

LABORATORIES

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TEST RESULTS

PROJECT NAME : MANYWELLS QUARRY

PROJECT NUMBER : 580006

SOIL HILL QUARRIES

SAMPLE DELIVERED : 01/05/91



ESTING
b. 0126N

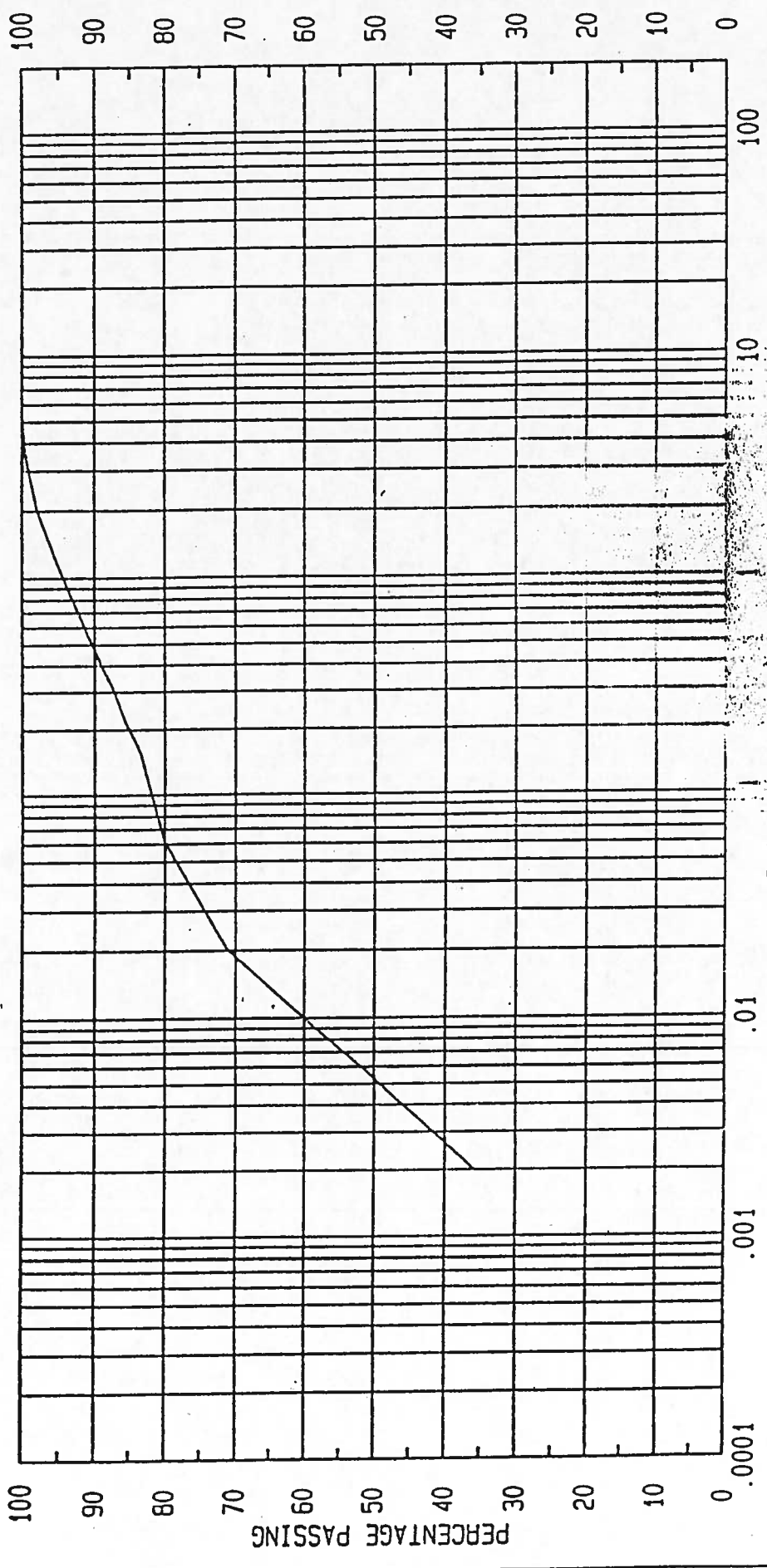


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SOIL HILL QUARRIES

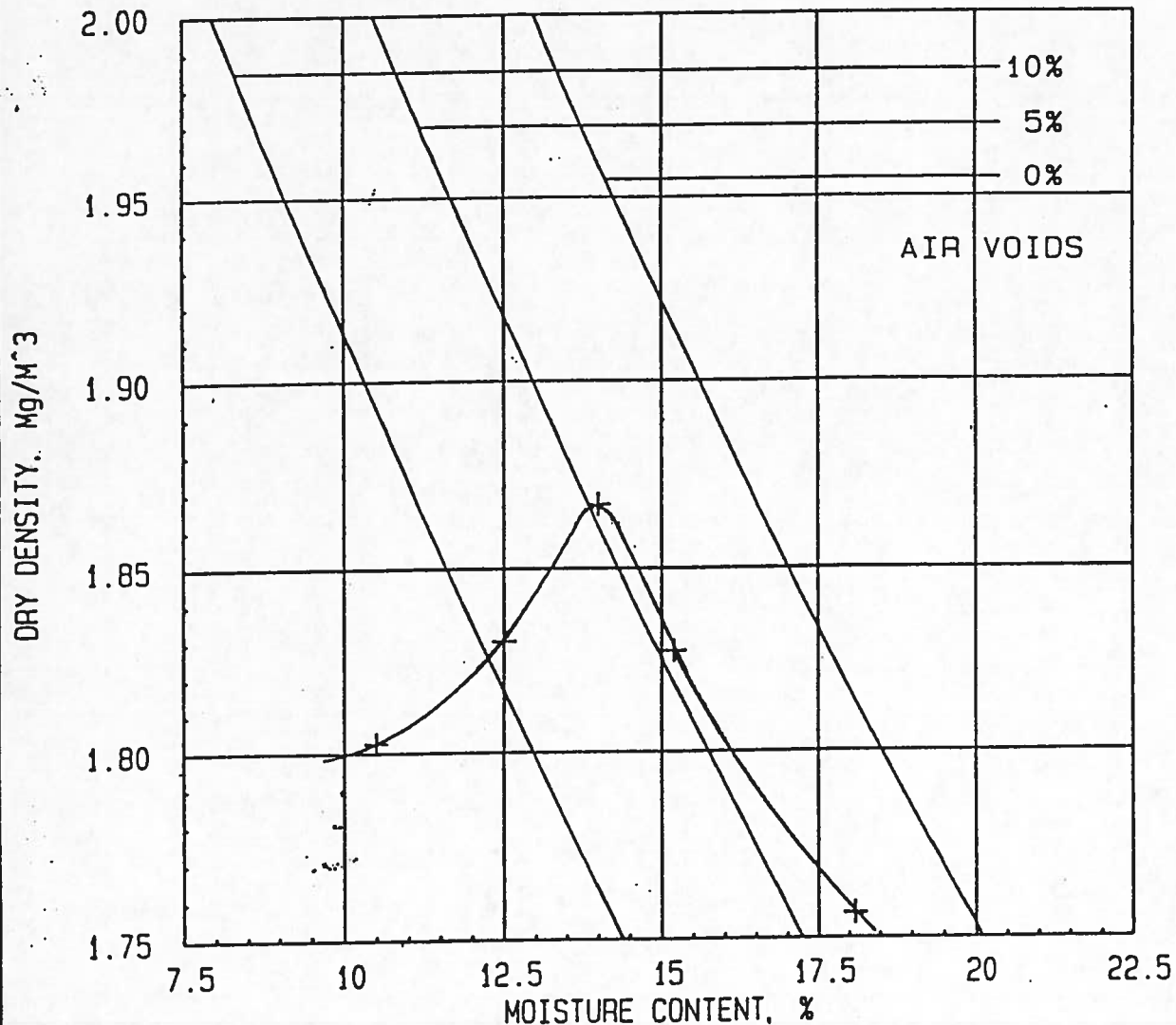
B.S.1377 PARTICLE SIZE DISTRIBUTION (TEST 7A WET SIEVING AND TEST 7C PIPETTE SEDIMENTATION)



CLAY			SILT			SAND			GRAVEL			COBBLES
FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	

PROJECT NAME : MANYWELLS QUARRY
 SAMPLE NUMBER : 1
 PROJECT NUMBER : S800006

SOIL HILL QUARRIES



TEST DETAILS :

SAMPLE WAS INITIALLY AIR DRIED

PROPORTION OF SAMPLE RETAINED ON 20 mm SIEVE, 0 %

TOTAL SAMPLE WAS REMIXED FOR EACH COMPACTION POINT.

