



Supplementary Statement of Intentions

for capping and restoration of

Stormy West Landfill Site

Pyle, Nr. Bridgend.

June 1996

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Supplementary Statement of Intentions

1.0 Introduction

1.0 The Site

1.1.1 Stormy West Landfill Site is located at Grid reference SS 846 805. The nearest centre of population is Pyle, 3km to the north west.

* 1.1.2 The site, outlined in blue on drawing No. L1, covers an area of approximately 9.8 hectares and is bound by the A48 road to the south, common land to the north and east, and farmland to the west.

1.1.3 The Site has been operated by Wimpey Waste Management Ltd. (WWM) and has received domestic waste from Ogwr BC waste collection services, commercial and industrial waste from third party operators and WWM's own collection services. The site is now operated by Wimpey Disposal Ltd., which as a wholly owned subsidiary of George Wimpey PLC, has operated the site since the sale of WWM in 1991.

1.1.4 The site is an old limestone quarry situated near the top of a gently sloping hill, although undulating the land slopes broadly south and west towards the coast.

1.1.5 The total capacity of the consented landfill was approximately 1,100,000 cubic metres.

2.0 Description of Works

2.1 Planning Requirements.

2.1.1 Condition No 16 of Planning permission 92/0174, dated 9th July 1992 requires the site to be restored with a minimum of one metre of soil covered by top soil and sown in accordance with drawing No. WSD B 008 7202. No reference is made to soil specifications.

2.1.2 Submission of detail with regard to consent 92/0174 was subsequently approved and the approved final restoration contours and planting specification are shown on drawing No. 668/01.

2.2 Licence Requirements

2.2.1 No requirements for restoration are contained in Waste Disposal Licence No. 5 dated 23rd August 1984. — *disposal*

2.2.2 Areas where putrescible waste has been tipped will be provided with an engineered capping layer conforming to 2.2.2.1 and 2.2.2.2.

2.2.2.1 The Working Plan accompanying the licence application dated 15th September 1992 contains restoration details requiring 750mm of low permeability material capable of achieving a permeability of 1×10^{-9} m/s. This would be overlaid by 750mm of subsoil, with sewage sludge rotavated into the top 150mm, thus increasing the organic content and providing a growth medium.

2.2.2.2 Further detail was supplied contained in a submission on 16th March 1995 outlining the preplacement testing and Construction Quality Assurance criteria to be used during emplacement of the engineered cap.

A 2.2.3 Restoration of the inert areas outside the putrescible void will take the form of an application of 750mm of subsoil, with sewage sludge rotavated into the top 150mm. Depth of subsoil will be reduced at the site boundaries to allow gradual contouring to existing groundlevels.

2.3 Engineering Works

2.3.1 Engineered works are to be undertaken on the putrescible waste area only.

2.3.2 The works will encompass movement of existing stockpiles of compliant material (see section 3.0) from around the site and placement upon the landfill followed by compaction to achieve the required permeability.

2.3.3 The cap will be placed in layers with each layer being compacted by a specified number of passes in accordance with the Department of Transport Specification for Highway Works Table 6/4 (Appendix C).

2.3.4 Upon completion of each layer samples will be taken in accordance with section 4.0 prior to application of the overlying layer.

2.3.5 Upon completion and satisfactory testing of the engineered portion of the cap subsoil will be applied as soon as practicable to prevent drying, shrinkage and cracking.

2.3.6 It is the Company's intention to let a contract for the works requiring the successful contractor to provide a Method Statement listing:-

- i) phasing of the operation
- ii) method of compaction
- iii) layer thickness and number of passes.

This information will be submitted to the Environment Agency prior to implementation of the works.

- 2.3.7 Burial of the gas extraction pipe network will be incorporated within the engineering operations. Gas well heads will be completed ^{to} protruding from the final finished surface to accommodate settlement and allow adjustments to flow rates to be undertaken, maintaining the integrity of the collection network.

3.0 Compliance of Existing On-site Material.

- 3.1 The total requirements for material capable of attaining a permeability of less than 1×10^{-9} m/s has been calculated at $38,280\text{m}^3$.
- 3.2 Available stockpiles of material around the perimeter of the site capable of achieving this permeability have been calculated at $36,132\text{m}^3$. Test results from these stockpiles, located as shown on drawing No. CQA 01 and a summary of properties and minimum standards of acceptance are contained in Appendix A.
- 3.3 A short fall of approximately 2000m^3 exists at this present time, however a source has been located and will be imported once works commence and following confirmation of acceptance criteria.

4.0 Restoration Timescale

- 4.1 The restoration programme in Appendix B shows estimated commencement, duration and completion periods of the major restoration items. These periods take no account of commencement and inclement weather delays and assume a weekly placement rate of engineered materials of $20,000\text{m}^2/\text{layer}/\text{week}$.
- *4.2 Monthly updated programs will be prepared and submitted to the Environment Agency. However the Company is aware of its planning constraints and all restoration earthworks will be completed by 31st May 1997.

5.0 Method Statement for Testing Regime.

- 5.1 The Environment Agency will be advised by facsimile with a minimum of 24 hours prior notice that an area of the engineered cap is to be tested.
- 5.1.1 Should the Environment Agency wish to attend the testing, test locations will be determined between the Agency and Wimpey Disposal's representative. Results will be forwarded with a location plan to the Environment Agency, when available.
- 5.1.2 Should the Environment Agency not wish to attend the testing, representative locations will be chosen and tested. Results will be forwarded with a location plan to the Environment Agency, when available.

- 5.2 Emplacement of subsequent layers will be dependent on test results achieving the minimum standards of acceptance.
- 5.3 Testing will consist of ten test locations per layer with the following tests being performed:-
- i) In-site density - BS 1377:Part 9:Test 2
 - ii) Moisture content - BS 1377
 - iii) Depth profiling - by excavation or augering.
- 5.4 The contractor will produce a plan showing the location of placement of each source of clay, which shall be used to determine the minimum standards of acceptance for a particular test location.
- 5.5 Should the tests in 5.3 indicate an area that does not meet the minimum standards of acceptance the extent of the suspect area shall be determined and agreed with the Environment Agency.
- 5.6 Core permeability samples will be taken on suspect areas to ascertain the actual permeability obtained. If this falls below the minimum standard that area will be excavated and either recompact to the specification or replaced with compliant material.
- 5.7 The contractor will have the right to recompact or replace all suspect material immediately without core permeability samples being taken, should he choose to do so, following evaluation under 5.5.

