

SITE INVESTIGATION
at
HAVANT THICKET
for
PORTSMOUTH & GOSPORT
WATER COMPANY.
R.W. Hall Esq., M.I.C.E., M.I.W.E.,
Engineer,
26 and 28 Commercial Road,
Portsmouth : Hampshire.

Results of Tests as follows:-

Consolidation Tests on
undisturbed and compacted samples

Standard Proctor Compaction Tests.

Index Property Tests.

Grading Analyses.

Edgar Morton and Partner,
Consulting Engineering
Geologists,
Styperson House,
Adlington, Macclesfield.

Pre-Piling Surveys Ltd.,
Wharf Works,
Peterborough.

CONSOLIDATION TEST

DATE: January 1963.

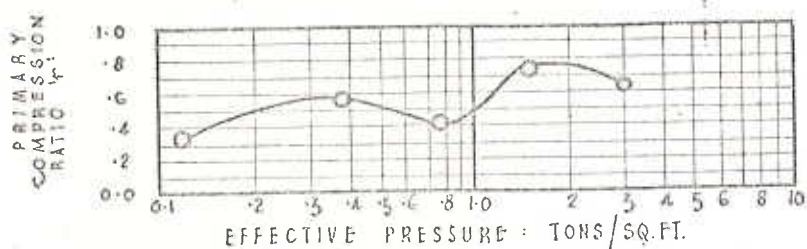
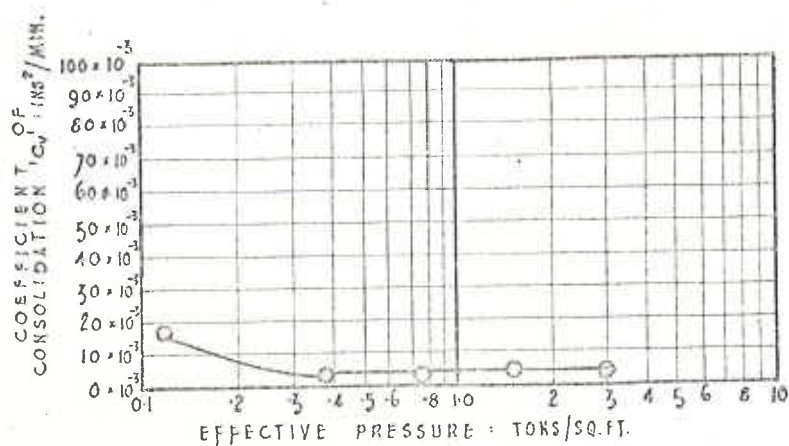
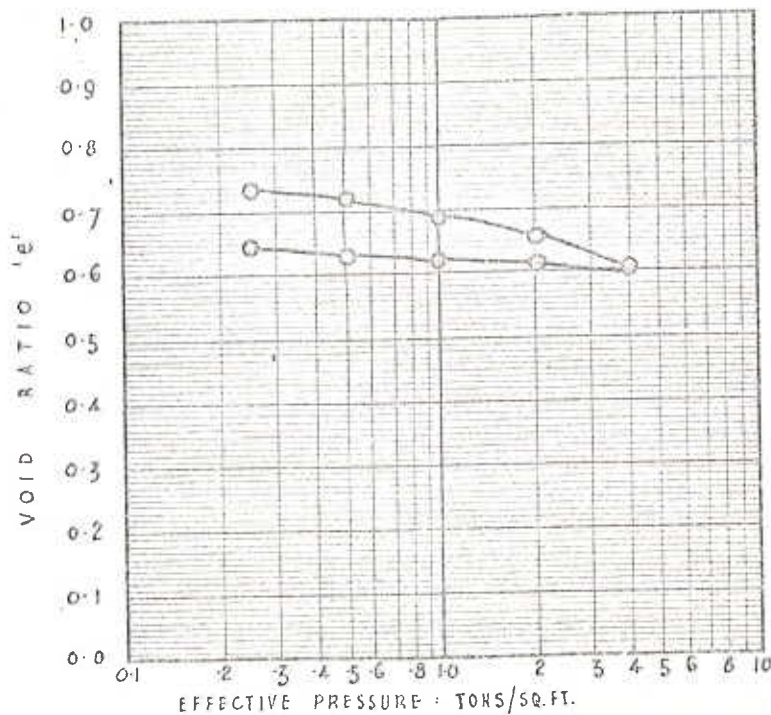
CONTRACT: Havant Thicket.
 SAMPLE REF: Tube No. 3, Depth 1'5" - 3'0" B.S.
 DESCRIPTION: Grey and brown mottled clay with a few water-worn pebbles.

EFFECTIVE PRESSURE (TONS/SQ. FT.)	VOID RATIO e
0	0.7317
$\frac{1}{2}$	0.7222
$\frac{1}{4}$	0.7222
1	0.6807
2	0.6552
4	0.6035
8	0.6180
1	0.6213
$\frac{1}{2}$	0.6512
$\frac{1}{4}$	0.6450
0	0.7210

PRESSURE RANGE (TONS/SQ. FT.)	COEFFICIENT OF COMPRESSIBILITY (FT^2/TON) a_v	COEFFICIENT OF VOLUME DECREASE (FT^2/TON) m_v	COEFFICIENT OF CONSOLIDATION ($HS^2/MIN.$) c_v	COEFFICIENT OF PERMEABILITY ($MS/MIN.$) k
0 - $\frac{1}{2}$	0.700	0.0102	17.71×10^{-3}	9.10×10^{-7}
$\frac{1}{2}$ - 1	0.0560	0.0335	3.60×10^{-3}	5.58×10^{-7}
$\frac{1}{4}$ - 1	0.0508	0.0350	2.92×10^{-3}	4.89×10^{-7}
1 - 2	0.0351	0.0210	4.77×10^{-3}	4.80×10^{-7}
2 - 4	0.0219	0.0153	3.43×10^{-3}	2.51×10^{-7}

BULK DENSITY: 128.4 lb/cu.ft.
 DRY DENSITY: 106.2 lb/cu.ft.
 INITIAL W/C: 20.2%
 FINAL W/C: 27.4%

PRE PILING SURVEYS LTD, PETERBOROUGH.



CONSOLIDATION TEST

CONTRACT : Havant Thicket.

SAMPLE REF. : Tube No. 151, Bore No. 3, Depth 1'6" - 3'0"

DESCRIPTION : Grey and brown mottled clay with a few water-worn pebbles.

BULK DENSITY : 128.4 lb/cu.ft. DRY DENSITY : 106.9 lb/cu.ft.

INITIAL MOISTURE CONTENT : 20.2% FINAL MOISTURE CONTENT : 27.4%

DATE : January 1963.

PRE PILING SURVEYS LTD : PETERBOROUGH.

CONSOLIDATION TEST

DATE: January 1963.

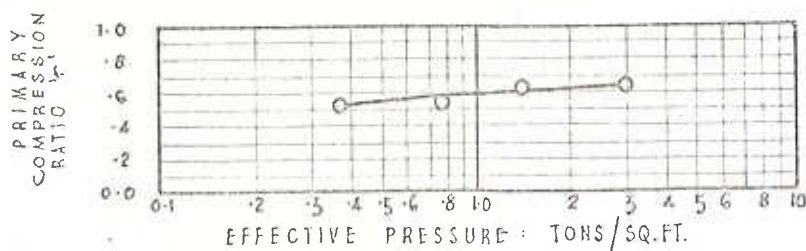
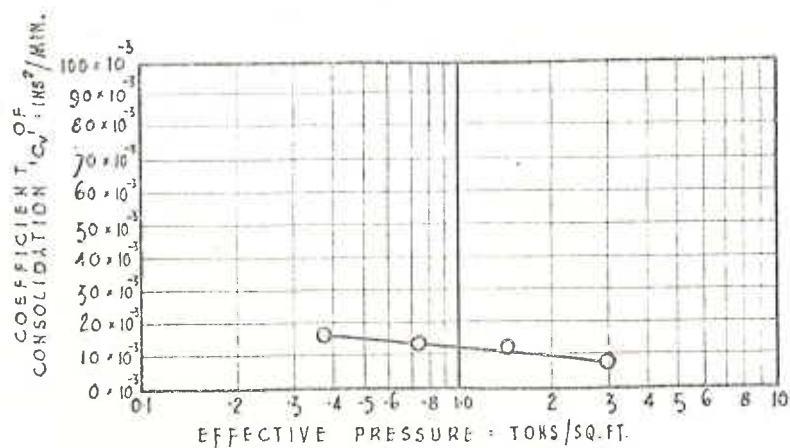
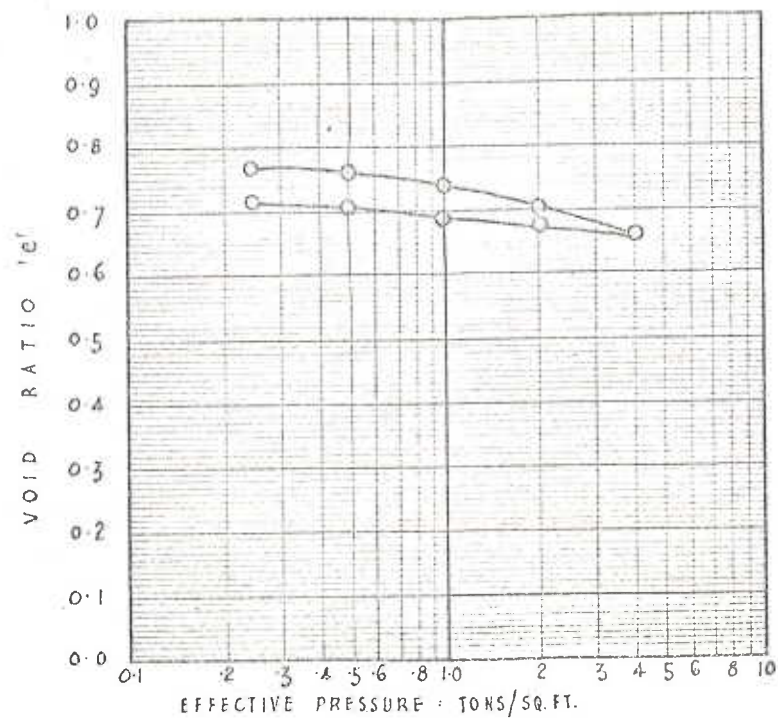
CONTRACT: Havant District.
 SAMPLE REF: Tube No. 176, Core No. 3, Depth 10'6" - 12'0" D.S.
 DESCRIPTION: Grey-bluish clay with pockets of fine sand.

EFFECTIVE PRESSURE (TONS/SQ. FT.)	VOID RATIO e
0	0.5035
1	0.7732
1	0.7628
1	0.7590
2	0.7070
4	0.5534
2	0.5791
1	0.5959
1	0.7215
1	0.7272
0	0.7000

PRESSURE RANGE (TONS/SQ. FT.)	COEFFICIENT OF COMPRESSIBILITY (FT^2/TON)	COEFFICIENT OF VOLUME DECREASE (FT^2/TON)	COEFFICIENT OF CONSOLIDATION ($MS^2/MIN.$)	COEFFICIENT OF PERMEABILITY ($MS/IN.$)
0 - 1				
1 - 1	0.0125	0.0212	16.15×10^{-3}	17.65×10^{-7}
1 - 1	0.0172	0.0270	13.03×10^{-3}	16.00×10^{-7}
1 - 2	0.0320	0.0186	10.76×10^{-3}	9.05×10^{-7}
2 - 4	0.0218	0.0129	7.57×10^{-3}	4.43×10^{-7}

BULK DENSITY: 121.6 lb/cu.ft.
 DRY DENSITY: 95.9 lb/cu.ft.
 INITIAL W/C: 26.9 %
 FINAL W/C: 29.7 %

* At this loading the sample expanded.



CONSOLIDATION TEST

CONTRACT : Havant Thicket.

