

https://dspace.org/

# The use of stabilised soil as a material in the dam construction

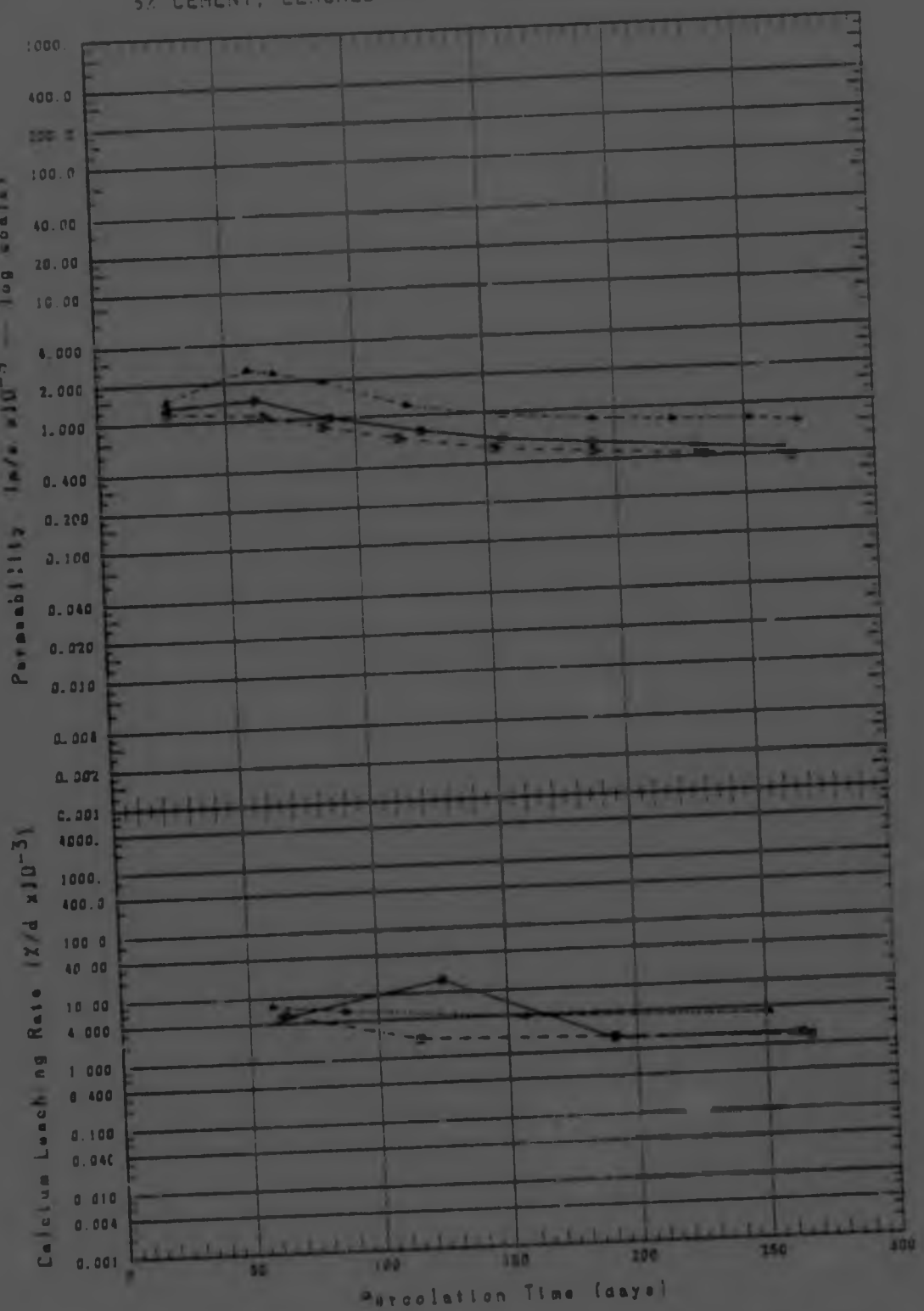
**Robertson, James Alexander**

**2015**
http://hdl.handle.net/10539/19213

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GRAPH D.21

5% CEMENT, LEACHED WITH MIDDELBURG RESERVOIR WATER

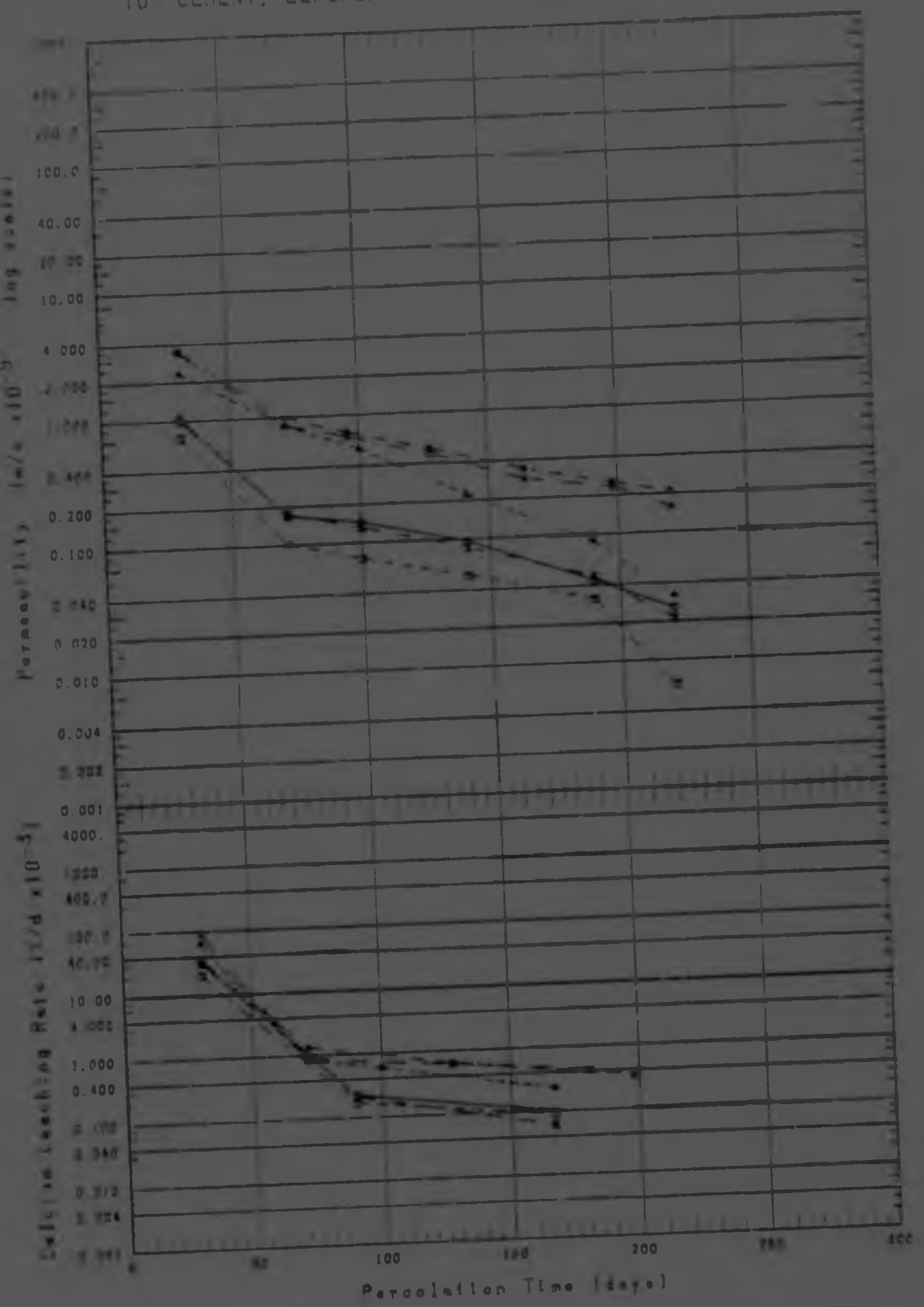



| Specimen # | Inc % | Int %/d | Ctl %/d | Pen mm | Flow l |
|---|---|---|---|---|---|
| 1=05/49 | 13.306 | -.0202 | -.05952 | .70 | 1.080 |
| 15=05/49 | 13.306 | -.0202 | -.05952 | 2.30 | 1.621 |
| 11=05/49 | 13.[illegible]2 | .0[illegible]871 | .001533 | .95 | .930 |
| Average | 13.355 | -.0008 | -.04212 | 1.32 | 1.210 |

MID-DEL.PLT — 21/03/88-8-[illegible]-v 1.1 (LCH-CONP DAT. 2 )