Prescribed

CQA 01

STOCKPILE
LOCATIONS



SUMMARY OF TEST DATA FOR ON-SITE MATERIAL

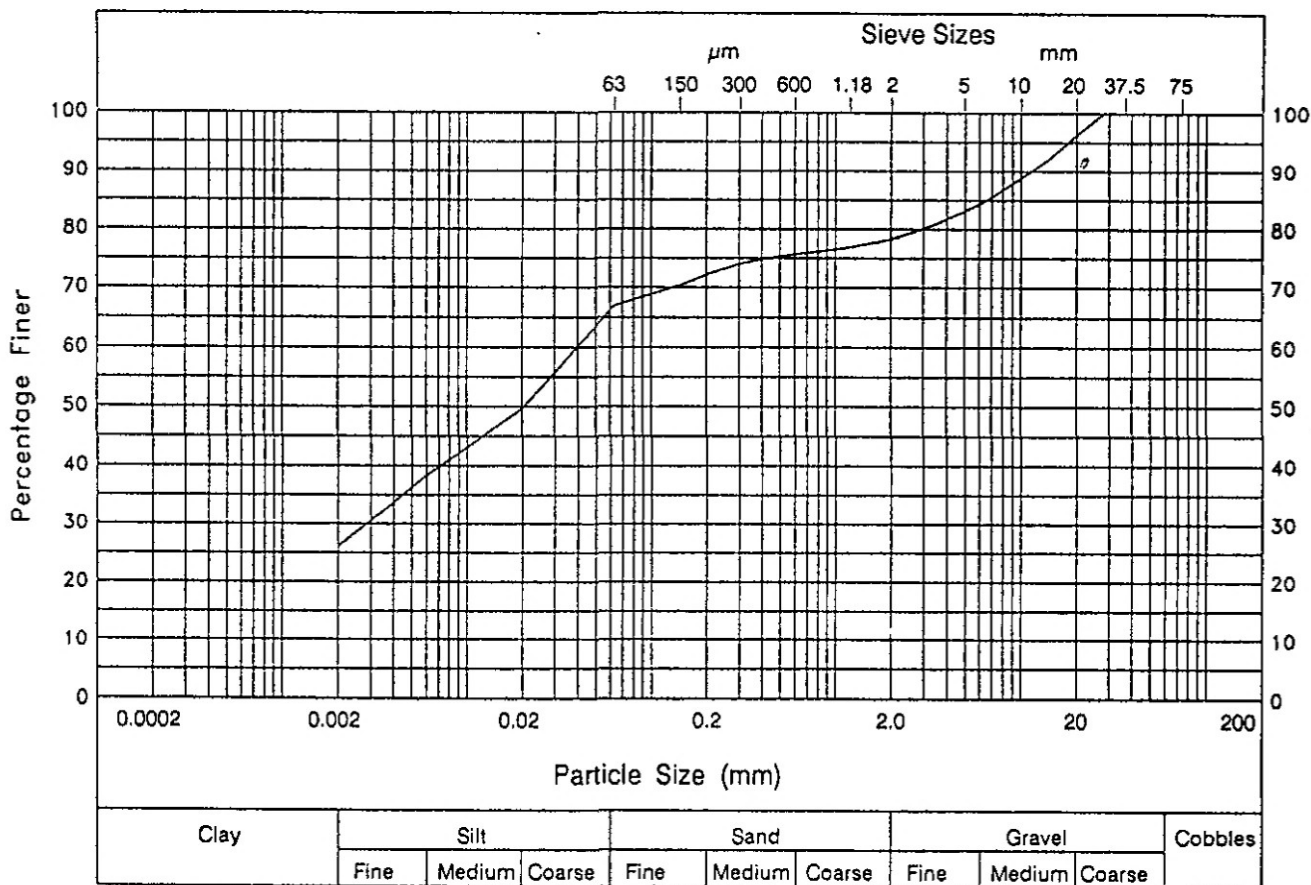
Source	Volume (m ³)	Date of test	Clay content (%)	Maximum dry density (T/m ³)	Optimum water content (%)	Liquid Limit (%)	Permeability (m/s)
McCarthy 'A'	4,100	22 May 1996	26	1.67	18	48	1.47 x 10 ⁻¹⁰
McCarthy 'B'	10,400	Sept 1994	23	1.62	12	38	3.07 x 10 ⁻¹¹
Bond 'A' #1	6,400	March 1996	8	2.01	11	34	2.09 x 10 ⁻¹⁰
Bond 'A' #2	-	4 June 1996	13	-	-	-	-
Bond 'B'	2,300	9 Feb 1996	13	2.02	10	21	6.02 x 10 ⁻¹⁰
Shillibier 'A'	7,500	March 1996	11	2.04	11	34	6.79 x 10 ⁻¹⁰
Shillibier 'B'	7,500	March 1996	11	2.04	11	40	6.79 x 10 ⁻¹⁰

#1 Original sample showing low clay content.

#2 Second sample confirming acceptance criteria for minimum clay content.

Minimum standards of acceptance for employed material

Source	Minimum moisture content (%)
McCarthy 'A'	18
McCarthy 'B'	12
Bond 'A'	11
Bond 'B'	10
Shillibier 'A'	11
Shillibier 'B'	11



Particle Size	% Passing	Particle Size	% Passing
28 mm	100	600 μm	76
20 mm	96	425 μm	75
14 mm	92	300 μm	74
10 mm	89	212 μm	72
6.3 mm	85	150 μm	71
5 mm	83	63 μm	67
3.35 mm	81	20 μm	50
2 mm	78	6 μm	38
1.18 mm	77	2 μm	26

Hole 1	Test Performed: WET Sedimentation sample pretreated using hydrogen peroxide
Depth 0.00	Description Brown mottled dark grey silty CLAY with fine to medium gravel
Type B	

Form 25/3

Laboratory - Particle Size Plot

Project

Contract

156061



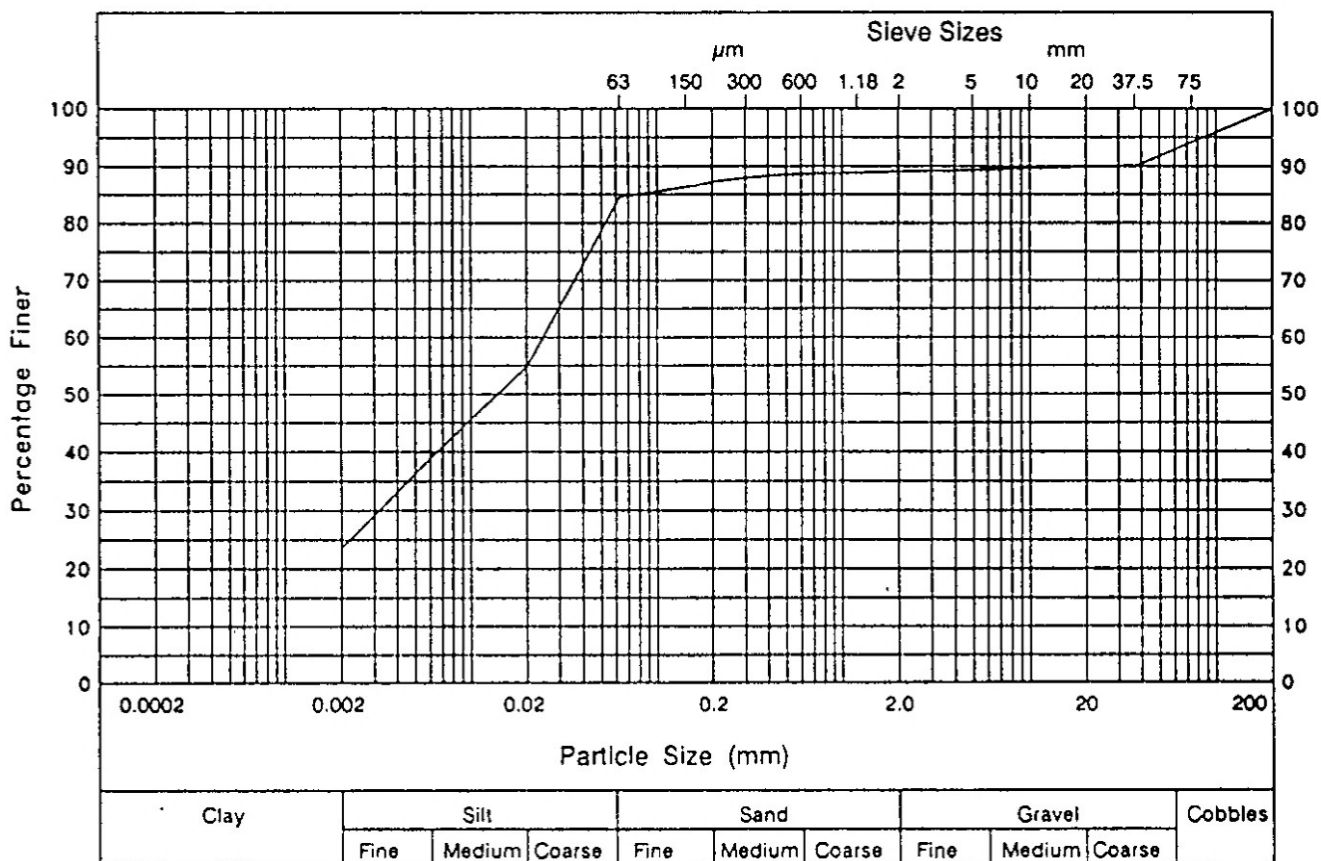
Exploration Associates

Wimpey Disposal
Stormy West Landfill Site

McCarthy A

Sheet

L2/1



Particle Size	% Passing	Particle Size	% Passing
50 mm	100	425 μm	88
37.5 mm	90	300 μm	88
14 mm	90	212 μm	87
6.3 mm	89	150 μm	86
5 mm	89	63 μm	85
3.35 mm	89	20 μm	55
2 mm	89	6 μm	39
1.18 mm	89	2 μm	23
600 μm	89		

Hole SAMP1 Depth 0.00 Type 8	Sample Description Yellow brown sandy very silty CLAY with occasional fine to medium gravel
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Form 25/2

