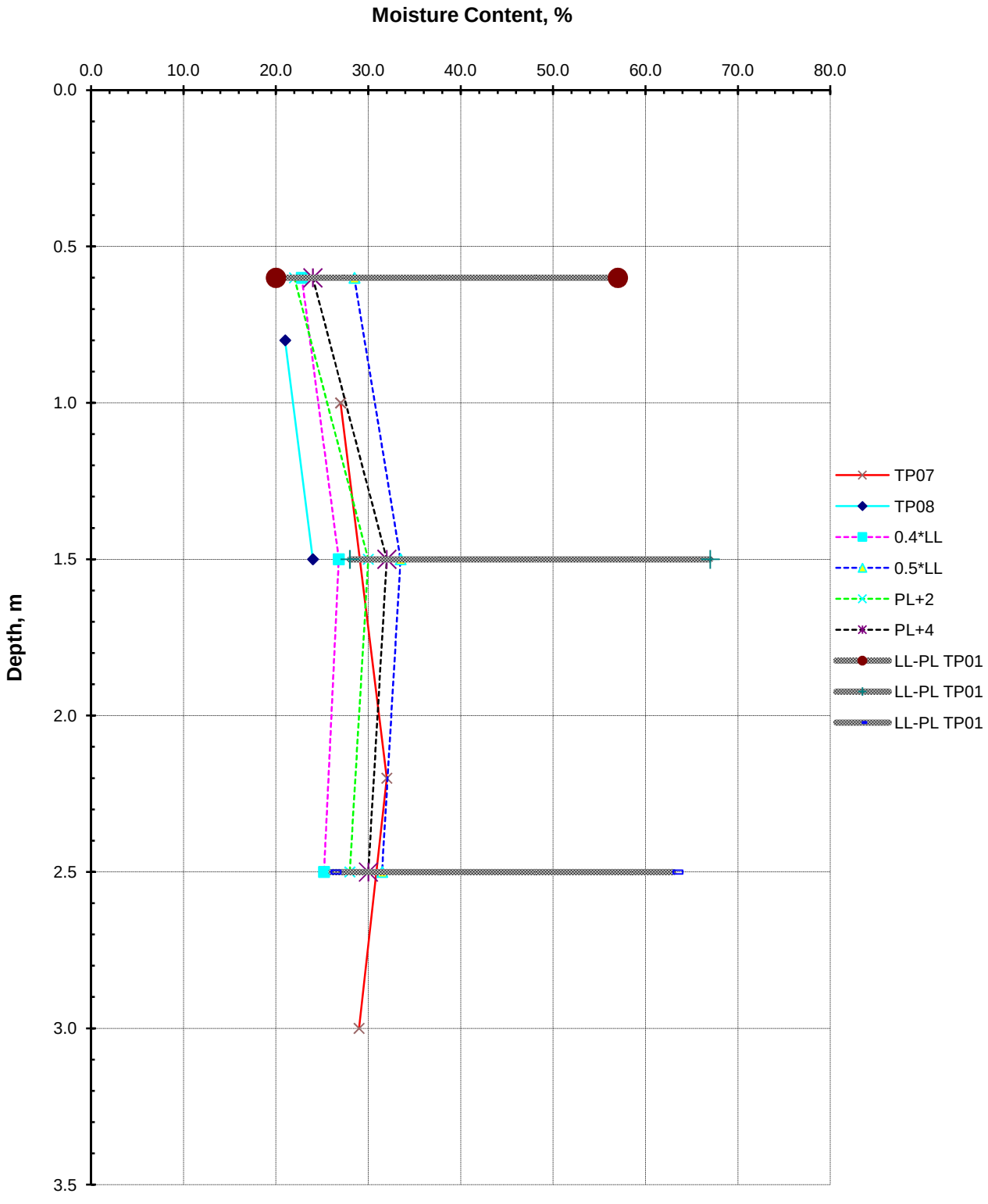


Note:

Client:	**Bell Farm**	**Site:**	**Crest Nicholson (Eastern)**		
Job No:	J12760	**Date:**	23/09/2016	**Figure:**	MC2

Moisture Content and Atterberg Limit Tests *vs* Depth

In Accordance with BS 1377 : Part 2 : 1990 : Clause 3

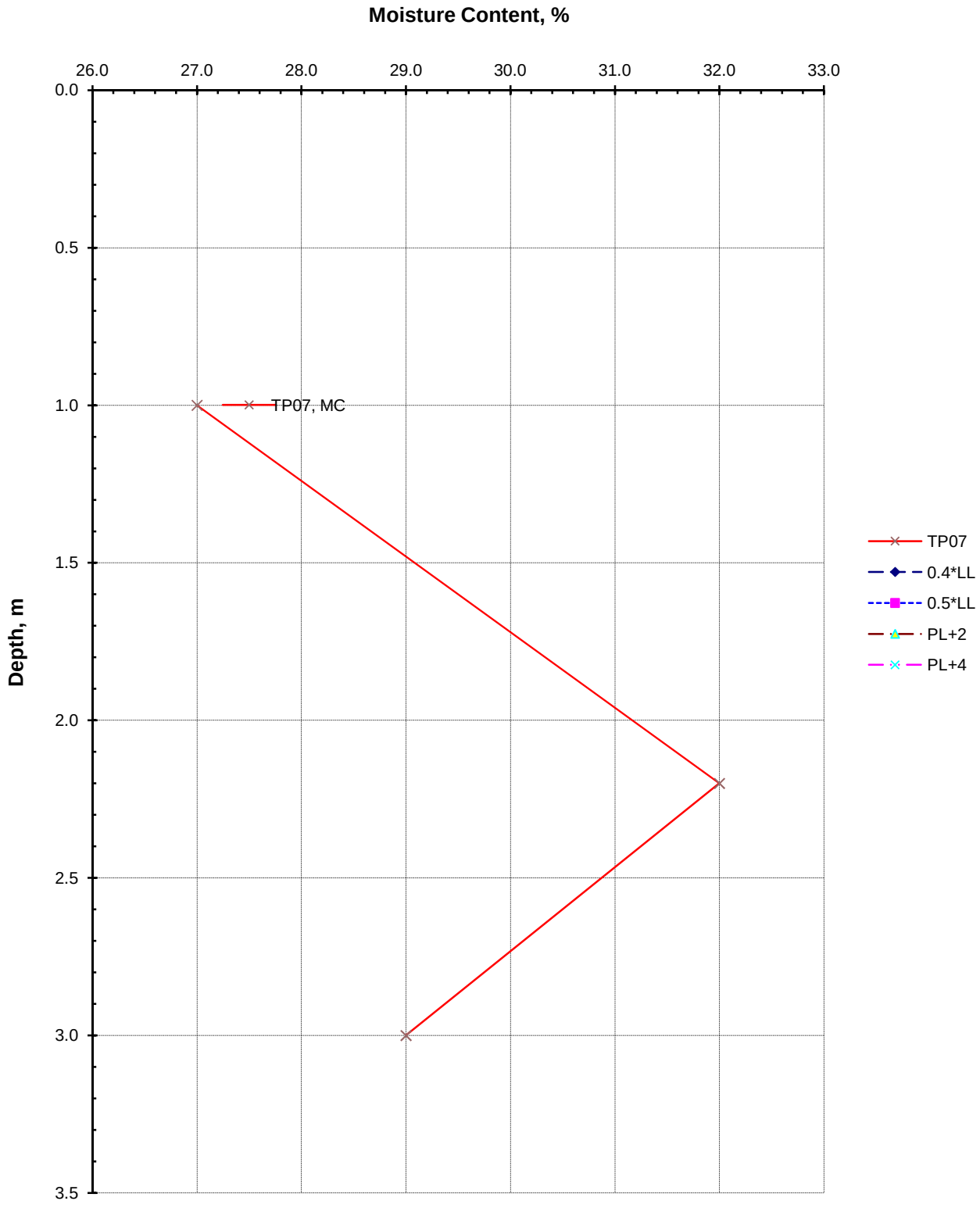


Note:

Client:	**Bell Farm**	**Site:**	**Crest Nicholson (Eastern)**		
Job No:	J12760	**Date:**	30/09/2016	**Figure:**	MC3

Moisture Content and Atterberg Limit Tests *vs* Depth

In Accordance with BS 1377 : Part 2 : 1990 : Clause 3

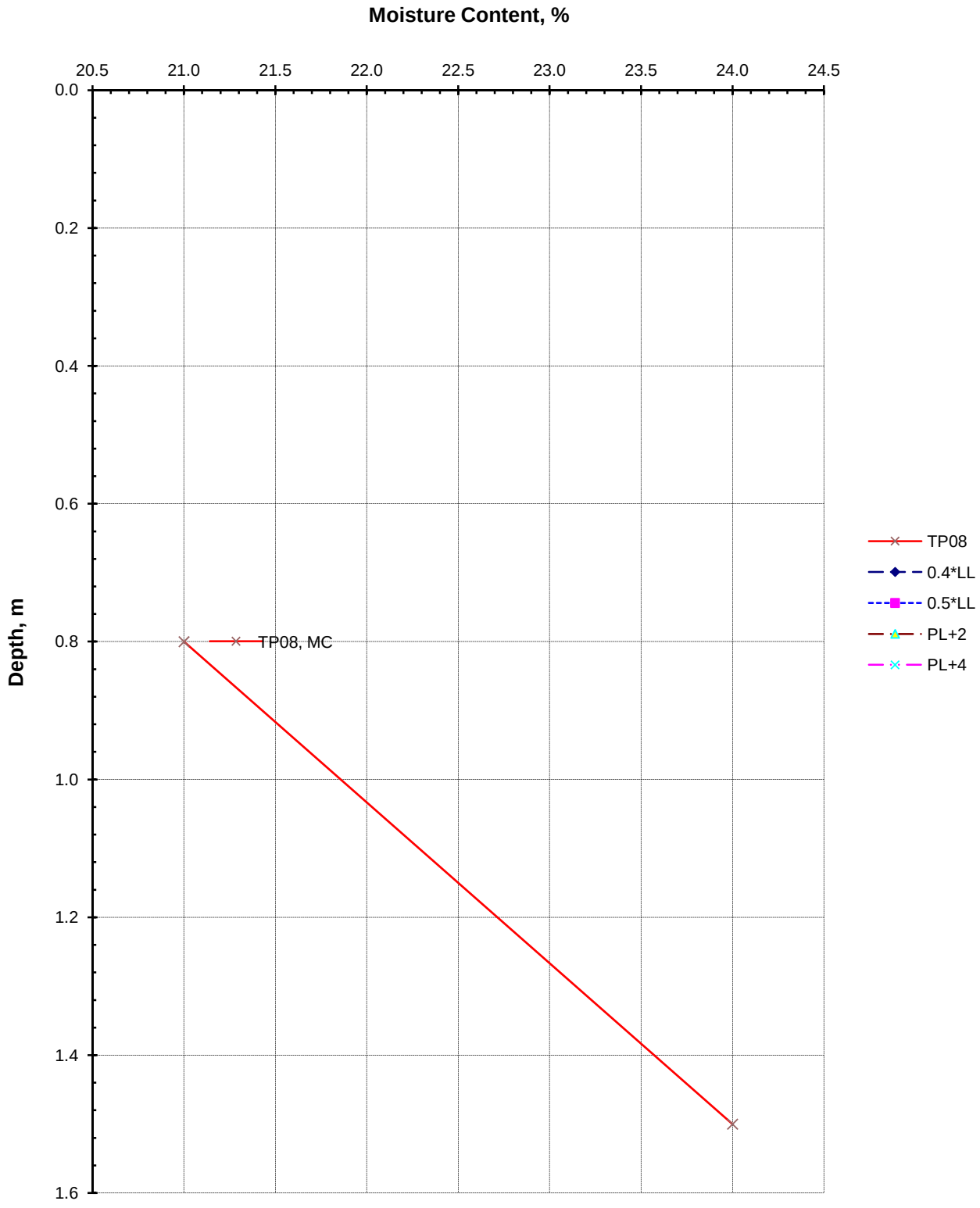


Note:

Client:	**Bell Farm**	**Site:**	**Crest Nicholson (Eastern)**		
Job No:	J12760	**Date:**	23/09/2016	**Figure:**	MC2

Moisture Content and Atterberg Limit Tests *vs* Depth

In Accordance with BS 1377 : Part 2 : 1990 : Clause 3

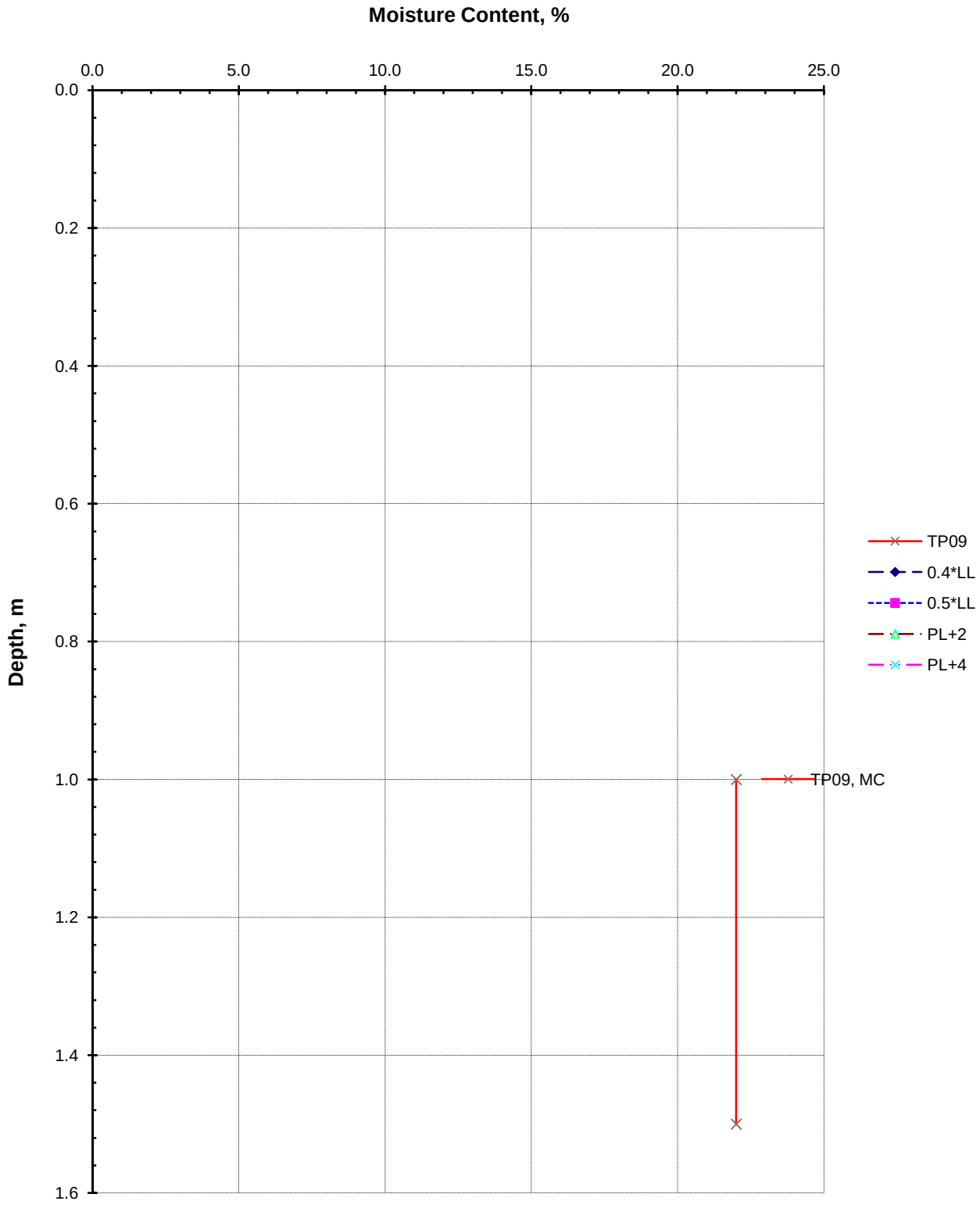


Note:

Client:	**Bell Farm**	**Site:**	**Crest Nicholson (Eastern)**		
Job No:	J12760	**Date:**	23/09/2016	**Figure:**	MC2

Moisture Content and Atterberg Limit Tests *vs* Depth

In Accordance with BS 1377 : Part 2 : 1990 : Clause 3

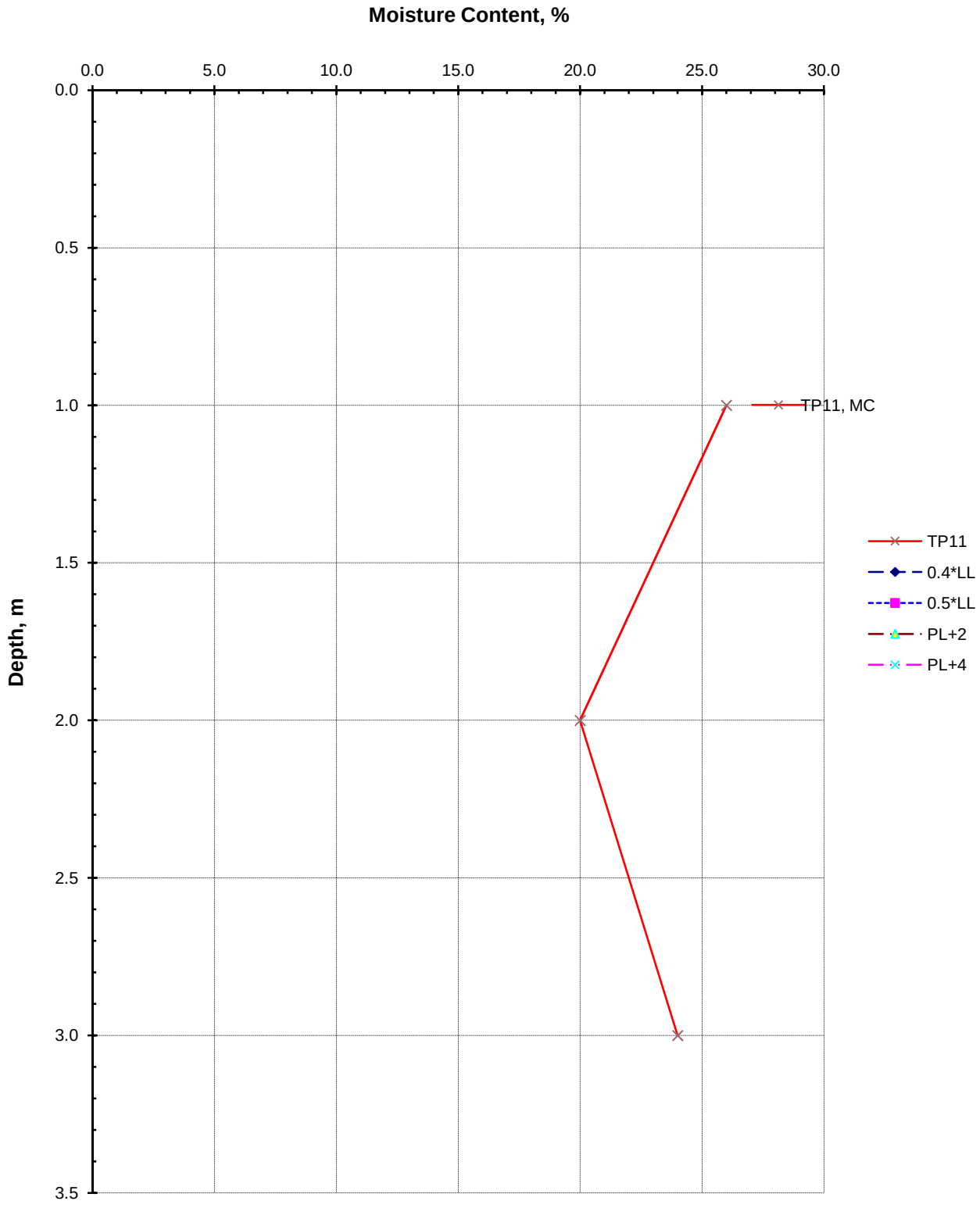


Note:

Client:	**Bell Farm**	**Site:**	**Crest Nicholson (Eastern)**		
Job No:	J12760	**Date:**	23/09/2016	**Figure:**	MC2

Moisture Content and Atterberg Limit Tests *vs* Depth

In Accordance with BS 1377 : Part 2 : 1990 : Clause 3

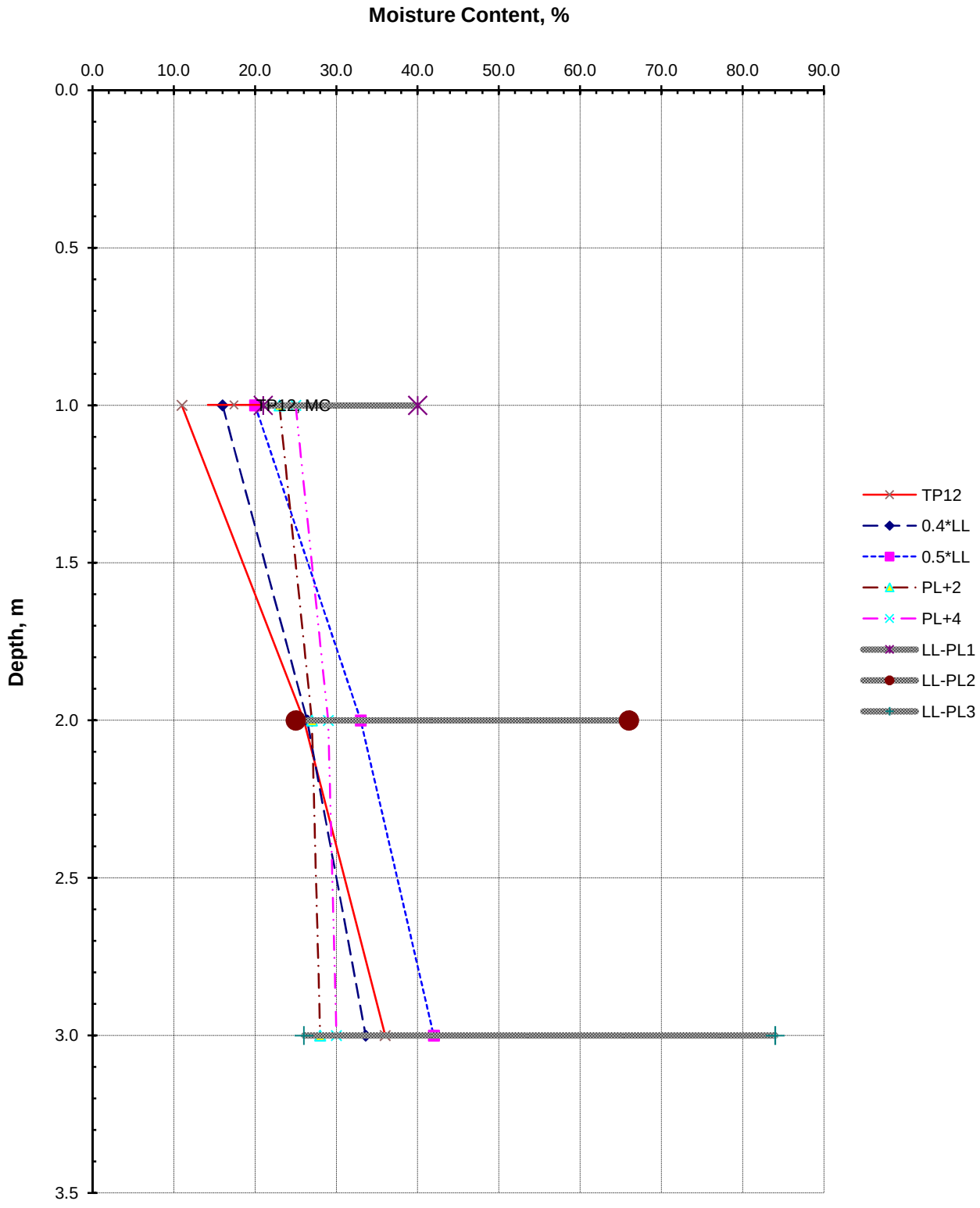


Note:

Client:	**Bell Farm**	**Site:**	**Crest Nicholson (Eastern)**		
Job No:	J12760	**Date:**	23/09/2016	**Figure:**	MC2

Moisture Content and Atterberg Limit Tests *vs* Depth

In Accordance with BS 1377 : Part 2 : 1990 : Clause 3

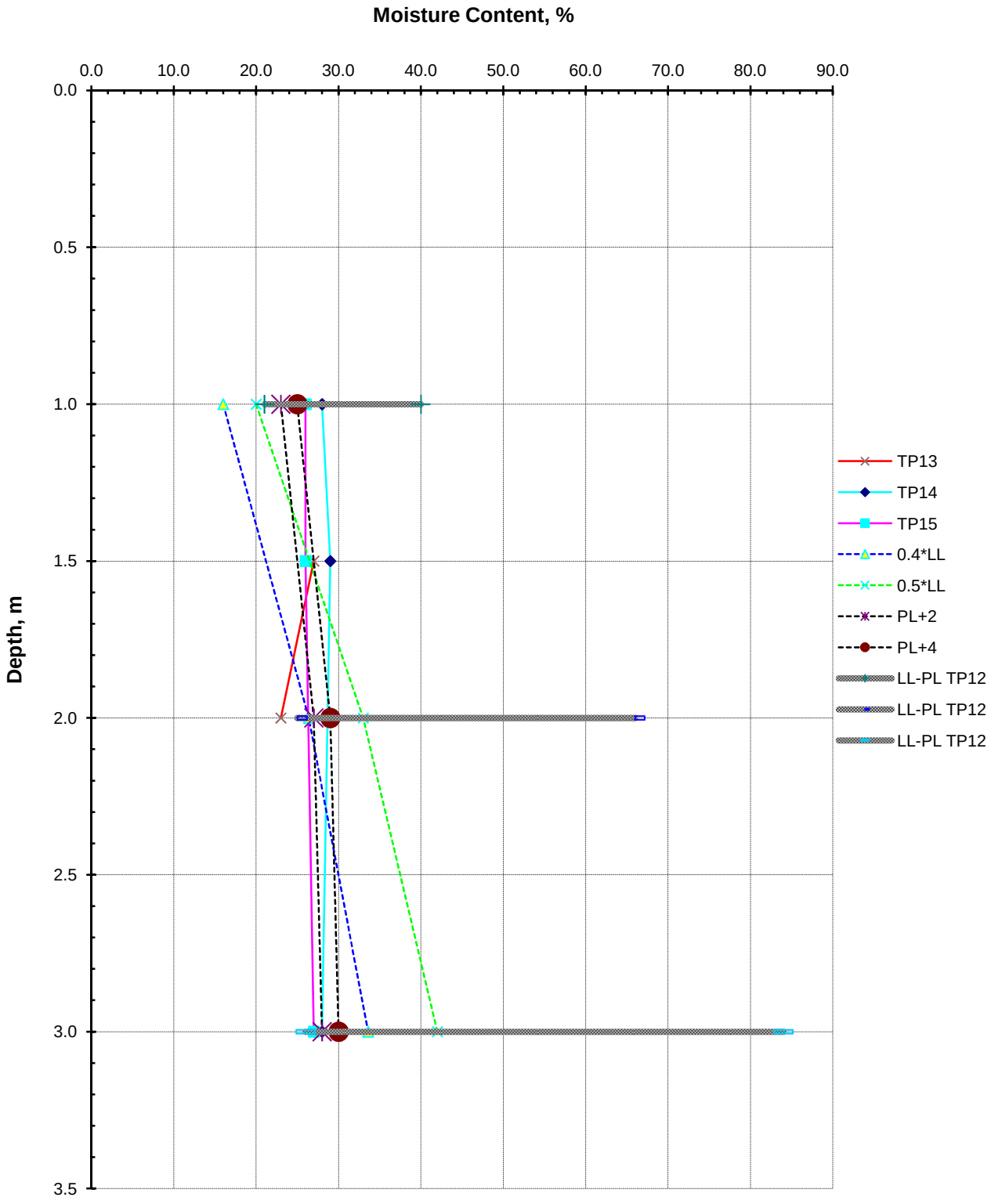


Note:

Client: Bell Farm		**Site:** Crest Nicholson (Eastern)	
Job No: J12760	**Date:** 23/09/2016	**Figure:** MC2	

Moisture Content and Atterberg Limit Tests *vs* Depth

In Accordance with BS 1377 : Part 2 : 1990 : Clause 3

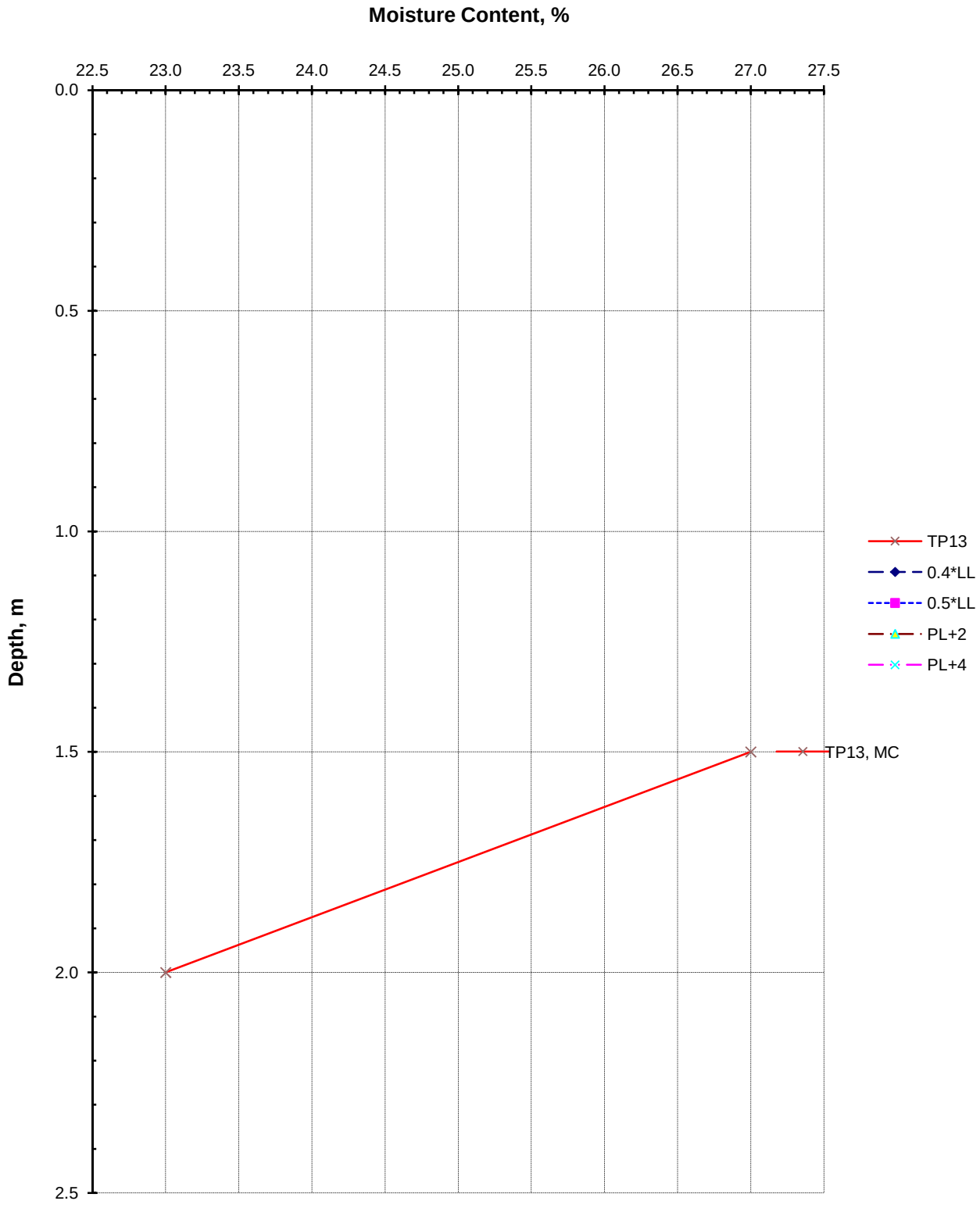


Note:

Client:	**Bell Farm**	**Site:**	**Crest Nicholson (Eastern)**		
Job No:	J12760	**Date:**	30/09/2016	**Figure:**	MC3

Moisture Content and Atterberg Limit Tests *vs* Depth

In Accordance with BS 1377 : Part 2 : 1990 : Clause 3

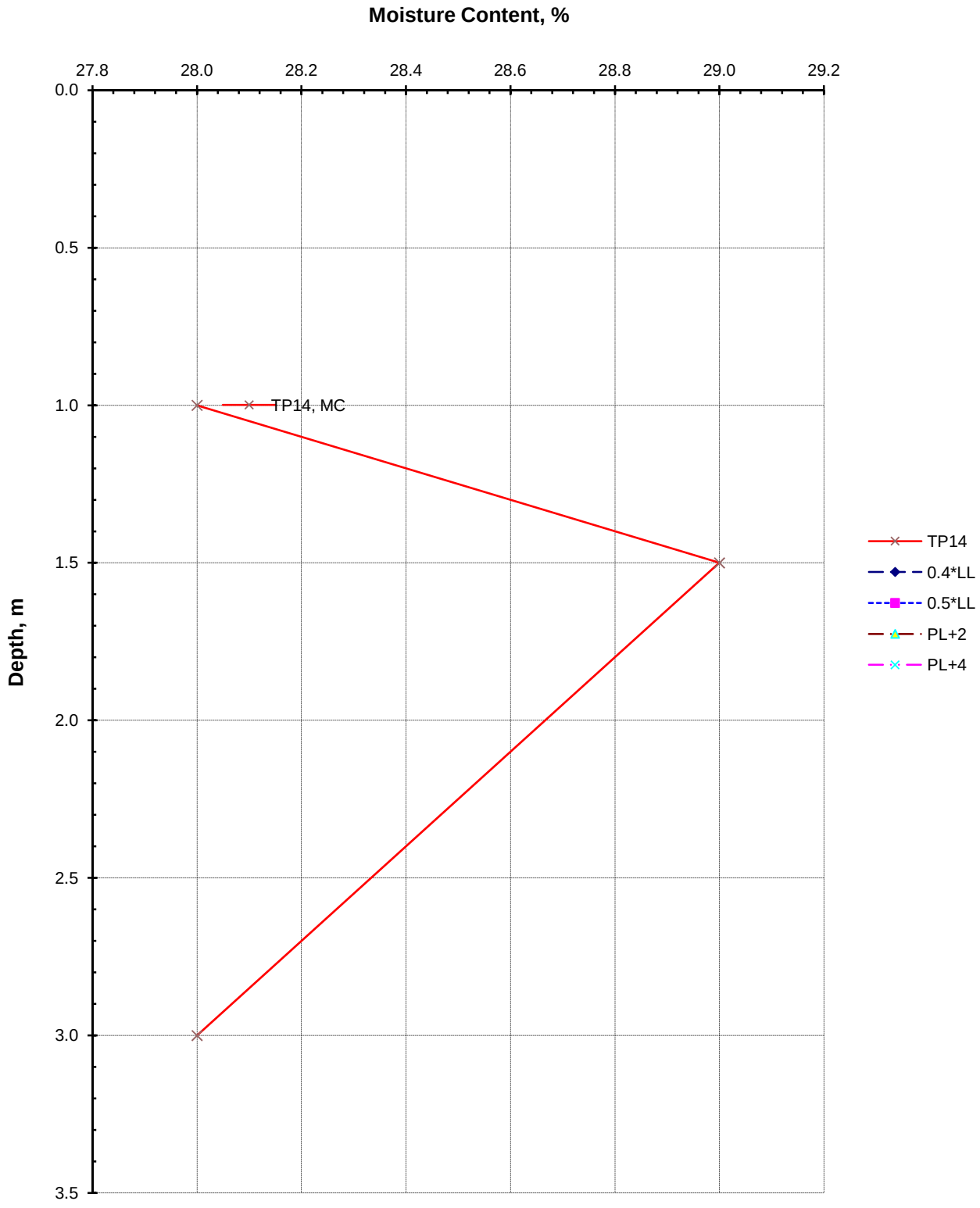


Note:

Client:	**Bell Farm**	**Site:**	**Crest Nicholson (Eastern)**		
Job No:	J12760	**Date:**	23/09/2016	**Figure:**	MC2

Moisture Content and Atterberg Limit Tests *vs* Depth

In Accordance with BS 1377 : Part 2 : 1990 : Clause 3

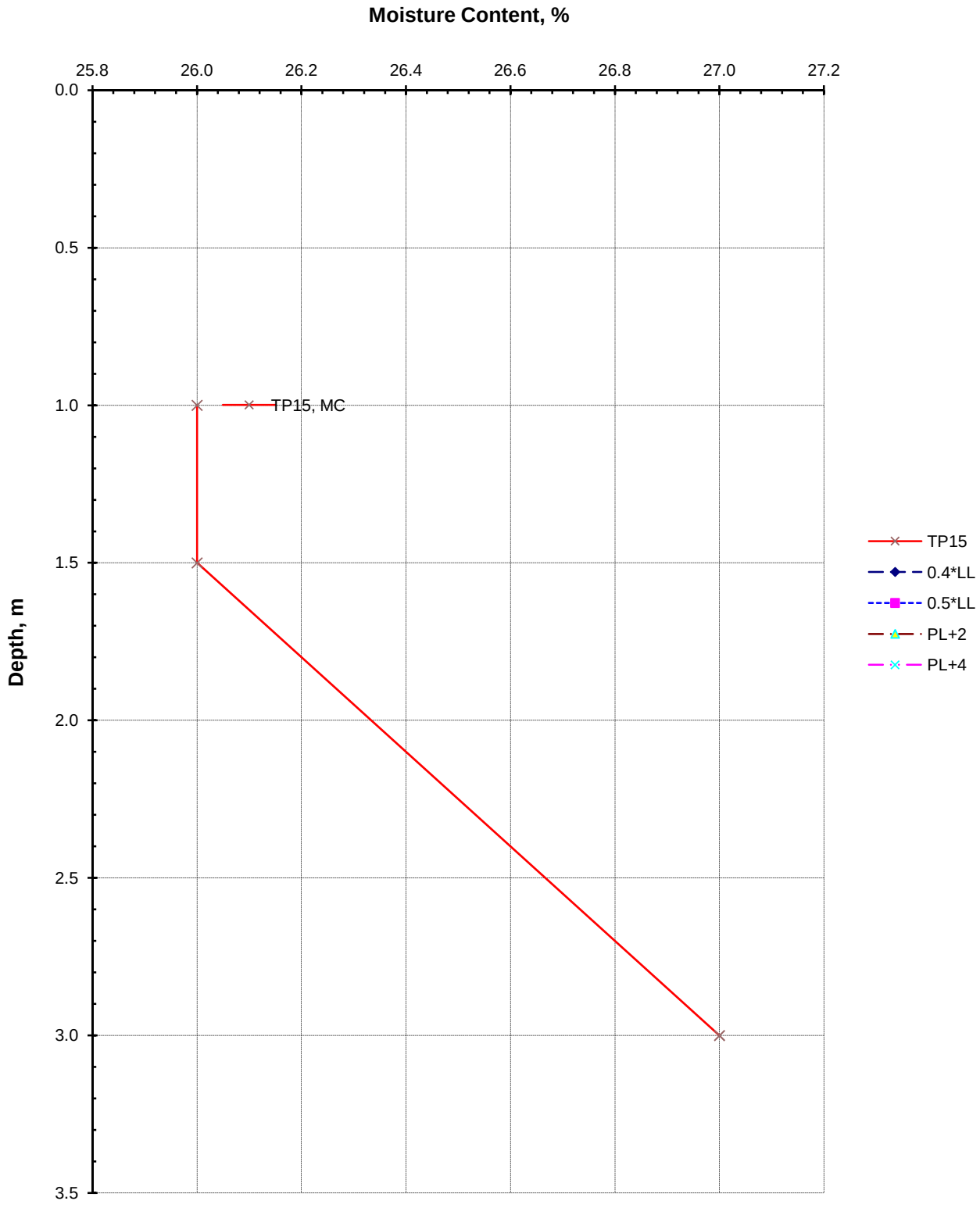


Note:

Client: Bell Farm		**Site:** Crest Nicholson (Eastern)	
Job No: J12760	**Date:** 23/09/2016	**Figure:**	MC2

Moisture Content and Atterberg Limit Tests *vs* Depth

In Accordance with BS 1377 : Part 2 : 1990 : Clause 3

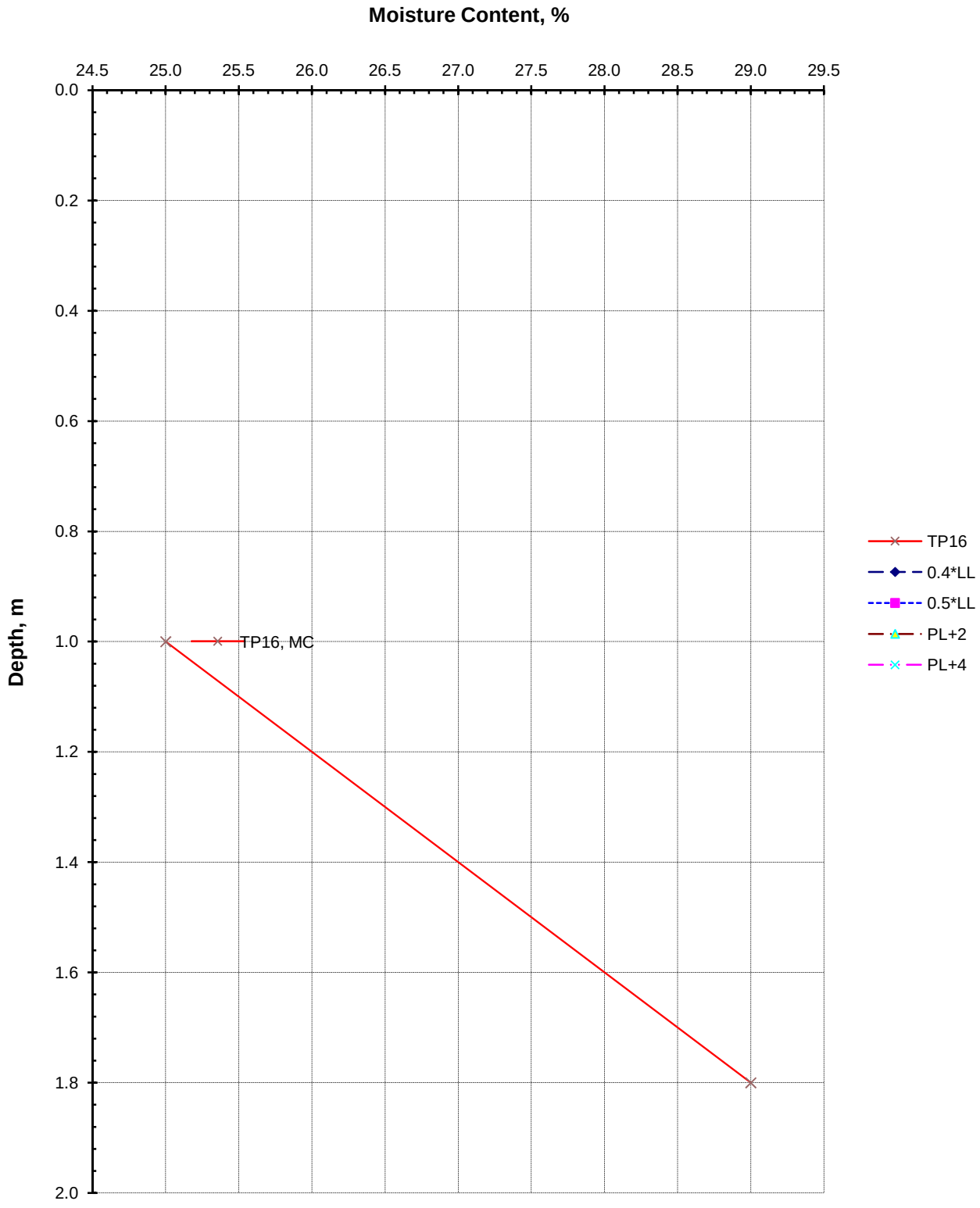


Note:

Client:	**Bell Farm**	**Site:**	**Crest Nicholson (Eastern)**		
Job No:	J12760	**Date:**	23/09/2016	**Figure:**	MC2