GRAPH D.22

10" CEMENT, LEACHED WITH MIDDELBURG MUNICIPAL WATER

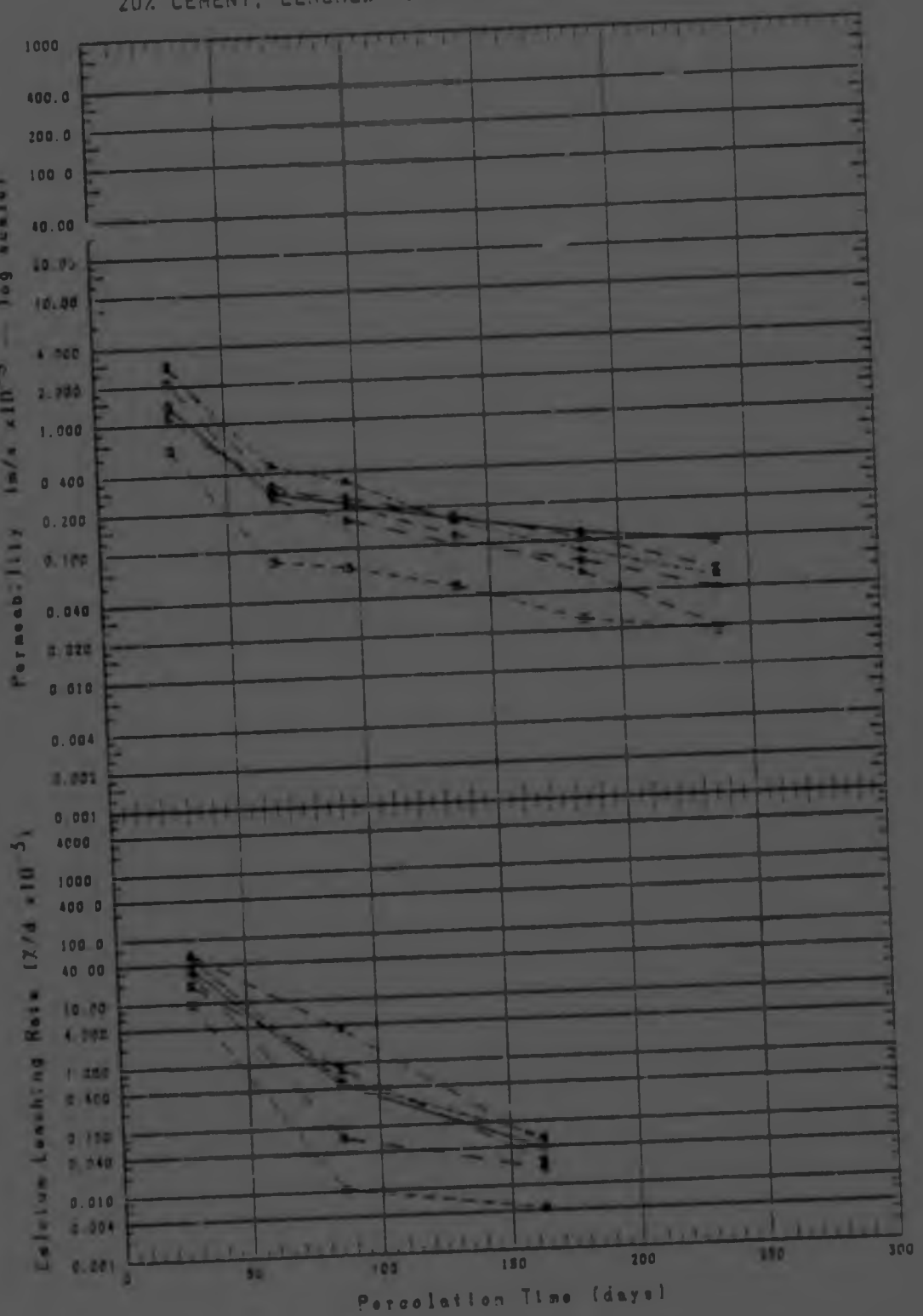



| Specimen # | Imp % | Int %/d | Ctl %/d | Pen mm | Flow l |
|---|---|---|---|---|---|
| 19=10/42 | 13.376 | N/A | N/A | N/A | .382 |
| 2=10/42 | 12.979 | .02627 | -.03003 | N/A | .934 |
| 9=10/42 | 13.045 | .05028 | -.00891 | N/A | .257 |
| 16=10/42 | 13.225 | .04109 | -.01681 | N/A | 1.399 |
| 23=10/42 | 13.181 | .06737 | .006156 | N/A | .363 |
| 6=10/42 | 11.343 | .03752 | -.02004 | N/A | 1.344 |
| Average | 12.918 | .0171 | -.01169 | N/A | 0.800 |

MID-10.PLT -- 14/03/84-9-11[illegible] 1.1 (LCH-COMP.DAT. 2 )

GRAPH D.25

20% CEMENT, LEACHED WITH MIDDELBURG RESERVOIR WATER

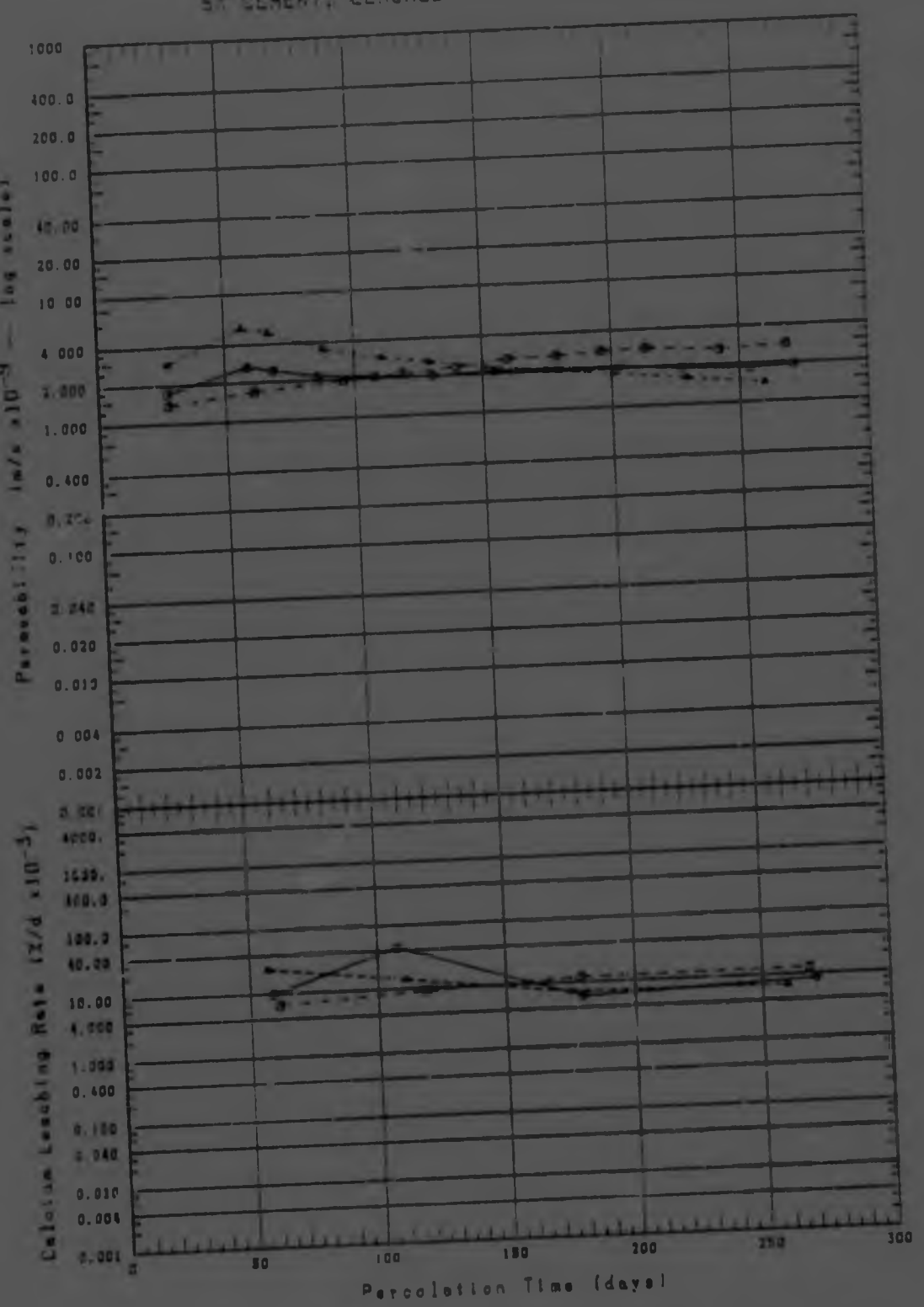



| Specimen # | Ino % | Int %/d | Ctl %/d | Pen mm | Flow l |
|---|---|---|---|---|---|
| 1=20/46 | 13.107 | .04680 | -.00658 | .05 | .539 |
| 8=20/46 | 12.887 | N/A | N/A | .05 | .914 |
| 15=20/46 | 12.867 | .04385 | -.00828 | .00 | .214 |
| 4=20/46 | 12.862 | .04275 | -.01186 | .00 | .925 |
| 11=20/46 | 12.906 | .04985 | -.00568 | .00 | .467 |
| 18=20/46 | 12.970 | .04408 | -.01070 | .00 | .634 |
| Average | 12.922 | .0465 | -.00862 | .02 | .626 |