SAMPLE REF. : Tube No. 176, Bore No. 3, Depth 10'6" - 12'0" B.S.

DESCRIPTION : Grey black clay with pockets of fine sand.

BULK DENSITY : 121.6 lb/cu.ft.

DRY DENSITY : 95.9 lb/cu.ft.

INITIAL MOISTURE CONTENT : 26.9% FINAL MOISTURE CONTENT : 29.7%

DATE : January 1963.

PRE PILING SURVEYS LTD : PETERBOROUGH.

CONSOLIDATION TEST

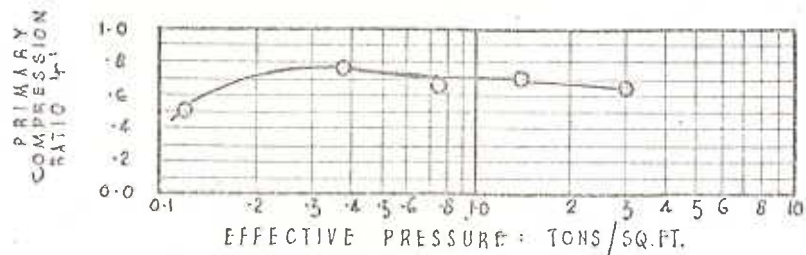
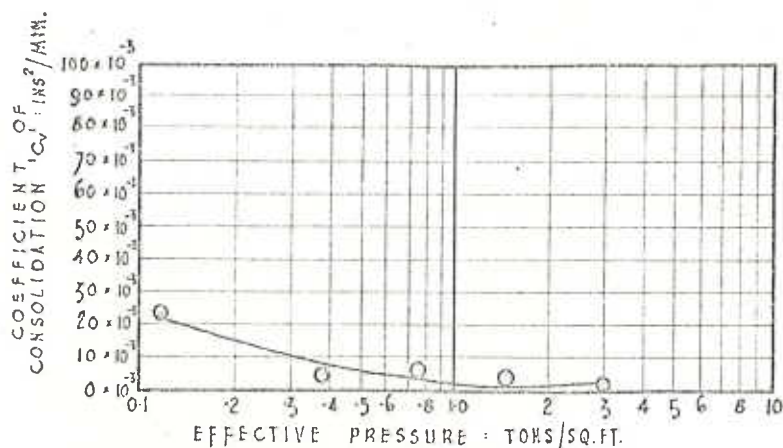
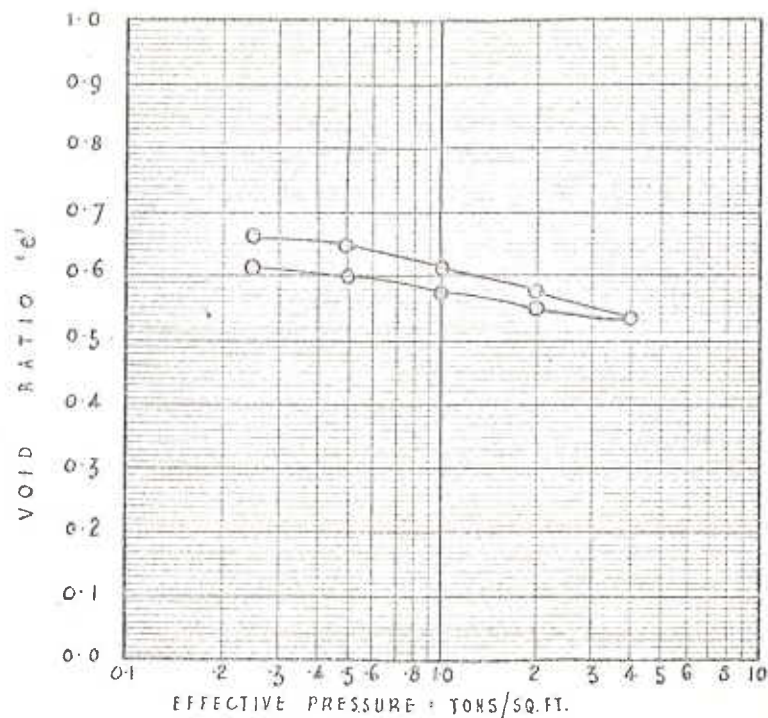
DATE: January 1963.

CONTRACT: Havant Thicket.
 SAMPLE REF.: Tube No. 174, Box No. 3, Depth 25'6" - 27'0" B.S.
 DESCRIPTION: Highly coloured brown clay with traces of black silt.

PRESSURE RANGE (TONS/SQ. FT.)	COEFFICIENT OF COMPRESSIBILITY (FT^2/TON) a_v	COEFFICIENT OF VOLUME DECREASE (FT^2/TON) m_v	COEFFICIENT OF CONSOLIDATION ($IN^2/MIN.$) c_v	COEFFICIENT OF PERMEABILITY ($IN^3/MIN.$) k
0 - 1	0.1043	0.0621	22.70×10^{-3}	55.90×10^{-7}
1 - 2	0.0903	0.0406	4.25×10^{-3}	9.65×10^{-7}
2 - 4	0.0684	0.0400	5.93×10^{-3}	11.18×10^{-7}
4 - 8	0.0577	0.0236	4.24×10^{-3}	6.67×10^{-7}
8 - 16	0.0205	0.0132	2.39×10^{-3}	1.47×10^{-7}

BULK DENSITY: 125.7 lb/cu.ft.
 DRY DENSITY: 100.9 lb/cu.ft.
 INITIAL W/C: 24.5%
 FINAL W/C: 26.3%

EFFECTIVE PRESSURE (TONS/SQ. FT.) p'	VOID RATIO e
0	0.6957
1	0.6626
2	0.6424
4	0.6167
8	0.5720
16	0.5321
32	0.5512
64	0.5767
128	0.5965
256	0.6175
512	0.7030



CONSOLIDATION TEST

CONTRACT : Havant Thicket.

SAMPLE REF. : Tube No. 174, Bore No. 3, Depth 25'6" - 27'0" B.S.

DESCRIPTION : Highly fissured brown clay with traces of black silt.

BULK DENSITY : 125.7 lb/cu.ft.

DRY DENSITY : 100.9 lb/cu.ft.

INITIAL MOISTURE CONTENT : 24.5%

FINAL MOISTURE CONTENT : 26.8%

DATE : January 1965.

PRE PILING SURVEYS LTD : PETERBOROUGH.

CONSOLIDATION TEST

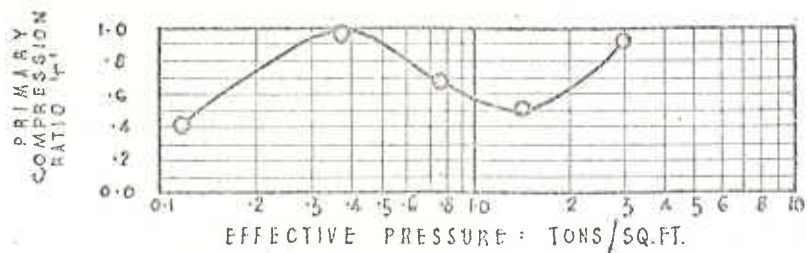
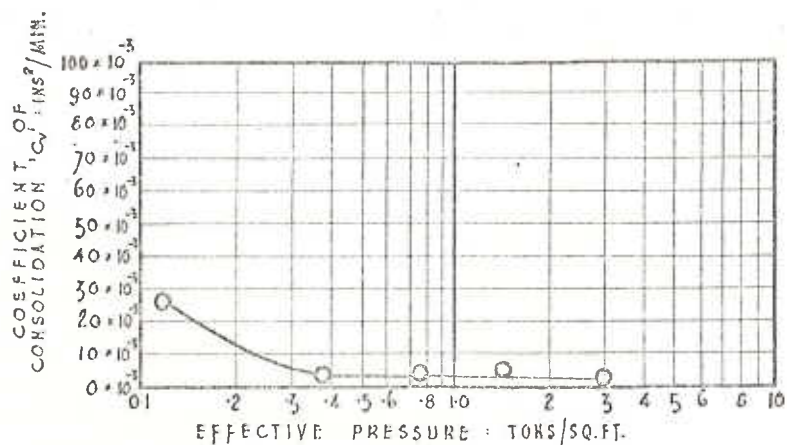
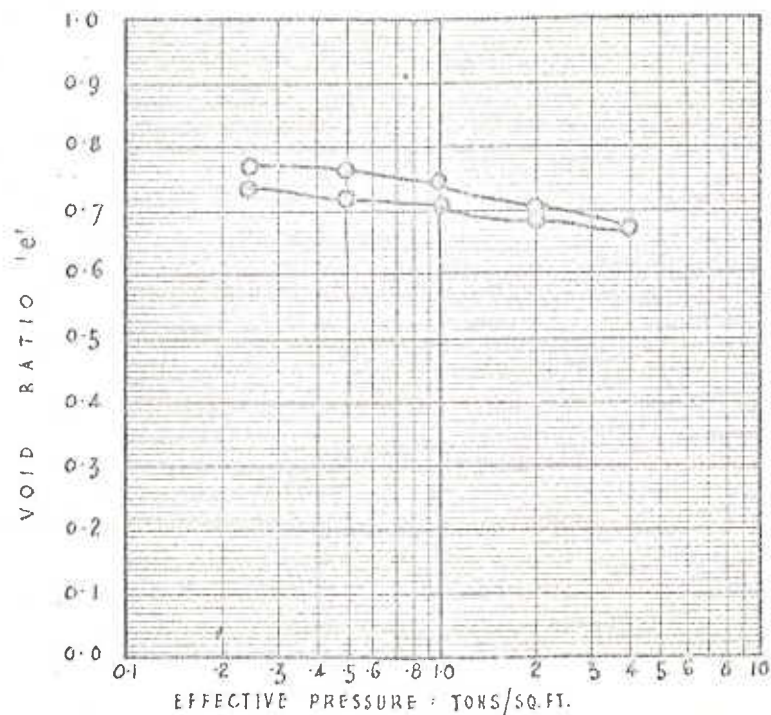
DATE: January 1963.

CONTRACT: Havant District.
 SAMPLE REF.: Tube No. 134, Bore No. 4, Depth 16'6" - 18'0" B.S.
 DESCRIPTION: Highly fissured grey-brown clay with small calcareous crystals.

EFFECTIVE PRESSURE (TONS/SQ. FT.) p'	VOID RATIO e'
0	0.7372
1	0.7736
1	0.7685
1	0.7412
2	0.7052
4	0.6713
2	0.6888
1	0.7030
1	0.7231
1	0.7270
0	0.8100

PRESSURE RANGE (TONS/SQ. FT.) p'	COEFFICIENT OF COMPRESSIBILITY (FT^2/TON) a_v'	COEFFICIENT OF VOLUME DECREASE (FT^2/TON) m_v'	COEFFICIENT OF CONSOLIDATION ($MS^2/MIN.$) c_v'	COEFFICIENT OF PERMEABILITY ($MS/MIN.$) k'
0 - 1	0.0360	0.0538	25.00×10^{-3}	53.60×10^{-7}
1 - 2	0.0356	0.0201	3.58×10^{-3}	3.27×10^{-7}
1 - 1	0.0456	0.0266	3.77×10^{-3}	4.55×10^{-7}
1 - 2	0.0353	0.0205	5.12×10^{-3}	4.77×10^{-7}
2 - 4	0.0173	0.0103	2.00×10^{-3}	0.94×10^{-7}

BULK DENSITY: 121.8 lb/cu.ft.
 DRY DENSITY: 93.5 lb/cu.ft.
 INITIAL M/C: 50.25
 FINAL M/C: 50.5%



CONSOLIDATION TEST

CONTRACT : Havant Thicket.

SAMPLE REF. Tube No. 194, Bore No. 4, Depth 16'6" - 18'0" B.S.