Moisture Content and Atterberg Limit Tests *vs* Depth

In Accordance with BS 1377 : Part 2 : 1990 : Clause 3

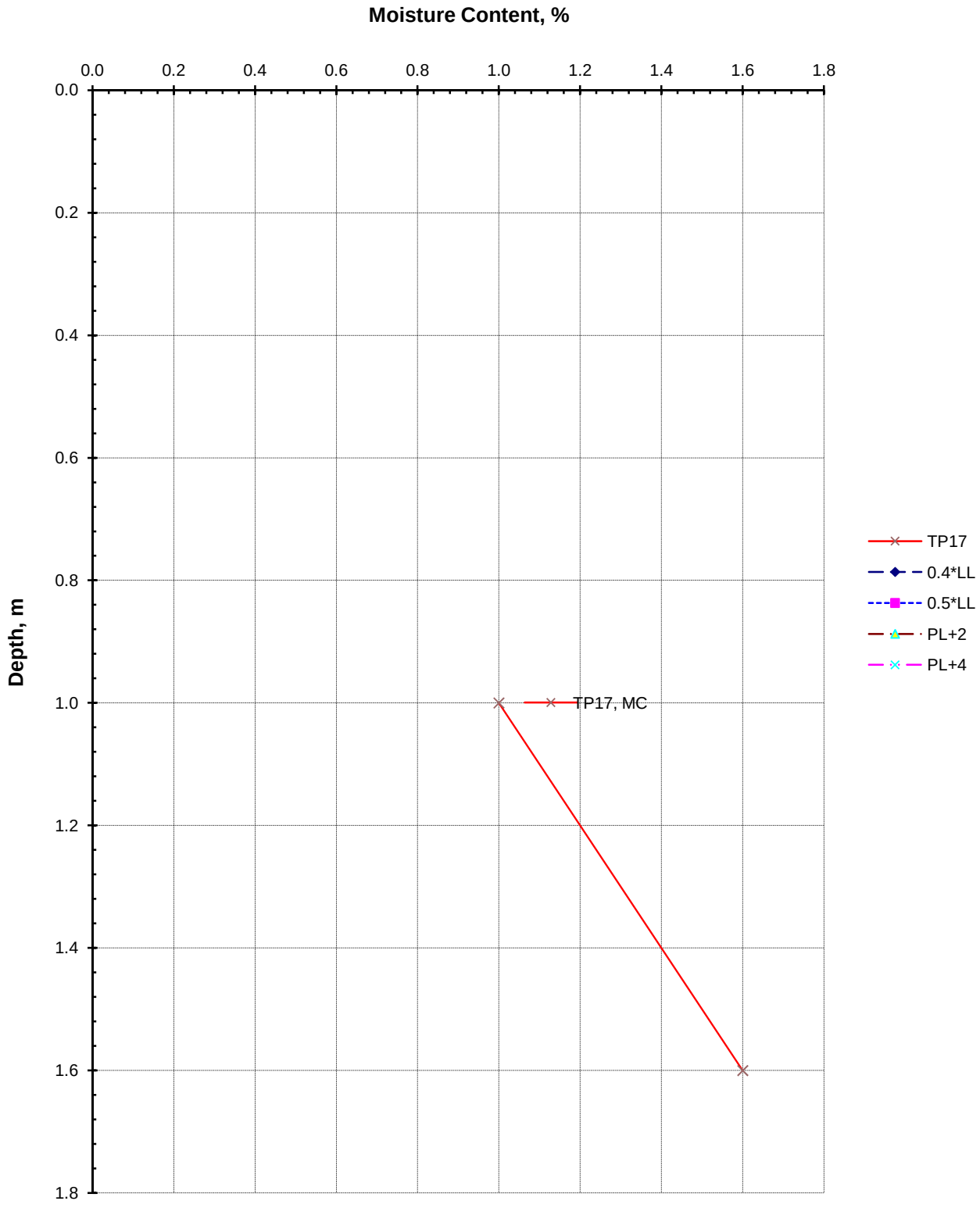


Note:

Client:	**Bell Farm**	**Site:**	**Crest Nicholson (Eastern)**		
Job No:	J12760	**Date:**	23/09/2016	**Figure:**	MC2

Moisture Content and Atterberg Limit Tests *vs* Depth

In Accordance with BS 1377 : Part 2 : 1990 : Clause 3

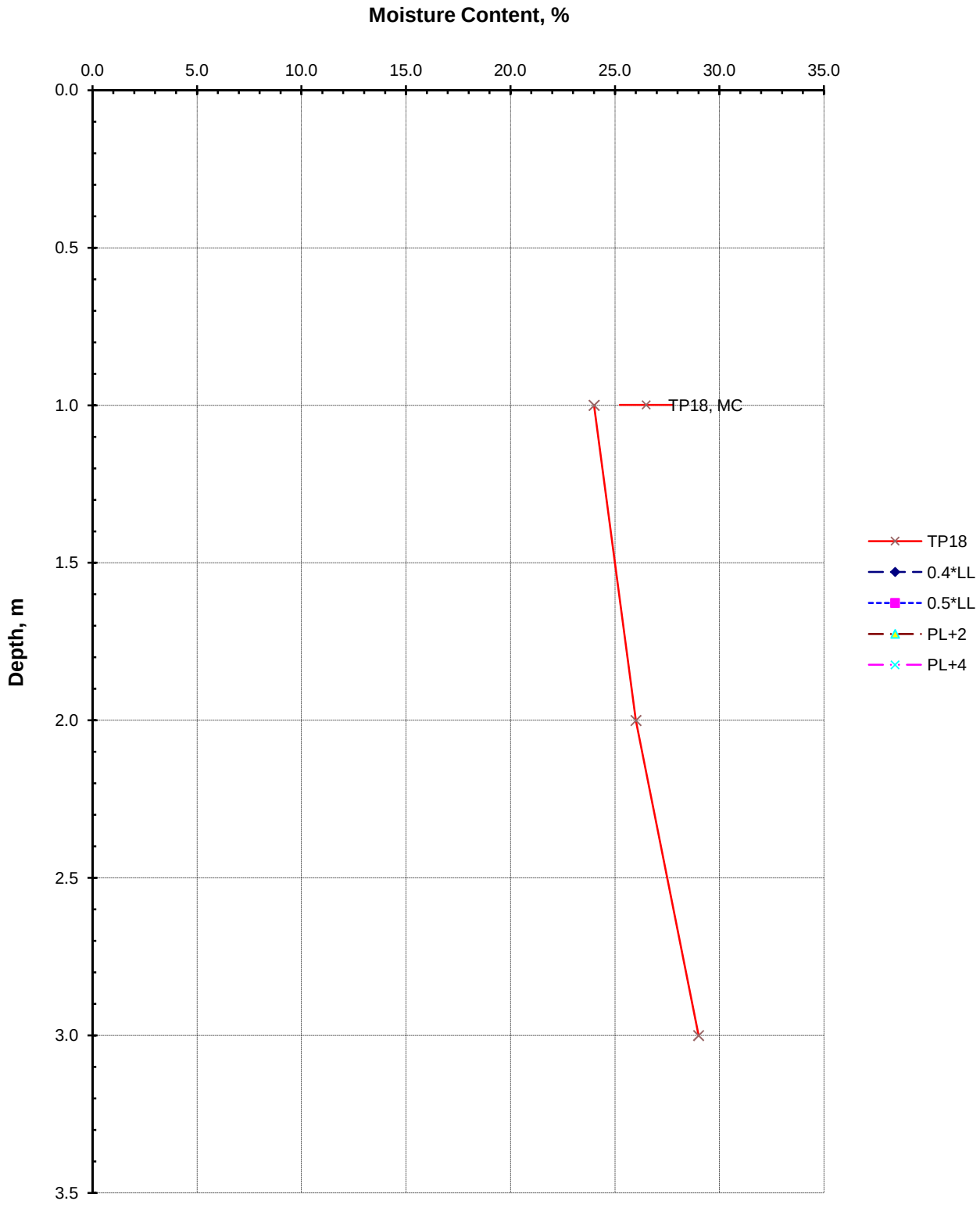


Note:

Client:	**Bell Farm**	**Site:**	**Crest Nicholson (Eastern)**		
Job No:	J12760	**Date:**	23/09/2016	**Figure:**	MC2

Moisture Content and Atterberg Limit Tests *vs* Depth

In Accordance with BS 1377 : Part 2 : 1990 : Clause 3

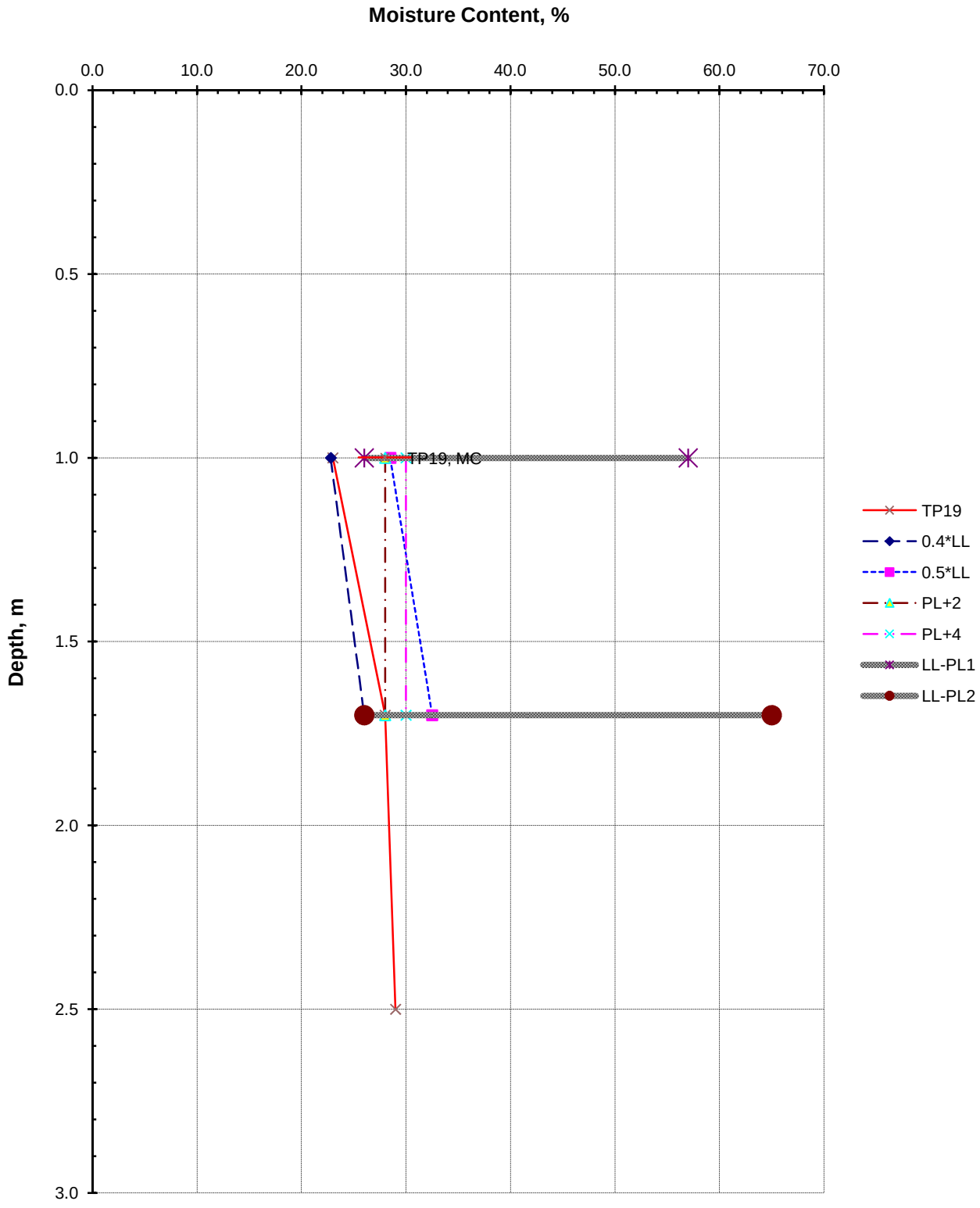


Note:

Client:	**Bell Farm**	**Site:**	**Crest Nicholson (Eastern)**		
Job No:	J12760	**Date:**	23/09/2016	**Figure:**	MC2