#10-30.PLT — 21/03/86-8=1204-v 1.0 (LCH-CONF DAT, 2 )

GRAPH D.24

5% CEMENT, LEACHED WITH CARBONATED WATER

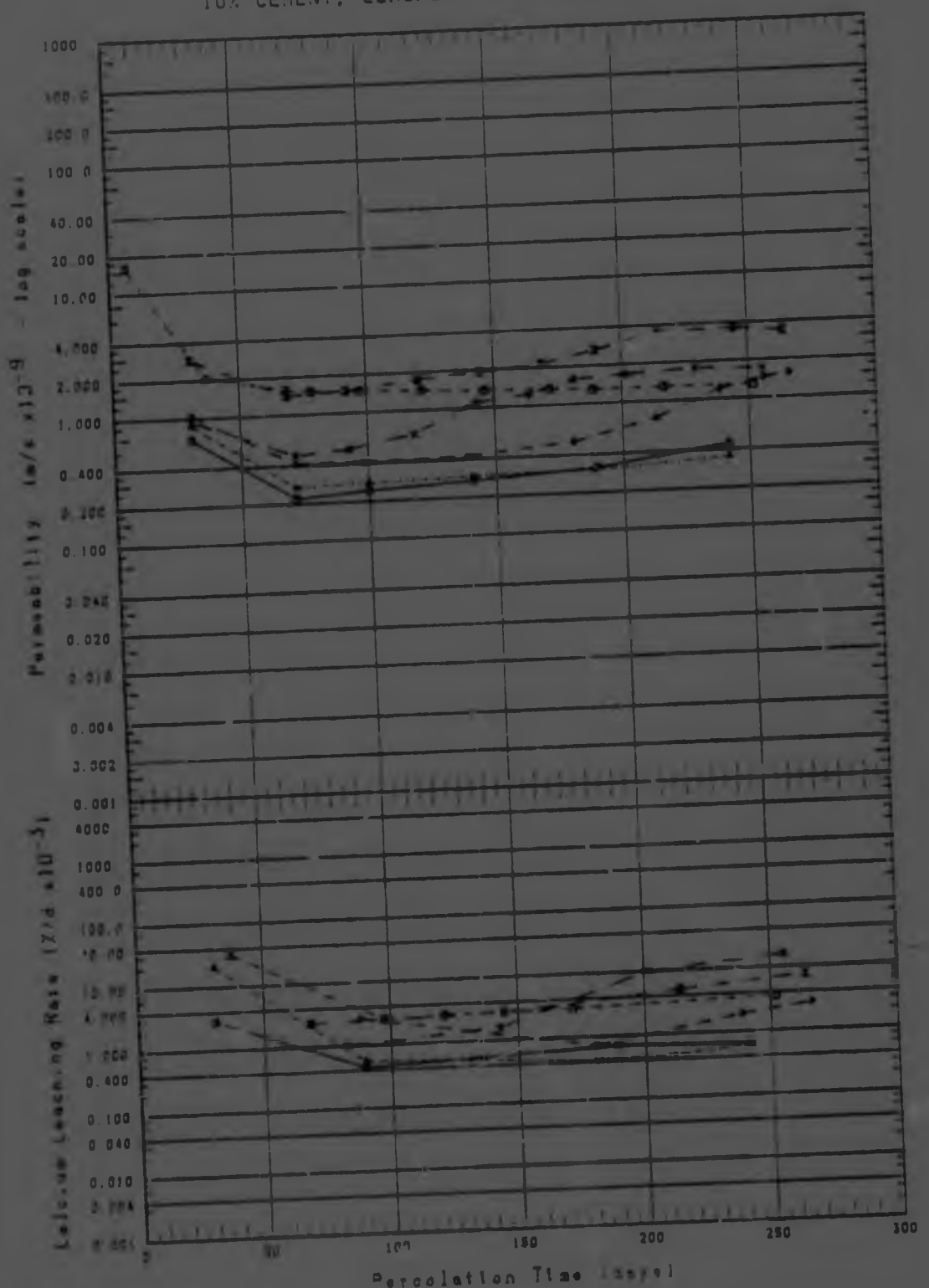



| Specimen # | Imc % | Int %/d | Ctl %/d | Pen mm | Flow l |
|---|---|---|---|---|---|
| 6=05/49 | 13.322 | -.0233 | -.06228 | 3.60 | 2.822 |
| 4=05/49 | 13.365 | -.0553 | -.09059 | 5.20 | 3.356 |
| 16=05/49 | 13.248 | -.0323 | -.07021 | 1.95 | 2.287 |
| Average | 13.312 | -.0369 | -.07408 | 3.58 | 2.755 |

C52-08.PLT — [illegible] L.C FLCH-CCMP DAT. 2 1

GRAPH D.25

10% CEMENT, LEACHED WITH CARBONATED WATER

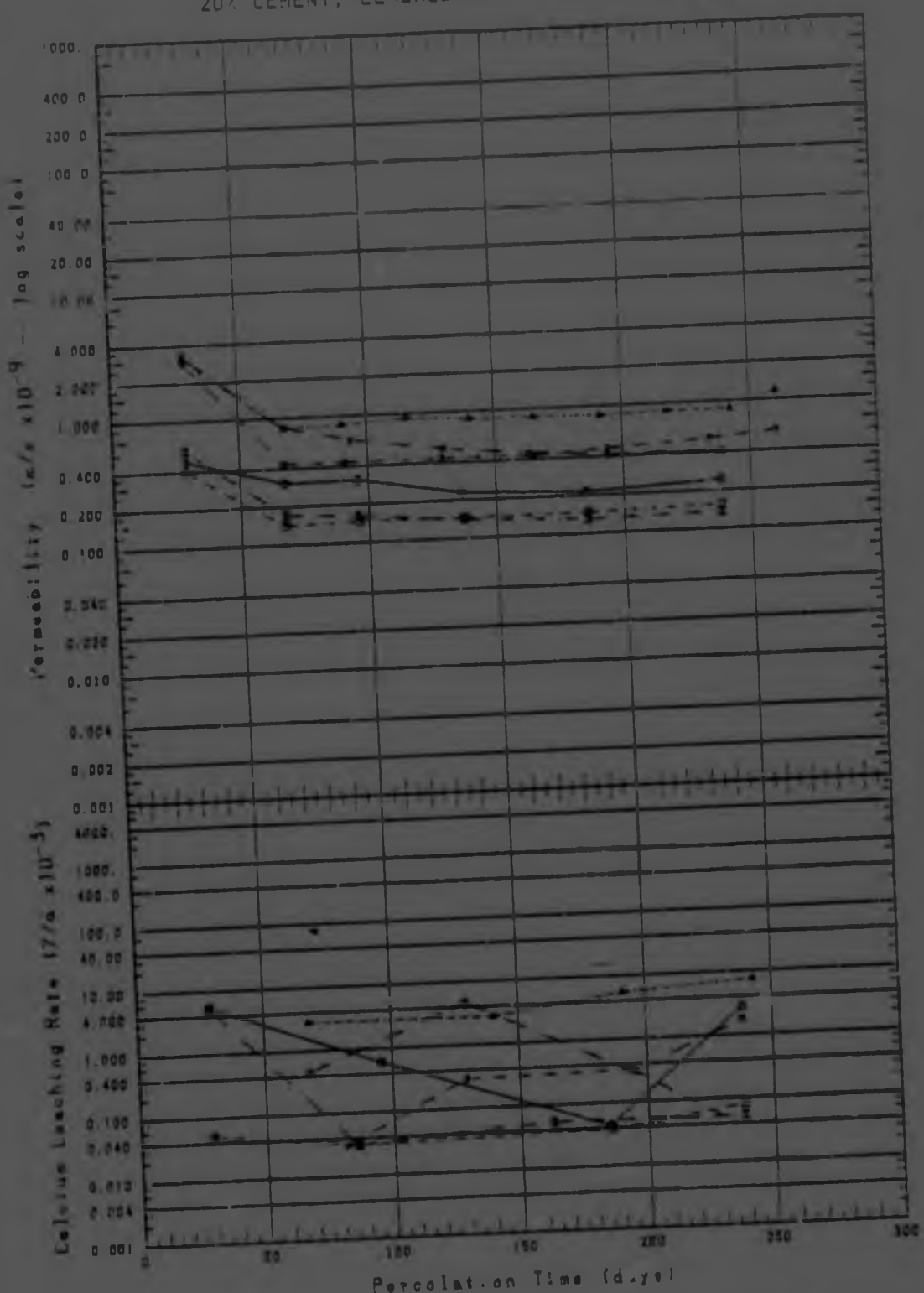



| Specimen # | Inc Z | Int Z/d | Ctl Z/d | Pen mm | Flow l |
|---|---|---|---|---|---|
| 7=10/42 | 13.229 | .04056 | -.00692 | 48 | .506 |
| 14=10/42 | 13.221 | .04346 | -.00639 | .95 | .554 |
| 21=10/42 | 13.203 | .01446 | -.03191 | 2.05 | 2.840 |
| 4=10/42 | 12.854 | .02950 | -.01867 | .20 | .949 |
| 11=10/42 | 13.009 | .00574 | -.03959 | 2.65 | 3.268 |
| 18=10/42 | 13.254 | .03466 | -.01411 | .15 | 1.486 |
| Average | 13.128 | .0281 | -.01993 | 1.08 | 1.598 |