DESCRIPTION : Highly fissured grey-brown clay with selenite crystals.

BULK DENSITY : 121.8 lb/cu.ft.

DRY DENSITY : 93.5 lb/cu.ft.

INITIAL MOISTURE CONTENT : 30.3%

FINAL MOISTURE CONTENT : 30.6%

DATE : January 1963.

PRE PILING SURVEYS LTD : PETERBOROUGH.

CONSOLIDATION TEST

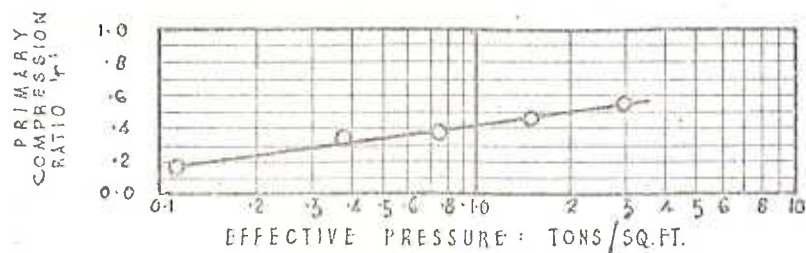
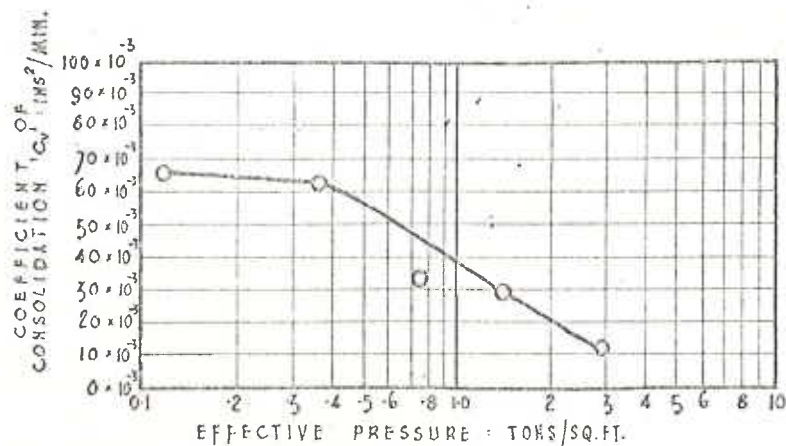
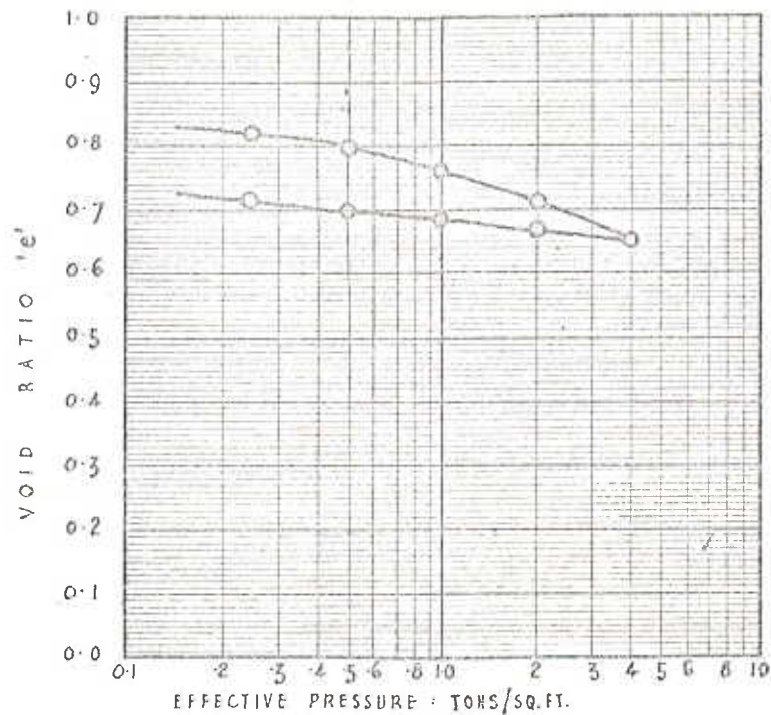
DATE: January 1953.

CONTRACT: Irving Trust Co.
 SAMPLE REF. No. 172, Core No. 5, Depth 11'6" - 13'0" B.S.
 DESCRIPTION: Highly fissured, friable grey-brown clay with ferruginous concretions.

PRESSURE RANGE (TONS/SQ. FT.)	COEFFICIENT OF COMPRESSIBILITY (FT^2/TON) c_{α_v}	COEFFICIENT OF VOLUME DECREASE (FT^2/TON) c_{m_v}	COEFFICIENT OF CONSOLIDATION ($MS^2/MIN.$) c_v	COEFFICIENT OF PERMEABILITY ($MS/MIN.$) k'
0 - 1	0.1284	0.0699	54.90×10^{-3}	199.00×10^{-7}
1 - 2	0.0848	0.0469	61.70×10^{-3}	126.30×10^{-7}
2 - 4	0.0712	0.0400	33.30×10^{-3}	59.30×10^{-7}
4 - 8	0.0484	0.0473	22.60×10^{-3}	33.90×10^{-7}
8 - 16	0.0220	0.0172	11.75×10^{-3}	9.32×10^{-7}

BULK DENSITY: 116.8 lb/cu.ft.
 DRY DENSITY: 89.9 lb/cu.ft.
 INITIAL W/C: 29.8 %
 FINAL W/C: 30.0 %

EFFECTIVE PRESSURE (TONS/SQ. FT.) p'	VOID RATIO e
0	0.8819
1	0.8193
2	0.7736
4	0.7630
8	0.7116
16	0.6366
32	0.6204
64	0.6067
128	0.7035
256	0.7173
512	0.7260



CONSOLIDATION TEST

CONTRACT : Havant Thicket.

SAMPLE REF. : Tube No. 172, Bore No. 5, Depth 11'6" - 13'0" B.S.

DESCRIPTION : Highly fissured friable grey brown clay with ferrous discolourations.

BULK DENSITY : 116.8 lb/cu.ft.

DRY DENSITY : 89.9 lb/cu.ft.

INITIAL MOISTURE CONTENT : 29.8%

FINAL MOISTURE CONTENT : 30.0%

DATE : January 1963.

PRE PILING SURVEYS LTD. PETERBOROUGH.

CONSOLIDATION TEST

CONTRACT: Havant Thicket.
 SAMPLE REF.: Borehole 9: Mixture of fragmentary samples 0 - 10 ft. depth.
 DESCRIPTION: Brown and grey silty sandy clay with flint and roots.

DATE: January 1963.

EFFECTIVE PRESSURE (TONS/SQ. FT.) p'	VOID RATIO e'
0	0.8356
$\frac{1}{2}$	0.7084
1	0.5611
2	0.5043
4	0.5167
2	0.5536
1	0.5585
$\frac{1}{2}$	0.5668
0	0.6320

PRESSURE RANGE (TONS/SQ. FT.) p'	COEFFICIENT OF COMPRESSIBILITY (FT^2/TON) a_v'	COEFFICIENT OF VOLUME DECREASE (FT^2/TON) m_v'	COEFFICIENT OF CONSOLIDATION ($INS^2/MIN.$) c_v'	COEFFICIENT OF PERMEABILITY ($INS/MIN.$) k'
0 - $\frac{1}{2}$	0.02514	0.1435	1.73×10^{-3}	11.10×10^{-7}
$\frac{1}{2}$ - 1	0.0246	0.0562	1.25×10^{-3}	4.90×10^{-7}
1 - 2	0.0568	0.0348	2.13×10^{-3}	3.41×10^{-7}
2 - 4	0.0288	0.0183	2.66×10^{-3}	2.13×10^{-7}

BULK DENSITY: 120.0 lb/cu.ft.
 DRY DENSITY: 93.9 lb/cu.ft.
 INITIAL W/C: 28.0%
 FINAL W/C: 23.8%

CONSOLIDATION TEST

DATE: January 1963.

CONTRACT: Haywards District.
SAMPLE REF.: Borehole 12: Mixture of fragmentary samples 0 - 10 ft. depth.
DESCRIPTION: Brown and gray sandy silty clay with roots.

EFFECTIVE PRESSURE (TONS/SQ. FT.) p_1'	VOID RATIO e_1'	COEFFICIENT OF COMPRESSION (FT ² /TON) a_v'	COEFFICIENT OF VOLUME DECREASE (FT ³ /TON) m_v'	COEFFICIENT OF CONSOLIDATION (HRS/MIN.) c_v'	COEFFICIENT OF PERMEABILITY (HRS/INCH) k_h'
0 - 1	1.0213				
1 - 2	1.0259	0.0432	0.0214	2.76×10^{-3}	2.50×10^{-7}
2 - 4	1.0253	0.0483	0.0244	1.87×10^{-3}	1.31×10^{-7}
	0.9560	0.0543	0.0179	0.60×10^{-3}	9.15×10^{-7}
	0.9274				
	0.9077				
	0.9106				
	0.9776				
	1.1390				

BULK DENSITY: 113.5 lb/cu.ft.

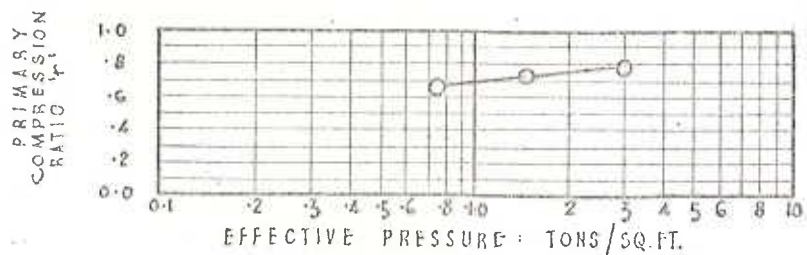
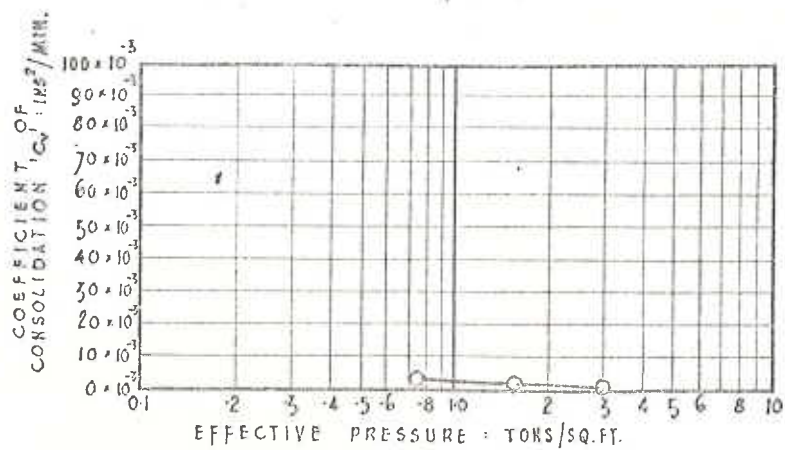
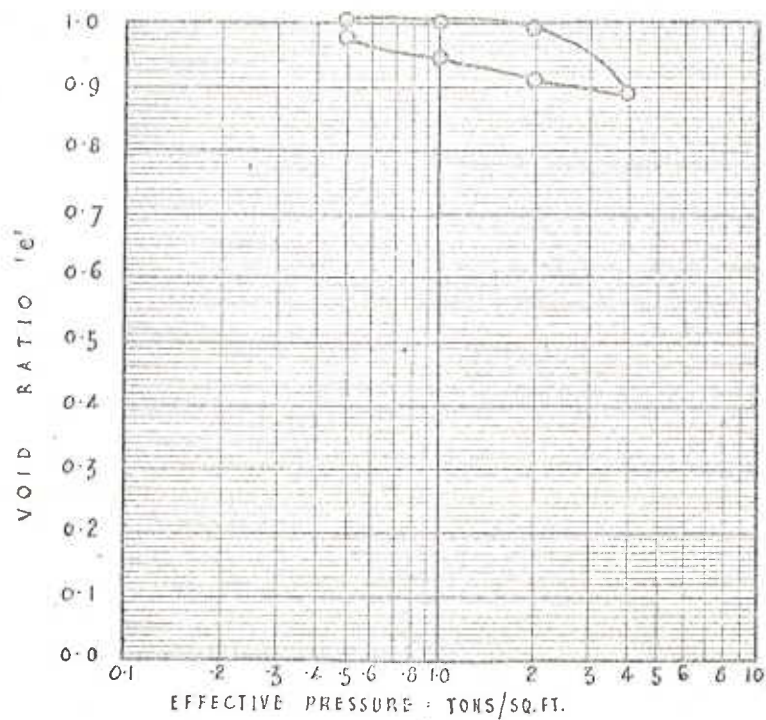
DRY DENSITY: 85.5 lb/cu.ft.