SPECIFIC GRAVITY : 2.70

MAXIMUM DRY DENSITY : 1.87 Mg/m^3

OPTIMUM MOISTURE CONTENT : 14 %

PROJECT NUMBER : S80006

PROJECT NAME : MANYWELLS QUARRY

SAMPLE NUMBER : 2+3 (COMBINED)

SOIL HILL QUARRIES

Project Name		MANYWELLS QUARRY
Project Number		S80006
Borehole Number		
Sample Number		2+3 (10.5%MC)
Depth	m	
Diameter	mm	105.0
Height	mm	115.8
Initial Moisture Content	%	12.7
Initial Wet Density	Mg/m ³	1.98
Differential Head	mm	9177
Hydraulic Gradient		79
Coefficient of Permeability	m/s	3.42×10^{-10}
Duration	day(s)	10
Final Moisture Content	%	21
Final Wet Density	Mg/m ³	-

SAMPLE DESCRIPTION Dark' grey/brown silty CLAY with some fine to medium gravel.

NOTES Specimen remoulded at 10.5% moisture content using 4.5 kg compactive effort.

CONSTANT HEAD PERMEABILITY TEST

SOIL HILL QUARRIES

Project Name	MANYWELLS QUARRY	
Project Number	S80006	
Borehole Number		
Sample Number	2+3 (12.5%MC)	
Depth	m	
Diameter	mm	105.0
Height	mm	115.8
Initial Moisture Content	%	10.2
Initial Wet Density	Mg/m ³	2.04
Differential Head	mm	9177
Hydraulic Gradient		79
Coefficient of Permeability	m/s	1.42×10^{-9}
Duration	day(s)	9
Final Moisture Content	%	19
Final Wet Density	Mg/m ³	-
<u>SAMPLE DESCRIPTION</u> Very stiff dark brown silty CLAY with occasional fine gravel.		
<u>NOTES</u> Specimen remoulded at 12.5% moisture content using 4.5kg compactive effort.		
CONSTANT HEAD PERMEABILITY TEST		

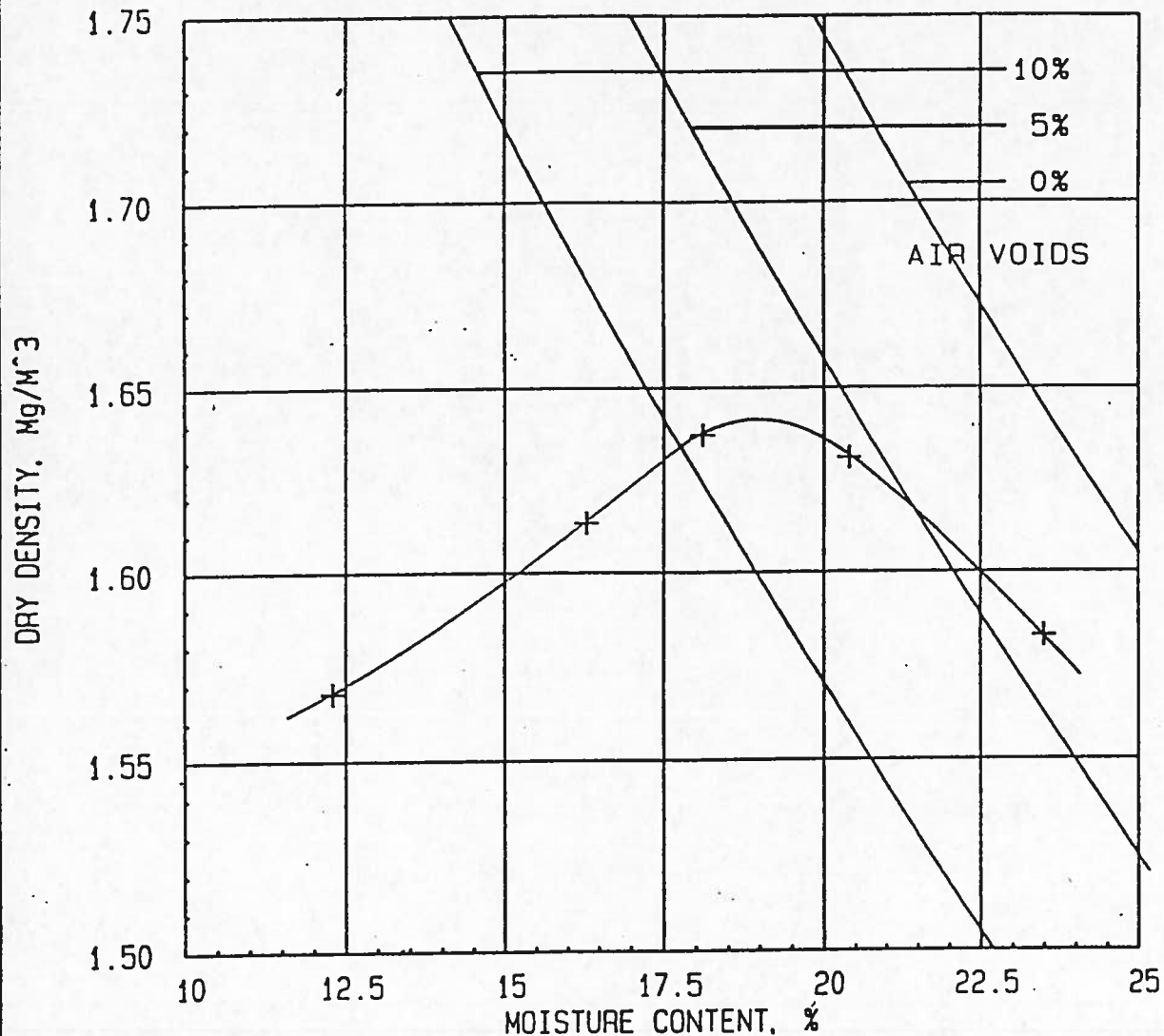
SOIL HILL QUARRIES

Project Name	MANYWELLS QUARRY	
Project Number	S80006	
Borehole Number		
Sample Number	2+3 (15.2%MC)	
Depth	m	
Diameter	mm	105.0
Height	mm	116.0
Initial Moisture Content	%	14.9
Initial Wet Density	Mg/m ³	2.08
Differential Head	mm	9177
Hydraulic Gradient		79
Coefficient of Permeability	M/s	2.97×10^{-10}
Duration	day(s)	11
Final Moisture Content	%	19
Final Wet Density	Mg/m ³	-
<u>SAMPLE DESCRIPTION</u> Very stiff dark brown silty CLAY with occasional fine gravel.		
<u>NOTES</u> Specimen remoulded at 15.2% moisture content using 4.5 kg compactive effort.		
CONSTANT HEAD PERMEABILITY TEST		

SOIL HILL QUARRIES

Project Name	MANYWELLS QUARRY	
Project Number	S80006	
Borehole Number		
Sample Number	2+3 (14.0ZMC)	
Depth	m	
Diameter	mm	105.0
Height	mm	115.4
Initial Moisture Content	%	14.7
Initial Wet Density	Mg/m ³	2.13
Differential Head	mm	9177
Hydraulic Gradient		80
Coefficient of Permeability	m/s	3.06×10^{-10}
Duration	day(s)	12
Final Moisture Content	%	19
Final Wet Density	Mg/m ³	-
<u>SAMPLE DESCRIPTION</u> Very stiff dark brown silty CLAY with gravel and rock fragments.		
<u>NOTES</u> Specimen remoulded at 14.0% moisture content using 4.5 kg compactive effort.		
CONSTANT HEAD PERMEABILITY TEST		