C02-10.PLT — 21/03/94-8=1204-v 1.0 (LCH-CONF.DAT, 7 )

GRAPH D.26

20% CEMENT, LEACHED WITH CARBONATED WATER

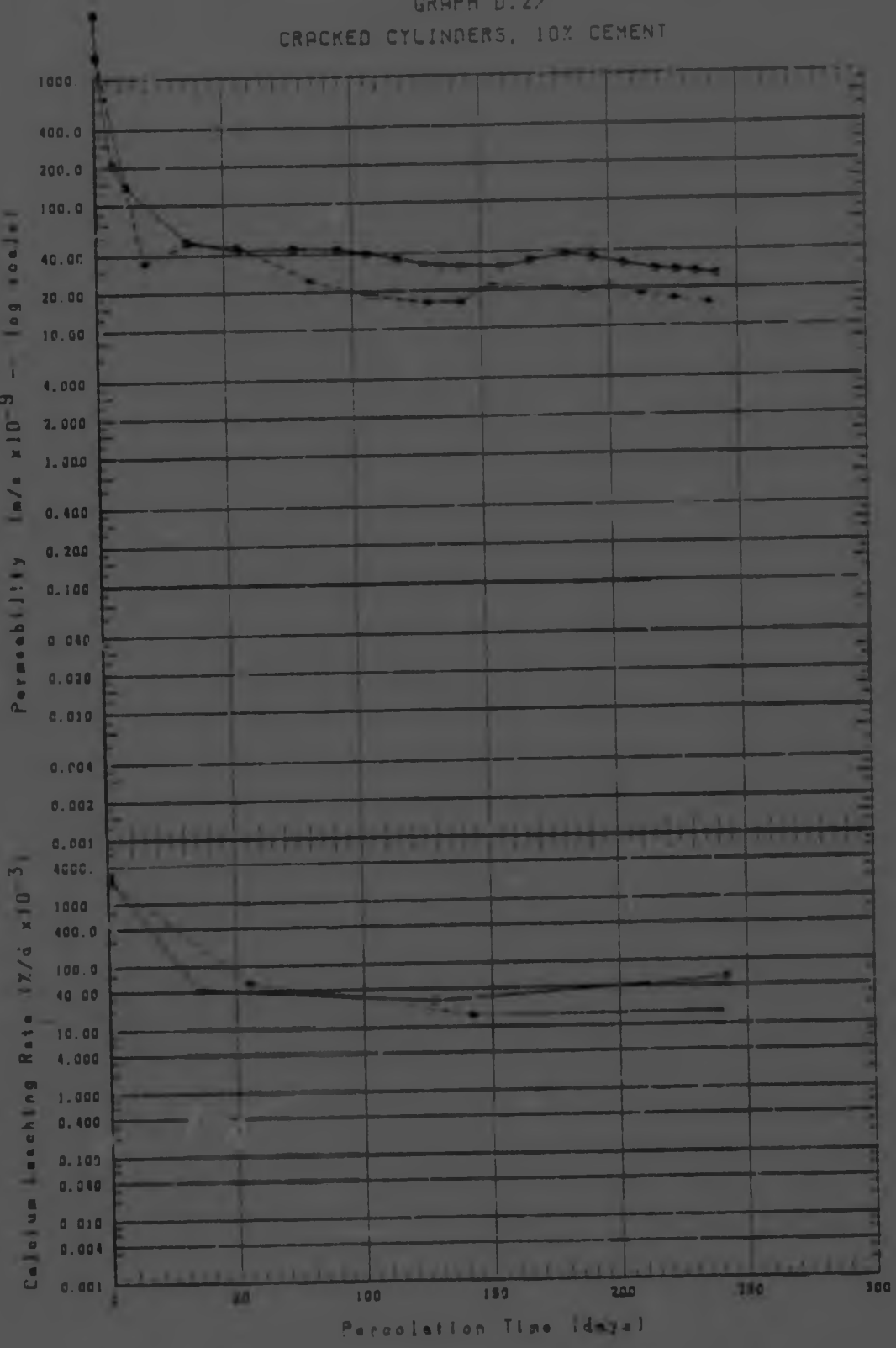



| Specimen # | Inc % | Int %/d | Ctl %/d | Pen mm | Flow l |
|---|---|---|---|---|---|
| 13=20/46 | 13.032 | .04940 | -.00589 | .00 | .378 |
| 2=20/46 | 12.879 | .02667 | -.02567 | 1.90 | 1.724 |
| 9=20/46 | 12.883 | .04901 | -.00622 | .00 | .257 |
| 18=20/46 | 12.908 | .03587 | -.01766 | .45 | 1.248 |
| 5=20/46 | 12.886 | .05056 | -.00467 | 1.90 | .302 |
| 12=20/46 | 13.027 | .03044 | -.02239 | .30 | 1.397 |
| Average | 12.936 | .0403 | -.01378 | .76 | .884 |

CD7-20.PLT -- [illegible]

