

The Department of Defence
Sarsfield Barracks, Limerick
MF136514



Óglaigh
na hÉireann
IRISH DEFENCE FORCES

MAY 5

The Department of Defence
Authored by: Enda Quinlan



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1.0 Project Overview

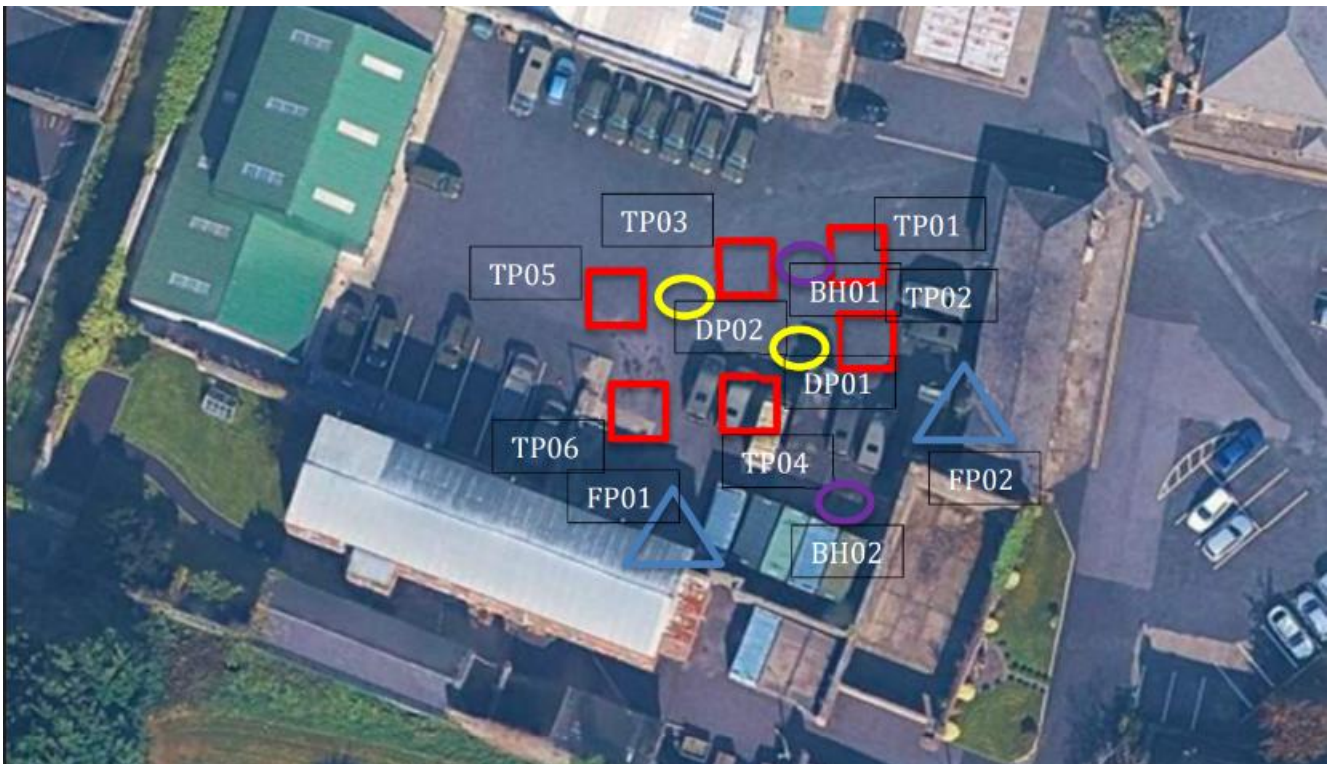
As part of some site investigation works for The Department of Defence at Sarsfield Barracks Limerick. The client was required to undertake Investigation work to investigate the condition of the ground at the location of the proposed new building.

BHP was contracted by Zoe Hanlon to provide these Investigation Work.

2.0 Project Requirements

The scope of work for these investigative works was as follows:

- 2no. Dynamic Probe Testing.
- 6no. Trial Holes
- 2 No. Foundation Inspection Pits
- 6no. Lab Testing on samples from Trial Holes.



Appendix A

Dynamic Probe Tests

BHP completed 2No. Dynamic probe tests to a target depth of 6m or refusal. This was undertaken by using a Grizzly dynamic probing rig supplied by Sol Solution in France. A specification sheet for the machine is included in Appendix C. The machine is a heavyweight constant energy dynamic cone penetrometer (DPSH) used for compaction control and soil investigation. There is also an ability for the machine to use a variable energy for probing – this means the drop height is automatically adjusted as it encounters variable ground conditions.

The results for this test are included in Appendix A of this report. It includes the determination of an estimated bearing capacity for the different layers. BHP has used the data recorded on the machines' software system to import into the accompanying geotechnical software called Websprint.

The dynamic probing test was undertaken using a 63.5kg hammer and a 20cm² cone. The probing method for this testing is the DPSH. A variable energy system was used. In the blow/blow account the drop height is confirmed.

The table below provides a summary of the data contained in this report. Please note the bearing capacities offered in the report format is the ultimate bearing capacity and the allowable has been added to the below along with the allowable if the ground tested is deemed to be below the water table.

DP01				
Depth	Cone Resistance (qd)	Ultimate Bearing Capacity (estimated)	Allowable Bearing Capacity (estimated)	Allowable Bearing Capacity (estimated) - if below water table
(m)	(Mpa)	(kPa)	(kPa)	(kPa)
0.28	13	661	220	110
0.52	3	164	55	27
0.76	3	150	50	25
1	16	824	275	137
1.24	33	1644	548	274
1.48	44	2217	739	369
1.707	68	3375	1125	563

DP02				
Depth	Cone Resistance (qd)	Ultimate Bearing Capacity (estimated)	Allowable Bearing Capacity (estimated)	Allowable Bearing Capacity (estimated) - if below water table
(m)	(Mpa)	(kPa)	(kPa)	(kPa)
0.24	19	930	310	155
0.44	11	533	178	89
0.64	6	275	92	46
0.84	4	200	67	33
1.04	4	182	61	30
1.24	4	190	63	32
1.44	5	227	76	38
1.64	8	406	135	68
1.84	18	897	299	150
1.918	46	2277	759	379

REPORT

SOIL INVESTIGATION



Report name : Report - The Department of Defence - Sarsfield Barracks Limerick

File reference : MF136514

Construction site address : Sarsfield Barracks, Limerick

City : Limerick

Investigation period : 23/03/2026 - 23/03/2026

Project owner : Defence Force

Project manager : Zoe Hanlon

Report date : 03/04/2026

Written by : Enda Quinlan

Review date : 03/04/2026

Reviewed by : James Purcell

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Summary

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1. Documents and information

1.1. Documents provided

<i>Documents</i>	<i>Provided by</i>
Site plan	Not provided
Project plan	Not provided
Updated project plan	Not provided
As-built plan	Not provided
Long profile	Not provided
Execution plan	Not provided
Layout plan	Not provided
Access authorization for crossing private land	Not provided

2. Soil investigation results

2.1. Summary of soundings carried out

<i>Sounding</i>	<i>Material</i>	<i>Altitude</i>	<i>Stop condition</i>	<i>Reached depth</i>	<i>Page</i>
DP01	Grizzly	26.3 m	Temporary	0.51 m	6
DP02	Grizzly	20.4 m	Temporary	1.37 m	7

2.2. Physical characteristics

2.3. Test report

Soundings results are displayed below



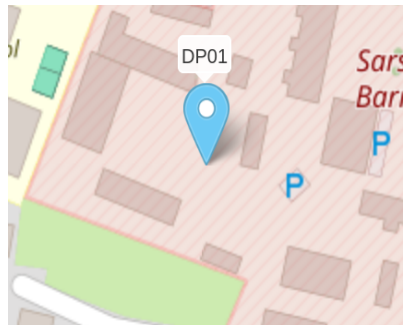
File reference : MF136514
Site : Sarsfield Barracks
Construction site address : Sarsfield Barracks, Limerick Limerick

Dynamic penetrometer test

Soil investigation
NF P 94-115 EN ISO 22476-2

Sounding : DP01
Date : 25/03/2026 11:43
Company : Sol Solution
User : -
Supervisor : -

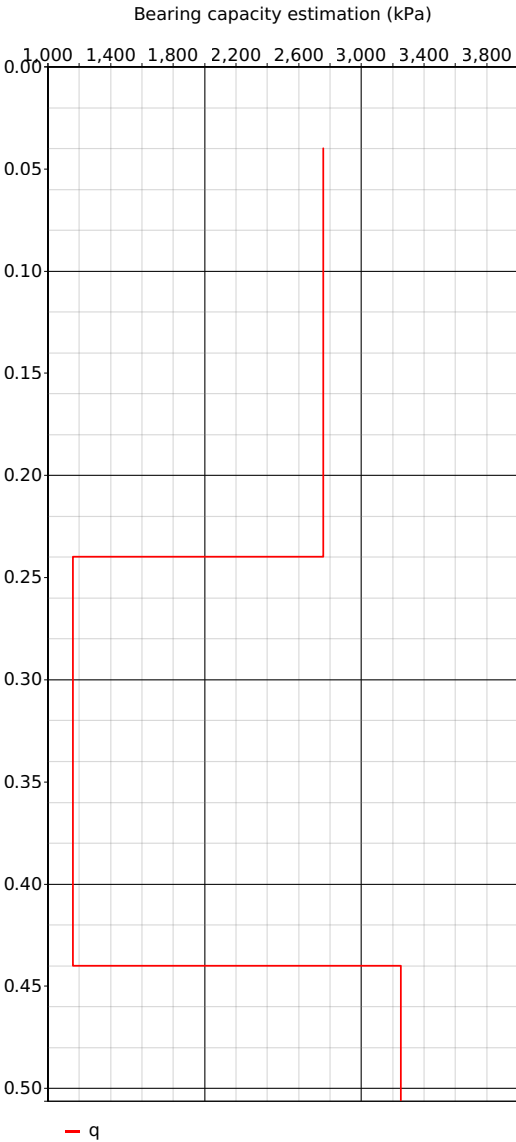
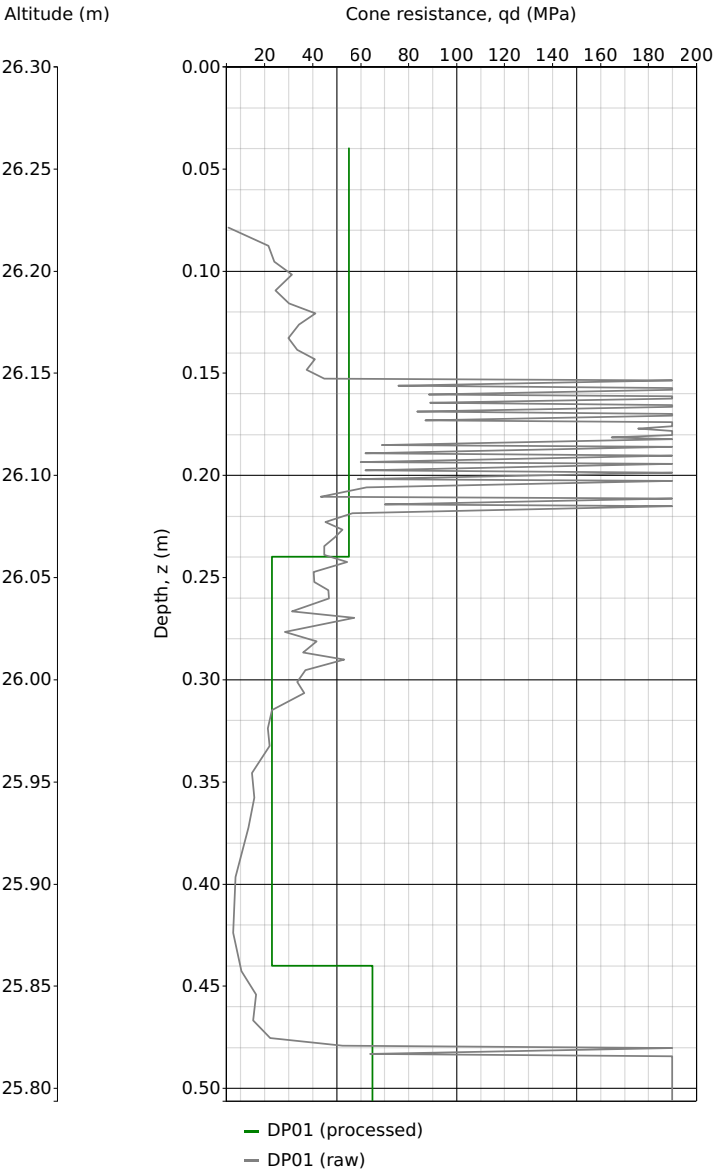
Comments
-