SOIL HILL QUARRIES

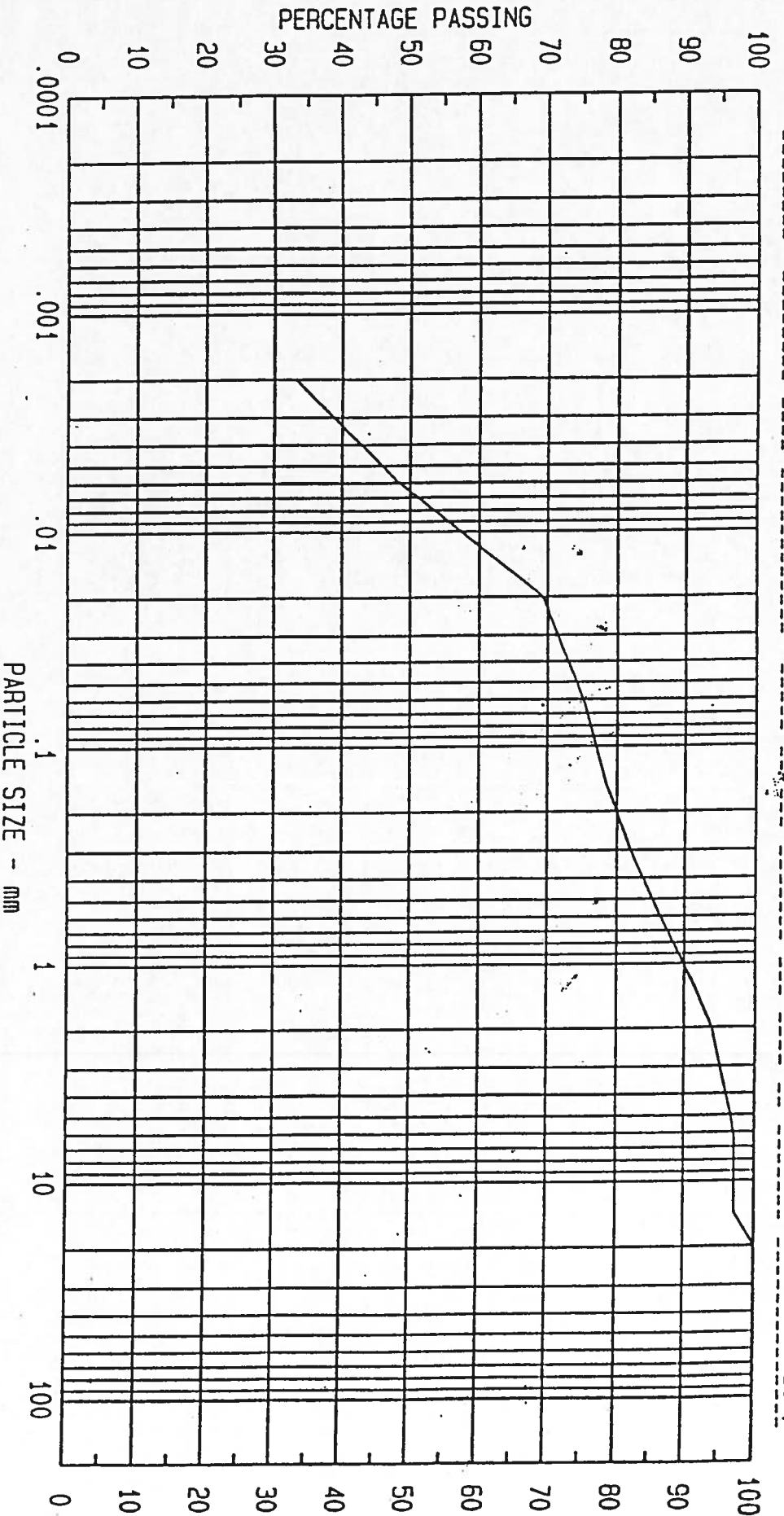


TEST DETAILS :

SAMPLE WAS INITIALLY AIR DRIED
PROPORTION OF SAMPLE RETAINED ON 20 mm SIEVE. 0 %
SEPARATE SAMPLES WERE USED FOR EACH COMPACTION POINT.
SPECIFIC GRAVITY : 2.68
MAXIMUM DRY DENSITY : 1.64 Mg/m^3
OPTIMUM MOISTURE CONTENT : 19 %
PROJECT NUMBER : S80006
PROJECT NAME : MANYWELLS QUARRY
SAMPLE NUMBER : 4

SOIL HILL QUARRIES

B.S.1377 PARTICLE SIZE DISTRIBUTION (TEST 7A WET SIEVING AND TEST 7C PIPETTE SEDIMENTATION)

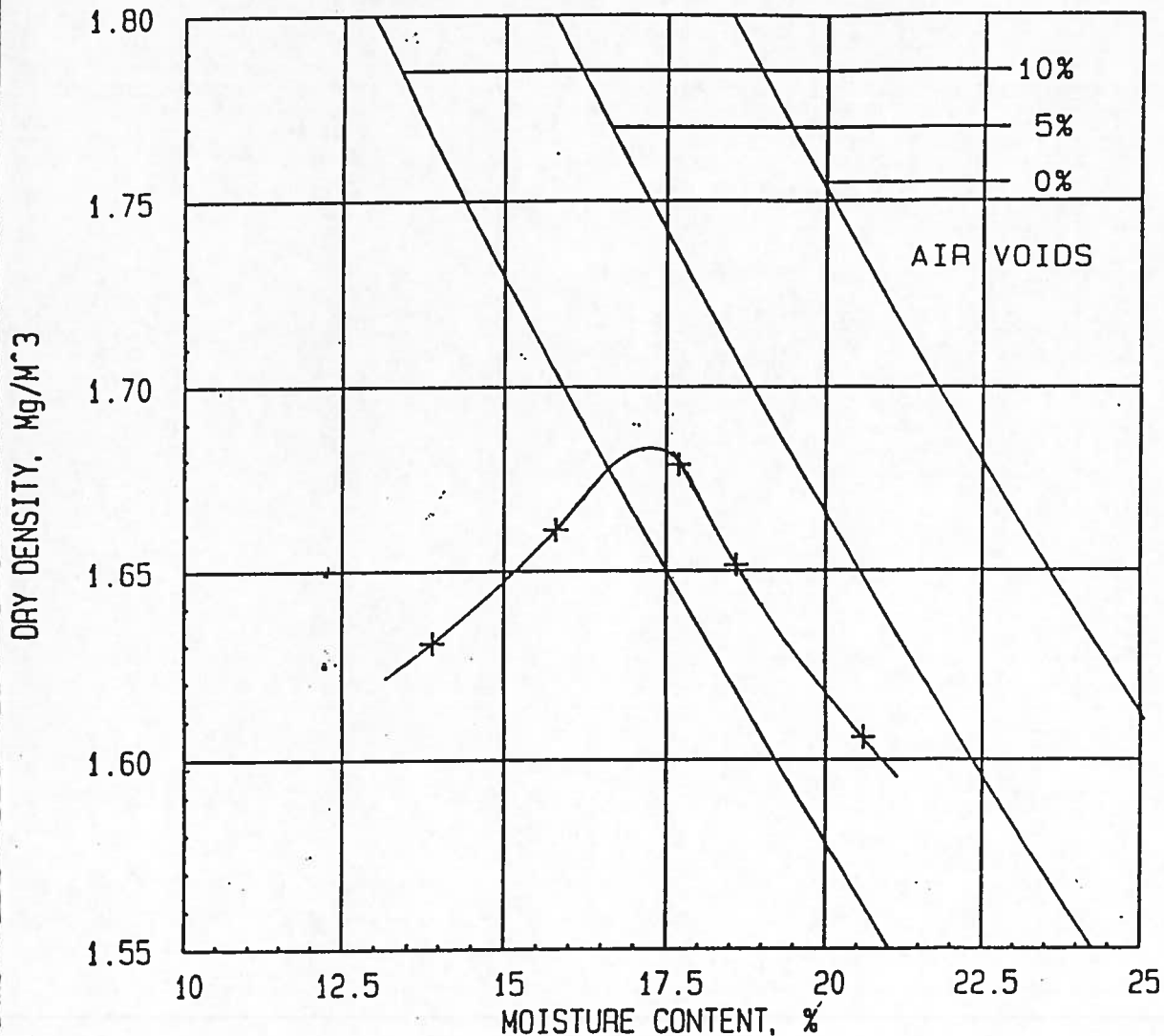


CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	COBBLES
	SILT			SAND			GRAVEL			