INITIAL M/C: 32.9%

FINAL M/C: 42.9%

* Samples expanded with this increment of load.

Note: This sample was compacted in the Proctor mould at natural moisture content.



CONSOLIDATION TEST

CONTRACT : Havant Thicket.

SAMPLE REF. : Borehole 12: Frag. samples 0 - 10 ft. depth.

DESCRIPTION : Brown and grey sandy silty clay with roots.

BULK DENSITY : 113.5 lb/cu.ft.

DRY DENSITY : 85.5 lb/cu.ft.

INITIAL MOISTURE CONTENT : 32.8%

FINAL MOISTURE CONTENT : 42.9%

DATE : January 1963.

PRE PILING SURVEYS LTD : PETERBOROUGH.

CONSOLIDATION TEST

DATE: January 1963.

CONTRACT: Harvey Whiskey.
SAMPLE REF: Tube No. 226, Borehole No. 15, Depth 12'0" - 13'0"
DESCRIPTION: Grey and dark red mottled clay.

EFFECTIVE PRESSURE (TONS/SQ. FT.)	VOID RATIO e	PRESSURE RANGE (TONS/SQ. FT.)	COEFFICIENT OF COMPRESSIBILITY $(\frac{FT^2}{TON})$	COEFFICIENT OF VOLUME DECREASE $(\frac{FT^2}{TON})$	COEFFICIENT OF CONSOLIDATION $(\frac{MHS^2}{MIN.})$	COEFFICIENT OF PERMEABILITY $(\frac{MHS}{MIN.})$
0	0.6111	0 - 1	#	#	#	#
1	0.5895	1 - 1	0.0664	0.0005	1.31×10^{-3}	2.62×10^{-7}
1/2	0.5370	1/2 - 1	0.0754	0.0067	1.16×10^{-3}	2.67×10^{-7}
1	0.5353	1 - 2	0.0745	0.0083	0.95×10^{-3}	1.19×10^{-7}
2	0.5303	2 - 4	0.0210	0.0157	0.62×10^{-3}	0.13×10^{-7}

BULK DENSITY: 132.3 lb/cu.ft.

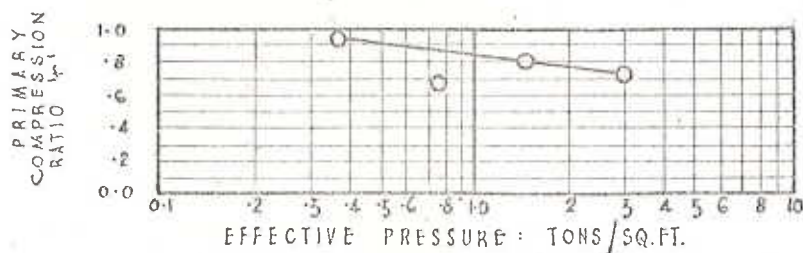
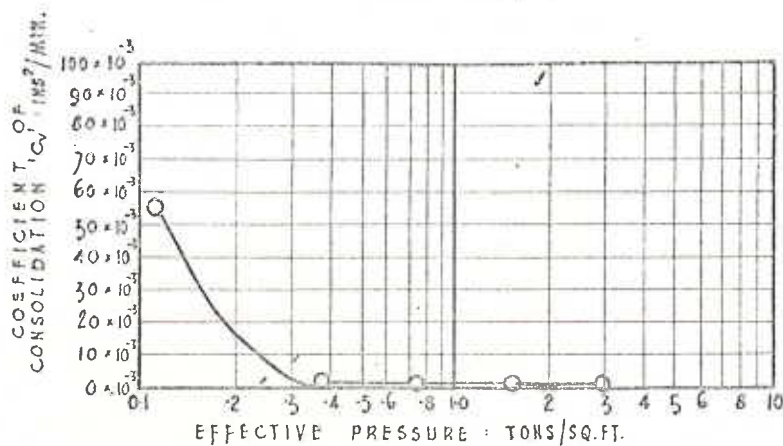
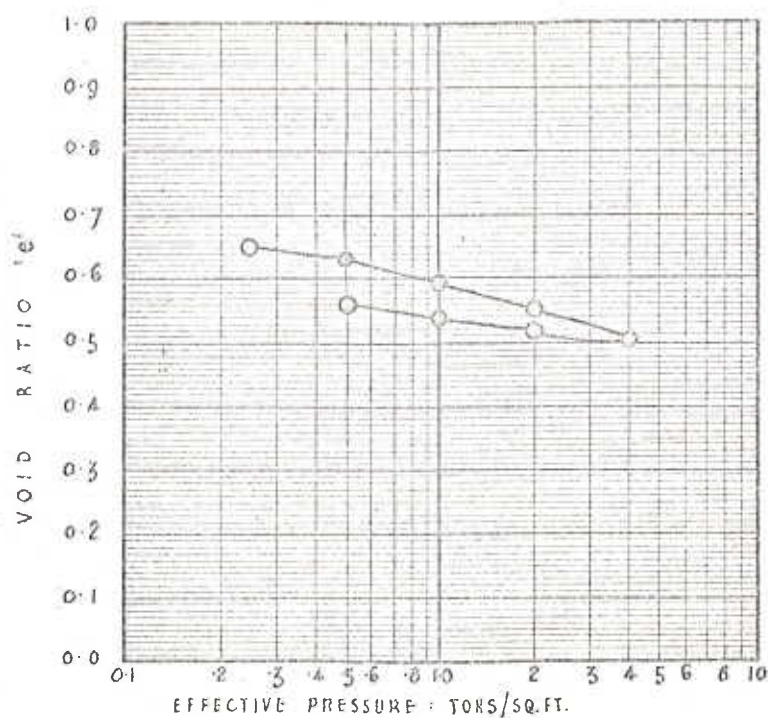
DRY DENSITY: 111.2 lb/cu.ft.

INITIAL W/C: 18.9%

FINAL W/C: 25.0%

* Sample expanded under this increment of load.

Note: This sample was corrected to the Doctor's natural moisture content.



CONSOLIDATION TEST

CONTRACT : Havant Thicket.

SAMPLE REF. : Tube No. 226; Bore 15 : Depth 12'0" - 13'0"

DESCRIPTION : Grey and dark red mottled clay.

BULK DENSITY : 132.3 lb/cu.ft.

DRY DENSITY : 111.2 lb/cu.ft.

INITIAL MOISTURE CONTENT : 18.9%

FINAL MOISTURE CONTENT : 25.0%

DATE : January 1963.

PRE PILING SURVEYS LTD : PETERBOROUGH.

CONSOLIDATION TEST

DATE: January 1963.

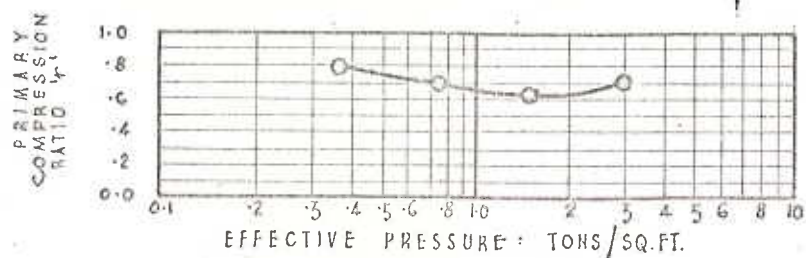
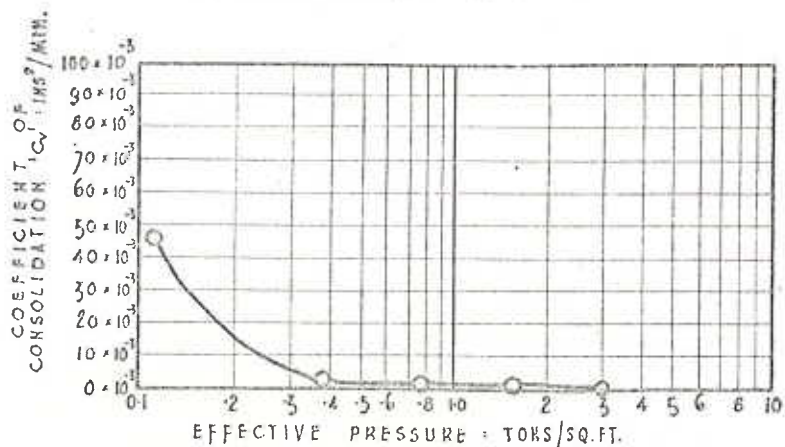
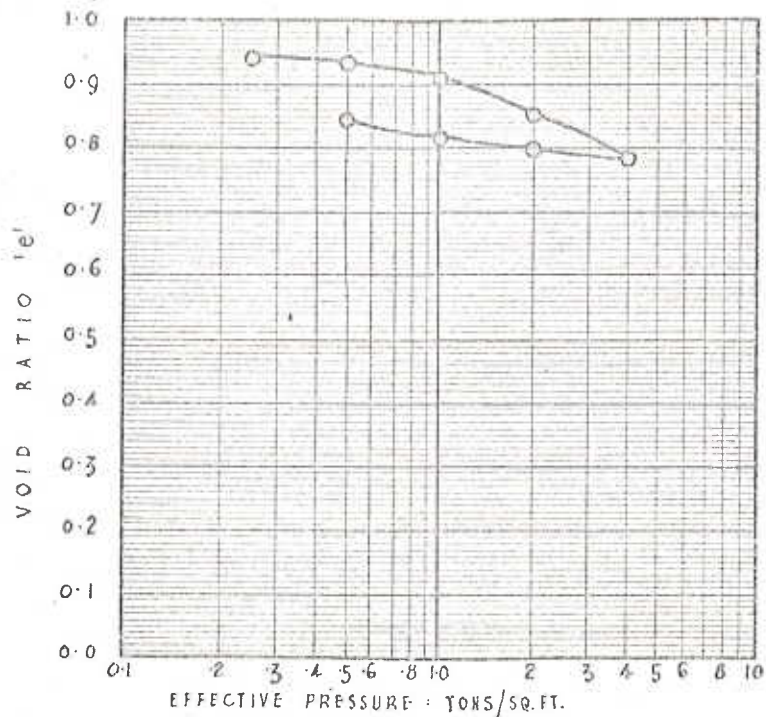
CONTRACT: Pavement Thickness.
 SAMPLE REF.: Borehole 16, Mixture of Crumbly samples 0 - 10 ft. depth.
 DESCRIPTION: Brown, orange and grey clay with a few small gravel particles.