GRAPH D.27

CRACKED CYLINDERS, 10% CEMENT

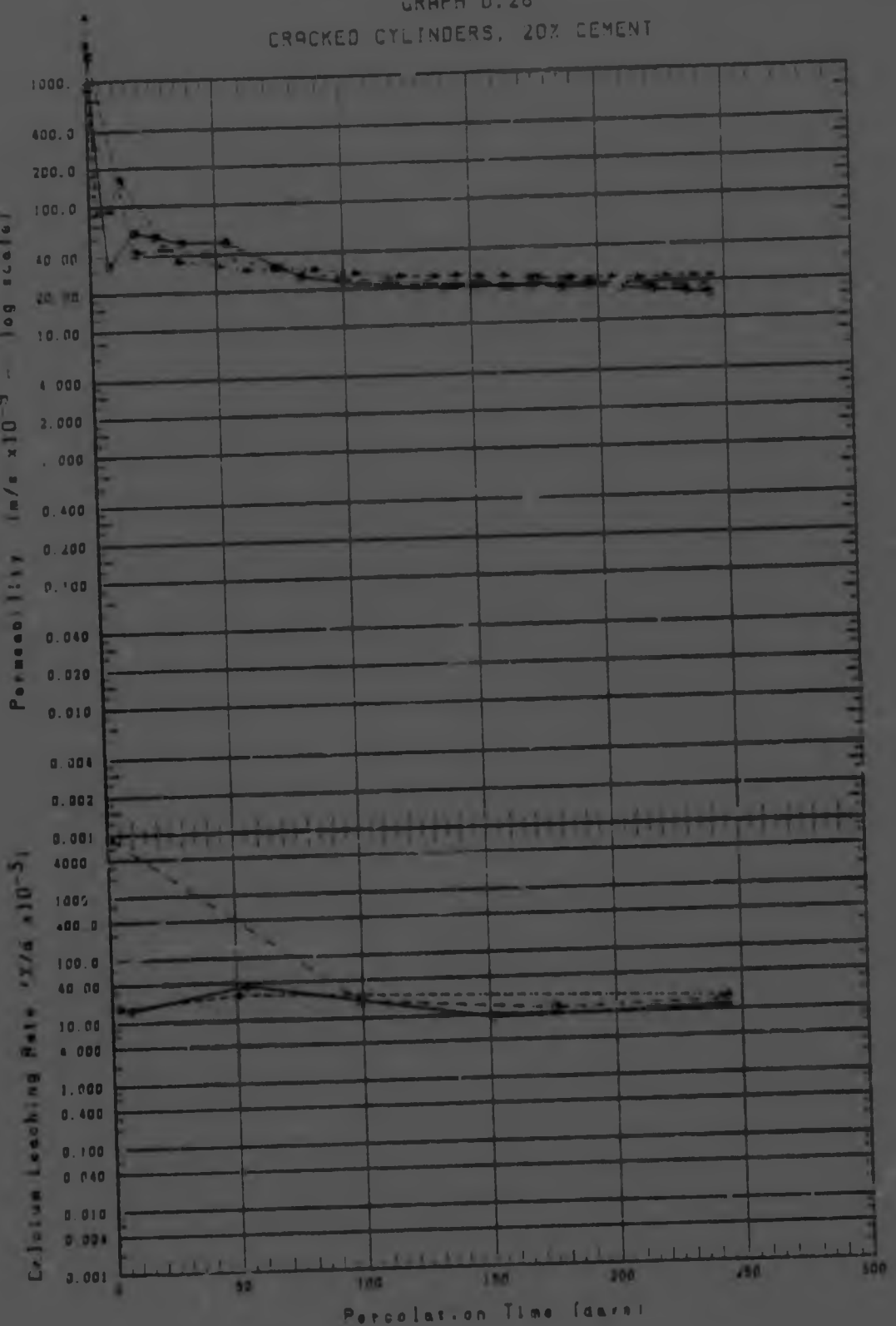



| Specimen # | Ino Z | Int Z/d | Ctl Z/d | Pen mm | Flow l |
|---|---|---|---|---|---|
| 13-10/56 | 13.325 | -.1652 | -.19720 | N/A | N/A |
| 9-10/56 | 13.289 | -.1076 | -.14310 | N/A | N/A |
| Average | 13.305 | -.1364 | -.17015 | | |

CRR-10.PLT -- 13/03/84-8-1187-v 1.7 (8:LCH-COMP.DAT, Z )

GRAPH 0.26

CRACKED CYLINDERS, 20% CEMENT

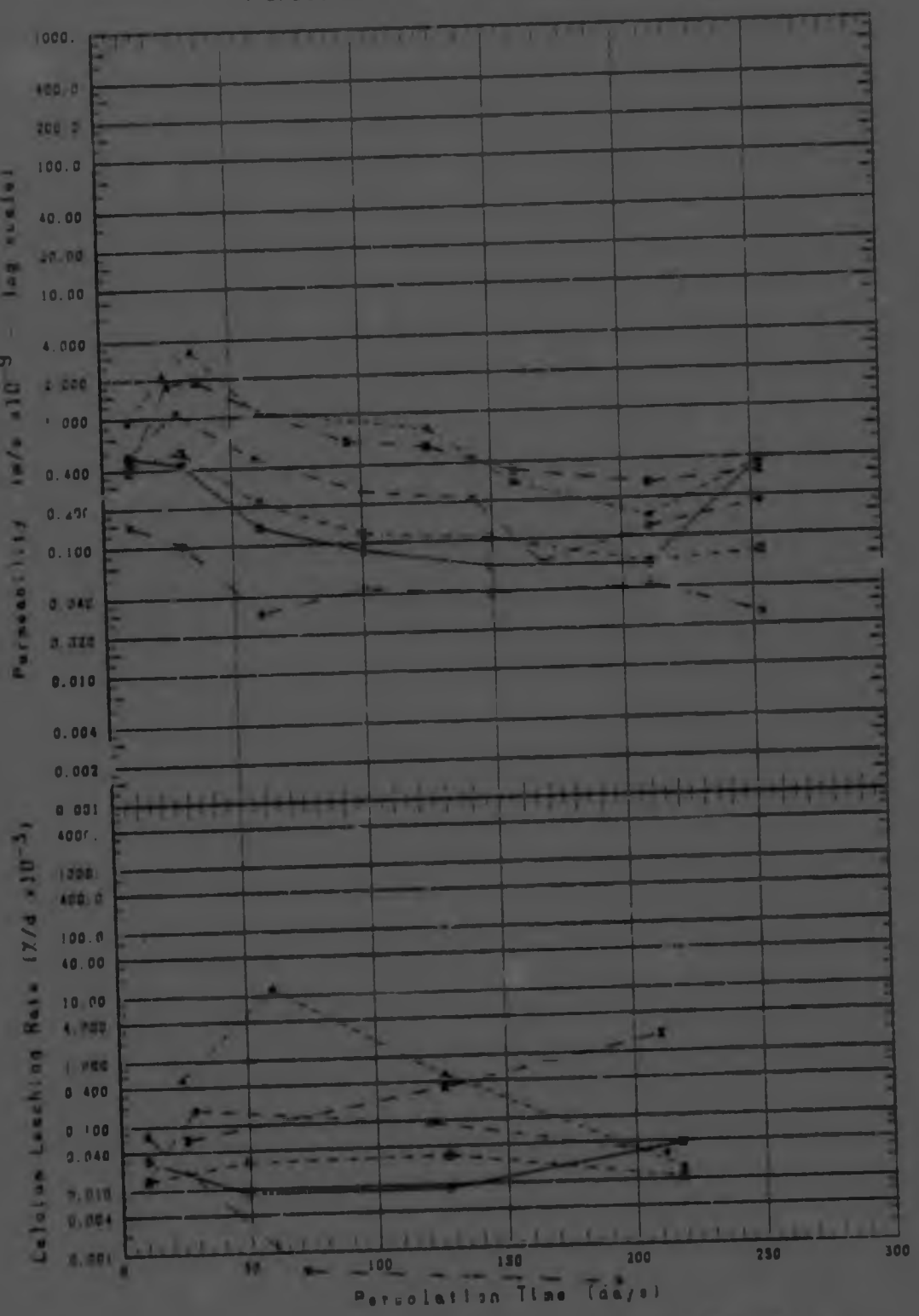



| Specimen # | Imc % | Int %/d | Ctl %/a | Pen mm | Flow l |
|---|---|---|---|---|---|
| 19=20/53 | 13.110 | -.0535 | -.09911 | N/A | N/A |
| 9=20/53 | 12.983 | -.0695 | -.11307 | N/A | N/A |
| 6=20/53 | 13.042 | -.0992 | -.13692 | N/A | N/A |
| Average | 13.045 | -.0741 | -.01170 | - | - |

CRK-20.PLT — 21/03/88-8=1204 : 1.2 (LCH-CONF.DAT. 2 )