Device type : Grizzly
Ref. device : -
Energy type : Constant
Hammering mode : Mass 63.5 kg
Cone section : 20.0 cm²
Angle of test : -
Stop condition : Temporary
Machine : -
Tool : -
Reached depth : 0.51 m
Water table : Not found



52.654722 N | -8.632483 E 26.3 m



Penetrogram processing
Smoothing step : 50.0 mm

Regularization step : 200.0 mm

Bearing capacity
Estimation coefficient : 20.00

The bearing capacity estimation is given as an indication and cannot be considered as a reference



Sounding : **DP02**
Date : 25/03/2026 11:27
Company : Sol Solution
User : -
Supervisor : -

Comments

-



Device type :
Ref. device :
Energy type :
Hammering mode :
Cone section :

Grizzly
-
Constant
Mass 63.5 kg
20.0 cm²

Angle of test :
Stop condition :
Machine :
Tool :
Reached depth :
Water table :

-
Temporary
-
-
1.37 m
Not found



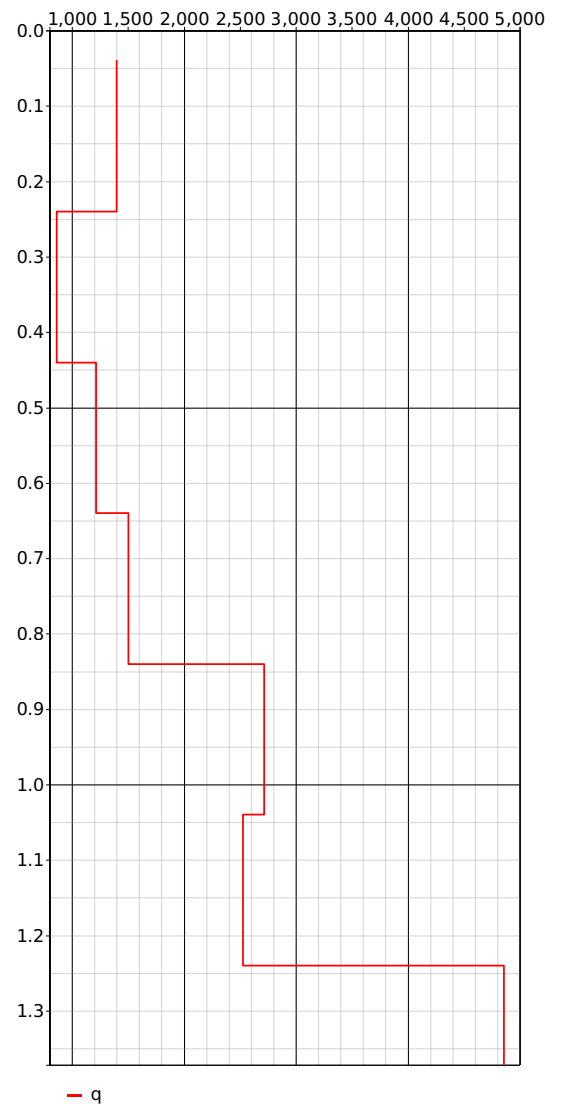
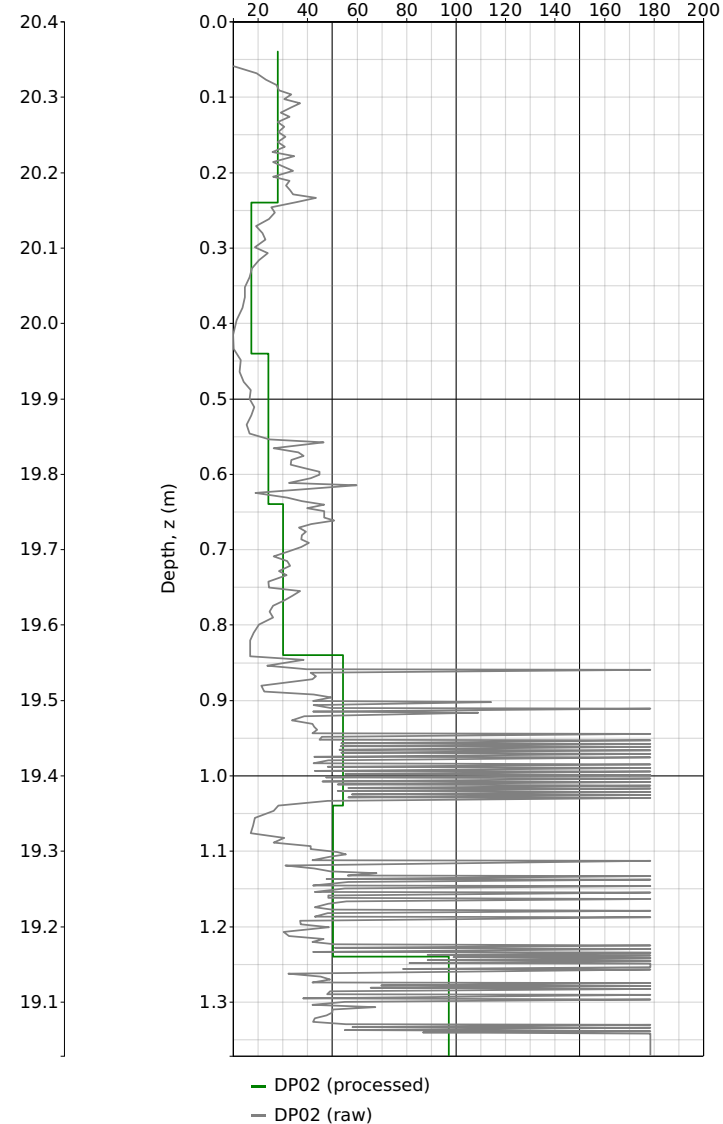
52.654612 N | -8.632573 E

20.4 m

Altitude (m)

Cone resistance, qd (MPa)

Bearing capacity estimation (kPa)



Penetrogram processing
Smoothing step : 50.0 mm

Regularization step : 200.0 mm

Bearing capacity
Estimation coefficient : 20.00

The bearing capacity estimation is given as an indication and cannot be considered as a reference



DP01

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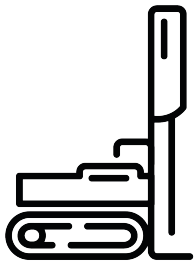
Sounding : DP01
Site : Sarsfield Barracks
Date : 25/03/2026 11:43
Company : Sol Solution
User :
Supervisor :
Lat. : 52.654722 N
Long. : -8.632483 E
Altitude : 26.3 m
Tracking :

Test

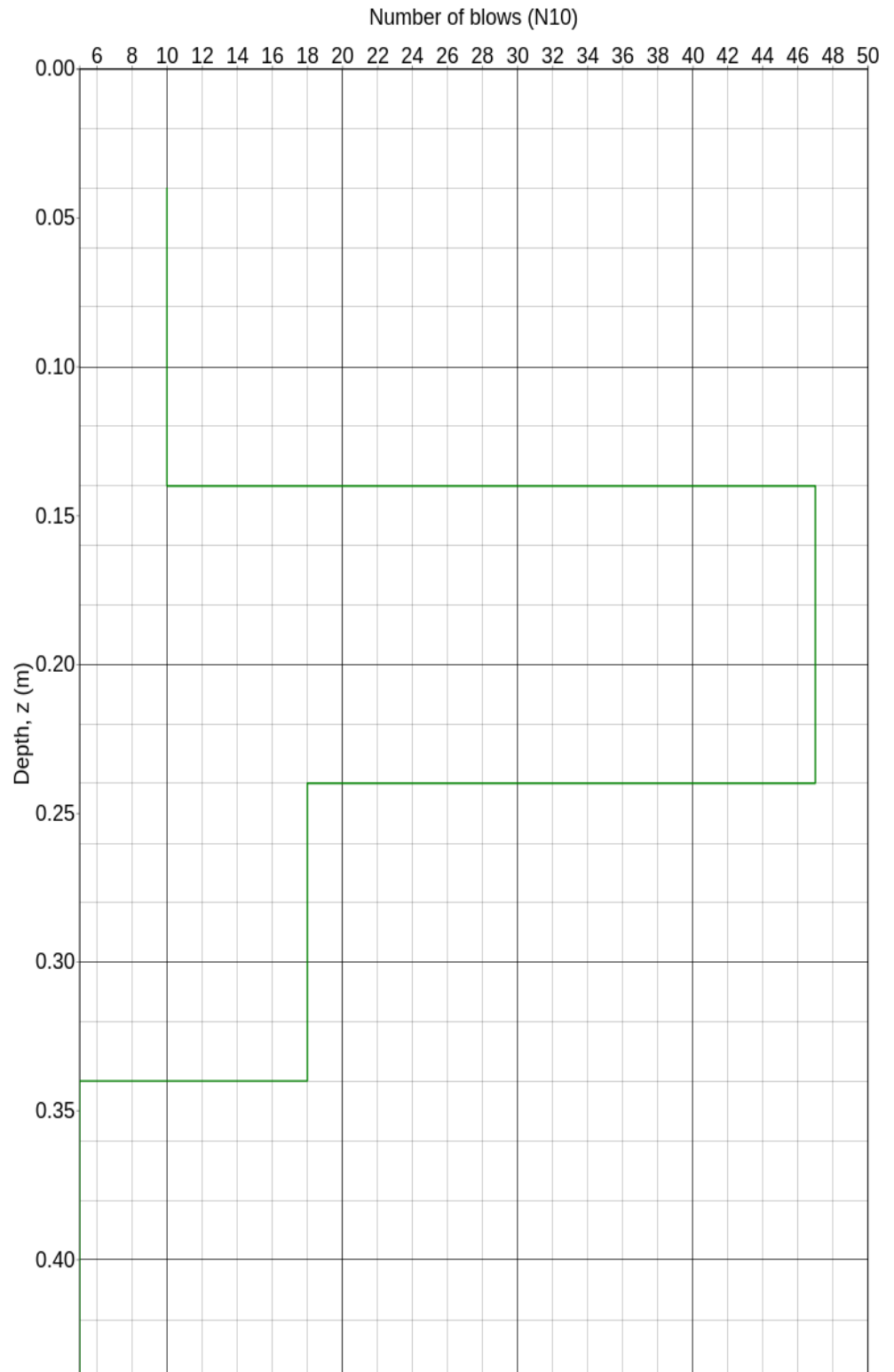
Target depth : 6.0 m
Pre-drilling depth : 0.04 m
Stop condition : Temporary
Reached depth : 0.51 m
Water table : Not found
Stable level :
Unstable level :

Characteristics

Device type : Grizzly
Hammering mode : Mass 63.5 kg
Cone section : 20 cm²
Calibration date : 30/01/2026



GRIZZLY®

**Observation**



DP02

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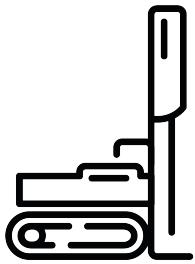
Sounding : DP02
Site : Sarsfield Barracks
Date : 25/03/2026 11:27
Company : Sol Solution
User :
Supervisor :
Lat. : 52.654612 N
Long. : -8.632573 E
Altitude : 20.4 m
Tracking :