EFFECTIVE PRESSURE (TONS/SQ. FT.)	VOID RATIO e
0	0.9403
1	0.9395
1	0.9300
1	0.9038
2	0.8520
4	0.7823
2	0.7773
1	0.8150
1	0.8112
0	0.8700

PRESSURE RANGE (TONS/SQ. FT.)	COEFFICIENT OF COMPRESSIBILITY a_v (FT ² /TON)	COEFFICIENT OF VOLUME DECREASE m_v (FT ² /TON)	COEFFICIENT OF CONSOLIDATION c_v (IN ² /MIN.)	COEFFICIENT OF PERMEABILITY k (IN ³ /MIN.)
0 - 1	0.0072	.0037	1.5×10^{-3}	7.51×10^{-7}
1 - 1	0.0340	.0176	1.90×10^{-3}	1.45×10^{-7}
1 - 1	0.0534	.0274	1.50×10^{-3}	1.79×10^{-7}
1 - 2	0.0503	.0271	0.72×10^{-3}	0.83×10^{-7}
2 - 4	0.0354	.0195	0.78×10^{-3}	0.65×10^{-7}

BULK DENSITY: 116.8 lb/cu.ft.
 DRY DENSITY: 89.0 lb/cu.ft.
 INITIAL W/C: 31.2%
 FINAL W/C: 33.1%

Note: This sample was compacted in the Proctor mould at natural moisture content.



CONSOLIDATION TEST

CONTRACT: Havant Thicket.

SAMPLE REF.: Borehole 16: Frag. samples 0 - 10 ft. depth.

DESCRIPTION: Brown, orange and grey clay with a few small particles of gravel.

BULK DENSITY: 116.8 lb/cu.ft.

DRY DENSITY: 89.0 lb/cu.ft.

INITIAL MOISTURE CONTENT: 31.2%

FINAL MOISTURE CONTENT: 33.1%

DATE: January 1963.

PRE PILING SURVEYS LTD: PETERBOROUGH.

CONSOLIDATION TEST

CONTRACT : Heavy Thickset.

DATE : January 1963.

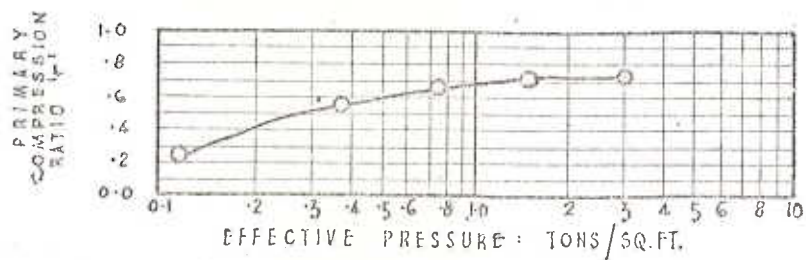
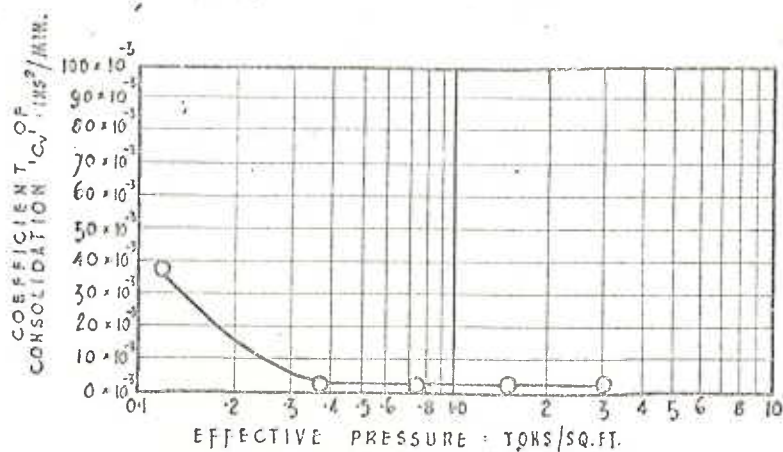
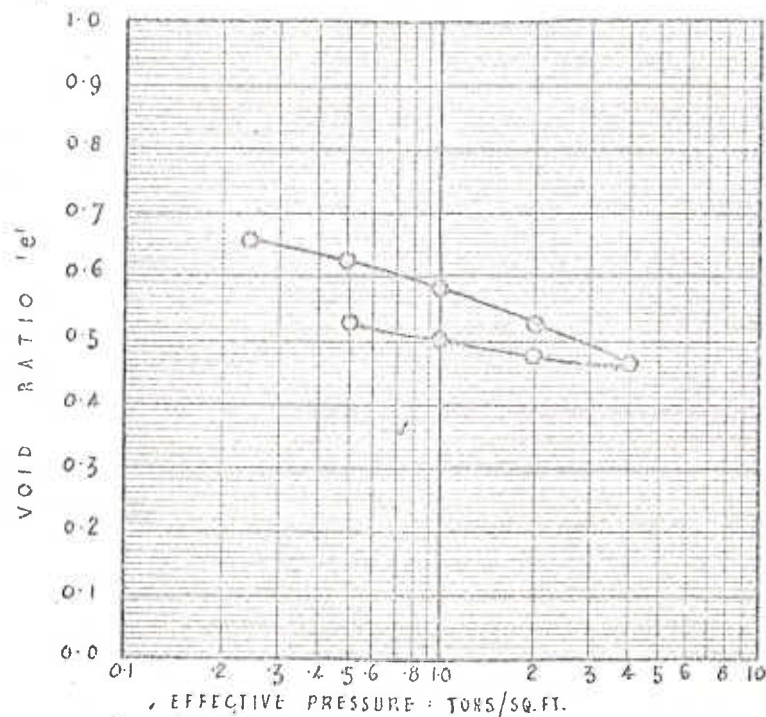
SAMPLE REF : Tube No. 225, Borehole No. 20, Depth 17'10" - 18'5".
DESCRIPTION : Light blue, grey, red and yellow mottled clay.

EFFECTIVE PRESSURE (TONS/SQ. FT.) p_1	VOID RATIO e
0	0.5259
1	0.5282
2	0.5280
3	0.5285
4	0.5282
5	0.5281
6	0.5282
7	0.5280
8	0.5280

PRESSURE RANGE (TONS/SQ. FT.) p_1	COEFFICIENT OF COMPRESSIBILITY (FT^2/TON) a_v	COEFFICIENT OF VOLUME DECREASE (FT^2/TON) m_v	COEFFICIENT OF CONSOLIDATION ($MS^2/MIN.$) c_v	COEFFICIENT OF PERMEABILITY ($MS/MIN.$) k
0 - 1	0.1655	0.0390	33.60×10^{-3}	121.6×10^{-7}
1 - 2	0.1060	0.0616	1.30×10^{-3}	4.22×10^{-7}
2 - 3	0.0950	0.0592	2.07×10^{-3}	6.17×10^{-7}
3 - 4	0.0956	0.0757	0.93×10^{-3}	1.67×10^{-7}
4 - 5	0.0304	0.0203	0.38×10^{-3}	0.90×10^{-7}

BULK DENSITY : 134.5 lb/cu.ft.
DRY DENSITY : 112.0 lb/cu.ft.
INITIAL W/C : 17.46%
FINAL W/C : 26.23%

Notes: This sample was compacted in the Proctor mould at natural moisture content.



CONSOLIDATION TEST

CONTRACT: Havant Thicket.

SAMPLE REF.: Tube No. 225: Bore 20, Depth 17'0" - 18'6"

DESCRIPTION: Light blue, grey, red and yellow mottled clay.

BULK DENSITY: 134.5 lb/cu.ft.

DRY DENSITY: 112.0 lb/cu.ft.

INITIAL MOISTURE CONTENT: 17.4%

FINAL MOISTURE CONTENT: 26.2%

DATE: January 1963.

PRE PILING SURVEYS LTD: PETERBOROUGH.

PROCTOR COMPACTION TEST

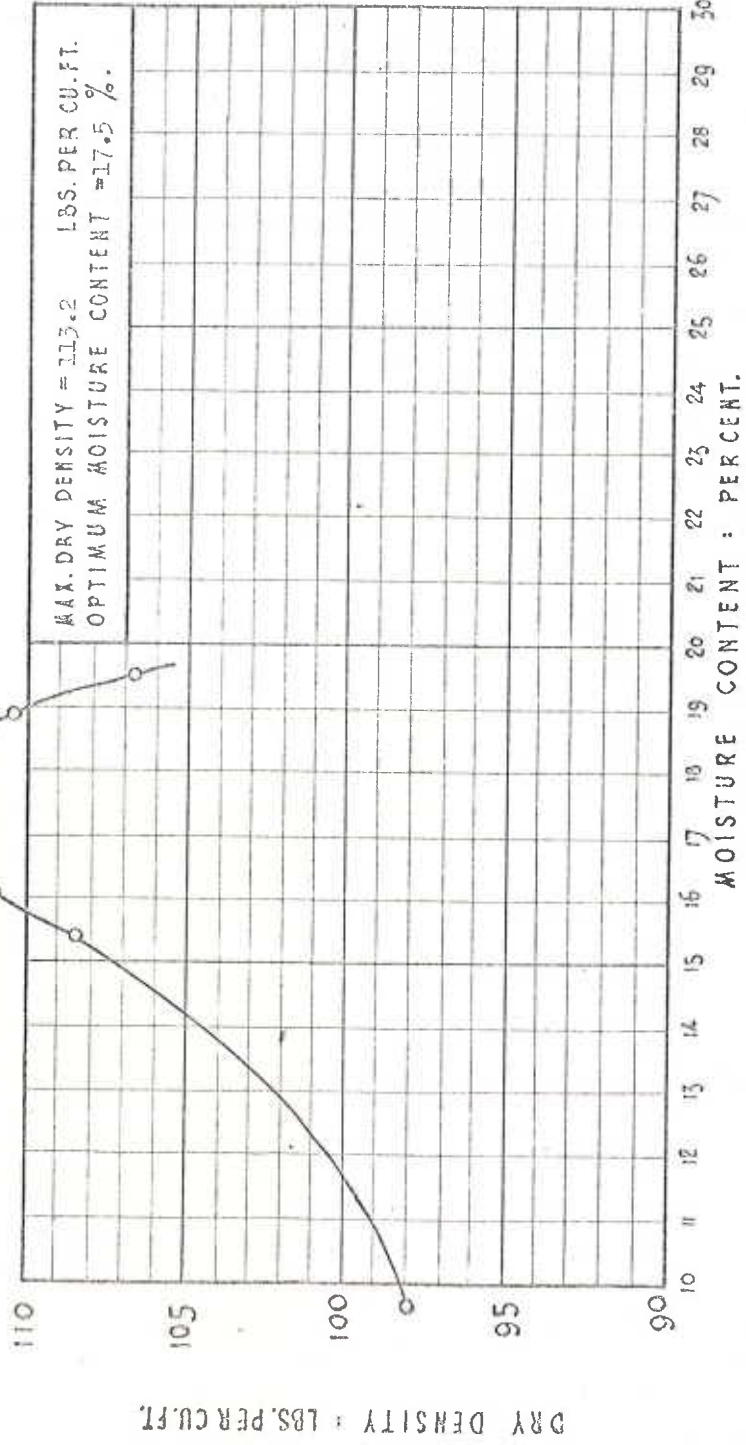
CONTRACT : Nevant Thicket.

SAMPLE REF :

DESCRIPTION :

DATE : January 1963.

Mixture of fragmentary samples 0 - 10 ft. depth in Bore 9.
Brown and grey silty sandy clay with flint and roots.