Moisture Content and Atterberg Limit Tests *vs* Depth

In Accordance with BS 1377 : Part 2 : 1990 : Clause 3

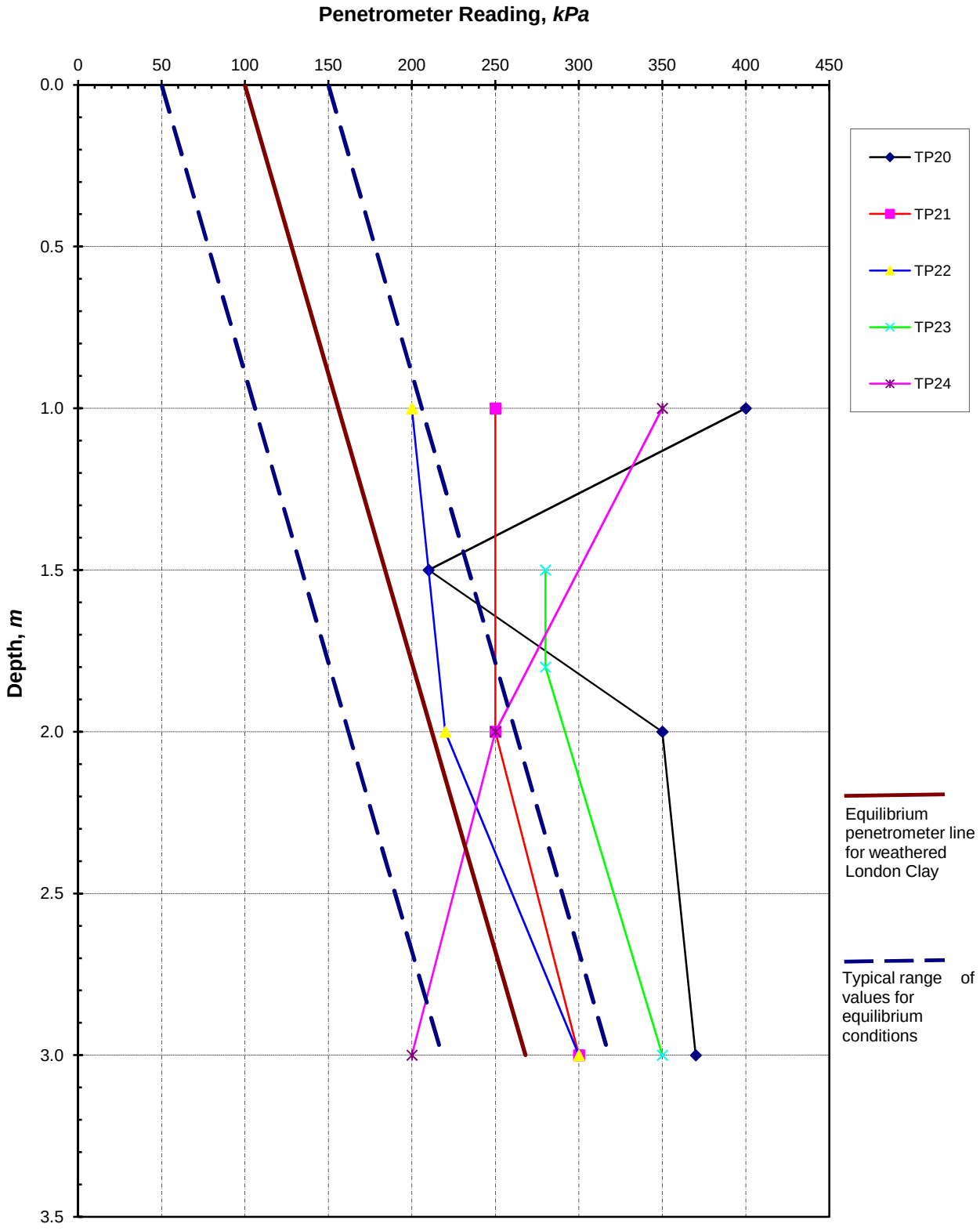


Note:

Client:	**Bell Farm**	**Site:**	**Crest Nicholson (Eastern)**		
Job No:	J12760	**Date:**	23/09/2016	**Figure:**	MC2

Pocket Penetrometer Reading *vs* Depth

Test Hole Nos:

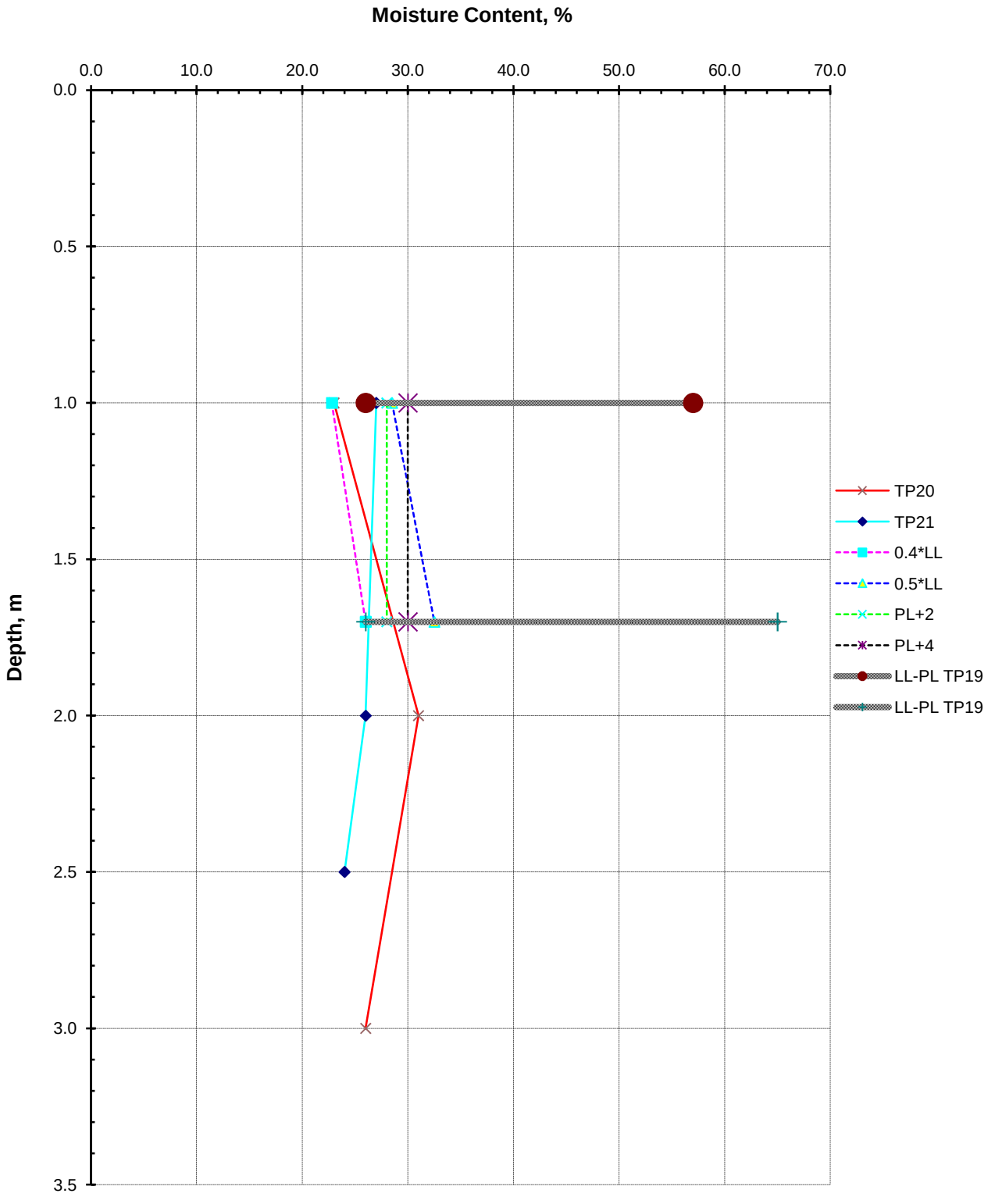


* *Reference made to "A rapid and reliable on-site method of assessing desiccation in clay soils", by R S Pugh, P G Parnell, and R D Parkes, Proc. Instn Civ. Engrs. Geotech. Engng. 1995, 113 pp. 25-30*

Client:	**Crest Nicholson**	**Job No:**	J12760	
Site:	**Bell Farm, Harrietsham**	**Date:**	30/09/2016	**Fig.**

Moisture Content and Atterberg Limit Tests *vs* Depth

In Accordance with BS 1377 : Part 2 : 1990 : Clause 3

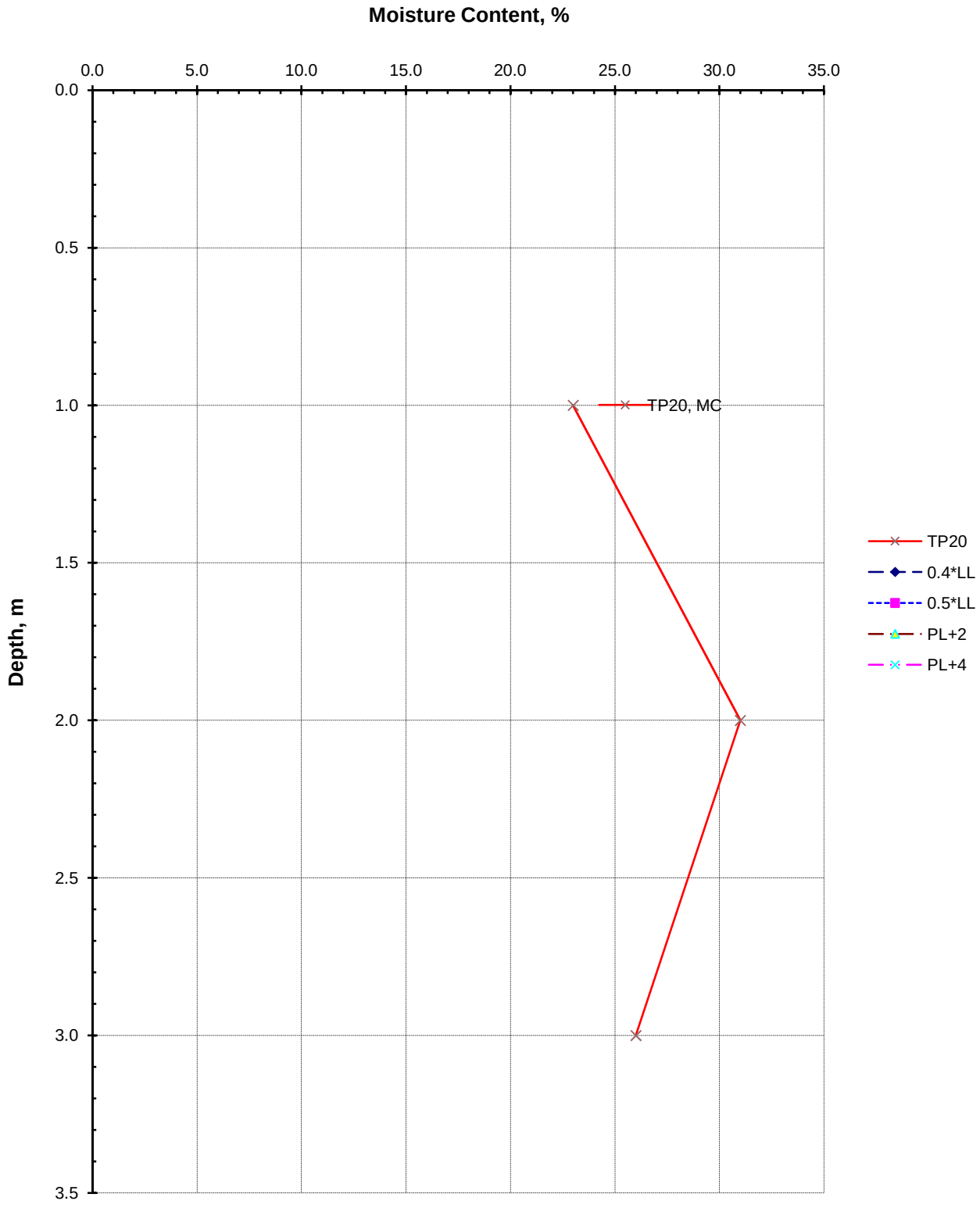


Note:

Client:	**Harrietsham**	**Site:**	**Crest Nicholson (Eastern)**		
Job No:	J12760	**Date:**	30/09/2016	**Figure:**	MC3