Test

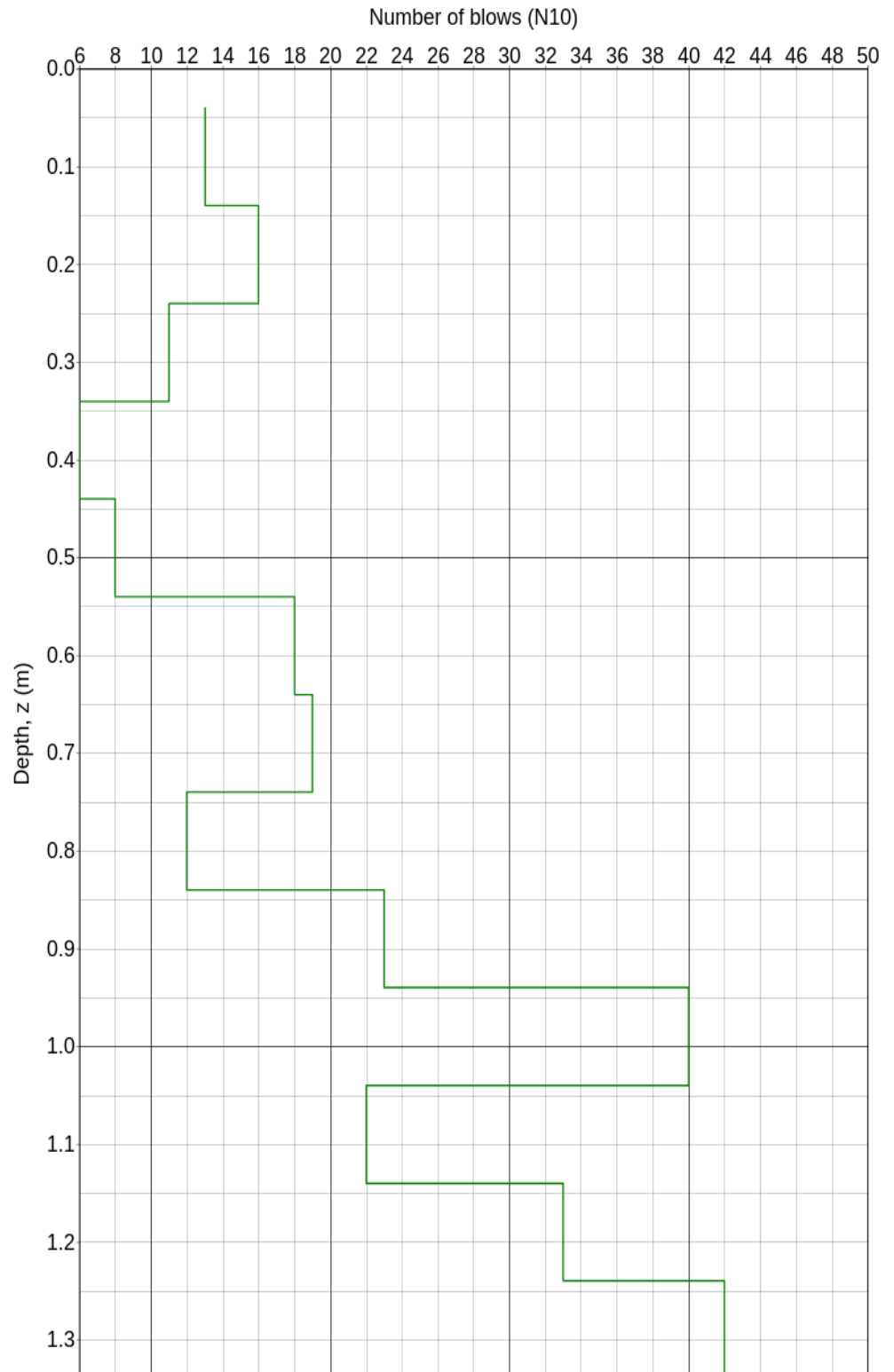
Target depth : 6.0 m
Pre-drilling depth : 0.04 m
Stop condition : Temporary
Reached depth : 1.37 m
Water table : Not found
Stable level :
Unstable level :

Characteristics

Device type : Grizzly
Hammering mode : Mass 63.5 kg
Cone section : 20 cm²
Calibration date : 30/01/2026



GRIZZLY®

**Observation**

Appendix B

Client: The Department of Defence	Trial Pit No: Excavation	Dimensions:	
Contact: Mr.Zoe Hanlon	Trial Pit Type: Hand Pit	Depth:	0.5m
Project Name:	Date: 24/03/2026	Width:	0.75m
Sarsfield Barracks	Logged By: Enda Quinlan	Length:	0.75m
Limerick	Reviewed By: Enda Quinlan		
Sheet 2 of 2			
Trial Pit Log			



Testing
Analysing
Consulting

BHP

New Road
Thomondgate
Limerick
00353 61 455399
jamespurcell@bhp.ie



Client: The Department of Defence	Trial Pit No: Excavation	Dimensions:		
Contact: Mr.Zoe Hanlon	Trial Pit Type: Trial Pit	Depth:	0.6m	
Project Name:	Date: 24/03/2026	Width:	1.0m	
Sarsfield Baracks	Logged By: Enda Quinlan	Length:	1.0m	
Limerick	Reviewed By: Enda Quinlan			
Sheet 2 of 2				
Trial Pit Log				

Testing
Analysing
Consulting



New Road
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Limerick
00353 61 455399
jamespurcell@bhp.ie



Client: The Department of Defence	Trial Pit No: Excavation	Dimensions:	
Contact: Mr.Zoe Hanlon	Trial Pit Type: Trial Pit	Depth:	1.3m
Project Name:	Date: 24/03/2026	Width:	1.0m
Sarsfield Barracks	Logged By: Enda Quinlan	Length:	1.0m
Limerick	Reviewed By: Enda Quinlan		
Sheet 2 of 2			
Trial Pit Log			

Testing
Analysing
Consulting



New Road
Thomondgate
Limerick
00353 61 455399
jamespurcell@bhp.ie



Client: The Department of Defence	Trial Pit No: Excavation	Dimensions:	
Contact: Mr.Zoe Hanlon	Trial Pit Type: Trial Pit	Depth:	1.2m
Project Name:	Date: 24/03/2026	Width:	1.0m
Sarsfield Baracks	Logged By: Enda Quinlan	Length:	1.0m
Limerick	Reviewed By: Enda Quinlan		
Sheet 2 of 2			
Trial Pit Log			

Testing
Analysing
Consulting



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Thomondgate
Limerick
00353 61 455399
jamespurcell@bhp.ie



Client: The Department of Defence	Trial Pit No: Excavation	Dimensions:	
Contact: Mr.Zoe Hanlon	Trial Pit Type: Trial Pit	Depth:	1.15m
Project Name:	Date: 24/03/2026	Width:	1.0m
Sarsfield Baracks	Logged By: Enda Quinlan	Length:	1.0m
Limerick	Reviewed By: Enda Quinlan		
Sheet 2 of 2			
Trial Pit Log			

Testing
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Limerick
00353 61 455399
jamespurcell@bhp.ie



Client: The Department of Defence	Trial Pit No: Excavation	Dimensions:		
Contact: Mr.Zoe Hanlon	Trial Pit Type: Trial Pit	Depth:	1.1m	
Project Name:	Date: 24/03/2026	Width:	1.0m	
Sarsfield Baracks	Logged By: Enda Quinlan	Length:	1.0m	
Limerick	Reviewed By: Enda Quinlan			
Sheet 2 of 2				
Trial Pit Log				

Testing
Analysing
Consulting



New Road
Thomondgate
Limerick
00353 61 455399
jamespurcell@bhp.ie



Client: The Department of Defence	Trial Pit No: Excavation	Dimensions:	
Contact: Mr.Zoe Hanlon	Trial Pit Type: Trial Pit	Depth:	0.9m
Project Name:	Date: 24/03/2026	Width:	1.0m
Sarsfield Barracks	Logged By: Enda Quinlan	Length:	1.0m
Limerick	Reviewed By: Enda Quinlan		
Sheet 2 of 2			
Trial Pit Log			

Testing
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jamespurcell@bhp.ie



Appendix C



SOIL TEST REPORT



DETERMINATION OF PARTICLE SIZE DISTRIBUTION

Client: The Department of Defence
Naval Base
Cork
Cork

F.A.O.: Paul Finnegan

Project: Sarsfield Barracks

BHP Ref. No.: 26/03/7554
Order No: H/S49/26
Date Received: 31/03/2026
Date Tested: 03/04/2026
Design-execution Standard: TII Spec. Series 600

Sampling Information

Method of Preparation: Disturbed BS1377-1 Cl.8
Material: Soil Sample - Soil Investigation
Client Reference: TP1
Source of Material: Site Won

Visual Description: Light Brownish Grey Sandy GRAVEL

Date of Sampling: 26/03/2026

Test Information

BS 1377-2:2022 & EN ISO 17892-4:2016 Cl 5.2

Sieve Size	% Passing	Particle Size	% Passing Minimum	% Passing Maximum
500mm	100	Boulders		
300mm	100	Cobbles		
125mm	100			
100mm	100			
90mm	100			
75mm	79			
63mm	79	Gravel		
50mm	75			
37.5mm	72			
28mm	71			
20mm	65			
14mm	61			
10mm	58			
6.3mm	54			
5mm	53			
3.35mm	50			
2mm	47	Sand		
1.18mm	45			
600µm	41			
425µm	38			
300µm	35			
212µm	32			
150µm	28			
63µm	21	Silt/Clay		

Remarks:

Sampling carried out by:	Client
Deviation from Test Method:	No
Comments associated with the test:	None
Particle Density of the soil is assumed to be 2.65 Mg/m ³	2.65 Mg/m ³
Pre-Treatment of the sample	Not Applicable
Amount of soil used for the test	Riffled from a bulk sample > 40 Kg
The uniformity coefficient is	Not Applicable

Approved By:
James Purcell
Laboratory Technical Manager

Signature:

Issue Date: 28/04/2026

Tested by BHP Laboratories, New Road, Thomondgate, Limerick. Phone: (061) 455399 Email: jamespurcell@bhp.ie
This test report shall not be duplicated in full without the permission of the test laboratory. Information identifying the 'Client', 'FAO', 'Project', 'Location Reference', 'Item', 'Test Specification' and 'Order No' has been provided by the customer. Results apply only to the sample tested and where the laboratory is not responsible for sampling, result apply to the sample as received. Sampling is outside the scope of accreditation.