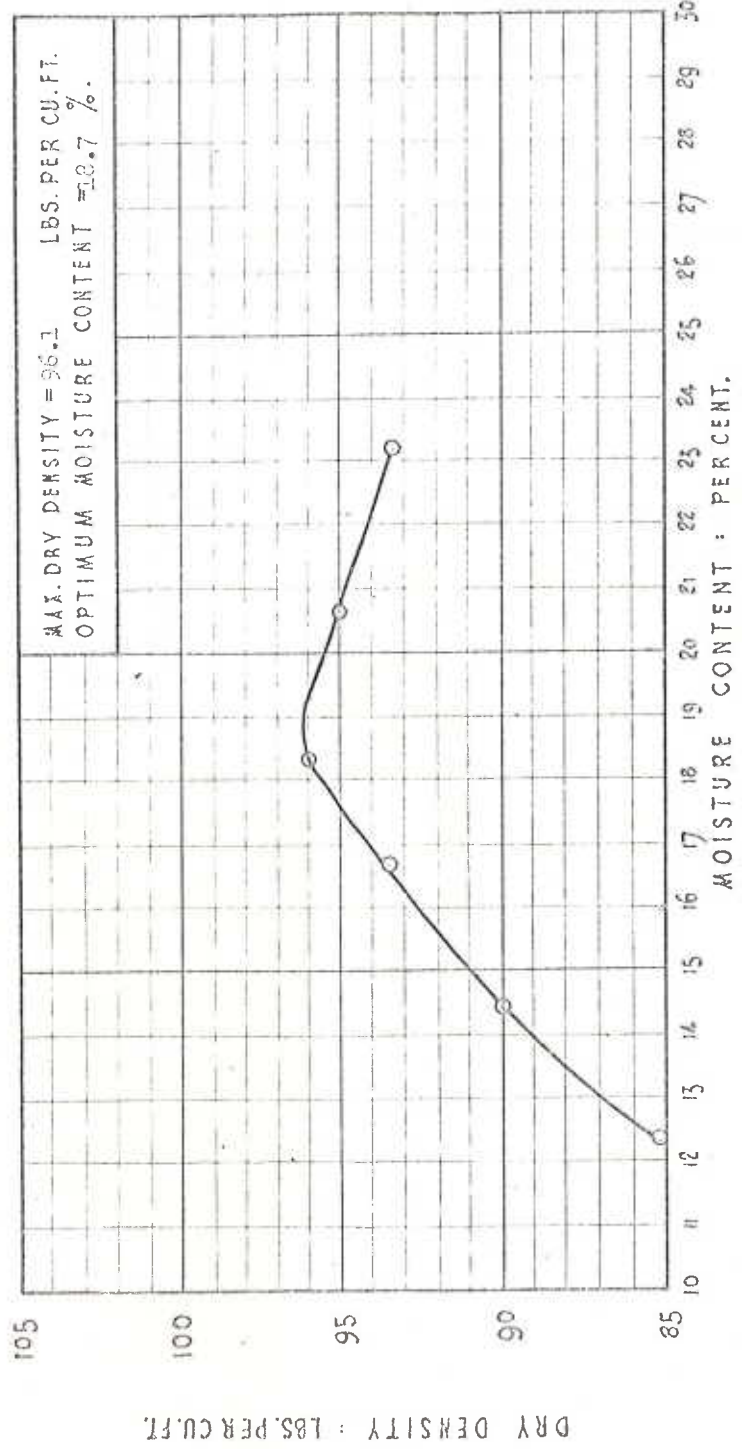
PROCTOR COMPACTION TEST

CONTRACT : Havant Thicket.

DATE : January 1963.

SAMPLE REF : Mixture of fragmentary samples 0 - 10 ft. B.S. in Bore 12.

DESCRIPTION : Brown and grey silty clay with roots.



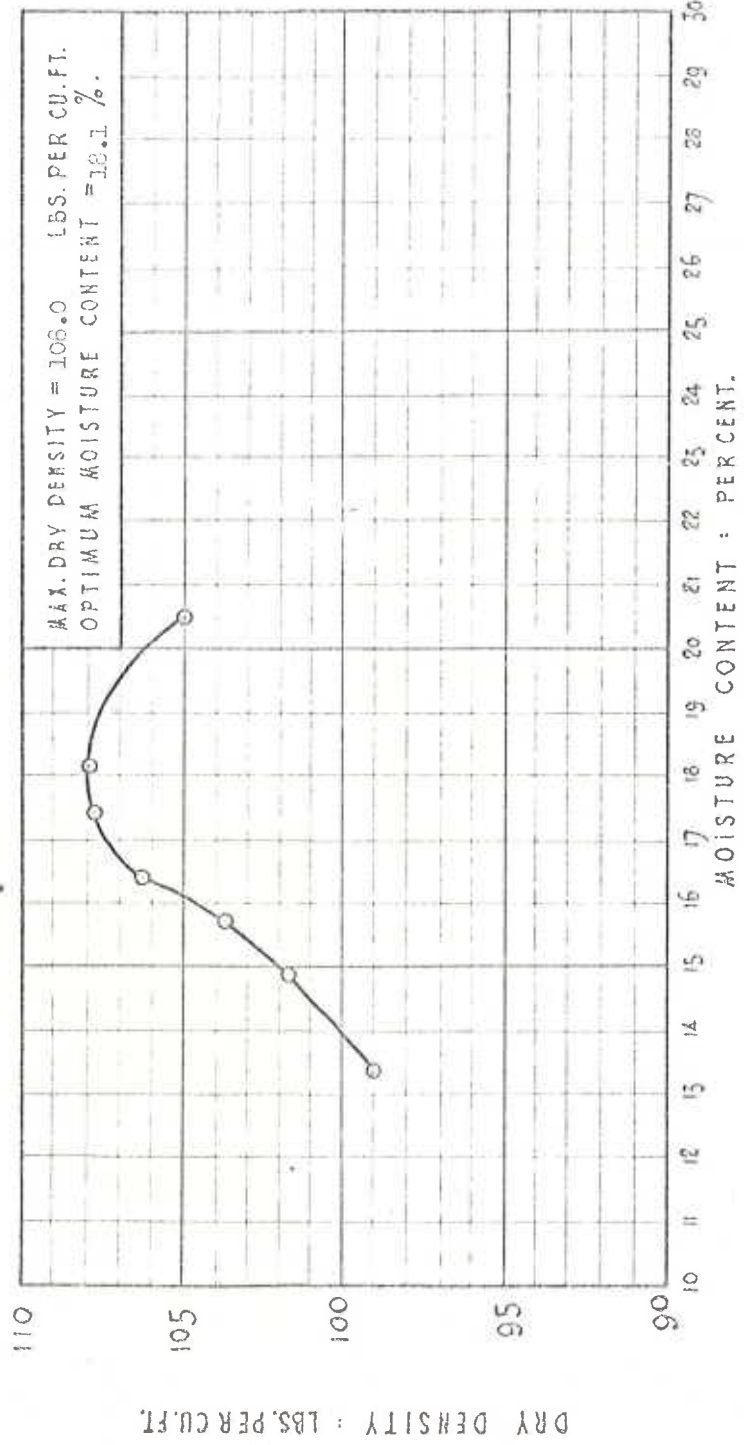
PROCTOR COMPACTION TEST

CONTRACT: Havant Thicket.

DATE: January 1963.

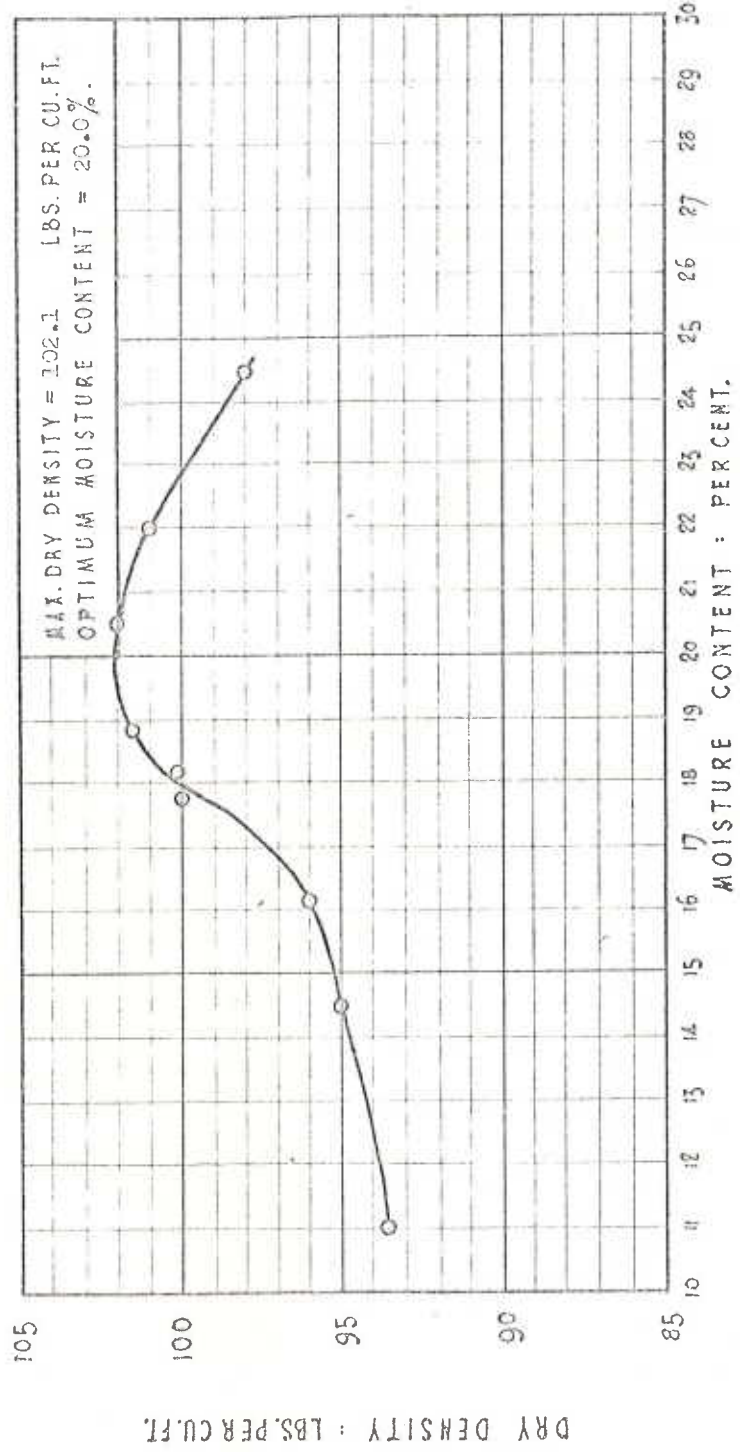
SAMPLE REF: Tube No. 226, Bore No. 15, Depth 12'0" - 13'0" D.S.

DESCRIPTION: Grey and dark red mottled clay.



PROCTOR COMPACTION TEST

CONTRACT : Havant Thicket.
 DATE : January 1963.
 SAMPLE REF : Mixture of fragmentary samples 0 - 10 ft. B.S. in Bore 16.
 DESCRIPTION : Brown, orange, blue and dark grey mottled clay with a few particles of black gravel.