GRAPH 29

MICROCONCRETE, 18.2% CEMENT, C/W IVD

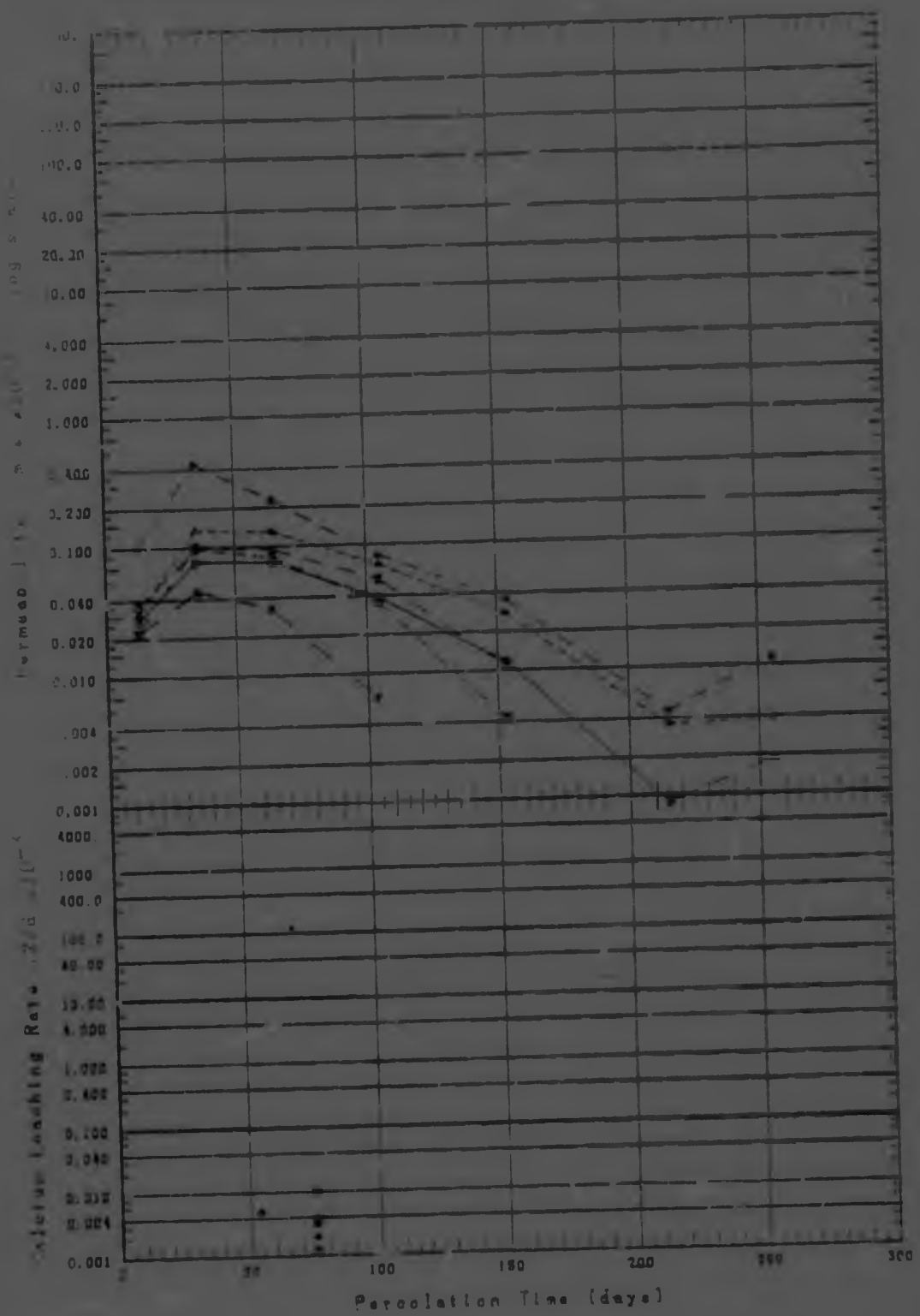



| Specimen # | Imp % | Int %/d | Ctl %/d | Perm ms | Flow l |
|---|---|---|---|---|---|
| 25=1.0/81 | 11.437 | - | - | .00 | .199 |
| 2=1.0/81 | 12.805 | - | - | 00 | N/A |
| 11=1.0/81 | 14.198 | - | - | .00 | .213 |
| 20=1.0/81 | 12.192 | - | - | .00 | .386 |
| 29=1.0/81 | 13.035 | - | - | .00 | .269 |
| 6 20/81 | 12.421 | - | - | .00 | .065 |
| Average | 12.590 | - | - | .00 | .430 |

CON-22.PLT — 21/03/84-8=1204-v 1.0 FLCH-CONF.DAT, 2

GRAPH D.30

...TCRCLCNCRETC. 22.0" CEMENT. C ... 1.2

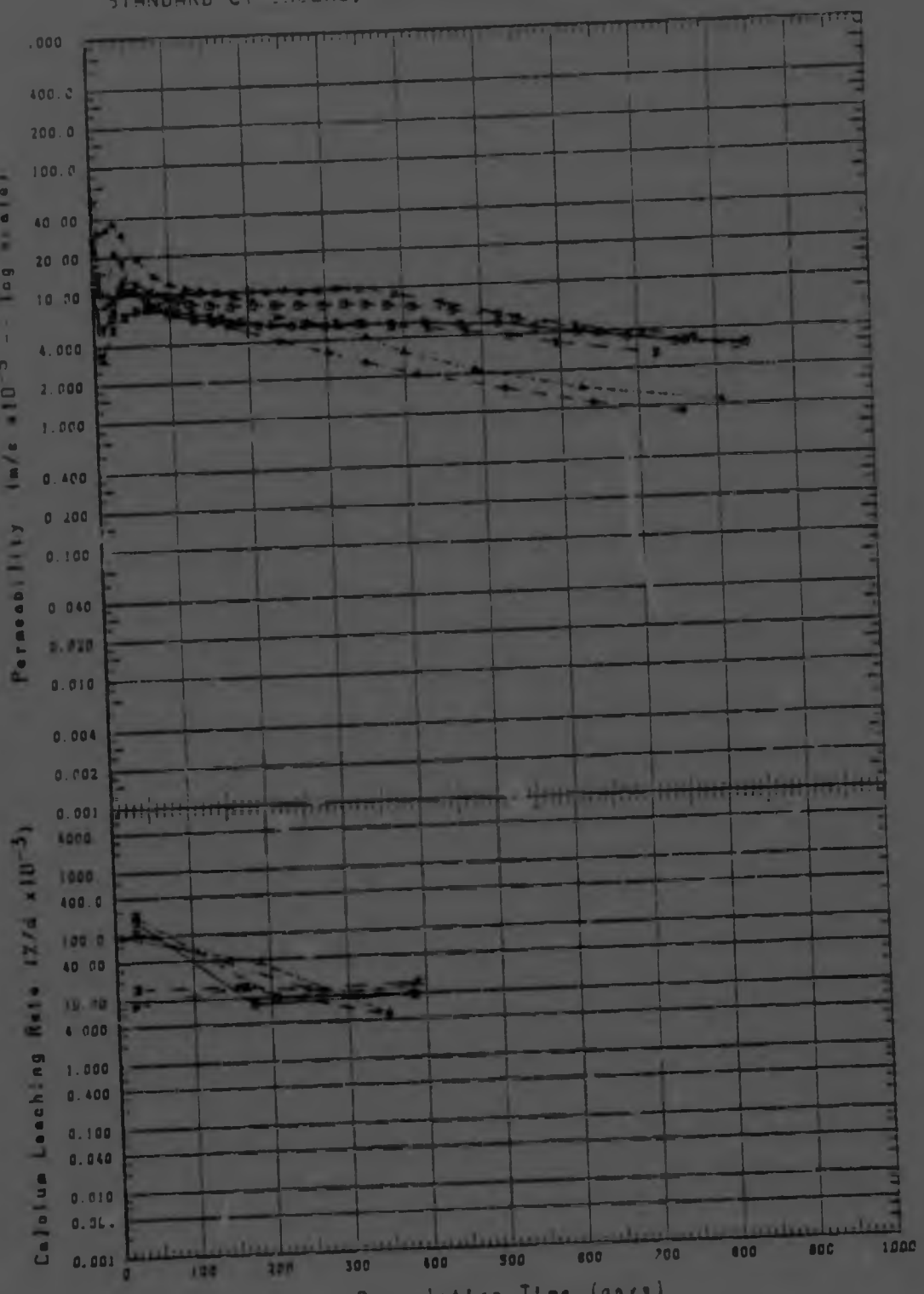



| Specimen # | In : % | Int %/d | Ctl %/d | Pen mm | Flow l |
|---|---|---|---|---|---|
| 25=1.2/77 | 11.310 | N/A | N/A | .00 | .036 |
| 2=1.2/77 | 11.433 | N/A | N/A | .00 | .064 |
| 11=1.2/77 | 11.843 | N/A | N/A | .00 | .037 |
| 20=1.2/77 | 11.533 | N/A | N/A | .00 | .126 |
| 29=1.2/77 | 11.256 | N/A | N/A | .00 | .044 |
| 6=1.2/77 | 11.448 | N/A | N/A | .00 | .015 |
| Average | 11.471 | | .. | 0.00 | 0.054 |