PROJECT NAME : MANYWELLS QUARRY
SAMPLE NUMBER : 5

PROJECT NUMBER : S80006

SOIL HILL QUARRIES



TEST DETAILS :

SAMPLE WAS INITIALLY AIR DRIED

PROPORTION OF SAMPLE RETAINED ON 20 mm SIEVE, 3 %

SEPARATE SAMPLES WERE USED FOR EACH COMPACTION POINT.

SPECIFIC GRAVITY : 2.70

MAXIMUM DRY DENSITY : 1.69 Mg/m^3

OPTIMUM MOISTURE CONTENT : 17 %

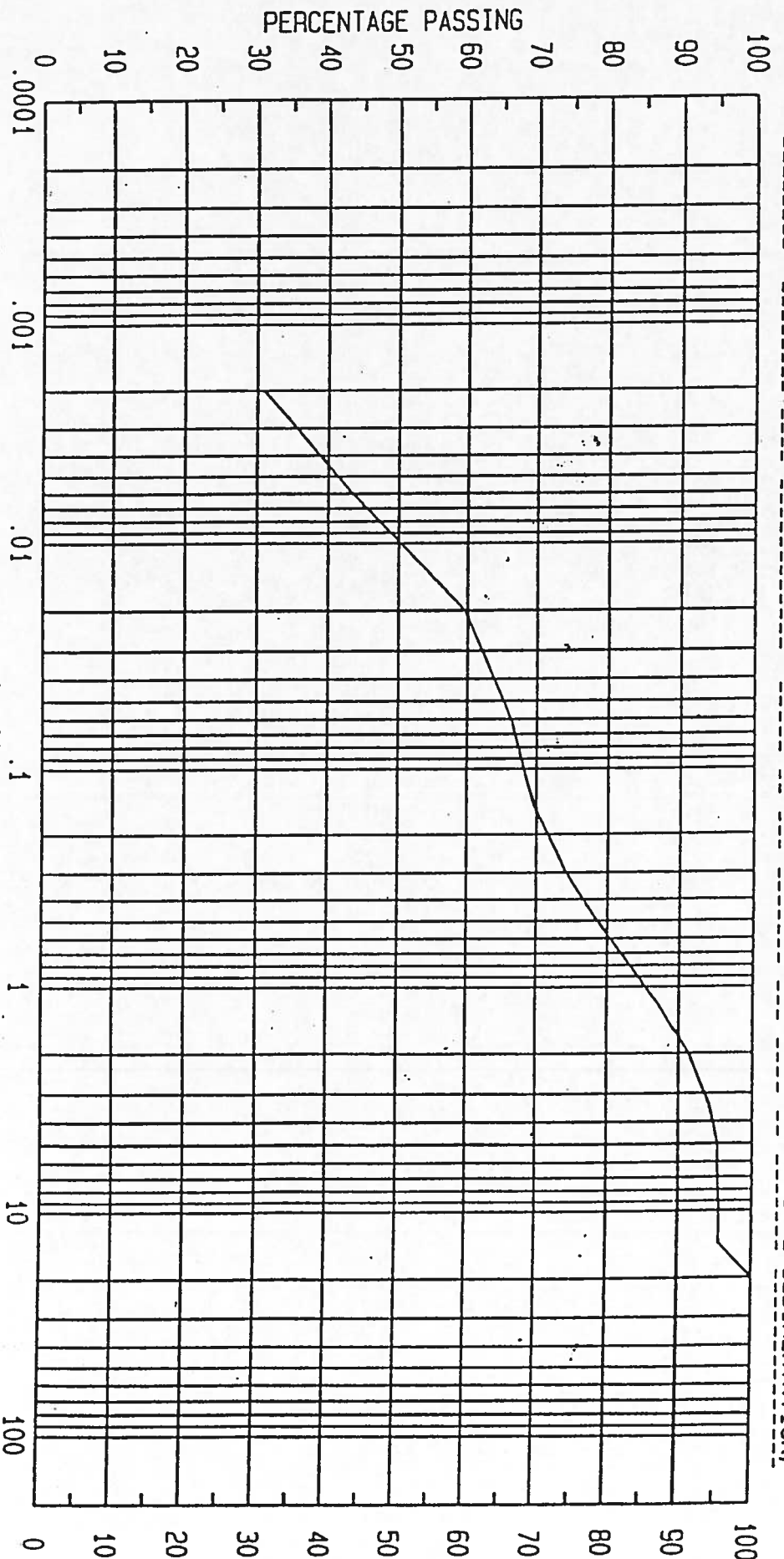
PROJECT NUMBER : S80006

PROJECT NAME : MANYWELLS QUARRY

SAMPLE NUMBER : 5

SOIL HILL QUARRIES

B.S.1377 PARTICLE SIZE DISTRIBUTION (TEST 7A WET SIEVING AND TEST 7C PIPETTE SEDIMENTATION)