Laboratory - Particle Size Plot

Project

Contract

154063



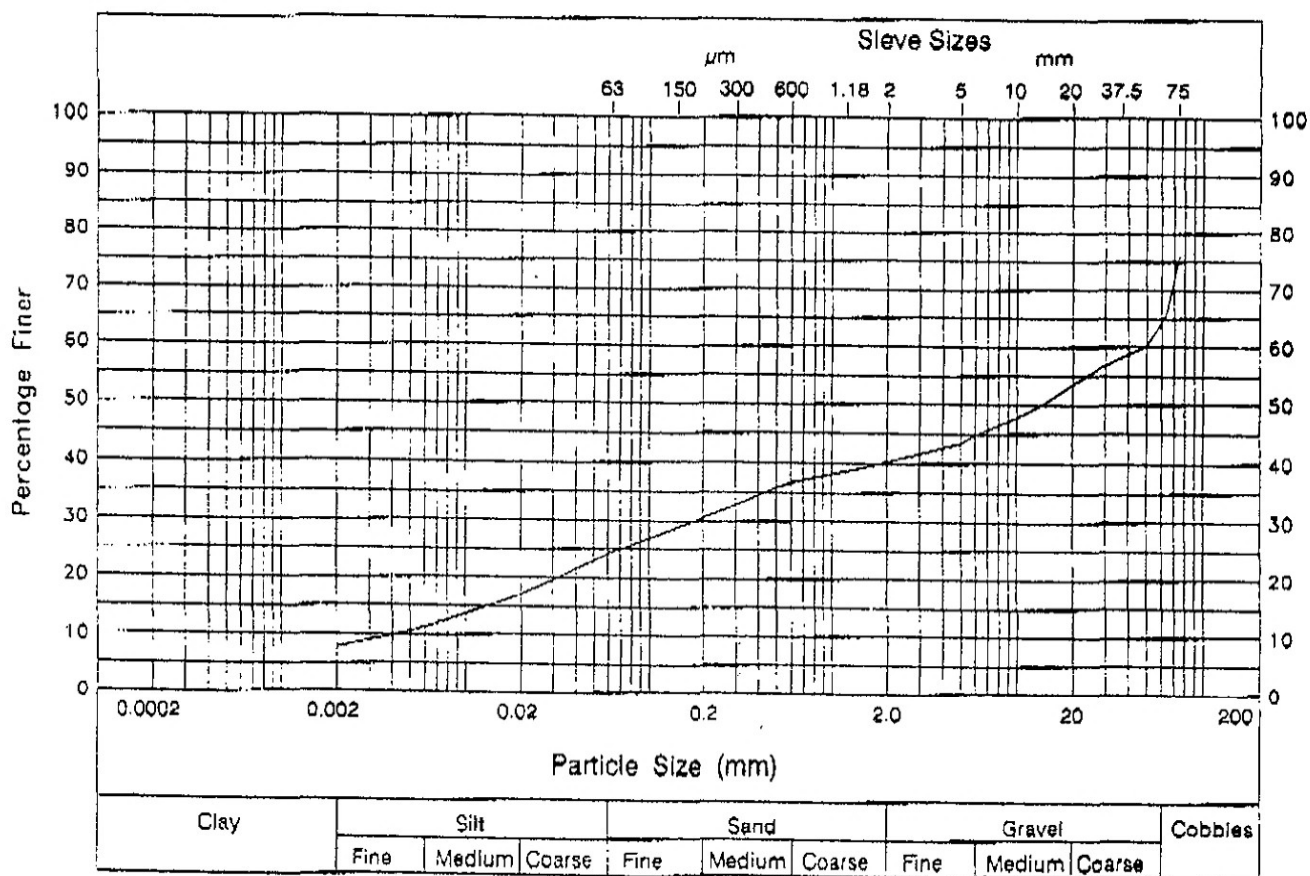
Exploration Associates

Stormy West - Clay Capping Analysis
Springfields

McCarthy B

Sheet

L2/1



Particle Size	% Passing	Particle Size	% Passing
75 mm	76	1.18 mm	39
63 mm	65	600 μm	37
50 mm	60	425 μm	35
28 mm	56	300 μm	33
20 mm	54	212 μm	31
14 mm	50	150 μm	29
10 mm	48	63 μm	24
6.3 mm	45	20 μm	17
5 mm	43	6 μm	11
3.35 mm	42	2 μm	8
2 mm	40		
Hole BOND	Test Performed: WET Sedimentation sample pretreated using hydrogen peroxide		
Depth 0.00	Description Brown silty sandy CLAY with some fine to coarse gravel and occasional cobbles with some rootlets		
Type B			

Form 25/3

Laboratory - Particle Size Plot

Project

Contract

156033



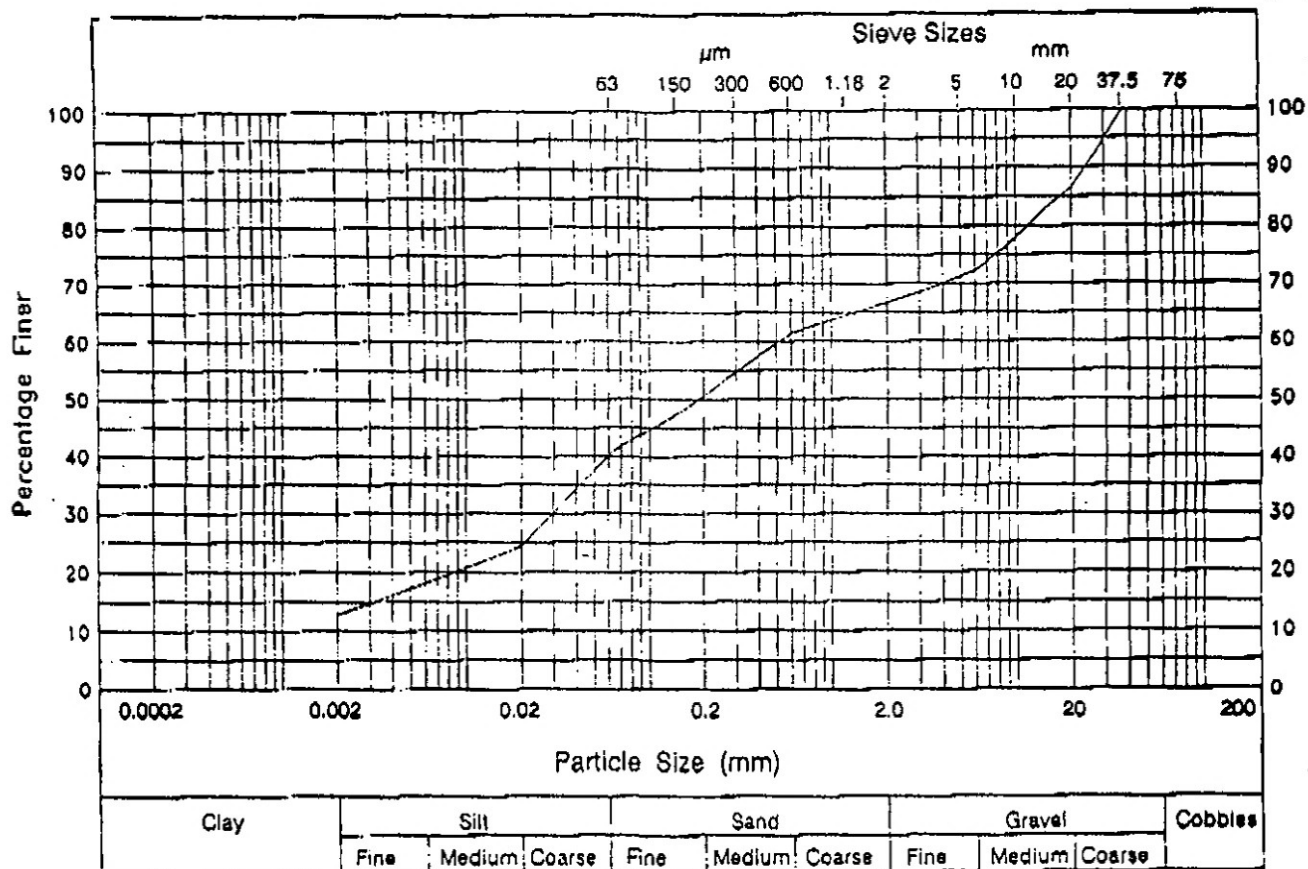
Exploration Associates

Wimpey Disposal
Wimpey Disposal Limited
Bond A^{RI}

Sheet

L2/1

TOTAL P.02



Particle Size	% Passing	Particle Size	% Passing
37.5 mm	100	600 μm	61
28 mm	93	425 μm	58
20 mm	86	300 μm	55
14 mm	83	212 μm	51
10 mm	78	150 μm	48
6.3 mm	72	63 μm	41
5 mm	71	20 μm	24
3.35 mm	69	6 μm	18
2 mm	67	2 μm	13
1.18 mm	64		
Hole BOND A		Test Performed: WET Sedimentation sample pretreated using hydrogen peroxide	
Depth 0.00			
Type B			

Form 25/3

Laboratory - Particle Size Plot

Project

Stormy West Landfill Site
Winpey Disposal Ltd.