Moisture Content and Atterberg Limit Tests *vs* Depth

In Accordance with BS 1377 : Part 2 : 1990 : Clause 3

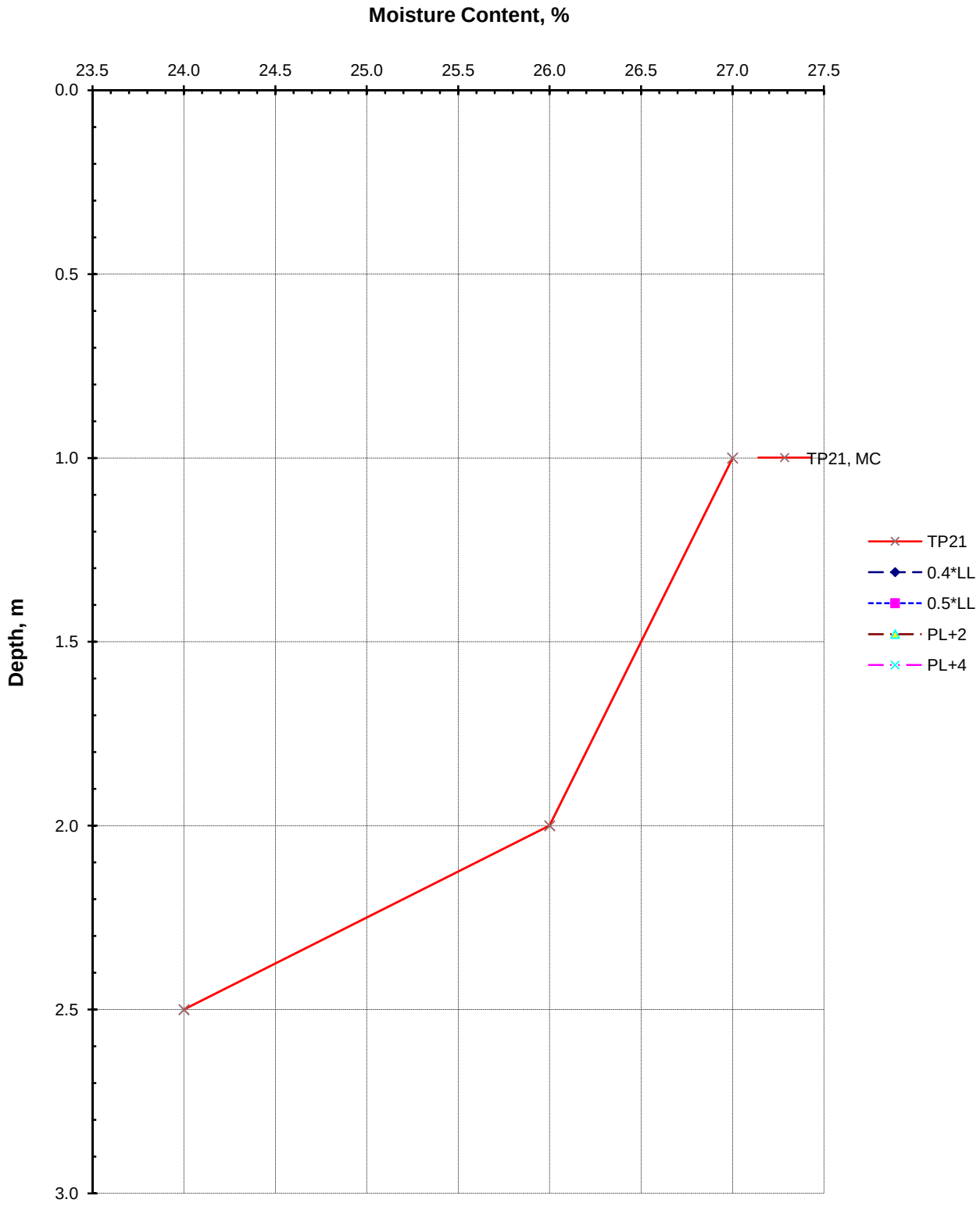


Note:

Client:	**Harrietsham**	**Site:**	**Crest Nicholson (Eastern)**		
Job No:	J12760	**Date:**	23/09/2016	**Figure:**	MC2

Moisture Content and Atterberg Limit Tests *vs* Depth

In Accordance with BS 1377 : Part 2 : 1990 : Clause 3

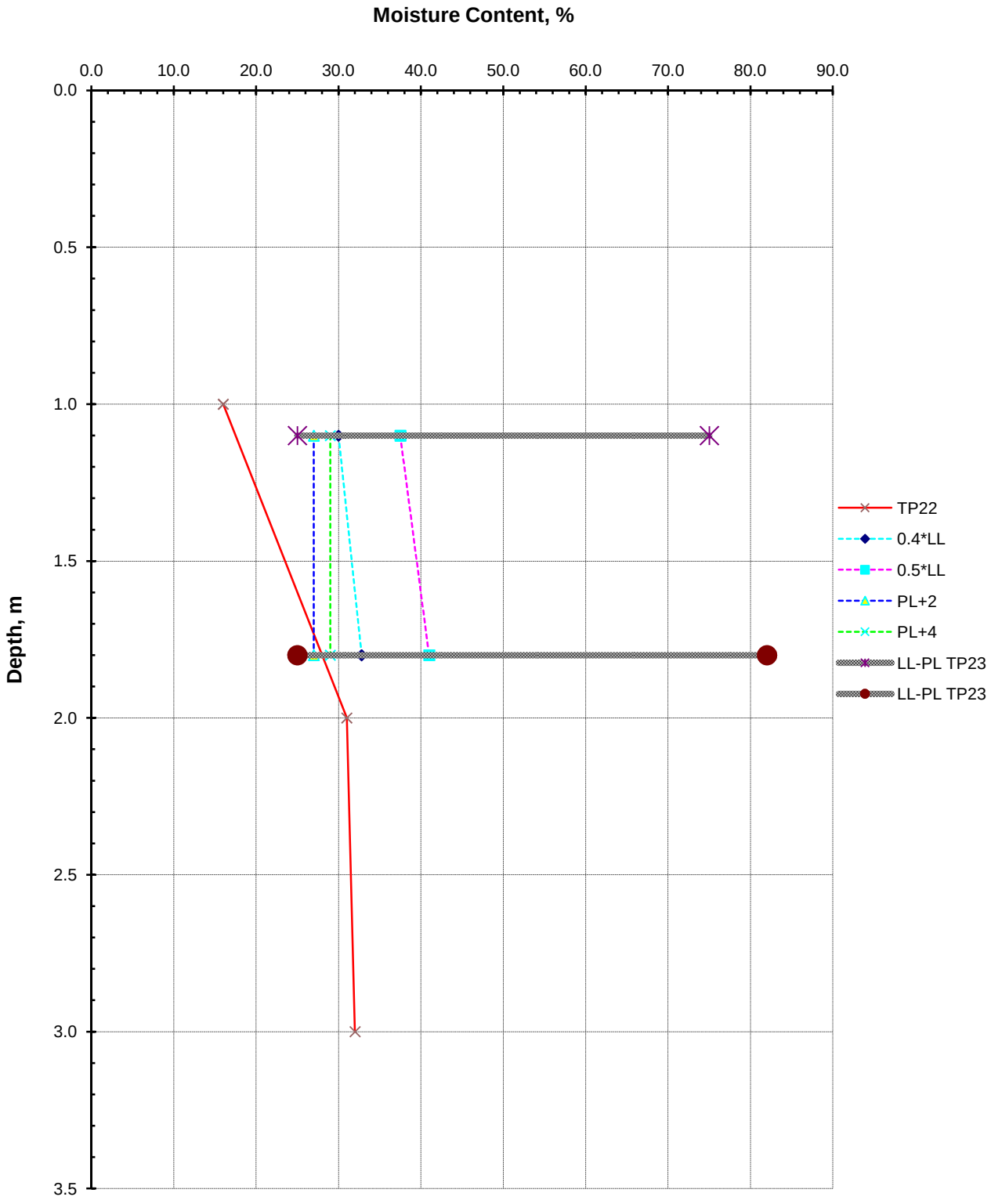


Note:

Client:	**Harrietsham**	**Site:**	**Crest Nicholson (Eastern)**		
Job No:	J12760	**Date:**	23/09/2016	**Figure:**	MC2

Moisture Content and Atterberg Limit Tests *vs* Depth

In Accordance with BS 1377 : Part 2 : 1990 : Clause 3

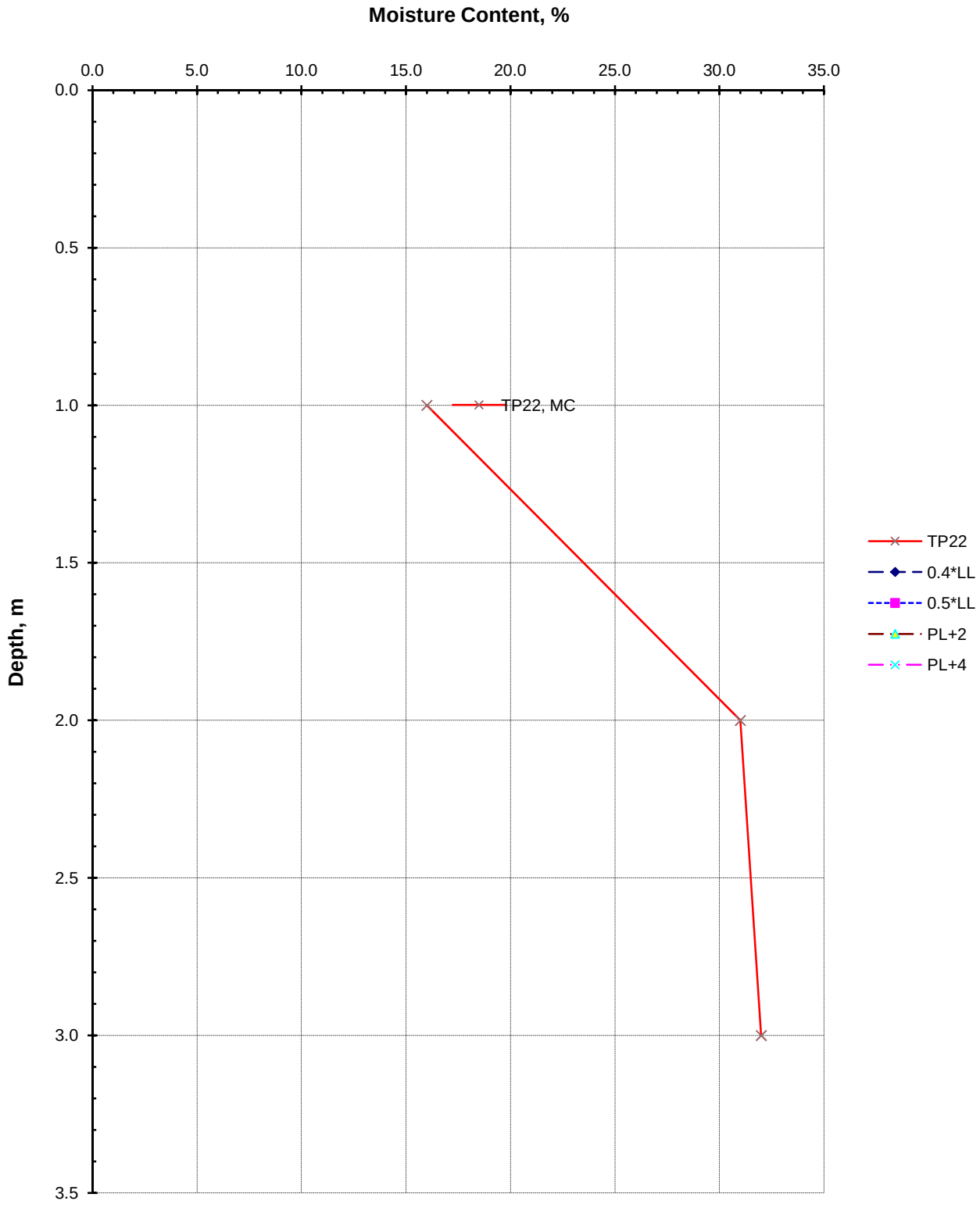


Note:

Client:	**Bell Farm**	**Site:**	**Crest Nicholson (Eastern)**		
Job No:	J12760	**Date:**	30/09/2016	**Figure:**	MC3