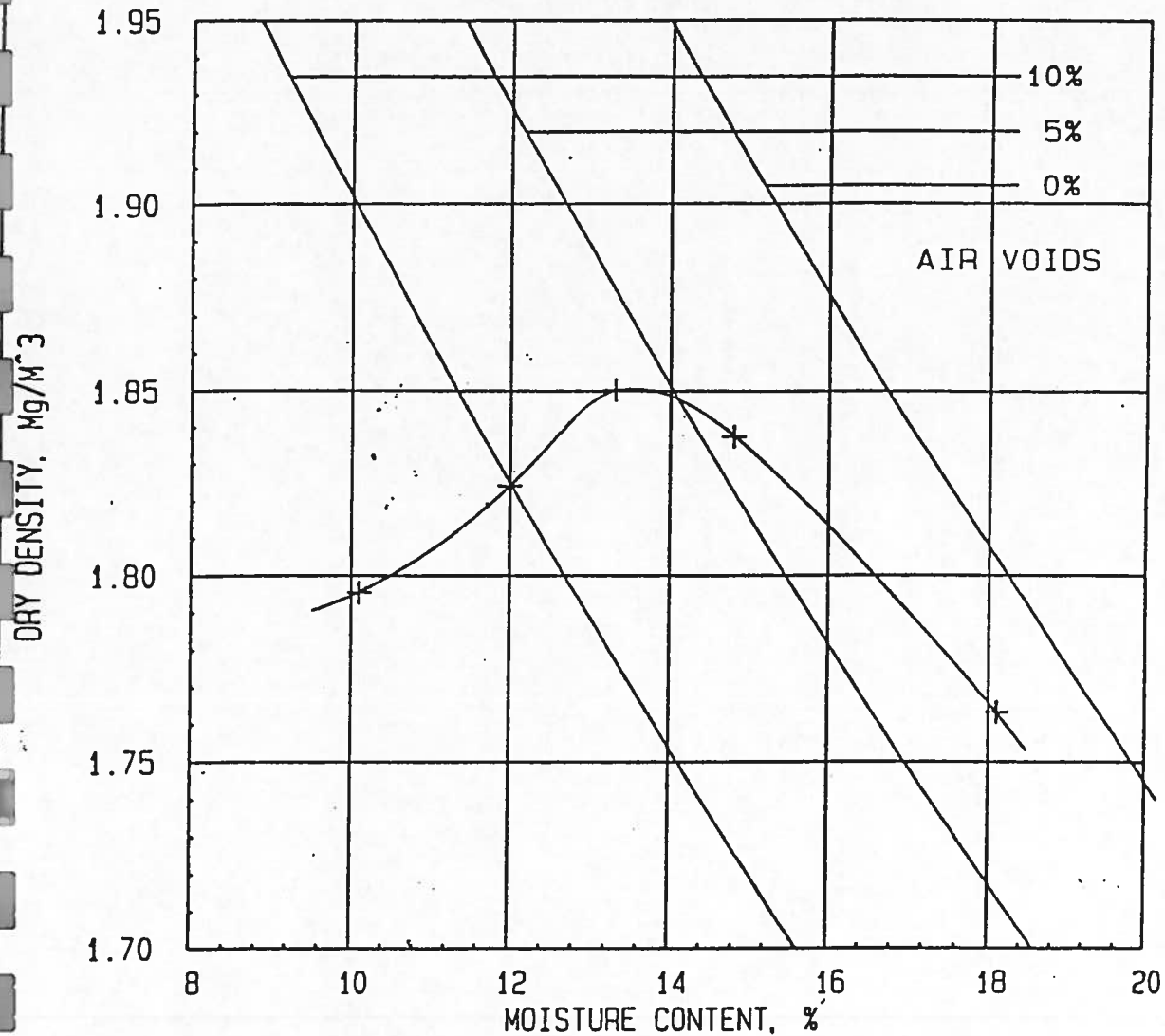


CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	COBBLES
	SILT			SAND			GRAVEL			

PROJECT NAME : MANYWELLS QUARRY
SAMPLE NUMBER : 6

PROJECT NUMBER : S80006

SOIL HILL QUARRIES

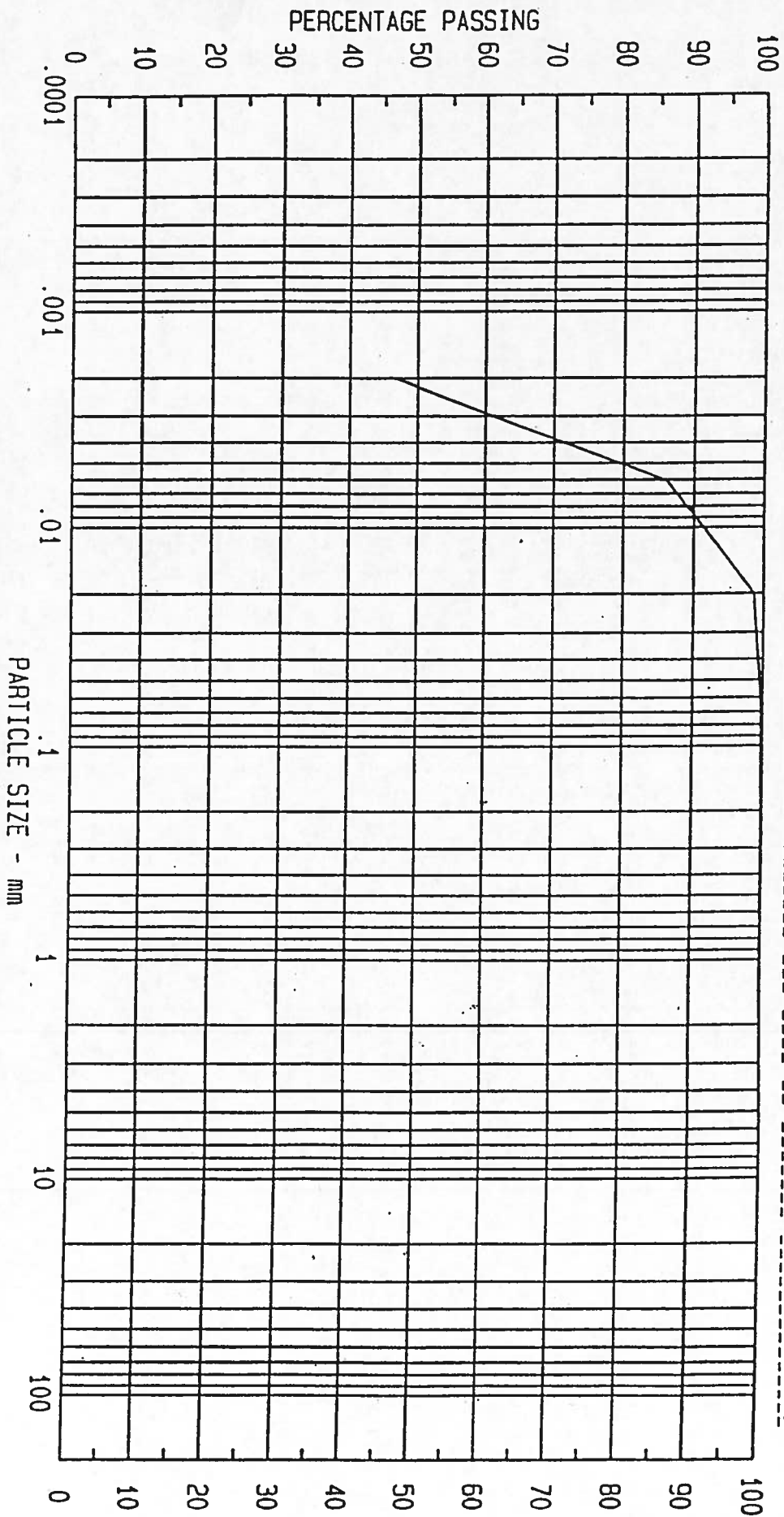


TEST DETAILS :

SAMPLE WAS INITIALLY AIR DRIED
PROPORTION OF SAMPLE RETAINED ON 20 mm SIEVE, 0 %
TOTAL SAMPLE WAS REMIXED FOR EACH COMPACTION POINT.
SPECIFIC GRAVITY : 2.68
MAXIMUM DRY DENSITY : 1.85 Mg/m^3
OPTIMUM MOISTURE CONTENT : 14 %
PROJECT NUMBER : S80006
PROJECT NAME : MANYWELLS QUARRY
SAMPLE NUMBER : 6

SOIL MILL QUANITIES

B.S. 1377 PARTICLE SIZE DISTRIBUTION (TEST 7A WET SIEVING AND TEST 7C PIPETTE SEDIMENTATION)