Contract

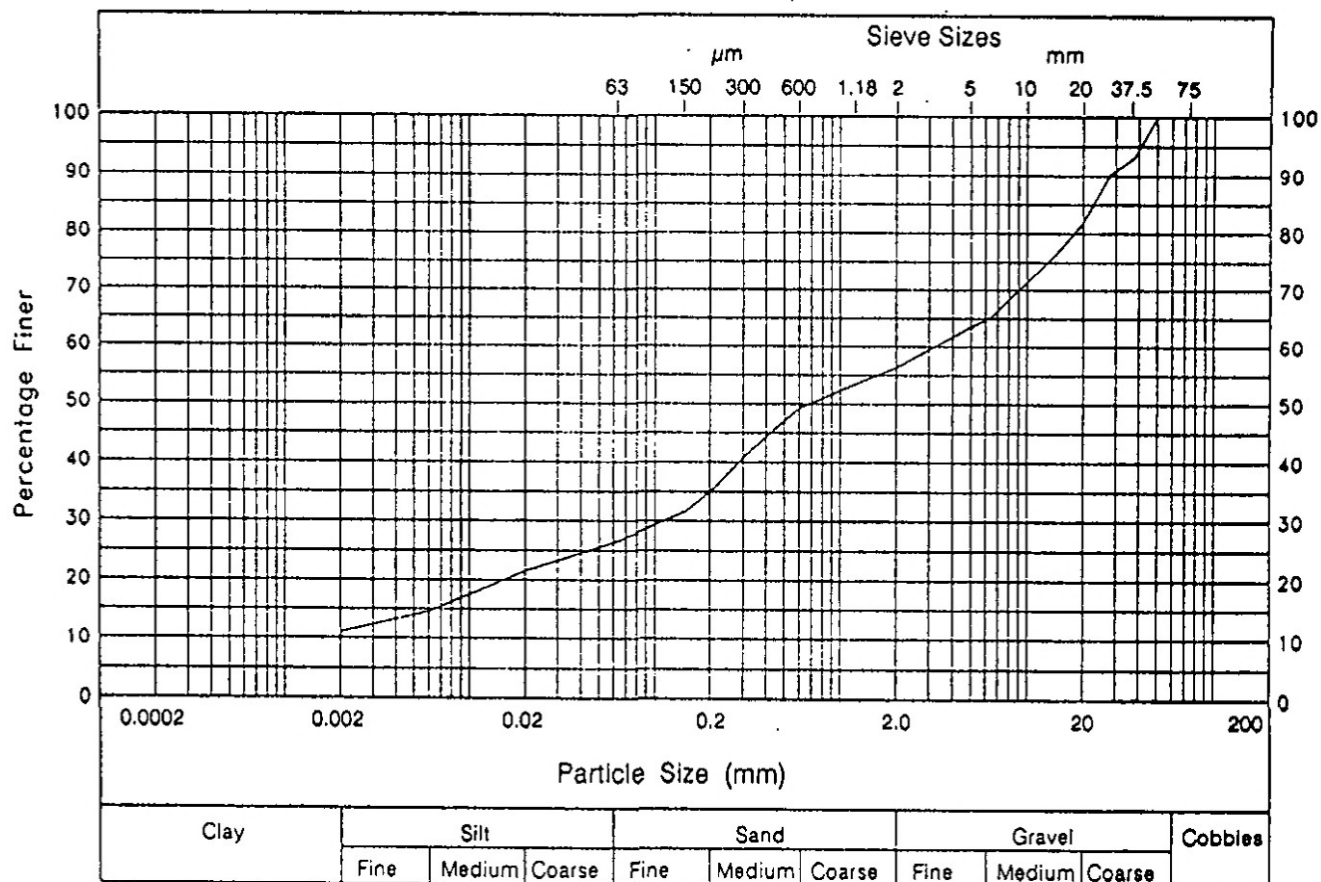
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Exploration Associates

Sheet

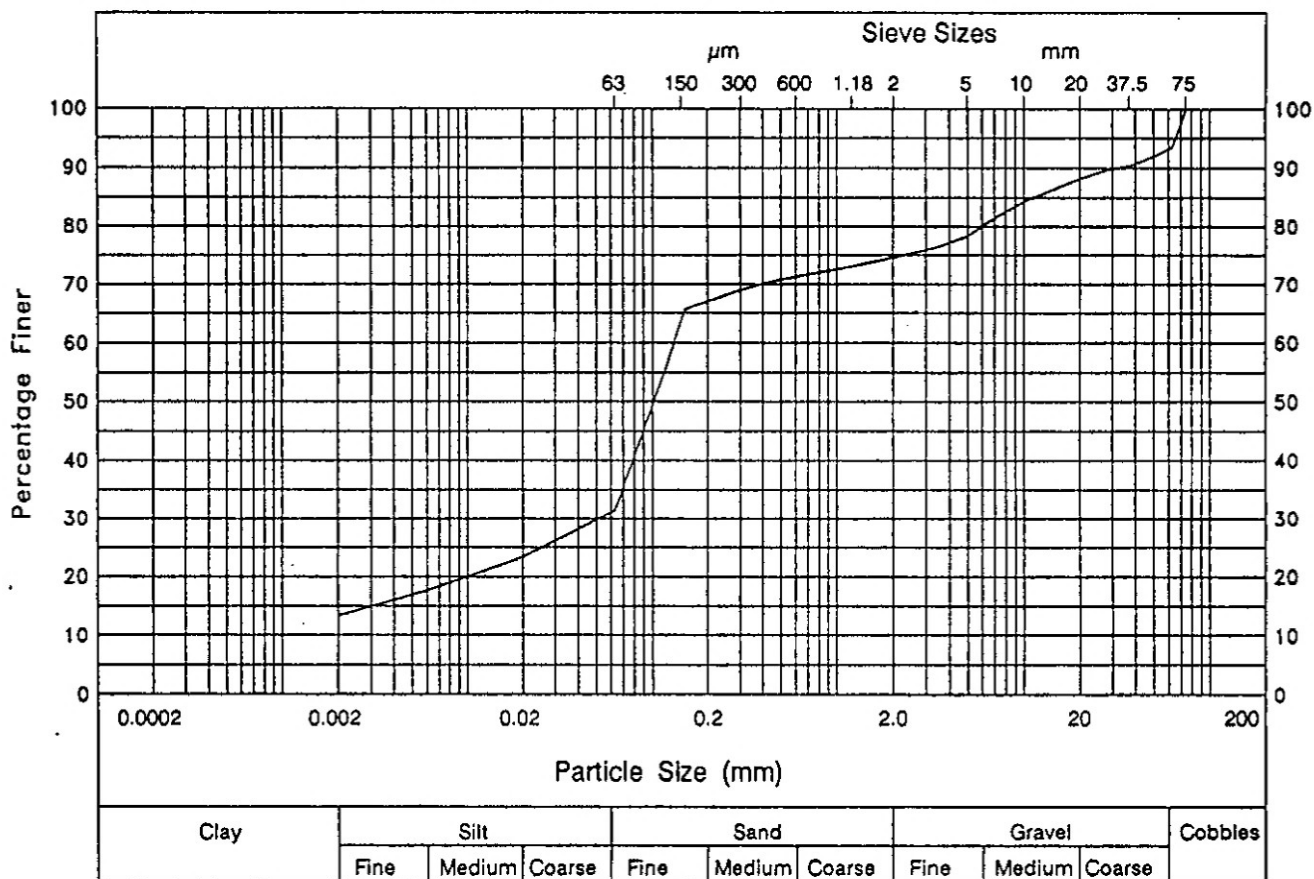
L3/1



Particle Size	% Passing	Particle Size	% Passing
50 mm	100	1.18 mm	53
37.5 mm	93	600 μm	49
28 mm	90	425 μm	45
20 mm	82	300 μm	41
14 mm	76	212 μm	36
10 mm	71	150 μm	32
6.3 mm	65	63 μm	27
5 mm	63	20 μm	21
3.35 mm	60	6 μm	14
2 mm	56	2 μm	11
Hole SCHLIB	Test Performed: WET Sedimentation sample pretreated using hydrogen peroxide		
Depth 0.00	Description Brown silty slightly sandy CLAY with some fine to coarse gravel and rare cobbles with some rootlets		
Type B			