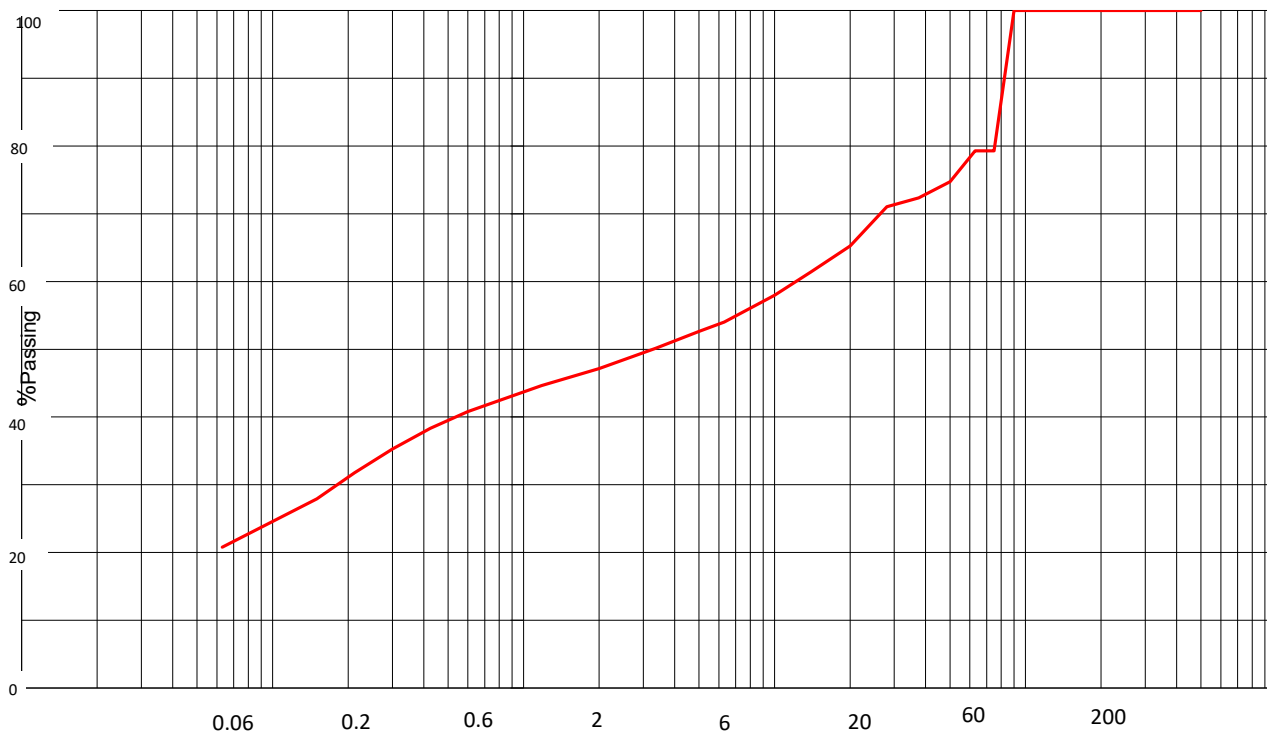
SOIL TEST REPORT

DETERMINATION OF PARTICLE SIZE DISTRIBUTION



GRAPH

BS 1377-2:2022 & EN ISO 17892-4:2016 Cl 5.2



CLAY	SILT	SAND	GRAVEL	COBBLES	BOULDERS
------	------	------	--------	---------	----------

Remarks:

Approved By:

Seamus O' Connell

Laboratory Technical Manager

Signature:

Issue Date: 28/04/2026

Tested by BHP Laboratories, New Road, Thomondgate, Limerick. Phone: (061) 455399 Email: jamespurcell@bhp.ie

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**SOIL TEST REPORT****DETERMINATION OF pH VALUE**

Client:	The Department of Defence	BHP Ref. No.:	26/03/7554
	Naval Base	Order No:	H/S49/26
	Cork	Date Received:	31/03/2026
	Cork	Date Tested:	08/04/2026
F.A.O.:	Paul Finnegan	Design-execution Standard:	TII Spec. Series 600
Project:	Sarsfield Barracks		

Sampling Information

Method of Preparation:	Disturbed BS1377-1 Cl.8	Visual Description:	Light Brownish Grey Sandy GRAVEL
Material:	Soil Sample - Soil Investigation		
Client Reference:	TP1		
Source of Material:	Site Won	Date of Sampling:	26/03/2026

Test Information**BS 1377-3:2022 Cl.12**

pH Value

8.1

Remarks:

Sampling carried out by:	Client
Deviation from Test Method:	No
Comments associated with the test:	None

Approved By:

James Purcell

Laboratory Technical Manager

Signature:

Issue Date: 28/04/2026

Tested by BHP Laboratories, New Road, Thomondgate, Limerick. Phone: (061) 455399 Email: jamespurcell@bhp.ie

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SOIL TEST REPORT



DETERMINATION OF LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX

Client:	The Department of Defence	BHP Ref. No.:	26/03/7554
	Naval Base	Order No:	H/S49/26
	Cork	Date Received:	31/03/2026
	Cork	Date Tested:	08/04/2026
F.A.O.:	Paul Finnegan	Design-execution Standard:	TII Spec. Series 600
Project:	Sarsfield Barracks		

Sampling Information

Method of Preparation:	Disturbed BS1377-1 Cl.8	Visual Description:	Light Brownish Grey Sandy GRAVEL
Material:	Soil Sample - Soil Investigation		
Client Reference:	TP1		
Source of Material:	Site Won	Date of Sampling:	26/03/2026

Test Information

BS 1377-2:2022 & EN 17892-12 2014 & A1 2022

Method to obtain the Liquid Limit	Not Applicable
Type of cone	Not Applicable
% Passing on 425µm test sieve	38
Penetration points	Not Applicable
Water Content of original sample	24.2
Liquid Limit	Not Applicable
Plastic Limit	Non-plastic
Plasticity Index	Non-plastic

Remarks:

Sampling carried out by:	Client
Deviation from Test Method:	No
Comments associated with the test:	None

Approved By:

James Purcell

Laboratory Technical Manager

Signature:

A handwritten signature in blue ink, appearing to read 'James Purcell'.

Issue Date: 28/04/2026

Tested by BHP Laboratories, New Road, Thomondgate, Limerick. Phone: (061) 455399 Email: jamespurcell@bhp.ie

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**SOIL TEST REPORT****DETERMINATION OF WATER CONTENT**

Client:	The Department of Defence	BHP Ref. No.:	26/03/7554
	Naval Base	Order No:	H/S49/26
	Cork	Date Received:	31/03/2026
	Cork	Date Tested:	02/04/2026
F.A.O.:	Paul Finnegan	Design-execution Standard:	TII Spec. Series 600
Project:	Sarsfield Barracks		

Sampling Information

Method of Preparation:	Disturbed BS1377-1 Cl.8	Visual Description:	Light Brownish Grey Sandy GRAVEL
Material:	Soil Sample - Soil Investigation		
Client Reference:	TP1		
Source of Material:	Site Won	Date of Sampling:	26/03/2026

Test Information**BS 1377-2:2022 Cl.4.1 & EN 17892 Part 1 2014 + A1 2022**

Water Content (% of dry mass)	24.2
-------------------------------	------

Remarks:

Sampling carried out by:	Client
Deviation from Test Method:	No
Comments associated with the test:	None

Approved By:

James Purcell

Laboratory Technical Manager

Signature:

Issue Date: 28/04/2026

Tested by BHP Laboratories, New Road, Thomondgate, Limerick. Phone: (061) 455399 Email: jamespurcell@bhp.ie

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SOIL TEST REPORT



DETERMINATION OF WATER SOLUBLE SULPHATE

Client:	The Department of Defence	BHP Ref. No.:	26/03/7554
	Naval Base	Order No:	H/S49/26
	Cork	Date Received:	31/03/2026
	Cork	Date Tested:	14/04/2026
F.A.O.:	Paul Finnegan	Design-execution Standard:	TII Spec. Series 600
Project:	Sarsfield Barracks		

Sampling Information

Method of Preparation:	Disturbed BS1377-1 Cl.8	Visual Description:	Light Brownish Grey Sandy GRAVEL
Material:	Soil Sample - Soil Investigation		
Client Reference:	TP1		
Source of Material:	Site Won	Date of Sampling:	26/03/2026

Test Information

Water extraction with ICPOES Analysis

Test Parameter / Determined Value	Units	Results	Method
Water Soluble Sulphate as SO ₄	%	0.025	ICPOES
Water Soluble Sulphate as SO ₄	g/L SO ₄	0.125	ICPOES
Water Soluble Sulphate as SO ₃	%	0.021	Calculation
Water Soluble Sulphate as SO ₃	g/L SO ₃	0.104	Calculation

Remarks:

Sampling carried out by:	Client
Deviation from Test Method:	No
Comments associated with the test:	None

Approved By:

James Purcell

Laboratory Technical Manager

Signature:

Issue Date: 28/04/2026

Tested by BHP Laboratories, New Road, Thomondgate, Limerick. Phone: (061) 455399 Email: jamespurcell@bhp.ie

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SOIL TEST REPORT



DETERMINATION OF PARTICLE SIZE DISTRIBUTION

Client: The Department of Defence
Naval Base
Cork
Cork

F.A.O.: Paul Finnegan

Project: Sarsfield Barracks

BHP Ref. No.: 26/03/7555
Order No: H/S49/26
Date Received: 31/03/2026
Date Tested: 03/04/2026
Design-execution Standard: TII Spec. Series 600

Sampling Information

Method of Preparation: Disturbed BS1377-1 Cl.8
Material: Soil Sample - Soil Investigation
Client Reference: TP2
Source of Material: Site Won

Visual Description: Dark Greyish Brown Sandy GRAVEL

Date of Sampling: 26/03/2026

Test Information

BS 1377-2:2022 & EN ISO 17892-4:2016 Cl 5.2

Sieve Size	% Passing	Particle Size	% Passing Minimum	% Passing Maximum
500mm	100	Boulders		
300mm	100	Cobbles		
125mm	100			
100mm	100			
90mm	100			
75mm	72			
63mm	72	Gravel		
50mm	68			
37.5mm	56			
28mm	51			
20mm	44			
14mm	39			
10mm	35			
6.3mm	30			
5mm	28			
3.35mm	26			
2mm	22	Sand		
1.18mm	20			
600µm	17			
425µm	15			
300µm	12			
212µm	11			
150µm	9			
63µm	7	Silt/Clay		

Remarks:

Sampling carried out by:	Client
Deviation from Test Method:	No
Comments associated with the test:	None
Particle Density of the soil is assumed to be 2.65 Mg/m ³	2.65 Mg/m ³
Pre-Treatment of the sample	Not Applicable
Amount of soil used for the test	Riffled from a bulk sample > 40 Kg
The uniformity coefficient is	226

Approved By:
James Purcell
Laboratory Technical Manager

Signature:

Issue Date: 28/04/2026

Tested by BHP Laboratories, New Road, Thomondgate, Limerick. Phone: (061) 455399 Email: jamespurcell@bhp.ie
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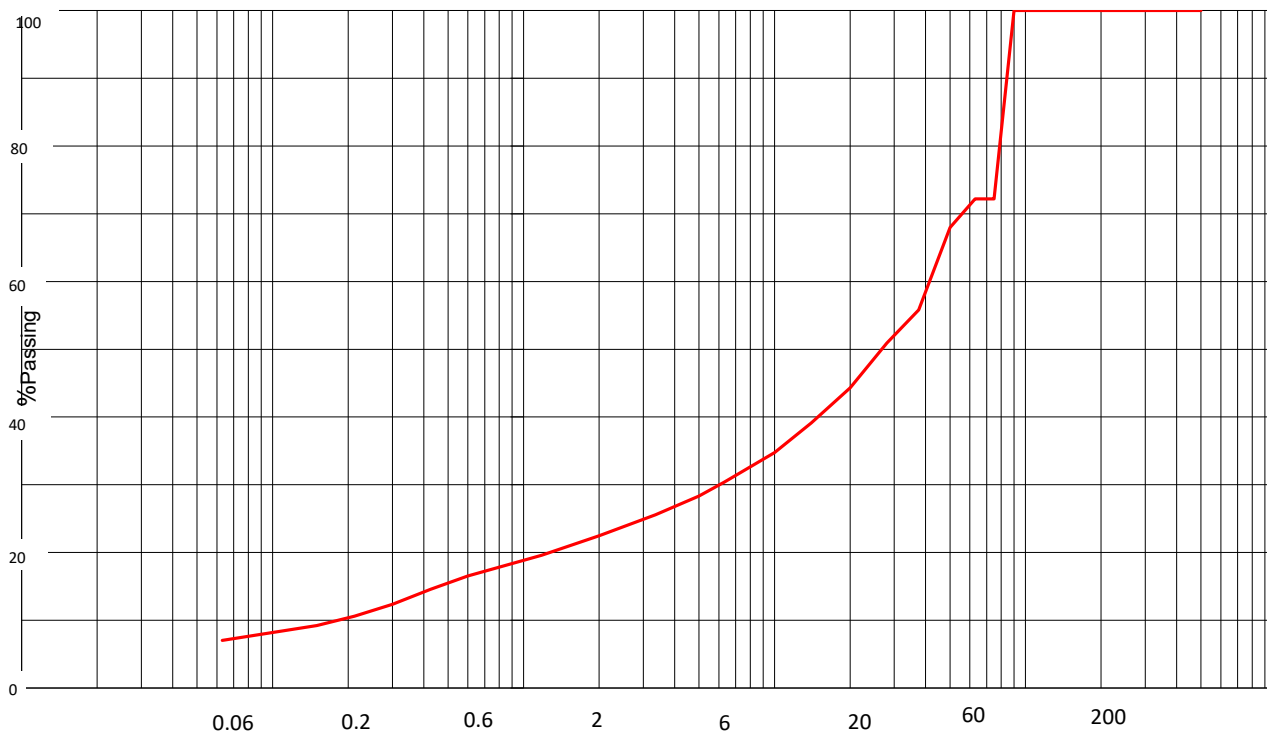
SOIL TEST REPORT