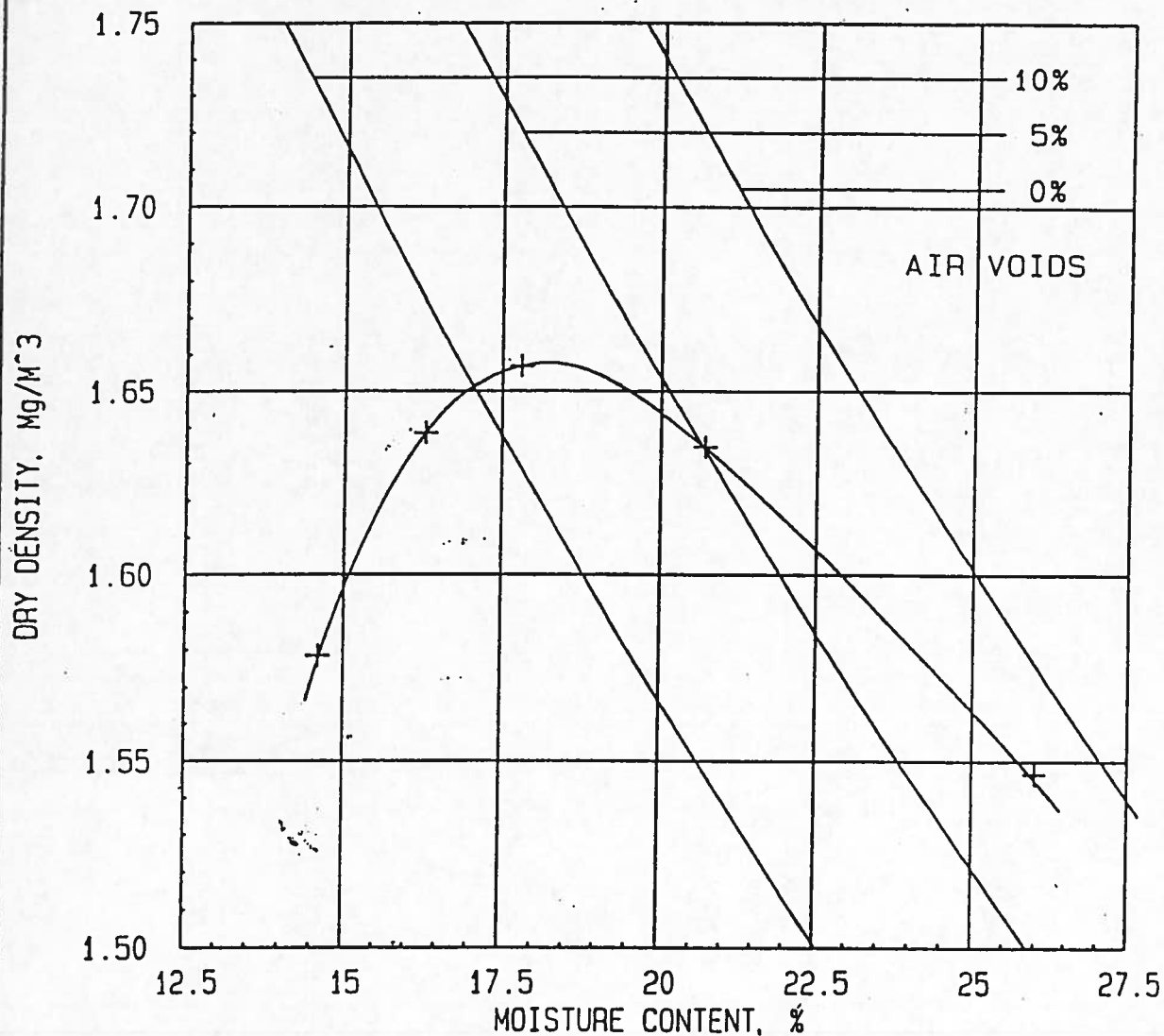
CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	COBBLES
	SILT			SAND			GRAVEL			

PROJECT NAME : MANYHELLS QUARRY
SAMPLE NUMBER : 7

PROJECT NUMBER : S80006

B.S.1377 COMPACTION TEST (TEST 13 : 4.5 Kg HAMMER METHOD)

SOIL HILL QUARRIES



TEST DETAILS :

SAMPLE WAS INITIALLY AIR DRIED
PROPORTION OF SAMPLE RETAINED ON 20 mm SIEVE, 0 %
SEPARATE SAMPLES WERE USED FOR EACH COMPACTION POINT.
SPECIFIC GRAVITY : 2.67
MAXIMUM DRY DENSITY : 1.66 Mg/m³
OPTIMUM MOISTURE CONTENT : 18 %
PROJECT NUMBER : S80006
PROJECT NAME : MANYWELLS QUARRY
SAMPLE NUMBER : 8

SOIL HILL QUARRIES

Project Name	MANYWELLS QUARRY	
Project Number	S80006	
Borehole Number		
Sample Number	8 (16.3%MC)	
Depth	m	
Diameter	mm	104.8
Height	mm	115.5
Initial Moisture Content	%	15.3
Initial Wet Density	Mg/m ³	1.90
Differential Head	mm	9177
Hydraulic Gradient		79
Coefficient of Permeability	m/s	1.72×10^{-9}
Duration	day(s)	10
Final Moisture Content	%	33
Final Wet Density	Mg/m ³	-
<u>SAMPLE DESCRIPTION</u> Very stiff grey silty CLAY with occasional coarse sand		
<u>NOTES</u> Specimen remoulded at 16.3% moisture content using 4.5 kg compactive effort.		
Optic - 18%.		
CONSTANT HEAD PERMEABILITY TEST		

SOIL HILL QUARRIES

Project Name		MANYWELLS QUARRY
Project Number		S80006
Borehole Number		
Sample Number		8 (17.8%)
Depth	m	
Diameter	mm	104.7
Height	mm	115.2
Initial Moisture Content	%	19.2
Initial Wet Density.	Mg/m ³	1.95
Differential Head	mm	9177
Hydraulic Gradient		80
Coefficient of Permeability	m/s	2.79×10^{-10}
Duration	day(s)	12
Final Moisture Content	%	30
Final Wet Density.	Mg/m ³	-

SAMPLE DESCRIPTION Very stiff dark grey/brown silty CLAY.

NOTES Specimen remoulded at 17.8% moisture content using 4.5kg compactive effort.

CONSTANT HEAD PERMEABILITY TEST

Project Name		MANYWELLS QUARRY
Project Number		S80006
Borehole Number		
Sample Number		8 (26.0%MC)
Depth	m	
Diameter	mm	104.9
Height	mm	115.4
Initial Moisture Content	%	23.2
Initial Wet Density	Mg/m ³	1.93
Differential Head	mm	9177
Hydraulic Gradient		80
Coefficient of Permeability	m/s	1.64×10^{-10}
Duration	day(s)	11
Final Moisture Content	%	29
Final Wet Density	Mg/m ³	-

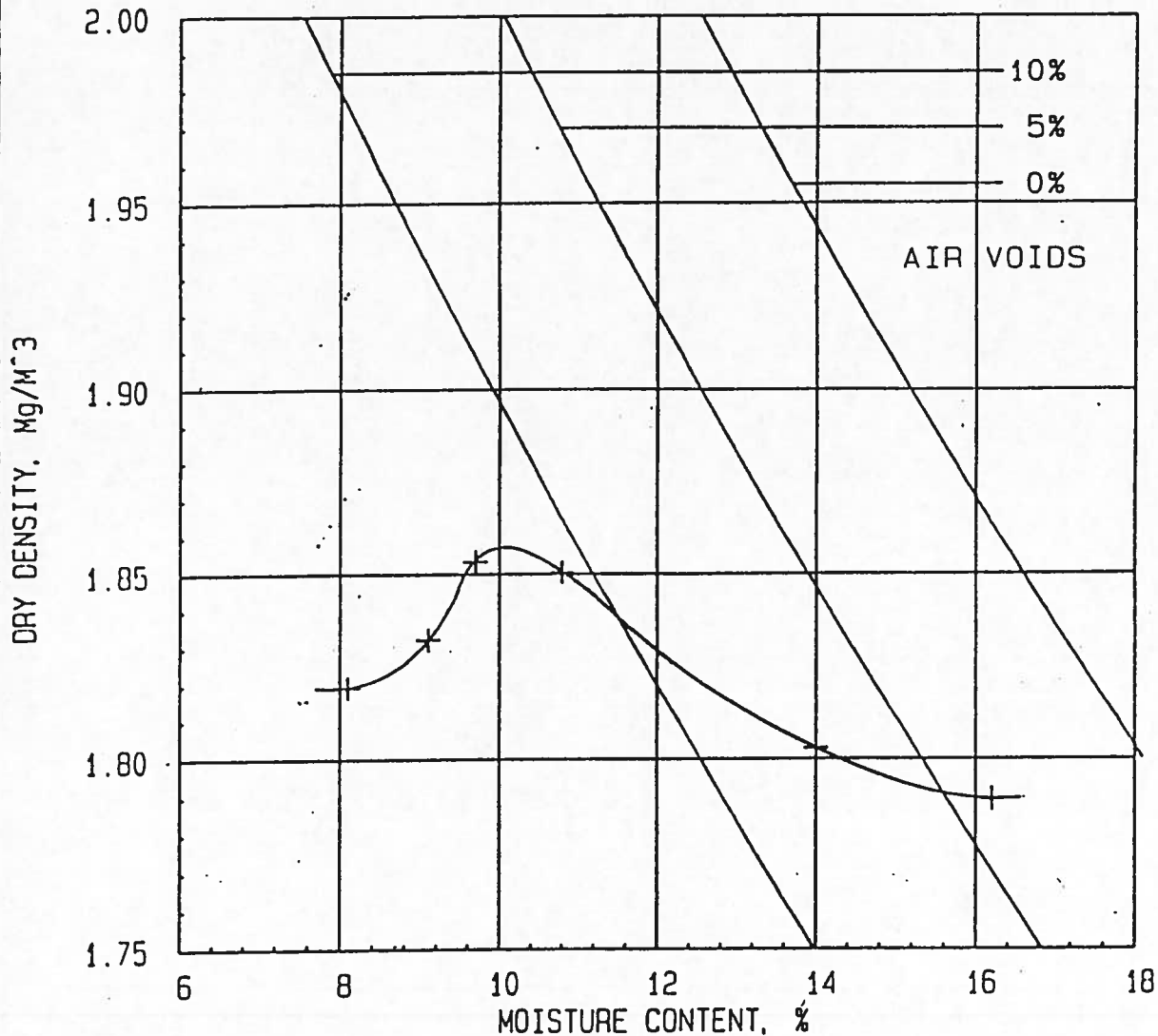
SAMPLE DESCRIPTION Very stiff dark grey silty CLAY.