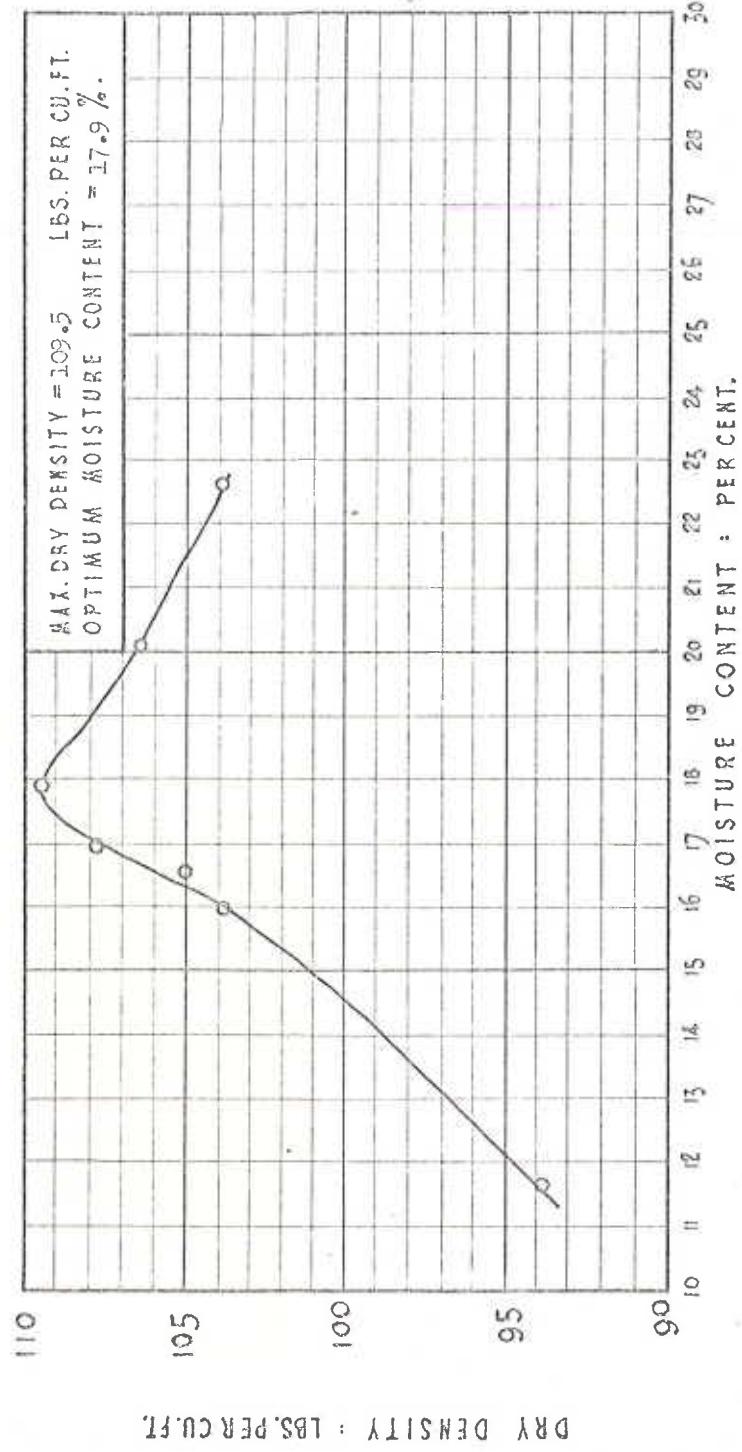
PROCTOR COMPACTION TEST

CONTRACT : Havant Thicket.

DATE : January 1963.

SAMPLE REF : Tube No. 225, Bore No. 20, Depth 17'0" - 18'6" B.S.

DESCRIPTION : Light blue grey, red and yellow mottled clay.



I N D E X P R O P E R T I E S .

Borehole 9 (Mixture of fragmentary samples
0-10 ft. depth).

Liquid limit	=	43.3%
Plastic limit	=	<u>17.9%</u>
Plasticity Index	=	25.4%
Liquidity Index	=	0.398

Cassagrande Classification : 'CI' -Medium Plastic clay.

Borehole 12 (Mixture of fragmentary samples
0 -10 ft. depth).

Liquid limit	=	75.0%
Plastic limit	=	<u>26.4%</u>
Plasticity Index	=	48.6%
Liquidity Index	=	0.132

Cassagrande Classification : 'CH' -Inorganic clay of high
plasticity.

Borehole 16 (Mixture of fragmentary samples
0 -10ft. depth).

Liquid limit	=	67.2%
Plastic limit	=	<u>22.2%</u>
Plasticity Index	=	45.0%
Liquidity Index	=	0.200

Cassagrande Classification : 'CH' -Inorganic clay of high
plasticity.

Tube 226: Borehole 15, depth 12'0" -13'0" B.S. .

Liquid limit	=	55.7
Plastic limit	=	<u>18.1</u>
Plasticity Index	=	37.6
Liquidity Index	=	0.021

Cassagrande Classification: 'CH' -Inorganic clay of high
plasticity.

Tube 225: Borehole 20, Depth 17'0" - 18'6" B.S.

Liquid limit	=	60.1
Plastic limit	=	<u>21.6</u>
Plasticity Index	=	38.5
Liquidity Index	=	negative.

Cassagrande Classification. 'CH' -Inorganic clay of high
plasticity.

PARTICLE SIZE DISTRIBUTION

CONTRACT: Havant Thicket.

SAMPLE: 0-10 ft. in Bore 9

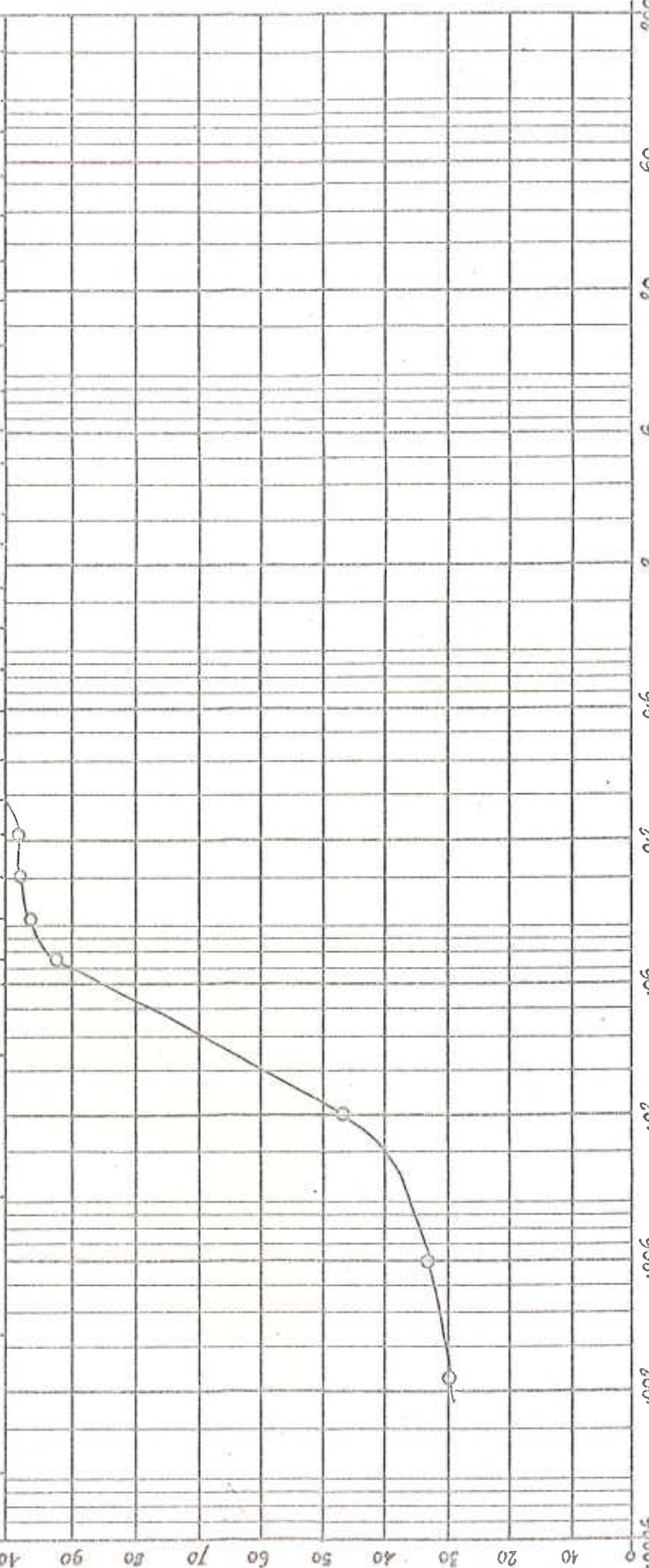
DATE: JANUARY 1963.

LOG SETTLING VELOCITY IN CMS. PER SECOND

BRITISH STANDARD SIEVE NUMBERS

APERTURE SIZES IN INCHES

2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 279 280 281 282 283 284 285 286 287 288 289 290 291 292 293 294 295 296 297 298 299 300 301 302 303 304 305 306 307 308 309 310 311 312 313 314 315 316 317 318 319 320 321 322 323 324 325 326 327 328 329 330 331 332 333 334 335 336 337 338 339 340 341 342 343 344 345 346 347 348 349 350 351 352 353 354 355 356 357 358 359 360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375 376 377 378 379 380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 400

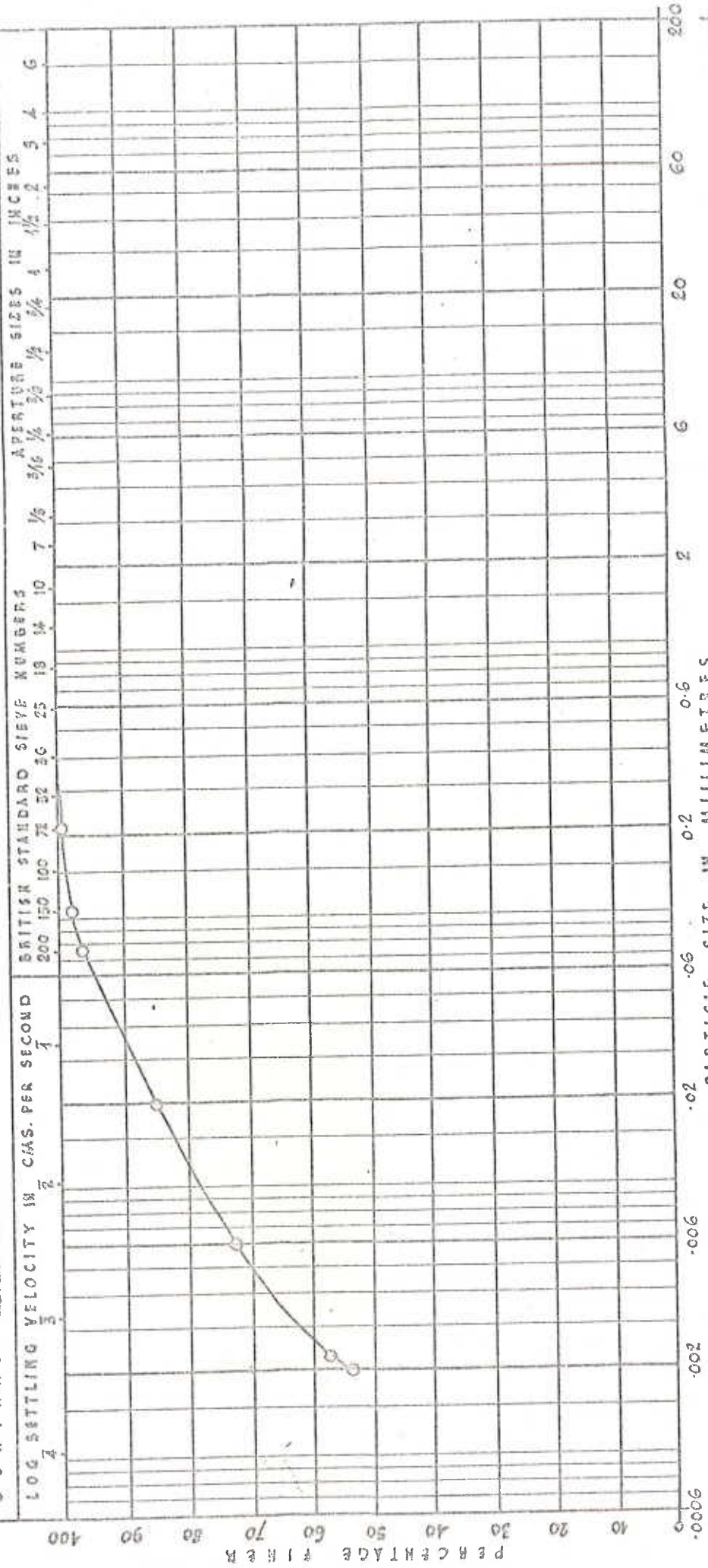


PARTICLE SIZE DISTRIBUTION

CONTRACT: Havant Thicket.