CBW-19 PLT -- 13/03/86-8=1184-- 1.2 TB:LCH-CONP DAT. 3 1

GRAPH D.51

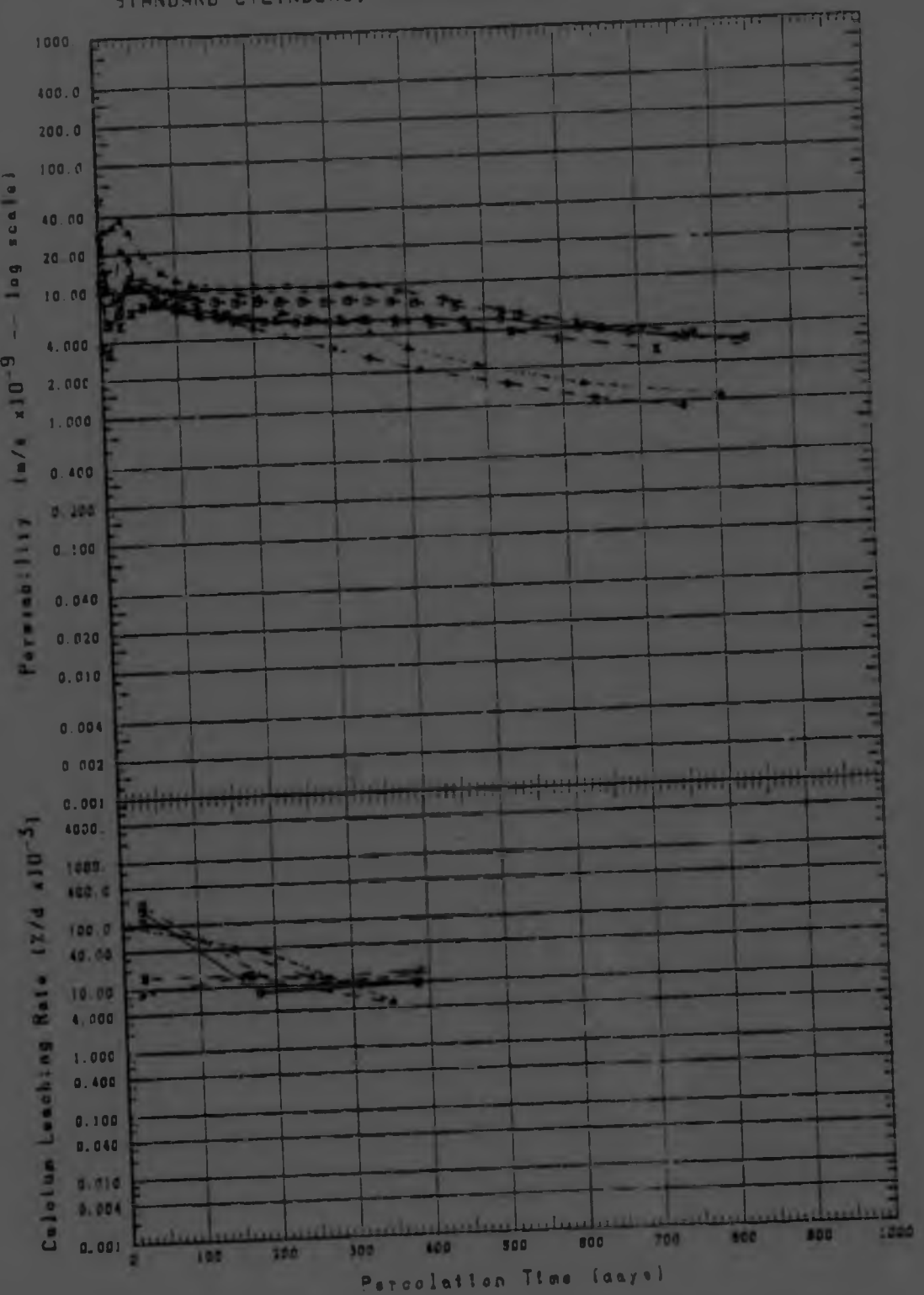
STANDARD CYLINDERS, 129 WEEK LEACH PERIOD, 10% CEMENT




| Specimen # | Inc % | Int %/d | Ctl %/d | Pen mm | Flow l |
|---|---|---|---|---|---|
| 4=10-09 | 13.208 | -.0302 | -.04143 | 5.95 | 21.013 |
| 1=10-09 | 13.739 | -.0402 | -.04971 | .0.60 | 25.305 |
| 11=10/09 | 13.396 | -.0319 | -.04307 | 4.13 | 25.342 |
| 14=10/09 | 13.277 | -.0307 | -.04299 | 5.95 | 14.165 |
| 18=10/09 | 16.294 | -.0238 | -.03704 | 5.60 | 18.086 |
| 21=10/09 | 13.404 | -.0399 | -.05120 | 6.20 | 30.096 |
| Average | 13.392 | -.0309 | -.04158 | 6.44 | 22.335 |

GRAPH D.31

STANDARD CYLINDERS, 129 WEEK LEACH PERIOD, 10% CEMENT

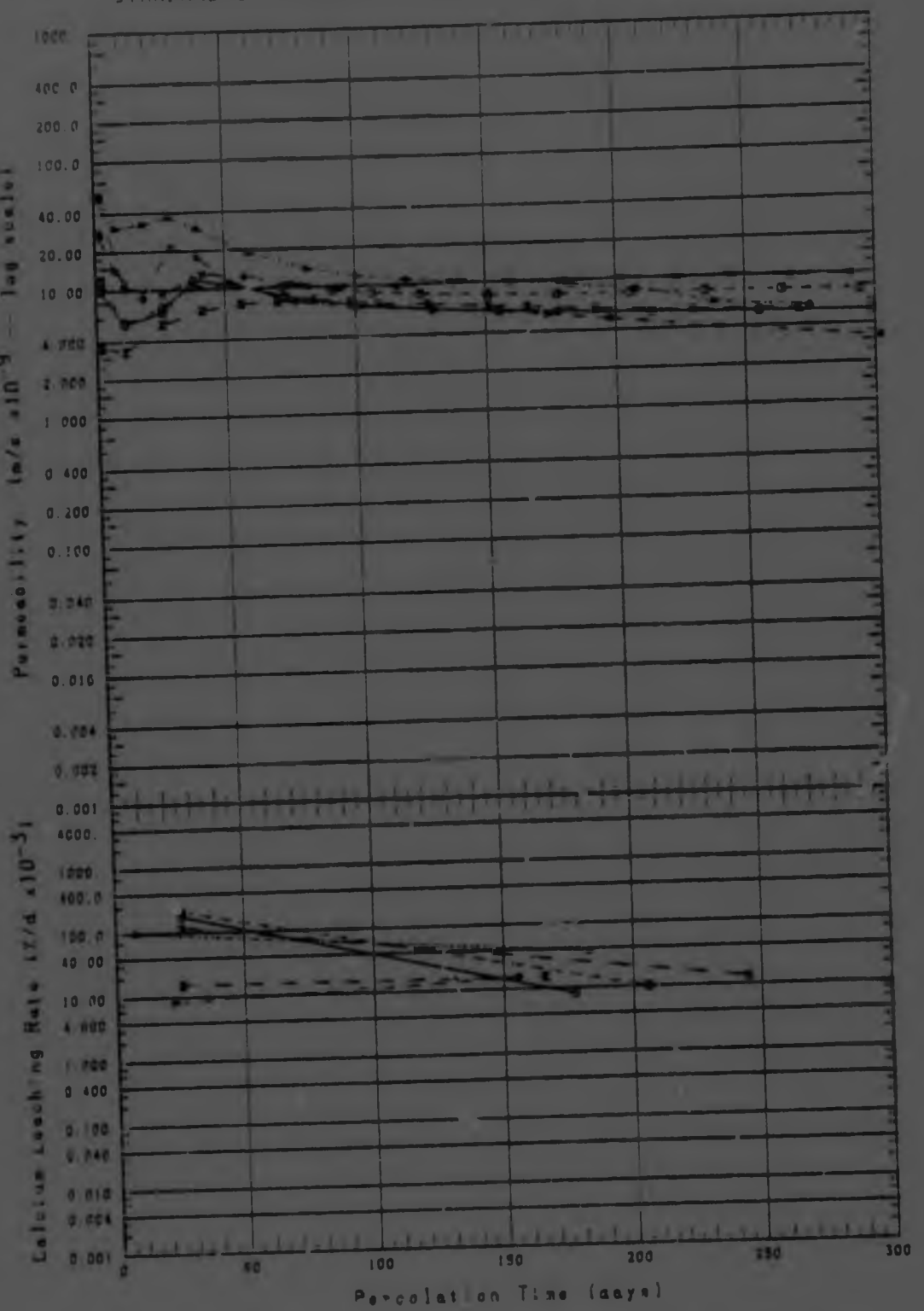



| Specimen # | Inc % | Int %/d | Ctl %/d | Pen mm | Flow l |
|---|---|---|---|---|---|
| 4=10-09 | 13.208 | -.0302 | -.04143 | 5.95 | 21.013 |
| 1=10-09 | 13.738 | -.0402 | -.04971 | 10.60 | 25.305 |
| 11=10/09 | 13.396 | -.0319 | -.04307 | 4.13 | 25.342 |
| 14=10/09 | 13.277 | -.0307 | -.04299 | 5.95 | 14.165 |
| 18=10/09 | 18.294 | -.0238 | -.03704 | 5.60 | 18.088 |
| 21=10/09 | 13.404 | -.0399 | -.05120 | 6.20 | 30.096 |
| Average | 13.392 | -.0309 | -.04158 | 6.44 | 22.335 |