SOIL HILL QUARRIES

NOTES Specimen remoulded at 26.0% moisture content using
4.5 kg compactive effort.

CONSTANT HEAD PERMEABILITY TEST

SOIL HILL QUARRIES



TEST DETAILS :

SAMPLE WAS INITIALLY AIR DRIED

PROPORTION OF SAMPLE RETAINED ON 20 mm SIEVE, 1 %

SEPARATE SAMPLES WERE USED FOR EACH COMPACTION POINT.

SPECIFIC GRAVITY : 2.67

MAXIMUM DRY DENSITY : 1.86 Mg/m^3

OPTIMUM MOISTURE CONTENT : 10 %

PROJECT NUMBER : S80006

PROJECT NAME : MANYWELLS QUARRY

SAMPLE NUMBER : 9

SOIL HILL QUARRIES

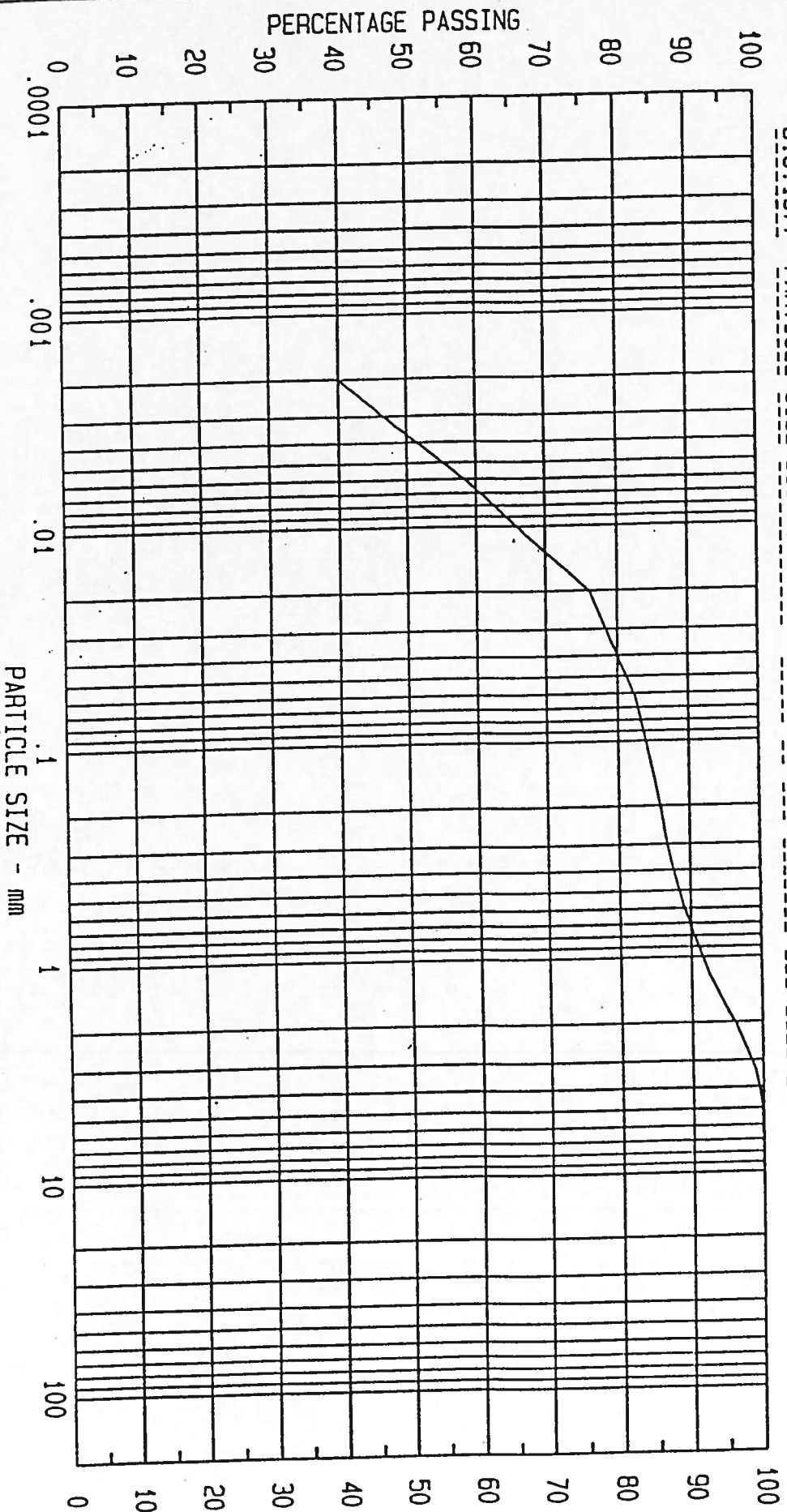
Project Name	MANYWELLS QUARRY	
Project Number	S80006	
Borehole Number		
Sample Number	9 (14.0%MC)	
Depth	m	
Diameter	mm	105.0
Height	mm	116.3
Initial Moisture Content	%	13.0
Initial Wet Density	Mg/m ³	2.02
Differential Head	mm	9177
Hydraulic Gradient		79
Coefficient of Permeability	m/s	2.09×10^{-9}
Duration	day(s)	9
Final Moisture Content	%	21
Final Wet Density	Mg/m ³	-
<u>SAMPLE DESCRIPTION</u> Very stiff dark grey silty CLAY.		
<u>NOTES</u> Specimen remoulded at 14.0% moisture content using 4.5 kg compactive effort.		
CONSTANT HEAD PERMEABILITY TEST		

SOIL HILL QUARRIES

Project Name	MANYWELLS QUARRY	
Project Number	S80006	
Borehole Number		
Sample Number	9 (16.2%MC)	
Depth	m	
Diameter	mm	104.9
Height	mm	115.8
Initial Moisture Content	%	16.2
Initial Wet Density	Mg/m ³	2.06
Differential Head	mm	9177
Hydraulic Gradient		79
Coefficient of Permeability	m/s	2.79×10^{-10}
Duration	day(s)	11
Final Moisture Content	%	20
Final Wet Density	Mg/m ³	-
<u>SAMPLE DESCRIPTION</u> Very stiff dark grey with mid-brown "flecks" silty CLAY.		
<u>NOTES</u> Specimen remoulded at 16.2% moisture content using 4.5 kg compactive effort.		
CONSTANT HEAD PERMEABILITY TEST		

SOIL HILL QUARRIES

B.S.1377 PARTICLE SIZE DISTRIBUTION (TEST 7A WET SIEVING AND TEST 7C PIPETTE SEDIMENTATION)