DETERMINATION OF PARTICLE SIZE DISTRIBUTION



GRAPH

BS 1377-2:2022 & EN ISO 17892-4:2016 Cl 5.2



CLAY	SILT	SAND	GRAVEL	COBBLES	BOULDERS
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Remarks:

Approved By:

Seamus O' Connell

Laboratory Technical Manager

Signature:

Issue Date: 28/04/2026

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**SOIL TEST REPORT****DETERMINATION OF pH VALUE**

Client:	The Department of Defence	BHP Ref. No.:	26/03/7555
	Naval Base	Order No:	H/S49/26
	Cork	Date Received:	31/03/2026
	Cork	Date Tested:	08/04/2026
F.A.O.:	Paul Finnegan	Design-execution Standard:	TII Spec. Series 600
Project:	Sarsfield Barracks		

Sampling Information

Method of Preparation:	Disturbed BS1377-1 Cl.8	Visual Description:	Dark Greyish Brown Sandy GRAVEL
Material:	Soil Sample - Soil Investigation		
Client Reference:	TP2		
Source of Material:	Site Won	Date of Sampling:	26/03/2026

Test Information**BS 1377-3:2022 Cl.12**

pH Value

8.3

Remarks:

Sampling carried out by:	Client
Deviation from Test Method:	No
Comments associated with the test:	None

Approved By:

James Purcell

Laboratory Technical Manager

Signature:

Issue Date: 28/04/2026

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SOIL TEST REPORT



DETERMINATION OF LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX

Client:	The Department of Defence	BHP Ref. No.:	26/03/7555
	Naval Base	Order No:	H/S49/26
	Cork	Date Received:	31/03/2026
	Cork	Date Tested:	10/04/2026
F.A.O.:	Paul Finnegan	Design-execution Standard:	TII Spec. Series 600
Project:	Sarsfield Barracks		

Sampling Information

Method of Preparation:	Disturbed BS1377-1 Cl.8	Visual Description:	Dark Greyish Brown Sandy GRAVEL
Material:	Soil Sample - Soil Investigation		
Client Reference:	TP2		
Source of Material:	Site Won	Date of Sampling:	26/03/2026

Test Information

BS 1377-2:2022 & EN 17892-12 2014 & A1 2022

Method to obtain the Liquid Limit	Fall Cone
Type of cone	80g/30°
% Passing on 425µm test sieve	15
Penetration points	Four-point test
Water Content of original sample	19.9
Liquid Limit	40
Plastic Limit	25
Plasticity Index	15

Remarks:

Sampling carried out by:	Client
Deviation from Test Method:	No
Comments associated with the test:	None

Approved By:

James Purcell

Laboratory Technical Manager

Signature:

A handwritten signature in blue ink, appearing to read 'James Purcell'.

Issue Date: 28/04/2026

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SOIL TEST REPORT



DETERMINATION OF WATER CONTENT

Client:	The Department of Defence	BHP Ref. No.:	26/03/7555
	Naval Base	Order No:	H/S49/26
	Cork	Date Received:	31/03/2026
	Cork	Date Tested:	02/04/2026
F.A.O.:	Paul Finnegan	Design-execution Standard:	TII Spec. Series 600
Project:	Sarsfield Barracks		

Sampling Information

Method of Preparation:	Disturbed BS1377-1 Cl.8	Visual Description:	Dark Greyish Brown Sandy GRAVEL
Material:	Soil Sample - Soil Investigation		
Client Reference:	TP2		
Source of Material:	Site Won	Date of Sampling:	26/03/2026

Test Information

BS 1377-2:2022 Cl.4.1 & EN 17892 Part 1 2014 + A1 2022

Water Content (% of dry mass)	19.9
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Remarks:

Sampling carried out by:	Client
Deviation from Test Method:	No
Comments associated with the test:	None

Approved By:

James Purcell

Laboratory Technical Manager

Signature:

Issue Date: 28/04/2026

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SOIL TEST REPORT



DETERMINATION OF WATER SOLUBLE SULPHATE

Client:	The Department of Defence	BHP Ref. No.:	26/03/7555
	Naval Base	Order No:	H/S49/26
	Cork	Date Received:	31/03/2026
	Cork	Date Tested:	14/04/2026
F.A.O.:	Paul Finnegan	Design-execution Standard:	TII Spec. Series 600
Project:	Sarsfield Barracks		

Sampling Information

Method of Preparation:	Disturbed BS1377-1 Cl.8	Visual Description:	Dark Greyish Brown Sandy GRAVEL
Material:	Soil Sample - Soil Investigation		
Client Reference:	TP2		
Source of Material:	Site Won	Date of Sampling:	26/03/2026

Test Information

Water extraction with ICPOES Analysis

Test Parameter / Determined Value	Units	Results	Method
Water Soluble Sulphate as SO ₄	%	0.01	ICPOES
Water Soluble Sulphate as SO ₄	g/L SO ₄	0.05	ICPOES
Water Soluble Sulphate as SO ₃	%	0.008	Calculation
Water Soluble Sulphate as SO ₃	g/L SO ₃	0.042	Calculation

Remarks:

Sampling carried out by:	Client
Deviation from Test Method:	No
Comments associated with the test:	None

Approved By:

James Purcell

Laboratory Technical Manager

Signature:

Issue Date: 28/04/2026

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SOIL TEST REPORT



DETERMINATION OF PARTICLE SIZE DISTRIBUTION

Client: The Department of Defence
 Naval Base
 Cork
 Cork
F.A.O.: Paul Finnegan
Project: Sarsfield Barracks

BHP Ref. No.: 26/03/7556
 Order No: H/S49/26
 Date Received: 31/03/2026
 Date Tested: 03/04/2026
 Design-execution Standard: TII Spec. Series 600

Sampling Information

Method of Preparation: Disturbed BS1377-1 Cl.8
 Material: Soil Sample - Soil Investigation
 Client Reference: TP3
 Source of Material: Site Won
 Visual Description: Light Brownish Grey Sandy GRAVEL
 Date of Sampling: 26/03/2026

Test Information

BS 1377-2:2022 & EN ISO 17892-4:2016 Cl 5.2

Sieve Size	% Passing	Particle Size	% Passing Minimum	% Passing Maximum
500mm	100	Boulders		
300mm	100	Cobbles		
125mm	100			
100mm	100			
90mm	100			
75mm	84			
63mm	72	Gravel		
50mm	61			
37.5mm	57			
28mm	51			
20mm	46			
14mm	42			
10mm	39			
6.3mm	36			
5mm	35			
3.35mm	33			
2mm	31			
1.18mm	29	Sand		
600µm	25			
425µm	22			
300µm	18			
212µm	15			
150µm	12			
63µm	10	Silt/Clay		

Remarks:

Sampling carried out by:	Client
Deviation from Test Method:	No
Comments associated with the test:	None
Particle Density of the soil is assumed to be 2.65 Mg/m ³	2.65 Mg/m ³
Pre-Treatment of the sample	Not Applicable
Amount of soil used for the test	Riffled from a bulk sample > 40 Kg
The uniformity coefficient is	623

Approved By:
 James Purcell
 Laboratory Technical Manager

Signature:

Issue Date: 28/04/2026

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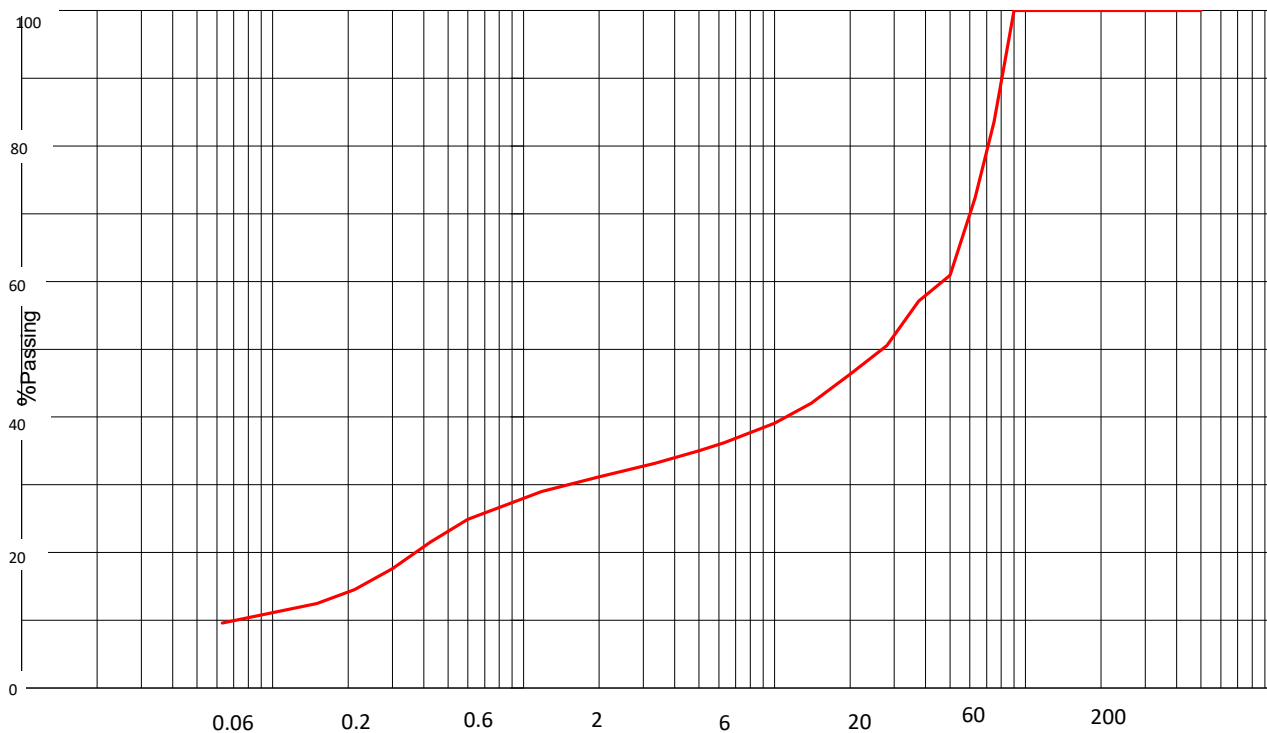
SOIL TEST REPORT

DETERMINATION OF PARTICLE SIZE DISTRIBUTION



GRAPH

BS 1377-2:2022 & EN ISO 17892-4:2016 Cl 5.2



CLAY	SILT	SAND	GRAVEL	COBBLES	BOULDERS
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Remarks:

Approved By:

Seamus O' Connell

Laboratory Technical Manager

Signature:

Issue Date: 28/04/2026

Tested by BHP Laboratories, New Road, Thomondgate, Limerick. Phone: (061) 455399 Email: jamespurcell@bhp.ie

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**SOIL TEST REPORT****DETERMINATION OF pH VALUE**