SAMPLE: 0 - 10 ft. B.S. in Bore 12.

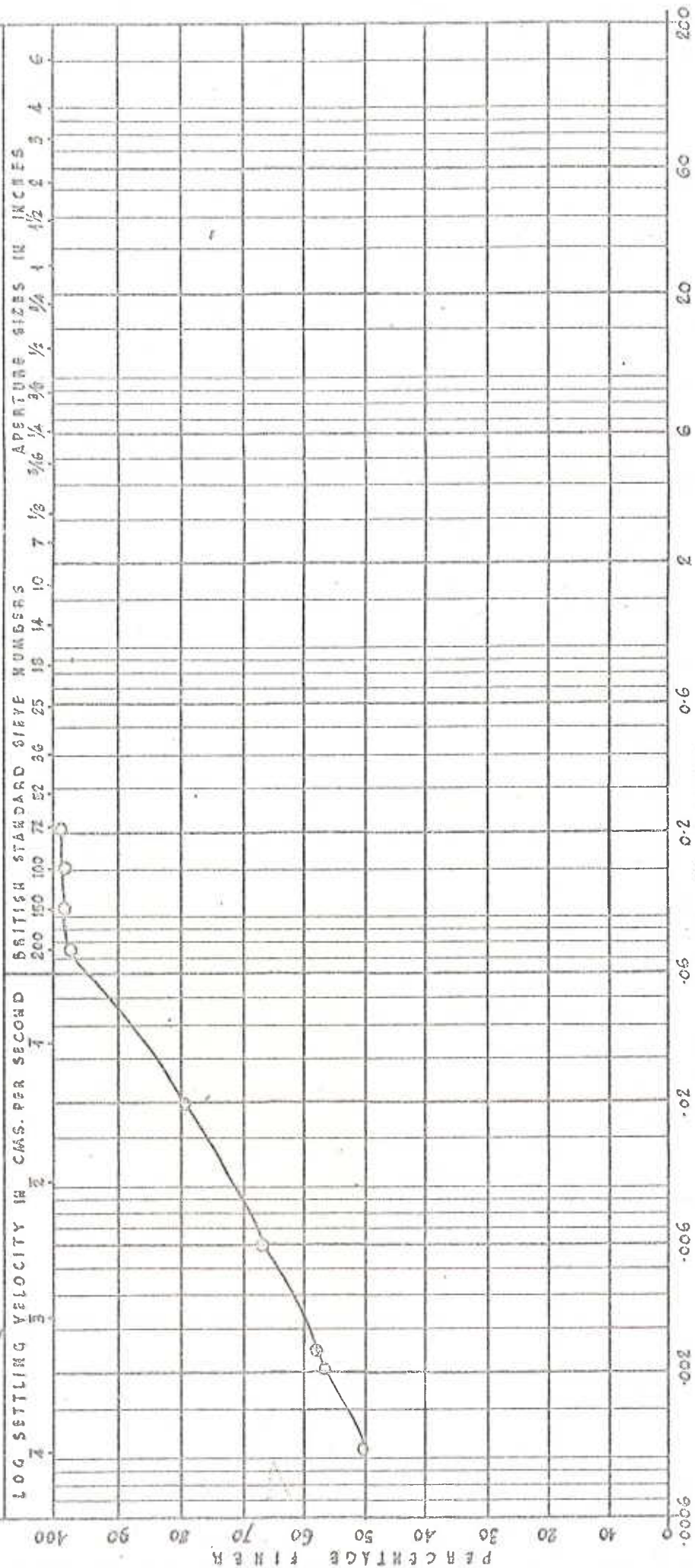
DATE: January 1963.



PARTICLE SIZE DISTRIBUTION

CONTRACT: Havant Thicket.

SAMPLE: Tube 226: Bore 15, Depth 12'6" B.S. DATE: January 1963.



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM		PRE PILING SURVEYS LEA WHARF WORKS, PETERBOROUGH.
FRACTION	SILT FRACTION									SAND GRAVEL

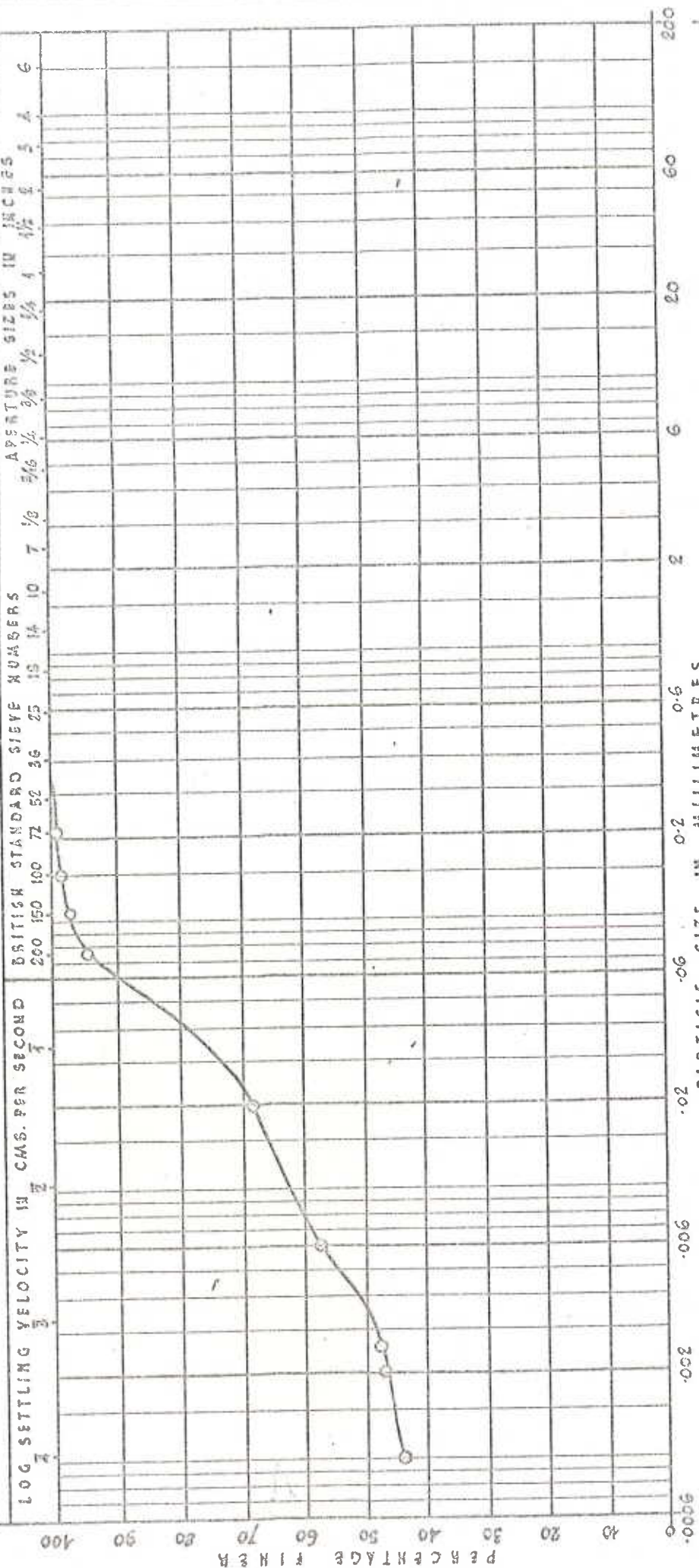
PARTICLE SIZE DISTRIBUTION

C O N T R A C T : Havant Thicket.

SAMPLE: 0 - 10 ft. B.S. in Bore 16.

C O N T R A C T: Havant Thicket.

DATE: January 1963.



CLAY FRACTION	FINE			MEDIUM			COARSE			FINE			MEDIUM			COARSE		
	FINE			MEDIUM			COARSE			FINE			MEDIUM			COARSE		
	SILT			FRACTION			SAND			GRAVEL								

PARTICLE SIZE DISTRIBUTION

CONTRACT: Havant Thicket.

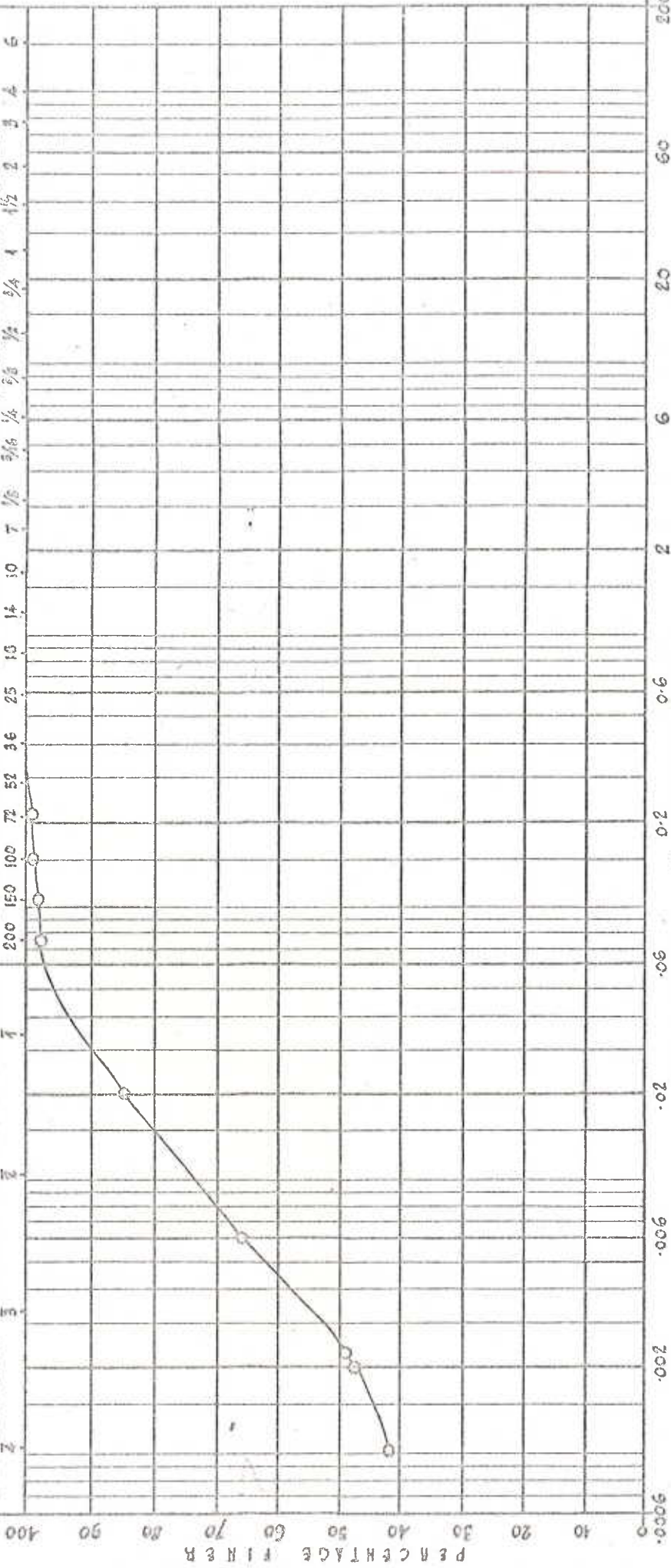
SAMPLE: Tube 225, Bore 20, Depth 17'9" B.S. DATE: January 1963.

LOG SETTLING VELOCITY IN CMAS. PER SECOND

BRITISH STANDARD SIEVE NUMBERS

APERTURE SIZES IN INCHES

200 150 100 72 52 36 25 18 14 10 7 5 3 1/8 1/4 1/2 3/4 1 1 1/2 2 3 4 6



PARTICLE SIZE IN MILLIMETRES

CLAY FRACTION	SILT FRACTION			SAND			GRAVEL			PRE PILING SURVEYS LTD. WHARF WORKS, PETERBOROUGH.
	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	