Form 25/3

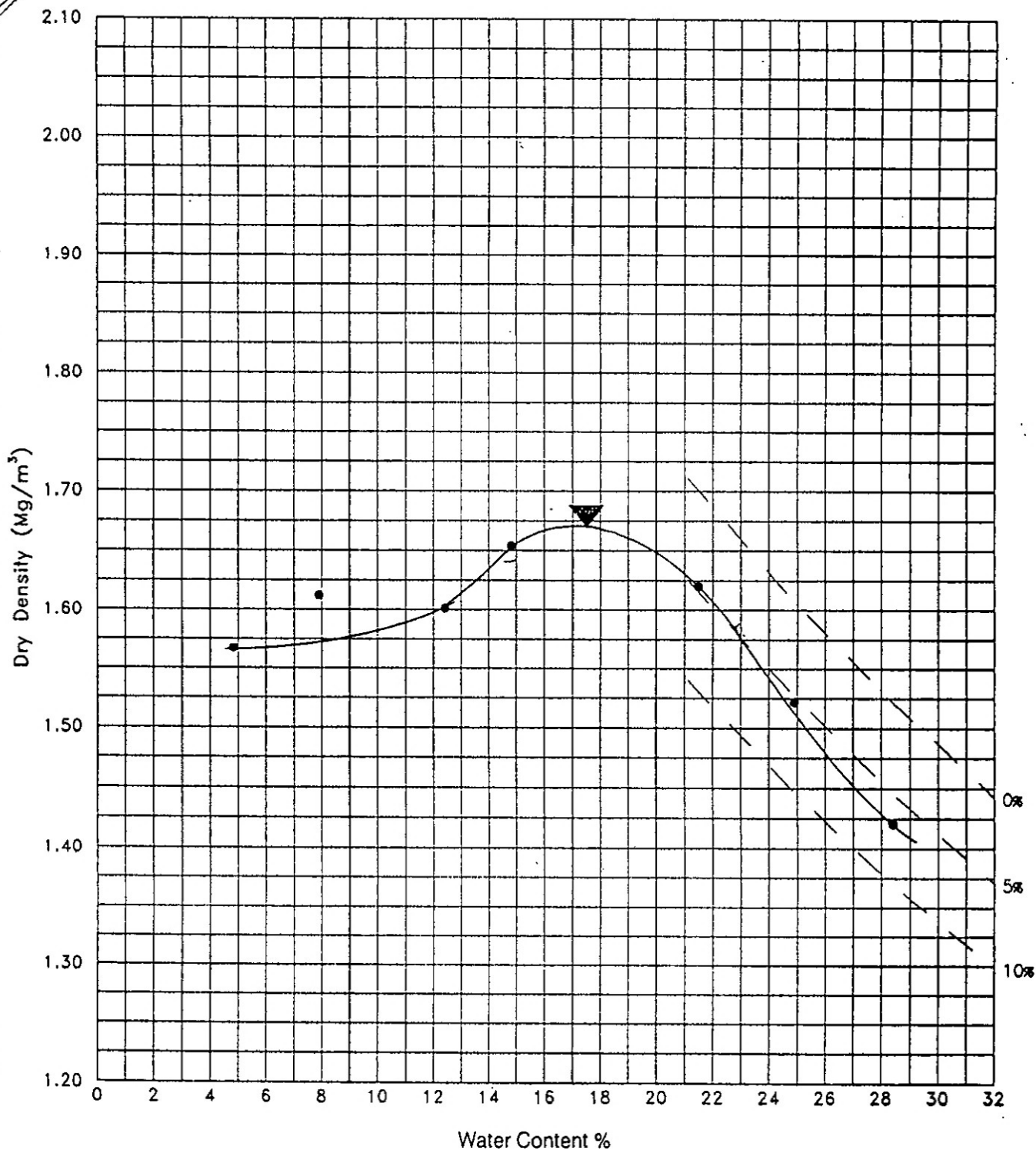
Laboratory - Particle Size Plot	Project	Contract
Exploration Associates	Wimpey Disposal Wimpey Disposal Limited Shillibier A & B	156033
		Sheet
		L2/2



Particle Size	% Passing	Particle Size	% Passing.
75 mm	100	2 mm	74
63 mm	93	1.18 mm	73
50 mm	92	600 μm	71
37.5 mm	90	425 μm	70
28 mm	90	300 μm	69
20 mm	88	212 μm	67
14 mm	86	150 μm	66
10 mm	84	63 μm	31
6.3 mm	80	20 μm	23
5 mm	78	6 μm	18
3.35 mm	76	2 μm	13
Hole SAMPLE 1	Test Performed: WET Sedimentation sample pretreated using hydrogen peroxide		
Depth 0.00	Description Light brown yellow very clayey SILT with some fine to coarse gravel		
Type B			

Form 25/3

Laboratory - Particle Size Plot 	Project Stormy West Landfill Site Wimpey Disposal Bond B	Contract 155221
		Sheet L2/1



- Moisture Content/Dry Density
- Compaction at Natural Water Content
- ▼ Maximum Dry Density/Optimum Water Content

Type of Test/Mould 2.5kg/1 Litre
 Particle Density Assumed 2.68 Mg/m³
 Maximum Dry Density 1.67 Mg/m³
 Optimum Water Content 18 %
 % retained 37.5mm sieve 0.00
 % retained 20mm sieve 0.69

Description

Brown mottled dark grey silty CLAY with fine to medium gravel

Hole 1

Depth 0.00

Type 8

Form 54/0

Remarks

Laboratory - Moisture Content/
Dry Density Relationship

Project

Wimpey Disposal
Stormy West Landfill Site

Contract 156061

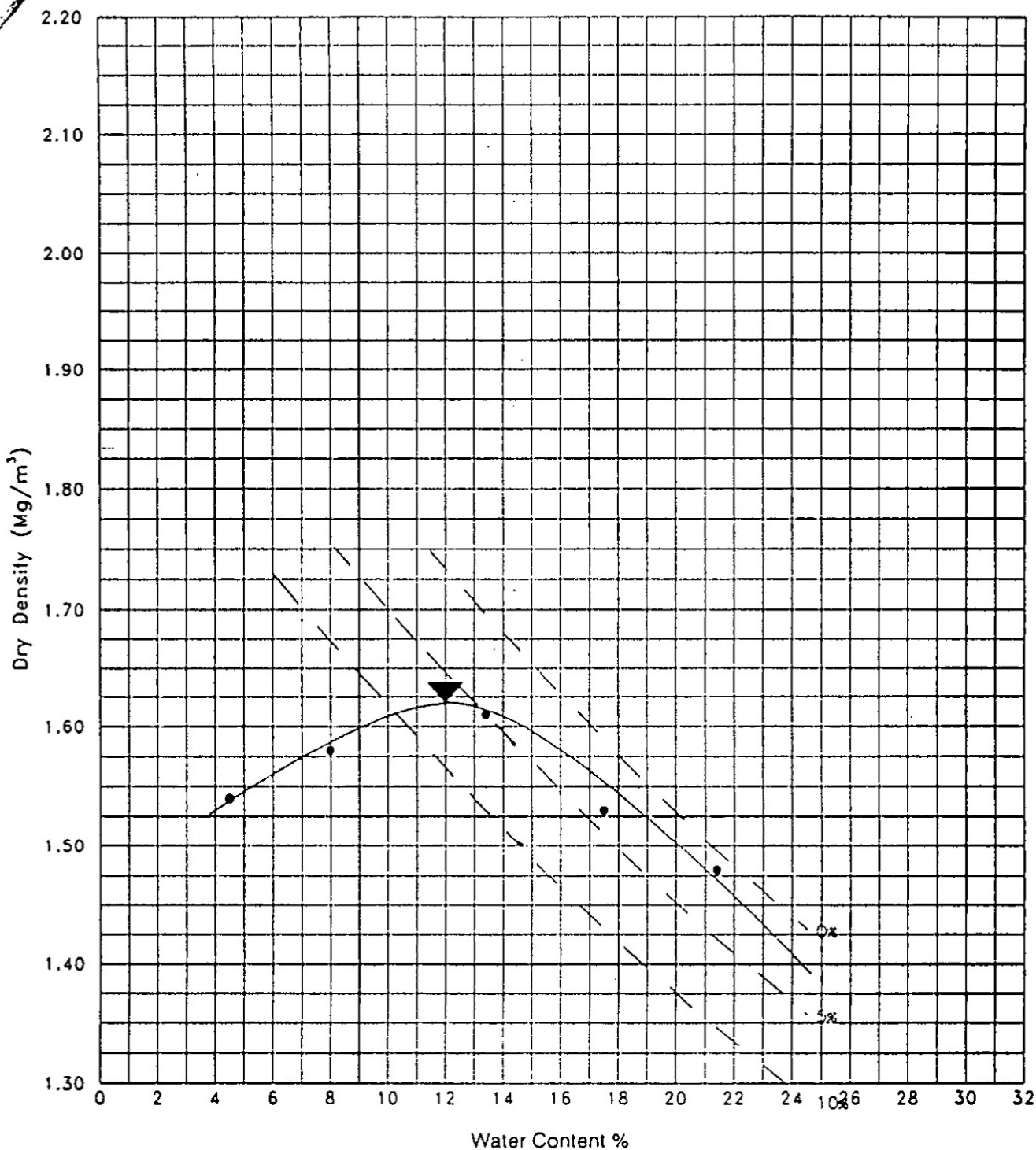


Exploration Associates

McCarthy A



L3/1



Type of Test/Mould	2.5kg/1 Litre	Description	Hole	SAHP1
Particle Density Assumed	2.20 Mg/m ³	Yellow brown sandy very silty CLAY with occasional fine to medium gravel	Depth	0.00
Maximum Dry Density	1.62 Mg/m ³		Type	B
Optimum Water Content	12 %		Form 54/0	
% retained 37.5mm sieve				
% retained 20mm sieve				