Client:	The Department of Defence	BHP Ref. No.:	26/03/7556
	Naval Base	Order No:	H/S49/26
	Cork	Date Received:	31/03/2026
	Cork	Date Tested:	08/04/2026
F.A.O.:	Paul Finnegan	Design-execution Standard:	TII Spec. Series 600
Project:	Sarsfield Barracks		

Sampling Information

Method of Preparation:	Disturbed BS1377-1 Cl.8	Visual Description:	Light Brownish Grey Sandy GRAVEL
Material:	Soil Sample - Soil Investigation		
Client Reference:	TP3		
Source of Material:	Site Won	Date of Sampling:	26/03/2026

Test Information**BS 1377-3:2022 Cl.12**

pH Value

8.1

Remarks:

Sampling carried out by:	Client
Deviation from Test Method:	No
Comments associated with the test:	None

Approved By:

James Purcell

Laboratory Technical Manager

Signature:

Issue Date: 28/04/2026

Tested by BHP Laboratories, New Road, Thomondgate, Limerick. Phone: (061) 455399 Email: jamespurcell@bhp.ie

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SOIL TEST REPORT



DETERMINATION OF LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX

Client:	The Department of Defence	BHP Ref. No.:	26/03/7556
	Naval Base	Order No:	H/S49/26
	Cork	Date Received:	31/03/2026
	Cork	Date Tested:	10/04/2026
F.A.O.:	Paul Finnegan	Design-execution Standard:	TII Spec. Series 600
Project:	Sarsfield Barracks		

Sampling Information

Method of Preparation:	Disturbed BS1377-1 Cl.8	Visual Description:	Light Brownish Grey Sandy GRAVEL
Material:	Soil Sample - Soil Investigation		
Client Reference:	TP3		
Source of Material:	Site Won	Date of Sampling:	26/03/2026

Test Information

BS 1377-2:2022 & EN 17892-12 2014 & A1 2022

Method to obtain the Liquid Limit	Fall Cone
Type of cone	80g/30°
% Passing on 425µm test sieve	22
Penetration points	Four-point test
Water Content of original sample	30.2
Liquid Limit	47
Plastic Limit	31
Plasticity Index	16

Remarks:

Sampling carried out by:	Client
Deviation from Test Method:	No
Comments associated with the test:	None

Approved By:

James Purcell

Laboratory Technical Manager

Signature:

A handwritten signature in blue ink, appearing to read 'James Purcell'.

Issue Date: 28/04/2026

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**SOIL TEST REPORT****DETERMINATION OF WATER CONTENT**

Client: The Department of Defence
Naval Base
Cork
Cork
F.A.O.: Paul Finnegan
Project: Sarsfield Barracks

BHP Ref. No.: 26/03/7556
Order No: H/S49/26
Date Received: 31/03/2026
Date Tested: 02/04/2026
Design-execution Standard: TII Spec. Series 600

Sampling Information

Method of Preparation: Disturbed BS1377-1 Cl.8
Material: Soil Sample - Soil Investigation
Client Reference: TP3
Source of Material: Site Won
Visual Description: Light Brownish Grey Sandy GRAVEL
Date of Sampling: 26/03/2026

Test Information

BS 1377-2:2022 Cl.4.1 & EN 17892 Part 1 2014 + A1 2022

Water Content (% of dry mass) 30.2

Remarks:

Sampling carried out by:	Client
Deviation from Test Method:	No
Comments associated with the test:	None

Approved By:

James Purcell

Laboratory Technical Manager

Signature:

Issue Date: 28/04/2026

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SOIL TEST REPORT



DETERMINATION OF WATER SOLUBLE SULPHATE

Client:	The Department of Defence	BHP Ref. No.:	26/03/7556
	Naval Base	Order No:	H/S49/26
	Cork	Date Received:	31/03/2026
	Cork	Date Tested:	14/04/2026
F.A.O.:	Paul Finnegan	Design-execution Standard:	TII Spec. Series 600
Project:	Sarsfield Barracks		

Sampling Information

Method of Preparation:	Disturbed BS1377-1 Cl.8	Visual Description:	Light Brownish Grey Sandy GRAVEL
Material:	Soil Sample - Soil Investigation		
Client Reference:	TP3		
Source of Material:	Site Won	Date of Sampling:	26/03/2026

Test Information

Water extraction with ICPOES Analysis

Test Parameter / Determined Value	Units	Results	Method
Water Soluble Sulphate as SO ₄	%	0.009	ICPOES
Water Soluble Sulphate as SO ₄	g/L SO ₄	0.045	ICPOES
Water Soluble Sulphate as SO ₃	%	0.008	Calculation
Water Soluble Sulphate as SO ₃	g/L SO ₃	0.038	Calculation

Remarks:

Sampling carried out by:	Client
Deviation from Test Method:	No
Comments associated with the test:	None

Approved By:

James Purcell

Laboratory Technical Manager

Signature:

Issue Date: 28/04/2026

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SOIL TEST REPORT



DETERMINATION OF PARTICLE SIZE DISTRIBUTION

Client: The Department of Defence
Naval Base
Cork
Cork

F.A.O.: Paul Finnegan

Project: Sarsfield Barracks

BHP Ref. No.: 26/03/7557
Order No: H/S49/26
Date Received: 31/03/2026
Date Tested: 03/04/2026
Design-execution Standard: TII Spec. Series 600

Sampling Information

Method of Preparation: Disturbed BS1377-1 Cl.8
Material: Soil Sample - Soil Investigation
Client Reference: TP4
Source of Material: Site Won

Visual Description: Dark Greyish Brown Crushed Rock

Date of Sampling: 26/03/2026

Test Information

BS 1377-2:2022 & EN ISO 17892-4:2016 Cl 5.2

Sieve Size	% Passing	Particle Size	% Passing Minimum	% Passing Maximum
500mm	100	Boulders		
300mm	100	Cobbles		
125mm	100			
100mm	100			
90mm	100			
75mm	80			
63mm	63	Gravel		
50mm	63			
37.5mm	52			
28mm	43			
20mm	35			
14mm	30			
10mm	24			
6.3mm	20			
5mm	18			
3.35mm	16			
2mm	13	Sand		
1.18mm	12			
600µm	9			
425µm	8			
300µm	7			
212µm	6			
150µm	5			
63µm	4	Silt/Clay		

Remarks:

Sampling carried out by:	Client
Deviation from Test Method:	No
Comments associated with the test:	None
Particle Density of the soil is assumed to be 2.65 Mg/m ³	2.65 Mg/m ³
Pre-Treatment of the sample	Not Applicable
Amount of soil used for the test	Riffled from a bulk sample > 40 Kg
The uniformity coefficient is	63

Approved By:
James Purcell
Laboratory Technical Manager

Signature:

Issue Date: 28/04/2026

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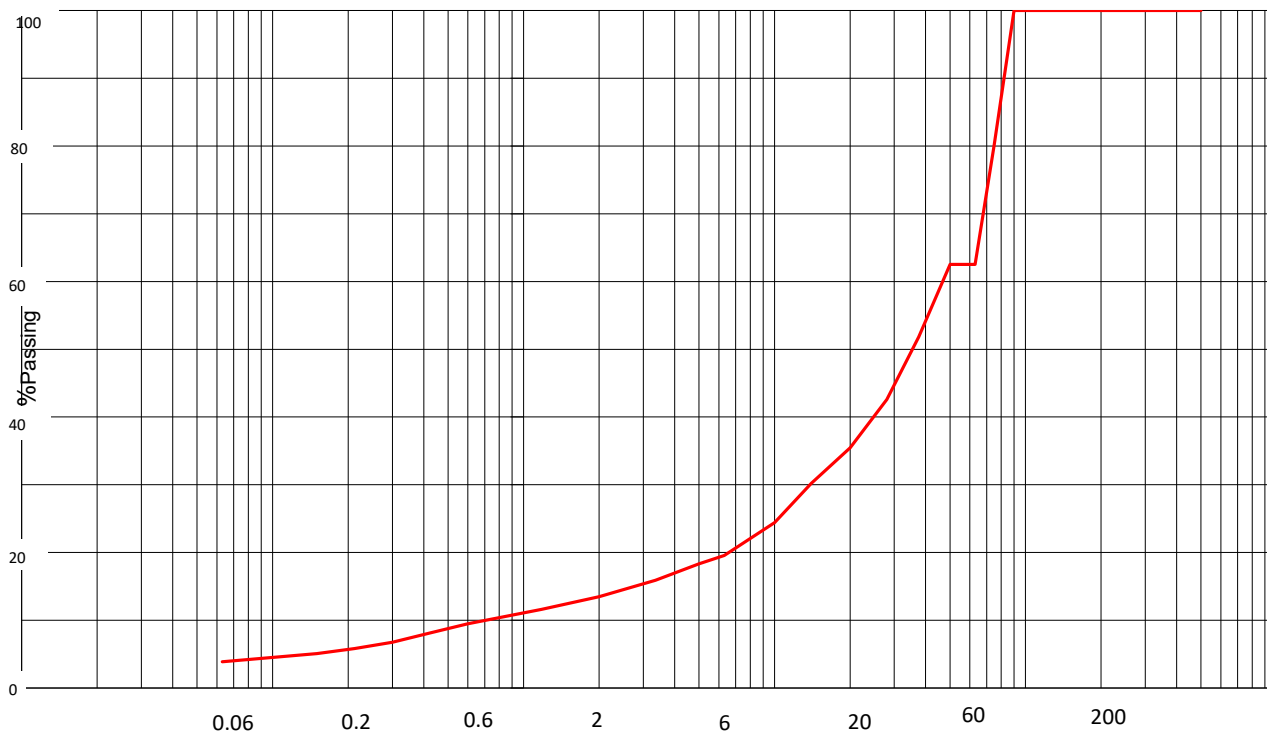
SOIL TEST REPORT

DETERMINATION OF PARTICLE SIZE DISTRIBUTION



GRAPH

BS 1377-2:2022 & EN ISO 17892-4:2016 Cl 5.2



CLAY	SILT	SAND	GRAVEL	COBBLES	BOULDERS
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Remarks:

Approved By:

Seamus O' Connell

Laboratory Technical Manager

Signature:

Issue Date: 28/04/2026

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**SOIL TEST REPORT****DETERMINATION OF pH VALUE**

Client:	The Department of Defence	BHP Ref. No.:	26/03/7557
	Naval Base	Order No:	H/S49/26
	Cork	Date Received:	31/03/2026
	Cork	Date Tested:	08/04/2026
F.A.O.:	Paul Finnegan	Design-execution Standard:	TII Spec. Series 600
Project:	Sarsfield Barracks		

Sampling Information

Method of Preparation:	Disturbed BS1377-1 Cl.8	Visual Description:	Dark Greyish Brown Crushed Rock
Material:	Soil Sample - Soil Investigation		
Client Reference:	TP4		
Source of Material:	Site Won	Date of Sampling:	26/03/2026

Test Information**BS 1377-3:2022 Cl.12**

pH Value

8.3

Remarks:

Sampling carried out by:	Client
Deviation from Test Method:	No
Comments associated with the test:	None

Approved By:

James Purcell

Laboratory Technical Manager

Signature:

Issue Date: 28/04/2026

Tested by BHP Laboratories, New Road, Thomondgate, Limerick. Phone: (061) 455399 Email: jamespurcell@bhp.ie

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SOIL TEST REPORT



DETERMINATION OF LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX

Client:	The Department of Defence	BHP Ref. No.:	26/03/7557
	Naval Base	Order No:	H/S49/26
	Cork	Date Received:	31/03/2026
	Cork	Date Tested:	08/04/2026
F.A.O.:	Paul Finnegan	Design-execution Standard:	TII Spec. Series 600
Project:	Sarsfield Barracks		

Sampling Information

Method of Preparation:	Disturbed BS1377-1 Cl.8	Visual Description:	Dark Greyish Brown Crushed Rock
Material:	Soil Sample - Soil Investigation		
Client Reference:	TP4		
Source of Material:	Site Won	Date of Sampling:	26/03/2026

Test Information

BS 1377-2:2022 & EN 17892-12 2014 & A1 2022

Method to obtain the Liquid Limit	Not Applicable
Type of cone	Not Applicable
% Passing on 425µm test sieve	8
Penetration points	Not Applicable
Water Content of original sample	13.7
Liquid Limit	Not Applicable
Plastic Limit	Non-plastic
Plasticity Index	Non-plastic

Remarks:

Sampling carried out by:	Client
Deviation from Test Method:	No
Comments associated with the test:	None

Approved By:

James Purcell

Laboratory Technical Manager

Signature:

A handwritten signature in blue ink, appearing to read 'James Purcell'.