Moisture Content and Atterberg Limit Tests *vs* Depth

In Accordance with BS 1377 : Part 2 : 1990 : Clause 3

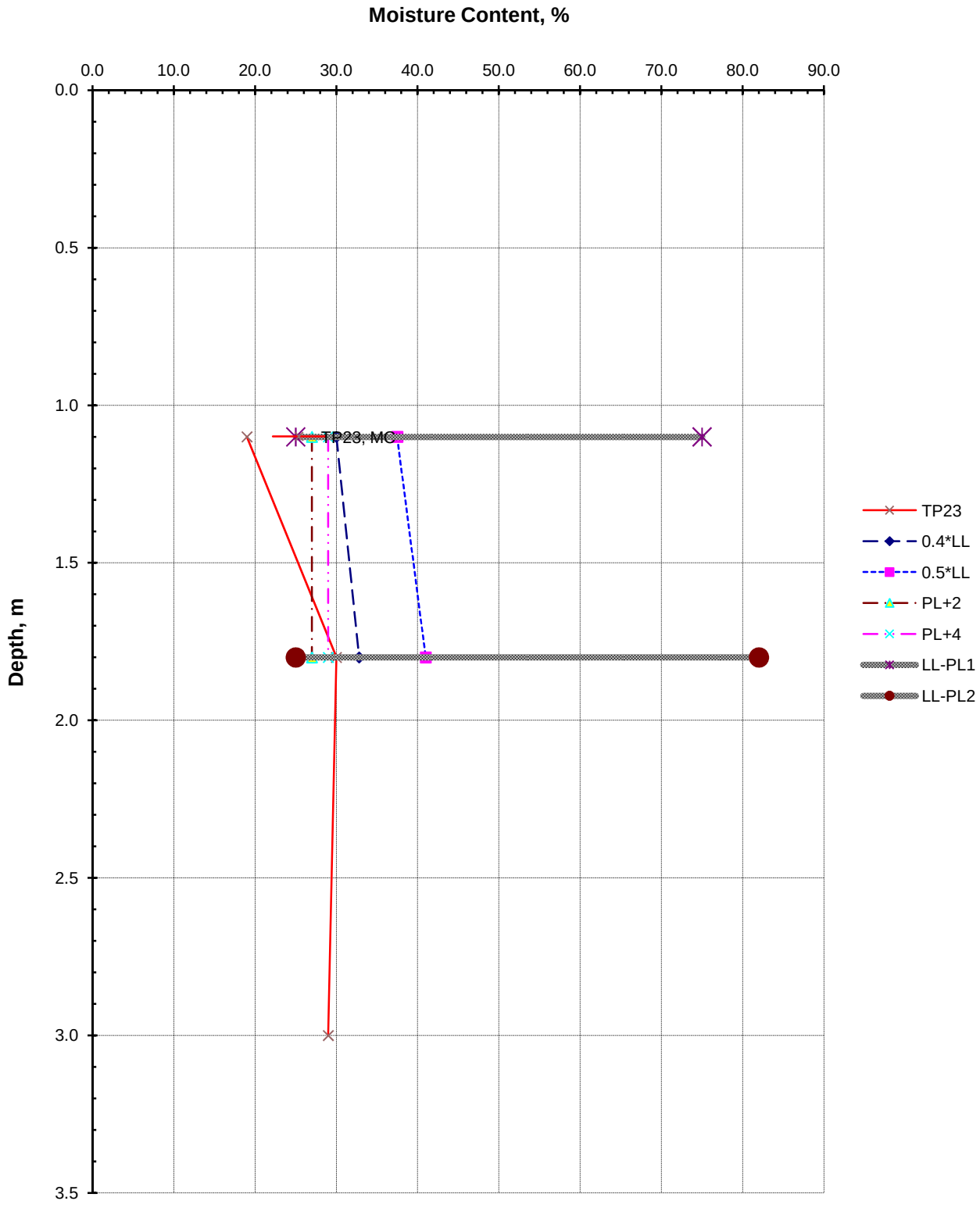


Note:

Client:	**Harrietsham**	**Site:**	**Crest Nicholson (Eastern)**		
Job No:	J12760	**Date:**	23/09/2016	**Figure:**	MC2

Moisture Content and Atterberg Limit Tests *vs* Depth

In Accordance with BS 1377 : Part 2 : 1990 : Clause 3

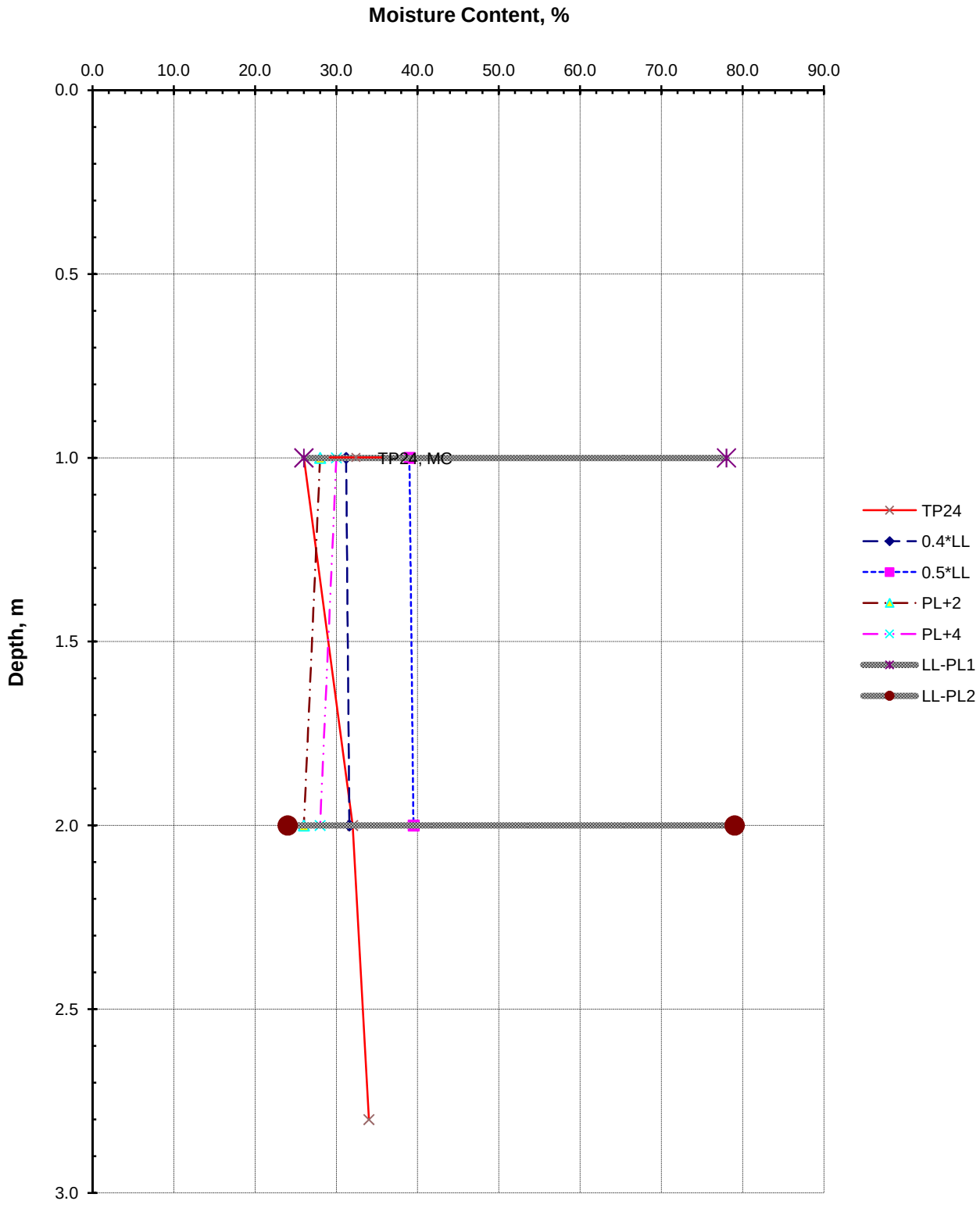


Note:

Client: Bell Farm		**Site:** Crest Nicholson (Eastern)	
Job No: J12760	**Date:** 23/09/2016	**Figure:**	MC2

Moisture Content and Atterberg Limit Tests *vs* Depth

In Accordance with BS 1377 : Part 2 : 1990 : Clause 3



Note:

Client: Bell Farm		**Site:** Crest Nicholson (Eastern)	
Job No: J12760	**Date:** 23/09/2016	**Figure:**	MC2

Trial Pit Num	Depth of Desiccation (m)		NHBC Calculated Foundation Depth (m) – recorded from the plan provided by Crest Nicholson	Advised Foundation depth (m)
	Hand Penetrometer Results	Atterberg limits Results		
TP01	Possibly desiccated to 3.0m.	Desiccated to 1.8, possible desiccation to 3.0m.	2.0m	3.0m
TP02		Desiccated to 1.8m.	2.0m	2.0m
TP03	Desiccated to 1.5m.	Desiccated to 1.8m.	1.5m	2.0m
TP04	Not Desiccated.		2.0m	Made Ground to 2.3m. Foundation needs to be below the Made Ground, therefore advised foundation depth is 2.5m.
TP05	Desiccated to 1.2m.	Desiccated.	2.5m	Hole terminated at 1.5 due to a hard sandstone layer being encountered. Not able to excavate. TP05a excavated beside TP05.
TP05a	Desiccated to 2.7m.		2.5m	2.8m
TP06	Desiccated to 2.4m.		1.0m	1.0m
TP07		Possible desiccated to 1.25m.	1.0m	1.3m
TP08	Desiccated to 1.9m.	Desiccated to 1.9m	2.0m	2.0m
TP09	Desiccated.	Desiccated to 1.6m.	1.5m	1.8m
TP10	Desiccated to 1.7m.		1m minimum	1.5m
TP11	Desiccated to 2.5m.	Desiccated to 2.0m.	1m minimum	2.5m
TP12	No Desiccation.	Desiccated to 2.1m.	1.5m	2.0m
TP13	Desiccated to 2.0m.		1.5m	2.0m
TP14	Desiccated to 2.7m.	Desiccated to 2.7m.	1m minimum	2.9m+
TP15	Desiccated to 2.0m.	Desiccated to 2.7m.	1m minimum	2.8m+
TP16	Desiccated to 2.0m.		1m minimum	2.2m
TP17	Desiccated to 2.8m.	Desiccated.	1m minimum	3.0m
TP18	Desiccated to 2.7m.		1.5m	2.9m
TP19	Desiccated to 2.5m.	Desiccated to 2.5m.	1.0m	2.7m
TP20	Desiccated to 3.0m.	Desiccated to 3.0m.	1.5m	3.2m
TP21	Desiccated to 1.8m.	Desiccated to 1.8m.	1.5m	2.0m
TP22	Not Desiccated.	Desiccated to 1.6 - 1.7m.	1.5m	1.9m
TP23	Desiccated.	Desiccated to 1.6 - 1.7m.	1.5m	1.9m
TP24	Desiccated to 1.9m.	Desiccated to 2.0m.	1.5m	2.1m

APPENDIX F

Photographs

Plate 1: Arisings from trial pit TP01.

Plate 2: Trial pit TP01.

Plate 3: Arisings from trial pit TP08.

Plate 4: Trial pit TP08.

Plate 5: Trial pit TP09.

Plate 6: Trial pit TP07.

Plate 7: Arisings from trial pit TP07.

Plate 8: Trial pit TP17.

Plate 9: Arisings from trial pit TP17.

Plate 10: Trial pit TP02.

Plate 11: Trial pit TP02.

Plate 12: Trial pit TP11.

Plate 13: Arisings from trial pit TP11.

Plate 14: Trial pit TP11.

Plate 15: Arisings from trial pit TP05.

Plate 16: Trial pit TP05.

Plate 17: Trail Pit 12.

Plate 18: Arisings from trial pit 12.

Plate 19: Archaeologists working on site.

Plate 20: Location of trial pit 14.

Plate 21: Trial pit 14.

Plate 22: Trial pit 14.