Remarks

Laboratory - Moisture Content/
Dry Density Relationship

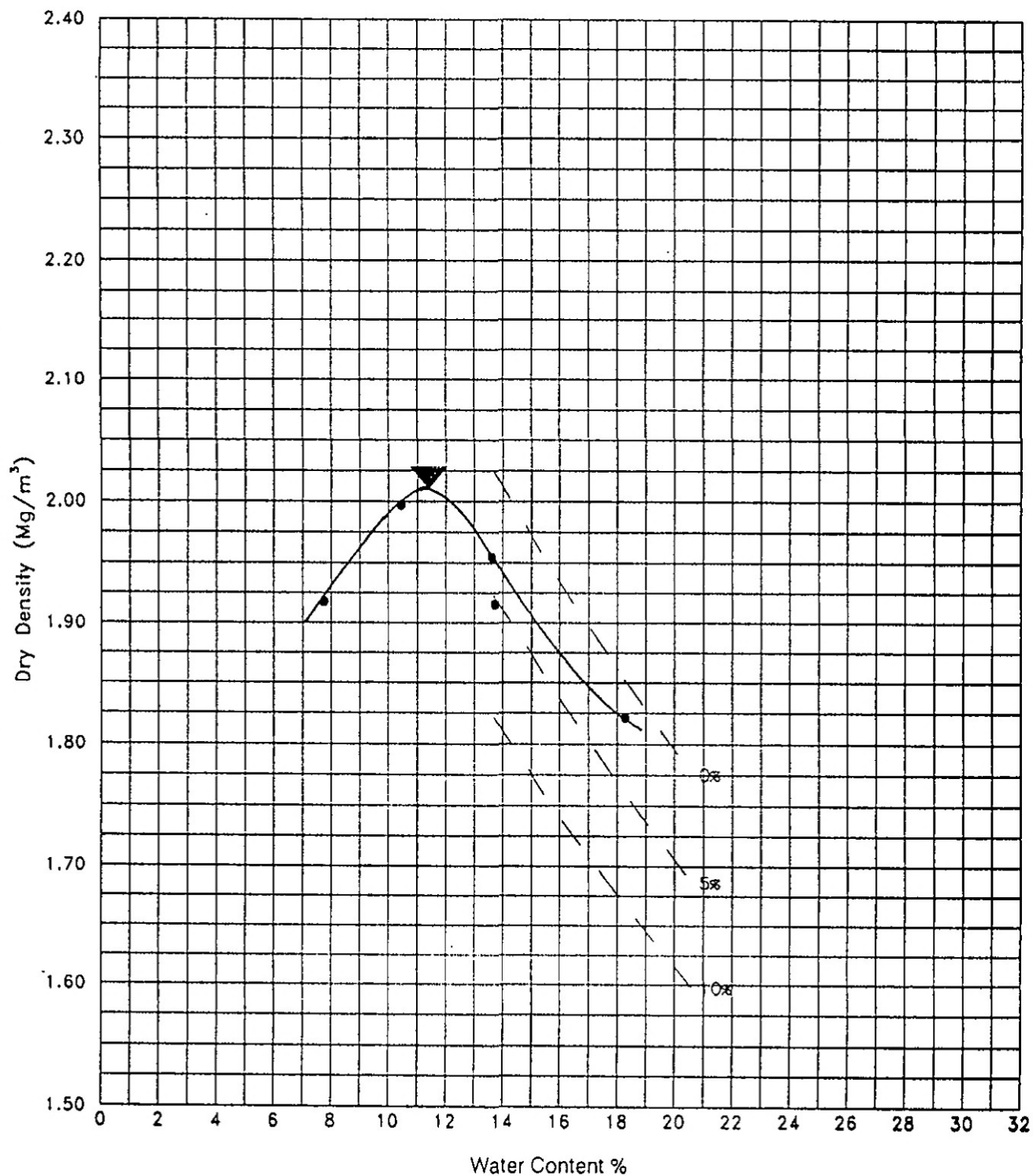
Project
Stormy West - Clay Capping Analysis
Springfields

Contract 154063

Exploration Associates

McCarthy B

L3/2



- Moisture Content/Dry Density
- Compaction at Natural Water Content
- ▼ Maximum Dry Density/Optimum Water Content

Type of Test/Mould	2.5kg/1 Litre
Particle Density Assumed	2.80 Mg/m ³
Maximum Dry Density	2.01 Mg/m ³
Optimum Water Content	11 %
% retained 37.5mm sieve	9.47
% retained 20mm sieve	7.75

Description

Brown silty sandy CLAY with some fine to coarse gravel and occasional cobbles with some rootlets

Hole	BOND
Depth	0.00
Type	B

Form 54/0

Remarks

Laboratory - Moisture Content/
Dry Density Relationship

Project

Wimpey Disposal
Wimpey Disposal Limited

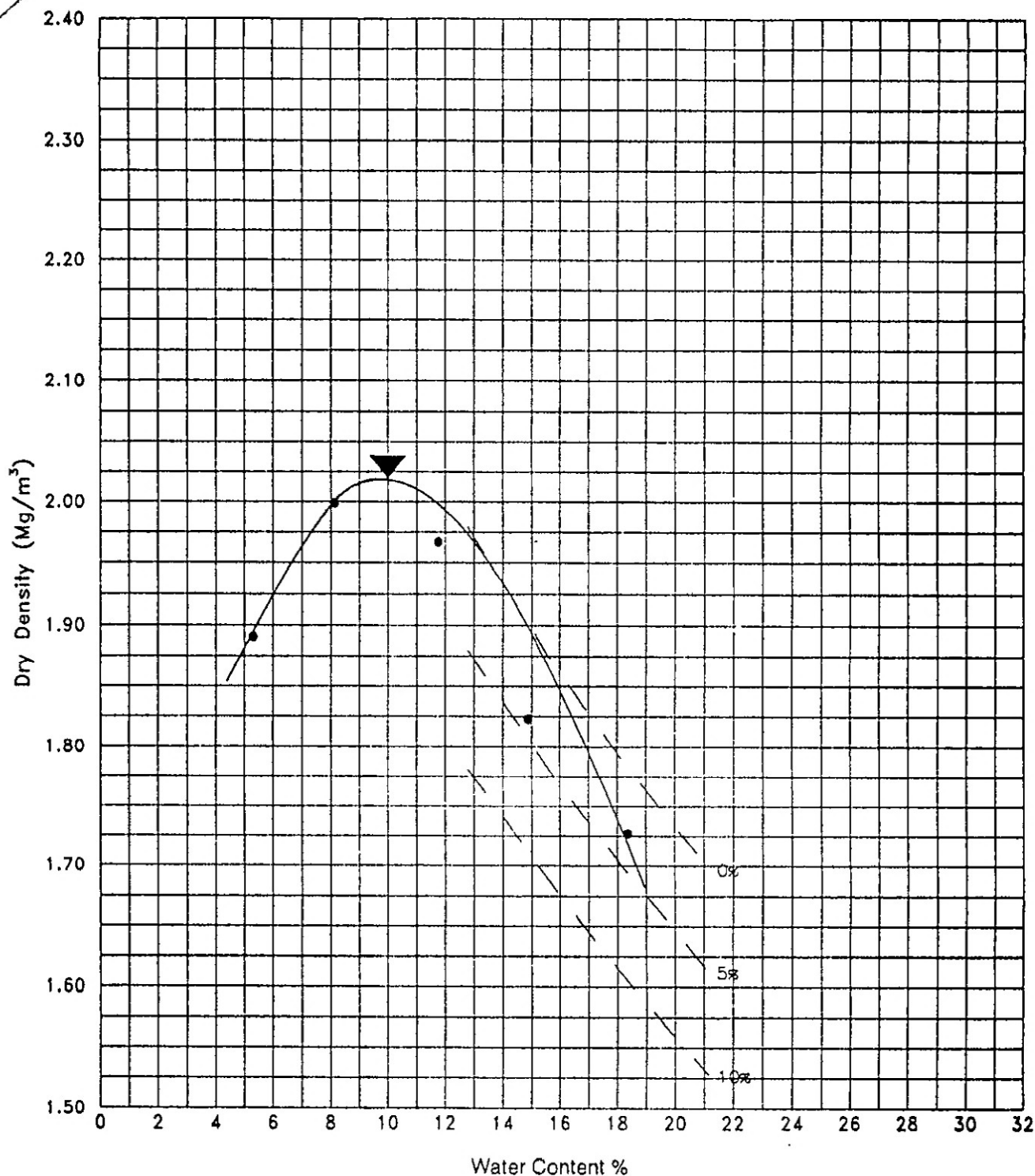
Contract 156033



Exploration Associates

Bond A^{#1}

L3/1



- Moisture Content/Dry Density
- Compaction at Natural Water Content
- ▼ Maximum Dry Density/Optimum Water Content