Issue Date: 28/04/2026

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SOIL TEST REPORT



DETERMINATION OF WATER CONTENT

Client:	The Department of Defence	BHP Ref. No.:	26/03/7557
	Naval Base	Order No:	H/S49/26
	Cork	Date Received:	31/03/2026
	Cork	Date Tested:	02/04/2026
F.A.O.:	Paul Finnegan	Design-execution Standard:	TII Spec. Series 600
Project:	Sarsfield Barracks		

Sampling Information

Method of Preparation:	Disturbed BS1377-1 Cl.8	Visual Description:	Dark Greyish Brown Crushed Rock
Material:	Soil Sample - Soil Investigation		
Client Reference:	TP4		
Source of Material:	Site Won	Date of Sampling:	26/03/2026

Test Information

BS 1377-2:2022 Cl.4.1 & EN 17892 Part 1 2014 + A1 2022

Water Content (% of dry mass)	13.7
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Remarks:

Sampling carried out by:	Client
Deviation from Test Method:	No
Comments associated with the test:	None

Approved By:

James Purcell

Laboratory Technical Manager

Signature:

Issue Date: 28/04/2026

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SOIL TEST REPORT



DETERMINATION OF WATER SOLUBLE SULPHATE

Client:	The Department of Defence	BHP Ref. No.:	26/03/7557
	Naval Base	Order No:	H/S49/26
	Cork	Date Received:	31/03/2026
	Cork	Date Tested:	14/04/2026
F.A.O.:	Paul Finnegan	Design-execution Standard:	TII Spec. Series 600
Project:	Sarsfield Barracks		

Sampling Information

Method of Preparation:	Disturbed BS1377-1 Cl.8	Visual Description:	Dark Greyish Brown Crushed Rock
Material:	Soil Sample - Soil Investigation		
Client Reference:	TP4		
Source of Material:	Site Won	Date of Sampling:	26/03/2026

Test Information

Water extraction with ICPOES Analysis

Test Parameter / Determined Value	Units	Results	Method
Water Soluble Sulphate as SO ₄	%	0.01	ICPOES
Water Soluble Sulphate as SO ₄	g/L SO ₄	0.04	ICPOES
Water Soluble Sulphate as SO ₃	%	0.008	Calculation
Water Soluble Sulphate as SO ₃	g/L SO ₃	0.033	Calculation

Remarks:

Sampling carried out by:	Client
Deviation from Test Method:	No
Comments associated with the test:	None

Approved By:

James Purcell

Laboratory Technical Manager

Signature:

Issue Date: 28/04/2026

Tested by BHP Laboratories, New Road, Thomondgate, Limerick. Phone: (061) 455399 Email: jamespurcell@bhp.ie

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SOIL TEST REPORT



DETERMINATION OF PARTICLE SIZE DISTRIBUTION

Client: The Department of Defence
 Naval Base
 Cork
 Cork
F.A.O.: Paul Finnegan
Project: Sarsfield Barracks

BHP Ref. No.: 26/03/7558
 Order No: H/S49/26
 Date Received: 31/03/2026
 Date Tested: 03/04/2026
 Design-execution Standard: TII Spec. Series 600

Sampling Information

Method of Preparation: Disturbed BS1377-1 Cl.8
 Material: Soil Sample - Soil Investigation
 Client Reference: TP5
 Source of Material: Site Won
 Visual Description: Light Greyish Brown Sandy GRAVEL
 Date of Sampling: 26/03/2026

Test Information

BS 1377-2:2022 & EN ISO 17892-4:2016 Cl 5.2

Sieve Size	% Passing	Particle Size	% Passing Minimum	% Passing Maximum
500mm	100	Boulders		
300mm	100	Cobbles		
125mm	100			
100mm	100			
90mm	100			
75mm	89			
63mm	81	Gravel		
50mm	63			
37.5mm	59			
28mm	55			
20mm	50			
14mm	44			
10mm	38			
6.3mm	33			
5mm	31			
3.35mm	28			
2mm	24	Sand		
1.18mm	22			
600µm	20			
425µm	18			
300µm	16			
212µm	14			
150µm	13			
63µm	10	Silt/Clay		

Remarks:

Sampling carried out by:	Client
Deviation from Test Method:	No
Comments associated with the test:	None
Particle Density of the soil is assumed to be 2.65 Mg/m ³	2.65 Mg/m ³
Pre-Treatment of the sample	Not Applicable
Amount of soil used for the test	Riffled from a bulk sample > 40 Kg
The uniformity coefficient is	643

Approved By:
 James Purcell
 Laboratory Technical Manager

Signature:

Issue Date: 28/04/2026

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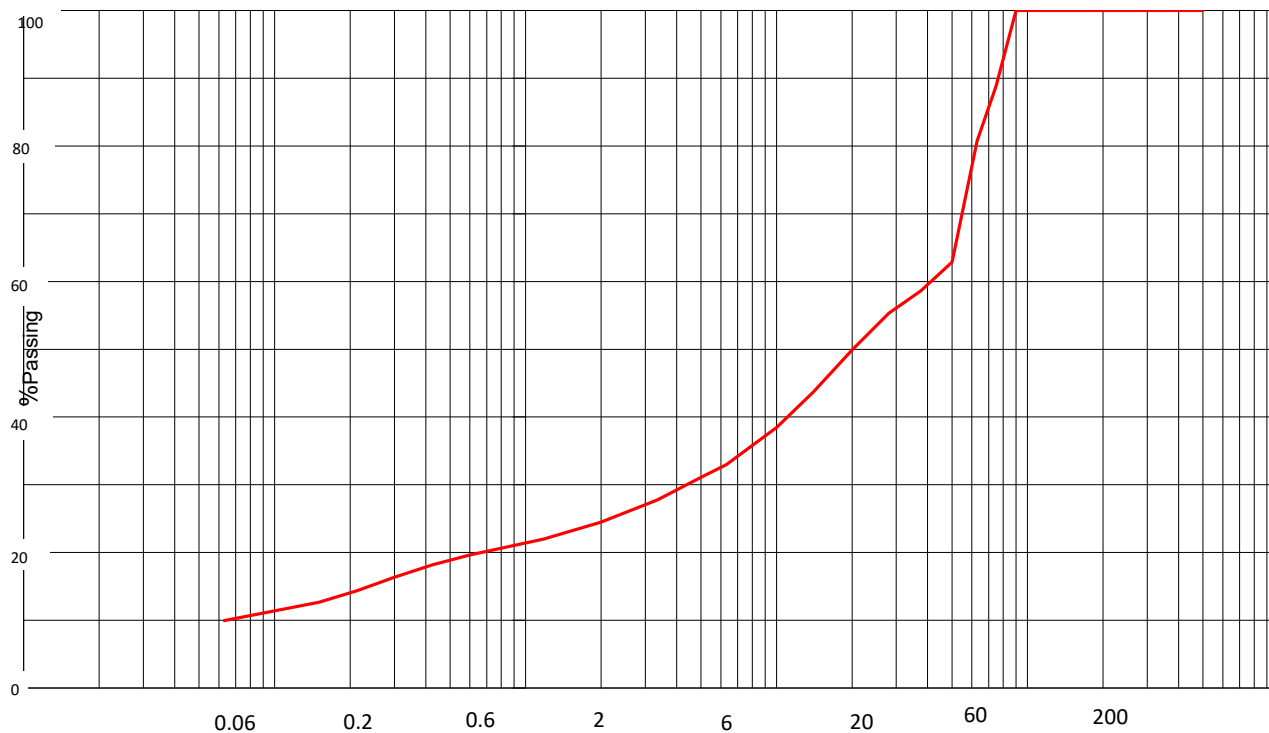
SOIL TEST REPORT

DETERMINATION OF PARTICLE SIZE DISTRIBUTION



GRAPH

BS 1377-2:2022 & EN ISO 17892-4:2016 Cl 5.2



CLAY	SILT	SAND	GRAVEL	COBBLES	BOULDERS
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Remarks:

Approved By:

Seamus O' Connell

Laboratory Technical Manager

Signature:

Issue Date: 28/04/2026

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**SOIL TEST REPORT****DETERMINATION OF pH VALUE**

Client:	The Department of Defence	BHP Ref. No.:	26/03/7558
	Naval Base	Order No:	H/S49/26
	Cork	Date Received:	31/03/2026
	Cork	Date Tested:	08/04/2026
F.A.O.:	Paul Finnegan	Design-execution Standard:	TII Spec. Series 600
Project:	Sarsfield Barracks		

Sampling Information

Method of Preparation:	Disturbed BS1377-1 Cl.8	Visual Description:	Light Greyish Brown Sandy GRAVEL
Material:	Soil Sample - Soil Investigation		
Client Reference:	TP5		
Source of Material:	Site Won	Date of Sampling:	26/03/2026

Test Information**BS 1377-3:2022 Cl.12**

pH Value

8.0

Remarks:

Sampling carried out by:	Client
Deviation from Test Method:	No
Comments associated with the test:	None

Approved By:

James Purcell

Laboratory Technical Manager

Signature:

Issue Date: 28/04/2026

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SOIL TEST REPORT



DETERMINATION OF LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX

Client:	The Department of Defence	BHP Ref. No.:	26/03/7558
	Naval Base	Order No:	H/S49/26
	Cork	Date Received:	31/03/2026
	Cork	Date Tested:	10/04/2026
F.A.O.:	Paul Finnegan	Design-execution Standard:	TII Spec. Series 600
Project:	Sarsfield Barracks		

Sampling Information

Method of Preparation:	Disturbed BS1377-1 Cl.8	Visual Description:	Light Greyish Brown Sandy GRAVEL
Material:	Soil Sample - Soil Investigation		
Client Reference:	TP5		
Source of Material:	Site Won	Date of Sampling:	26/03/2026

Test Information

BS 1377-2:2022 & EN 17892-12 2014 & A1 2022

Method to obtain the Liquid Limit	Fall Cone
Type of cone	80g/30°
% Passing on 425µm test sieve	18
Penetration points	Four-point test
Water Content of original sample	13.8
Liquid Limit	Not Applicable
Plastic Limit	Non-plastic
Plasticity Index	Non-plastic

Remarks:

Sampling carried out by:	Client
Deviation from Test Method:	No
Comments associated with the test:	None

Approved By:

James Purcell

Laboratory Technical Manager

Signature:

A handwritten signature in blue ink, appearing to read 'James Purcell'.