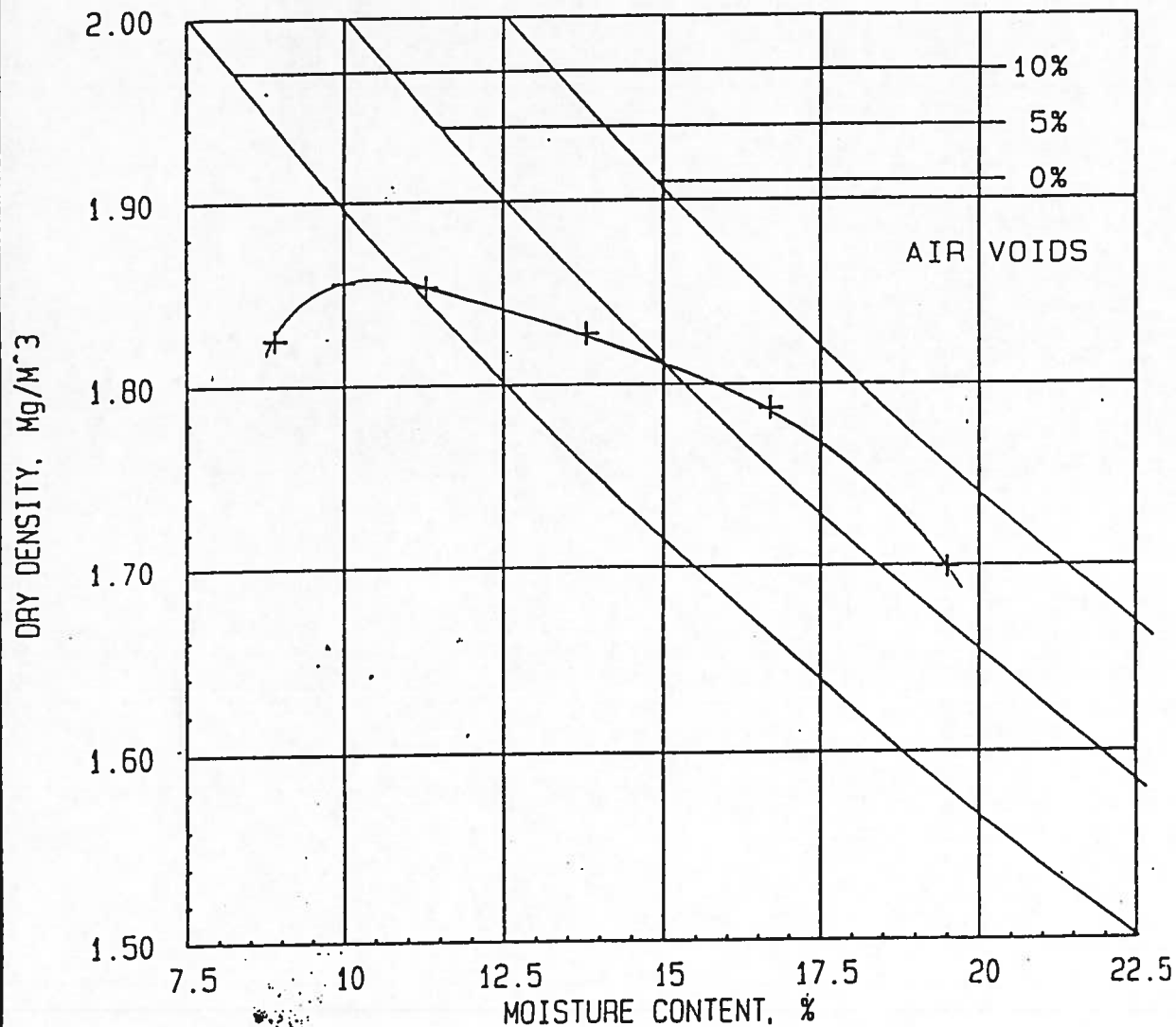


CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	COBBLES
	SILT			SAND			GRAVEL			

PROJECT NAME : MANYHELLS QUARRY
SAMPLE NUMBER : 10 & 11 COMBINED

PROJECT NUMBER : S80006

SOIL HILL QUARRIES



TEST DETAILS :

SAMPLE WAS INITIALLY AIR DRIED

PROPORTION OF SAMPLE RETAINED ON 20 mm SIEVE, 0 %

SEPARATE SAMPLES WERE USED FOR EACH COMPACTION POINT.

SPECIFIC GRAVITY : 2.67

MAXIMUM DRY DENSITY : 1.86 Mg/m^3

OPTIMUM MOISTURE CONTENT : 11 %

PROJECT NUMBER : S80006

PROJECT NAME : MANYWELLS QUARRY

SAMPLE NUMBER : 10+11

SOIL HILL QUARRIES

Project Name	MANYWELLS QUARRY	
Project Number	S80006	
Borehole Number		
Sample Number	10+11 (11.3%MC)	
Depth	m	
Diameter	mm	105.1
Height	mm	115.8
Initial Moisture Content	%	12.1
Initial Wet Density	Mg/m ³	2.04
Differential Head	mm	9177
Hydraulic Gradient		79
Coefficient of Permeability	m/s	1.72*10 ⁻⁹
Duration	day(s)	14
Final Moisture Content	%	21
Final Wet Density	Mg/m ³	-
<u>SAMPLE DESCRIPTION</u> Very stiff dark grey silty CLAY.		
<u>NOTES</u> Specimen remoulded at 11.3% moisture content using 4.5 kg compactive effort.		
CONSTANT HEAD PERMEABILITY TEST		

SOIL HILL QUARRIES

Project Name	MANYWELLS QUARRY	
Project Number	S80006	
Borehole Number	10+11 (8.9%MC)	
Sample Number		
Depth	m	
Diameter	mm	105.1
Height	mm	116.5
Initial Moisture Content	%	11.1
Initial Wet Density	Mg/m ³	1.98
Differential Head	mm	9177
Hydraulic Gradient		79
Coefficient of Permeability	m/s	3.42×10^{-9}
Duration	day(s)	12
Final Moisture Content	%	22
Final Wet Density	Mg/m ³	-
<u>SAMPLE DESCRIPTION</u> Very stiff grey silty CLAY.		
<u>NOTES</u> Specimen remoulded at 8.9% moisture content using 4.5 kg compactive effort.		
CONSTANT HEAD PERMEABILITY TEST		

Project Name		MANYWELLS QUARRY
Project Number		S80006
Borehole Number		
Sample Number		10+11 (13.8%MC)
Depth	m	
Diameter	mm	105.1
Height	mm	115.3
Initial Moisture Content	%	13.8
Initial Wet Density	Mg/m ³	2.05
Differential Head	mm	9177
Hydraulic Gradient		80
Coefficient of Permeability	m/s	1.60×10^{-9}
Duration	day(s)	9
Final Moisture Content	%	21
Final Wet Density	Mg/m ³	-

SAMPLE DESCRIPTION Stiff dark grey silty CLAY.

SOIL HILL QUARRIES

NOTES Specimen remoulded at 13.8% moisture content
using 4.5 kg compactive effort.

CONSTANT HEAD PERMEABILITY TEST

Project Name		MANYWELLS QUARRY
Project Number		S80006
Borehole Number		
Sample Number		10+11 (19.5%MC)
Depth	m	
Diameter	mm	104.8
Height	mm	115.6
Initial Moisture Content	%	19.5
Initial Wet Density	Mg/m ³	2.01
Differential Head	mm	9177
Hydraulic Gradient		79
Coefficient of Permeability	m/s	2.29×10^{-10}
Duration	day (s)	10
Final Moisture Content	%	21
Final Wet Density	Mg/m ³	-

SAMPLE DESCRIPTION Stiff dark grey silty CLAY.

SOIL HILL QUARRIES

NOTES Specimen remoulded at 19.5% moisture content
using 4.5 kg compactive effort .

CONSTANT HEAD PERMEABILITY TEST