Type of Test/Mould 4.5kg/1 Litre
 Particle Density Assumed 2.65 Mg/m³
 Maximum Dry Density 2.02 Mg/m³
 Optimum Water Content 10 %
 % retained 37.5mm sieve
 % retained 20mm sieve

Description
 Light brown yellow very clayey SILT with
 some fine to coarse gravel

Hole SAMPLE 1
 Depth 0.00
 Type 8

Form 54/0

Remarks

Laboratory - Moisture Content/
 Dry Density Relationship

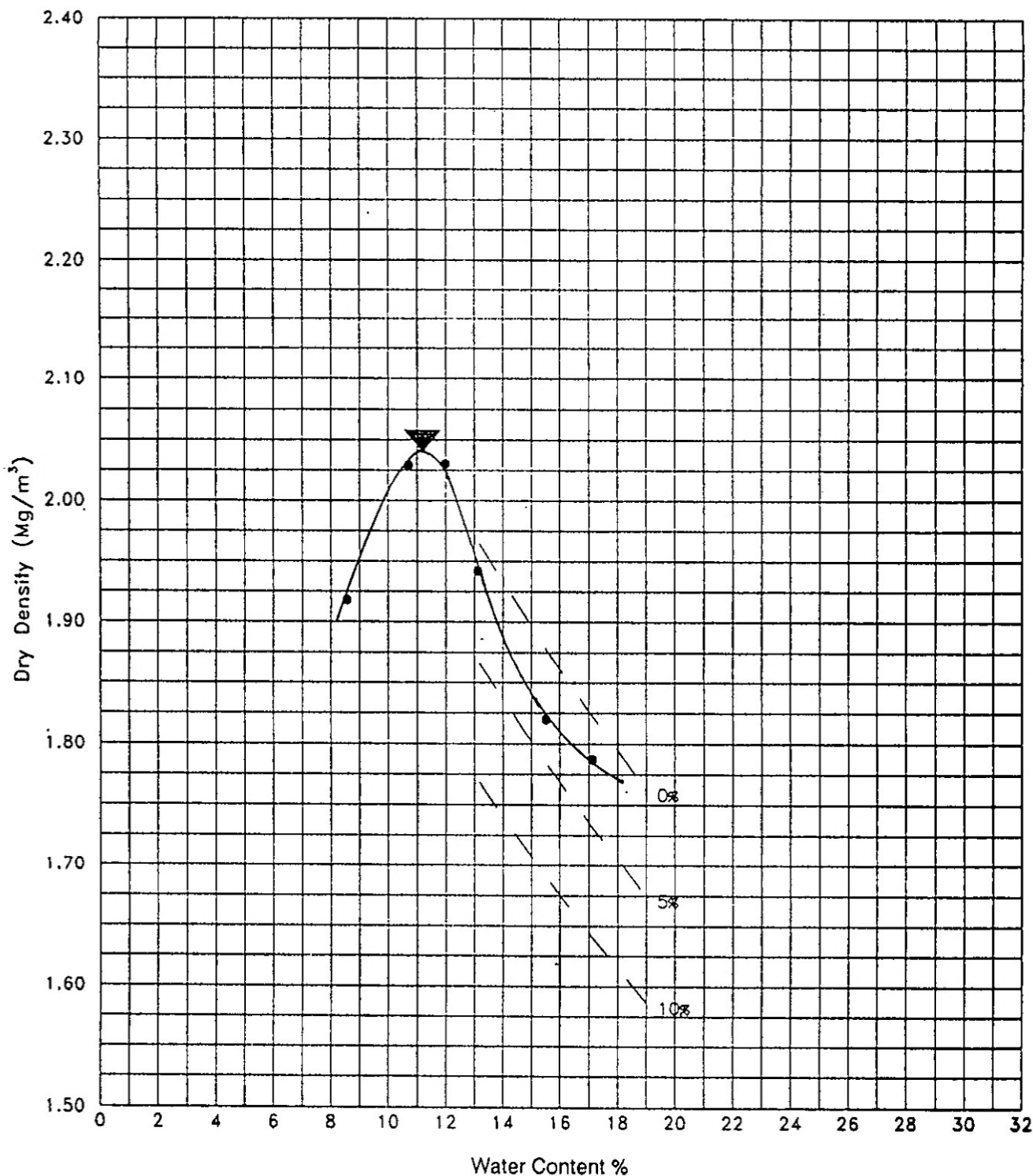
Project
 Stormy West Landfill Site
 Wimpey Disposal

Contract 155221

 Exploration Associates

Bond B

L3/1



- Moisture Content/Dry Density
- Compaction at Natural Water Content
- ▼ Maximum Dry Density/Optimum Water Content

Type of Test/Mould	2.5kg/CBR	Description Brown silty slightly sandy CLAY with some fine to coarse gravel and rare cobbles with some rootlets	Hole	SCHL1B
Particle Density Assumed	2.65 Mg/m ³		Depth	0.00
Maximum Dry Density	2.04 Mg/m ³		Type	B
Optimum Water Content	11 %			
% retained 37.5mm sieve	12.595			
% retained 20mm sieve	11.03			

Form 54/0

Remarks

Laboratory - Moisture Content/
Dry Density Relationship

Project

Wimpey Disposal
Wimpey Disposal Limited
Shillibier A & B

Contract 156033



Exploration Associates

L3/2

Samples				Classification					Strength			Other Tests
Hole	Depth	Type	Description	425 I _p	Prep w _L	w _p	Water %	γ _b Mg/m ³	Test	σ ₃ kPa	C kPa	
BOND A	0.00	B		72% 10	washed 34	24	16					Particle Size Analysis
BOND B	0.00	B		67%	washed 21	NP	22					
MCCAR A	0.00	B		81% 10	washed 48	38	31					
MCCAR B	0.00	B		81%	washed 38	NP	19					
SHILL A	0.00	B		79% 10	washed 34	24	16					
SHILL B	0.00	B		100% 13	net 40	27	17					

Remarks

Form 10/2

Laboratory - Results Summary

Project

Contract 156090



Exploration Associates

Stormy West Landfill Site
Wimpey Disposal Ltd.

Sheet

Liquid Limit (W_L)

L1/1

Samples				Water Content		Density			Permeability				
Hole	Depth	Type	Description	Initial %	Final %	Initial Mg/m ³	Final Mg/m ³	Dry Mg/m ³	Prep.	Test	P'o kN/m ²	Head m	m/sec
SAMPLE		U	Brown slightly silty sandy CLAY with some fine to medium and occasional stiff slightly silty sandy clay pockets.	19	22	1.98	2.02	1.66	REM	FHP	-	1.900	1.47×10^{-10}

Remarks

Laboratory - Permeability Test

Project

Contract 156061



Exploration Associates

Wimpey Disposal Limited
Stormy West Landfill Site
McCarthy A

Figure

Samples				Water Content		Density			Permeability				
Hole	Depth	Type	Description	Initial %	Final %	Initial Mg/m ³	Final Mg/m ³	Dry Mg/m ³	Prep.	Test	P'o kN/m ²	Head m	m/sec
SAMPLE 1		B	Orange brown silty CLAY with fine to medium gravel	12	28	1.78	2.43	1.59	REM	CHP	200	1.00	1.84×10^{-10}
SAMPLE 1		B	Orange brown silty CLAY with fine to medium gravel	26	33	1.61	1.84	1.28	REM	CHP	200	1.00	3.70×10^{-11}