Issue Date: 28/04/2026

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SOIL TEST REPORT



DETERMINATION OF WATER CONTENT

Client:	The Department of Defence	BHP Ref. No.:	26/03/7558
	Naval Base	Order No:	H/S49/26
	Cork	Date Received:	31/03/2026
	Cork	Date Tested:	02/04/2026
F.A.O.:	Paul Finnegan	Design-execution Standard:	TII Spec. Series 600
Project:	Sarsfield Barracks		

Sampling Information

Method of Preparation:	Disturbed BS1377-1 Cl.8	Visual Description:	Light Greyish Brown Sandy GRAVEL
Material:	Soil Sample - Soil Investigation		
Client Reference:	TP5		
Source of Material:	Site Won	Date of Sampling:	26/03/2026

Test Information

BS 1377-2:2022 Cl.4.1 & EN 17892 Part 1 2014 + A1 2022

Water Content (% of dry mass)	13.8
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Remarks:

Sampling carried out by:	Client
Deviation from Test Method:	No
Comments associated with the test:	None

Approved By:

James Purcell

Laboratory Technical Manager

Signature:

Issue Date: 28/04/2026

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SOIL TEST REPORT



DETERMINATION OF WATER SOLUBLE SULPHATE

Client:	The Department of Defence	BHP Ref. No.:	26/03/7558
	Naval Base	Order No:	H/S49/26
	Cork	Date Received:	31/03/2026
	Cork	Date Tested:	14/04/2026
F.A.O.:	Paul Finnegan	Design-execution Standard:	TII Spec. Series 600
Project:	Sarsfield Barracks		

Sampling Information

Method of Preparation:	Disturbed BS1377-1 Cl.8	Visual Description:	Light Greyish Brown Sandy GRAVEL
Material:	Soil Sample - Soil Investigation		
Client Reference:	TP5		
Source of Material:	Site Won	Date of Sampling:	26/03/2026

Test Information

Water extraction with ICPOES Analysis

Test Parameter / Determined Value	Units	Results	Method
Water Soluble Sulphate as SO ₄	%	0.015	ICPOES
Water Soluble Sulphate as SO ₄	g/L SO ₄	0.073	ICPOES
Water Soluble Sulphate as SO ₃	%	0.013	Calculation
Water Soluble Sulphate as SO ₃	g/L SO ₃	0.061	Calculation

Remarks:

Sampling carried out by:	Client
Deviation from Test Method:	No
Comments associated with the test:	None

Approved By:

James Purcell

Laboratory Technical Manager

Signature:

Issue Date: 28/04/2026

Tested by BHP Laboratories, New Road, Thomondgate, Limerick. Phone: (061) 455399 Email: jamespurcell@bhp.ie

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SOIL TEST REPORT



DETERMINATION OF PARTICLE SIZE DISTRIBUTION

Client: The Department of Defence
 Naval Base
 Cork
 Cork
F.A.O.: Paul Finnegan
Project: Sarsfield Barracks

BHP Ref. No.: 26/03/7559
 Order No: H/S49/26
 Date Received: 31/03/2026
 Date Tested: 03/04/2026
 Design-execution Standard: TII Spec. Series 600

Sampling Information

Method of Preparation: Disturbed BS1377-1 Cl.8
 Material: Soil Sample - Soil Investigation
 Client Reference: TP6
 Source of Material: Site Won
 Visual Description: Light Greyish Brown Crushed Rock
 Date of Sampling: 26/03/2026

Test Information

BS 1377-2:2022 & EN ISO 17892-4:2016 Cl 5.2

Sieve Size	% Passing	Particle Size	% Passing Minimum	% Passing Maximum
500mm	100	Boulders		
300mm	100	Cobbles		
125mm	100			
100mm	100			
90mm	100			
75mm	100			
63mm	94	Gravel		
50mm	86			
37.5mm	79			
28mm	67			
20mm	54			
14mm	45			
10mm	38			
6.3mm	31			
5mm	29			
3.35mm	26			
2mm	22	Sand		
1.18mm	19			
600µm	15			
425µm	13			
300µm	11			
212µm	9			
150µm	8			
63µm	5	Silt/Clay		

Remarks:

Sampling carried out by:	Client
Deviation from Test Method:	No
Comments associated with the test:	None
Particle Density of the soil is assumed to be 2.65 Mg/m ³	2.65 Mg/m ³
Pre-Treatment of the sample	Not Applicable
Amount of soil used for the test	Riffled from a bulk sample > 40 Kg
The uniformity coefficient is	94

Approved By:
 James Purcell
 Laboratory Technical Manager

Signature:

Issue Date: 28/04/2026

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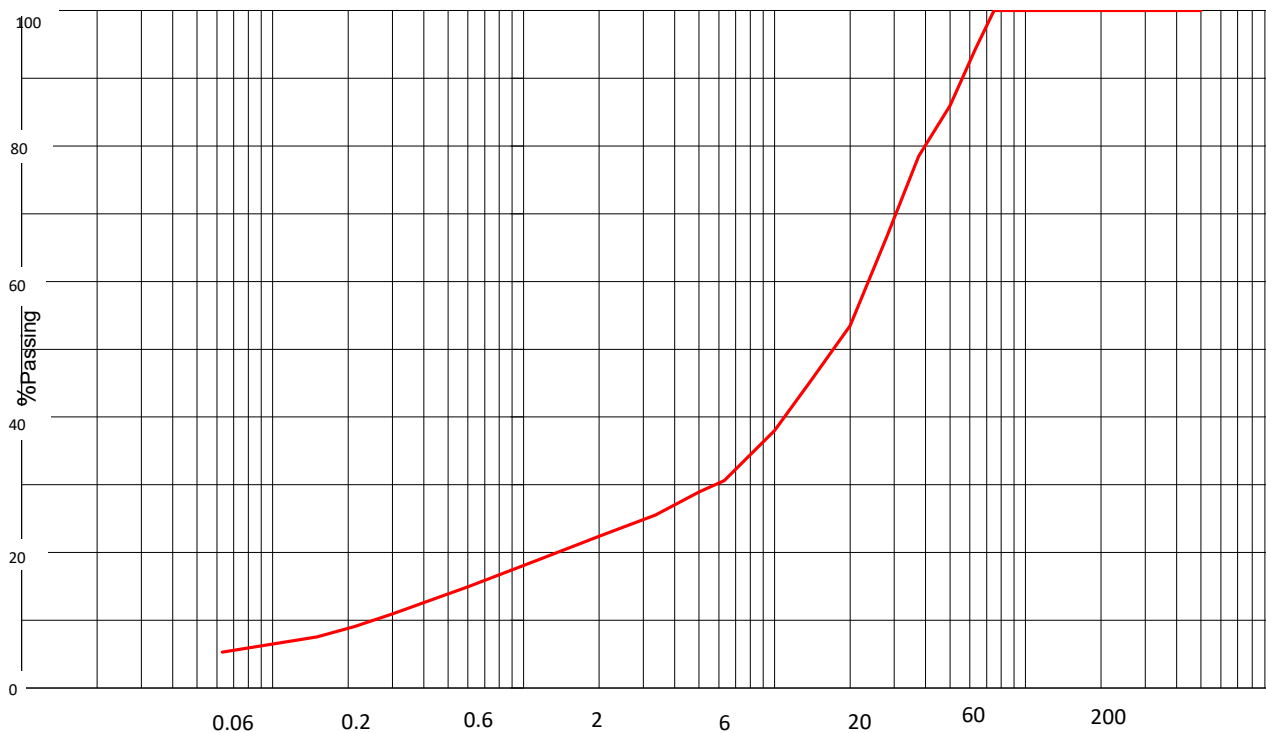
SOIL TEST REPORT

DETERMINATION OF PARTICLE SIZE DISTRIBUTION



GRAPH

BS 1377-2:2022 & EN ISO 17892-4:2016 Cl 5.2



CLAY	SILT	SAND	GRAVEL	COBBLES	BOULDERS
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Remarks:

Approved By:

Seamus O' Connell

Laboratory Technical Manager

Signature:

Issue Date: 28/04/2026

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**SOIL TEST REPORT****DETERMINATION OF pH VALUE**

Client:	The Department of Defence	BHP Ref. No.:	26/03/7559
	Naval Base	Order No:	H/S49/26
	Cork	Date Received:	31/03/2026
	Cork	Date Tested:	08/04/2026
F.A.O.:	Paul Finnegan	Design-execution Standard:	TII Spec. Series 600
Project:	Sarsfield Barracks		

Sampling Information

Method of Preparation:	Disturbed BS1377-1 Cl.8	Visual Description:	Light Greyish Brown Crushed Rock
Material:	Soil Sample - Soil Investigation		
Client Reference:	TP6		
Source of Material:	Site Won	Date of Sampling:	26/03/2026

Test Information**BS 1377-3:2022 Cl.12**

pH Value

8.5

Remarks:

Sampling carried out by:	Client
Deviation from Test Method:	No
Comments associated with the test:	None

Approved By:

James Purcell

Laboratory Technical Manager

Signature:

Issue Date: 28/04/2026

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SOIL TEST REPORT



DETERMINATION OF LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX

Client:	The Department of Defence	BHP Ref. No.:	26/03/7559
	Naval Base	Order No:	H/S49/26
	Cork	Date Received:	31/03/2026
	Cork	Date Tested:	08/04/2026
F.A.O.:	Paul Finnegan	Design-execution Standard:	TII Spec. Series 600
Project:	Sarsfield Barracks		

Sampling Information

Method of Preparation:	Disturbed BS1377-1 Cl.8	Visual Description:	Light Greyish Brown Crushed Rock
Material:	Soil Sample - Soil Investigation		
Client Reference:	TP6		
Source of Material:	Site Won	Date of Sampling:	26/03/2026

Test Information

BS 1377-2:2022 & EN 17892-12 2014 & A1 2022

Method to obtain the Liquid Limit	Not Applicable
Type of cone	Not Applicable
% Passing on 425µm test sieve	13
Penetration points	Not Applicable
Water Content of original sample	7.8
Liquid Limit	Not Applicable
Plastic Limit	Non-plastic
Plasticity Index	Non-plastic

Remarks:

Sampling carried out by:	Client
Deviation from Test Method:	No
Comments associated with the test:	None

Approved By:

James Purcell

Laboratory Technical Manager

Signature:

A handwritten signature in blue ink, appearing to read 'James Purcell'.

Issue Date: 28/04/2026

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SOIL TEST REPORT



DETERMINATION OF WATER CONTENT

Client:	The Department of Defence	BHP Ref. No.:	26/03/7559
	Naval Base	Order No:	H/S49/26
	Cork	Date Received:	31/03/2026
	Cork	Date Tested:	02/04/2026
F.A.O.:	Paul Finnegan	Design-execution Standard:	TII Spec. Series 600
Project:	Sarsfield Barracks		

Sampling Information

Method of Preparation:	Disturbed BS1377-1 Cl.8	Visual Description:	Light Greyish Brown Crushed Rock
Material:	Soil Sample - Soil Investigation		
Client Reference:	TP6		
Source of Material:	Site Won	Date of Sampling:	26/03/2026

Test Information

BS 1377-2:2022 Cl.4.1 & EN 17892 Part 1 2014 + A1 2022

Water Content (% of dry mass)	7.8
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Remarks:

Sampling carried out by:	Client
Deviation from Test Method:	No
Comments associated with the test:	None

Approved By:

James Purcell

Laboratory Technical Manager

Signature:

Issue Date: 28/04/2026

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SOIL TEST REPORT



DETERMINATION OF WATER SOLUBLE SULPHATE

Client:	The Department of Defence	BHP Ref. No.:	26/03/7559
	Naval Base	Order No:	H/S49/26
	Cork	Date Received:	31/03/2026
	Cork	Date Tested:	23/04/2026
F.A.O.:	Paul Finnegan	Design-execution Standard:	TII Spec. Series 600
Project:	Sarsfield Barracks		

Sampling Information

Method of Preparation:	Disturbed BS1377-1 Cl.8	Visual Description:	Light Greyish Brown Crushed Rock
Material:	Soil Sample - Soil Investigation		
Client Reference:	TP6		
Source of Material:	Site Won	Date of Sampling:	26/03/2026

Test Information

Water extraction with ICPOES Analysis

Test Parameter / Determined Value	Units	Results	Method
Water Soluble Sulphate as SO ₄	%	0.01	ICPOES
Water Soluble Sulphate as SO ₄	g/L SO ₄	0.049	ICPOES
Water Soluble Sulphate as SO ₃	%	0.008	Calculation
Water Soluble Sulphate as SO ₃	g/L SO ₃	0.041	Calculation

Remarks:

Sampling carried out by:	Client
Deviation from Test Method:	No
Comments associated with the test:	None

Approved By:

James Purcell

Laboratory Technical Manager

Signature:

Issue Date: 28/04/2026

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