Remarks

Laboratory - Permeability Test

Project

Contract 154063

Stormy Down
Springfield

Figure L4/1



Exploration Associates

McCarthy B

Samples				Water Content		Density			Permeability				
Hole	Depth	Type	Description	Initial %	Final %	Initial Mg/m ³	Final Mg/m ³	Dry Mg/m ³	Prep.	Test	P'o kN/m ²	Head m	m/sec
BOND		B	Top soil silty sandy CLAY with some rootlets.	12	11	2.24	2.24	2.01	REM	FHP	-	1.900	2.09×10^{-10}
SCHLIB		B	Top soil silty sandy CLAY with some rootlets	11	11	2.26	2.26	2.04	REM	FHP	-	1.900	6.79×10^{-10}
Remarks													
Laboratory - Permeability Test				Project						Contract 156033			
 Exploration Associates				Shillibier A & B / Bond A ¹¹						Figure			

Samples				Water Content		Density			Permeability				
Hole	Depth	Type	Description	Initial %	Final %	Initial Mg/m ³	Final Mg/m ³	Dry Mg/m ³	Prep.	Test	P'o kN/m ²	Head m	m/sec
SAMPLE 1		U	Light brown yellow very clayey SILT with some fine to medium coarse gravel.	10	12	2.22	2.26	2.01	REM	FHP	-	1.900	6.02 x 10 ⁻¹⁰
Remarks													
Laboratory - Permeability Test				Project						Contract 155221			
 Exploration Associates				Stormy West Landfill Site Waste Disposal						Figure			

STORMY WEST LANDFILL RESTORATION PROGRAMME 1996

[illegible]

TABLE 6/4: Method Compaction for Earthworks Materials Plant and Methods
(This Table is to be read in conjunction with Clause 612.10)

Type of Compaction Plant	Ref No	Category	Method 1	
			D	Ns
Smooth wheeled roller (or vibratory roller operating without vibration)	1	Mass per metre width of roll:—	125	8
	2	over 2100 kg up to 2700 kg	125	6
	3	over 2700 kg up to 5400 kg over 5400 kg	150	4
Grid roller	1	Mass per metre width of roll:—	150	10
	2	over 2700 kg up to 5400 kg	150	8
	3	over 5400 kg up to 8000 kg over 8000 kg	150	4
Tamping roller	1	Mass per metre width of roll:— over 4000 kg	225	4
Pneumatic-tyred roller	1	Mass per wheel:—	125	6
	2	over 1000 kg up to 1500 kg	150	5
	3	over 1500 kg up to 2000 kg	175	4
	4	over 2000 kg up to 2500 kg	225	4
	5	over 2500 kg up to 4000 kg	300	4
	6	over 4000 kg up to 6000 kg	350	4
	7	over 6000 kg up to 8000 kg	400	4
	8	over 8000 kg up to 12000 kg over 12000 kg	450	4
Vibratory roller	1	Mass per metre width of a vibrating roll:—	unsuitable	
	2	over 270 kg up to 450 kg	unsuitable	
	3	over 450 kg up to 700 kg	100	12
	4	over 700 kg up to 1300 kg	125	8
	5	over 1300 kg up to 1800 kg	150	4
	6	over 1800 kg up to 2300 kg	175	4
	7	over 2300 kg up to 2900 kg	200	4
	8	over 2900 kg up to 3600 kg	225	4
	9	over 3600 kg up to 4300 kg	250	4
	10	over 4300 kg up to 5000 kg over 5000 kg	275	4
Vibrating plate compactor	1	Mass per m ² of base plate:—	unsuitable	
	2	over 680 kg up to 1100 kg	unsuitable	
	3	over 1100 kg up to 1200 kg	unsuitable	
	4	over 1200 kg up to 1400 kg	100	6
	5	over 1400 kg up to 1800 kg	150	6
	6	over 1800 kg up to 2100 kg over 2100 kg	200	6
Vibro-tamper	1	Mass:—	100	3
	2	over 50 kg up to 65 kg	125	3
	3	over 65 kg up to 75 kg	150	3
	4	over 75 kg up to 100 kg over 100 kg	225	3
Power rammer	1	Mass:—	150	4
	2	100 kg up to 500 kg over 500 kg	275	8
Dropping-weight compactor	1	Mass of rammer over 500 kg height drop:—	600	4
	2	over 1 m up to 2 m over 2 m	600	2

D = Maximum depth of compacted layer (mm)

Ns = Minimum number of passes

DoT "Specification for Highway Works, Part 2"
Table 6/4 (abstract)

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For the purposes of Table 6/4 the following shall apply:-

- (i) The minimum number of passes N is the minimum number of times that each point on the surface of the layer being compacted shall be traversed by the item of compaction plant in its operating mode, or struck by power rammers or falling weight compactors. D is the maximum depth of the compacted layer.
- (ii) In column headed $N \neq$ the number of passes shown is to be doubled for material Classes 1A, 1B, 2A, 2B, 2C and 2D when such materials occur within 600 mm of sub-formation if a capping is required, or formation. Such extra compaction shall, unless otherwise described in Appendix 6/3, either be carried out for the full width of the embankment or, in other areas of fill which are to receive a pavement, between the outer extremities of the verges.
- (iii) The compaction plant in Table 6/4 is categorised in terms of static mass. The mass per metre width of roll is the total mass on the roll divided by the total roll width. Where a roller has more than one axle the category of the machine shall be determined on the basis of the axle giving the highest value of mass per metre width.
- (iv) A grid roller is a machine with a compacting roll or rolls constructed of heavy steel mesh of square pattern.
- (v) A tamping roller is a machine with a roll or rolls from which 'feet' project and where the projected end area of each 'foot' exceeds 0.01 m^2 and the sum of the areas of the feet exceeds 15% of the area of the cylinder swept by the ends of the feet. The requirements for tamping rollers apply to machines that have 2 rolls in tandem. If only one tamping roll traverses each point on the surface of the layer on any one pass of the machine, the minimum number of passes shall be twice the number given in Table 6/4 plus any further doubling required to satisfy (ii) above.
- (vi) For pneumatic-tyred rollers the mass per wheel is the total mass of the roller divided by the number of wheels.
- (vii) For vibratory rollers the following shall apply:-
 - (a) Vibratory rollers are self-propelled or towed smooth-wheeled rollers having means of applying mechanical vibration to one or more rolls except that vibratory rollers employed for Method 5 compaction shall be single roll types.
 - (b) The requirements for vibratory rollers are based on the use of the lowest gear on a self-propelled machine with mechanical transmission and a speed of 1.5-2.5 km/h for a towed machine, or a self-propelled machine with hydrostatic transmission. If higher gears or speeds are used an increased number of passes shall be provided in proportion to the increase in speed of travel.
 - (c) Where the mechanical vibration is applied to two rolls in tandem, the minimum number of passes shall be half the number given in Table 6/4 for the

appropriate mass per metre width of one vibrating roll but if one roll differs in mass per metre width from the other the number of passes shall be calculated as for the roll with the smallest value. Alternatively the minimum number of passes may be determined by treating the machine as having a single vibrating roll with a mass per metre width equal to that of the roll with the higher value.

(d) Vibratory rollers operating without vibration will be classified as smooth-wheeled rollers.

(e) Vibratory rollers shall be operated with their vibratory mechanism operating at the frequency of vibration which produces the highest measurement of amplitude unless the manufacturers recommend otherwise for the material being compacted.

(f) Vibratory rollers shall be equipped or provided with devices indicating the frequency at which the mechanism is operating and the speed of travel. Both devices shall be capable of being read by an inspector alongside the machine.

(viii) Vibrating-plate compactors are machines having a base-plate to which is attached a source of vibration consisting of one or two eccentrically weighted shafts and:-

(a) the mass per square metre of the base-plate of a vibrating-plate compactor is calculated by dividing the total mass of the machine in its working condition by its area in contact with the material to be compacted.

(b) vibrating-plate compactors shall be operated at the frequency of vibration recommended by the manufacturers. They shall normally be operated at travelling speeds of less than 1 km/h but if higher speeds are necessary the number of passes shall be increased in proportion to the increase in speed of travel.

(ix) Vibro-tampers are machines in which an engine-driven reciprocating mechanism acts on a spring system through which oscillations are set up in a base-plate.

(x) Power rammers are machines which are actuated by explosions in an internal combustion cylinder, each explosion being controlled manually by the operator.

(xi) Dropping weight compactors are machines in which a dead weight is dropped from a controlled height using a hoist mechanism and they include self propelled machines with mechanical traversing mechanisms capable of compacting soil in trenches and close to structures.

(xii) In the case of power rammers and dropping-weight compactors one pass will be considered as made when the compacting shoe has made one strike on the area in question.

(xiii) For items marked * in the Method 3 column the roller shall be towed by track-laying tractors. Self-propelled rollers are unsuitable.

(xiv) Where combinations of different types or categories of plant are used, the following shall apply:-

(a) the depth of layer shall be that for the type of plant requiring the least depth of layer, and

(b) the number of passes shall be that for the type of plant requiring the greatest number of passes.