UWL-10.PLT — 22/03/94-8-1204-v 1.0 (LCH-CBNF.DAT, 1

GRAPH D.31a

STANDARD CYLINDERS, 129 WEEK LEACH PERIOD, 10% CEMENT

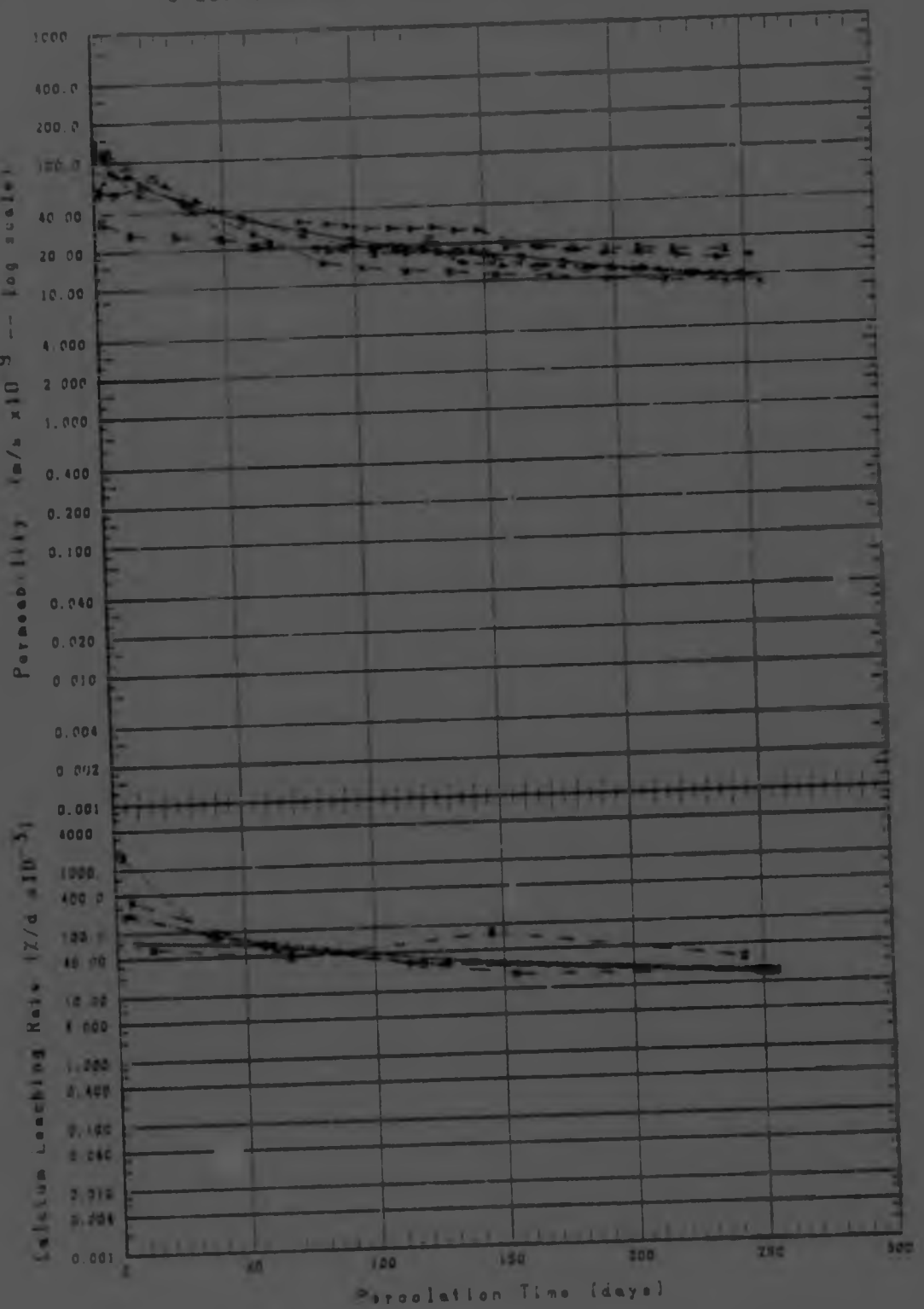



| Specimen # | Ino % | Int %/d | Ctl %/a | Pen mm | Flow l |
|---|---|---|---|---|---|
| 4=10-09 | 13.208 | -.0302 | -.04143 | 5.55 | 21.013 |
| 1=10-09 | 13.739 | -.0402 | -.04971 | 10.60 | 25.305 |
| 11=10/09 | 13.396 | -.0319 | -.04307 | 4.13 | 25.347 |
| 14=10/09 | 13.277 | -.0307 | -.04299 | 5.95 | 14.165 |
| 18=10/09 | 18.294 | -.0238 | -.03704 | 5.80 | 18.086 |
| 21=10/09 | 13.404 | -.0399 | -.05120 | 6.20 | 30.096 |
| Average | 13.392 | -.0309 | -.04158 | 6.44 | 22.335 |

UWL-10.PLT -- 22/03/84-9=1204-v 1.0 (LCH-CONF.DAT, 2 1

GRAPH D.32

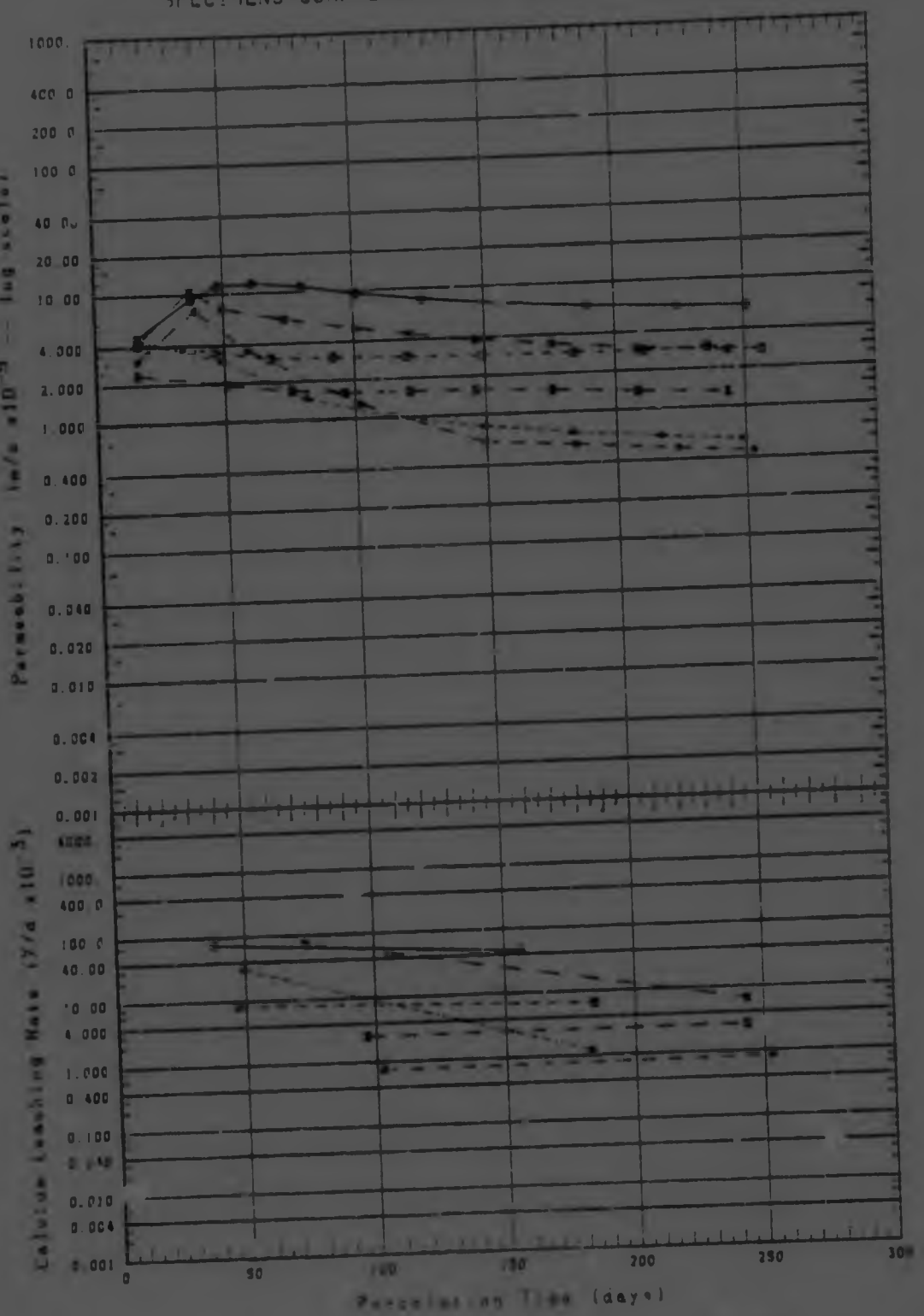
SPECIMENS COMPACTED AT 1% BELOW PROCTOR O.M.C.




| Specimen # | Ime % | Int %/d | Ctl %/d | Pen mm | Flow l |
|---|---|---|---|---|---|
| 1=10d/24 | 12.095 | -.1530 | -.18126 | 9.85 | 29.889 |
| 8=10d/28 | 12.075 | -.1818 | -.20660 | 13.20 | 32.094 |
| 15=10d/24 | 11.992 | -.1725 | -.20282 | 11.35 | 31.455 |
| 22=10d/24 | 12.070 | -.2052 | -.22720 | 12.80 | 37.504 |
| 5=10d/24 | 11.482 | -.1355 | -.16584 | 7.20 | 24.134 |
| 12=10d/24 | 11.416 | -.1447 | -.17393 | 8.55 | 25.307 |
| Average | 11.855 | -.1628 | -.18893 | 10.49 | 30.073 |

GRAPH D.33

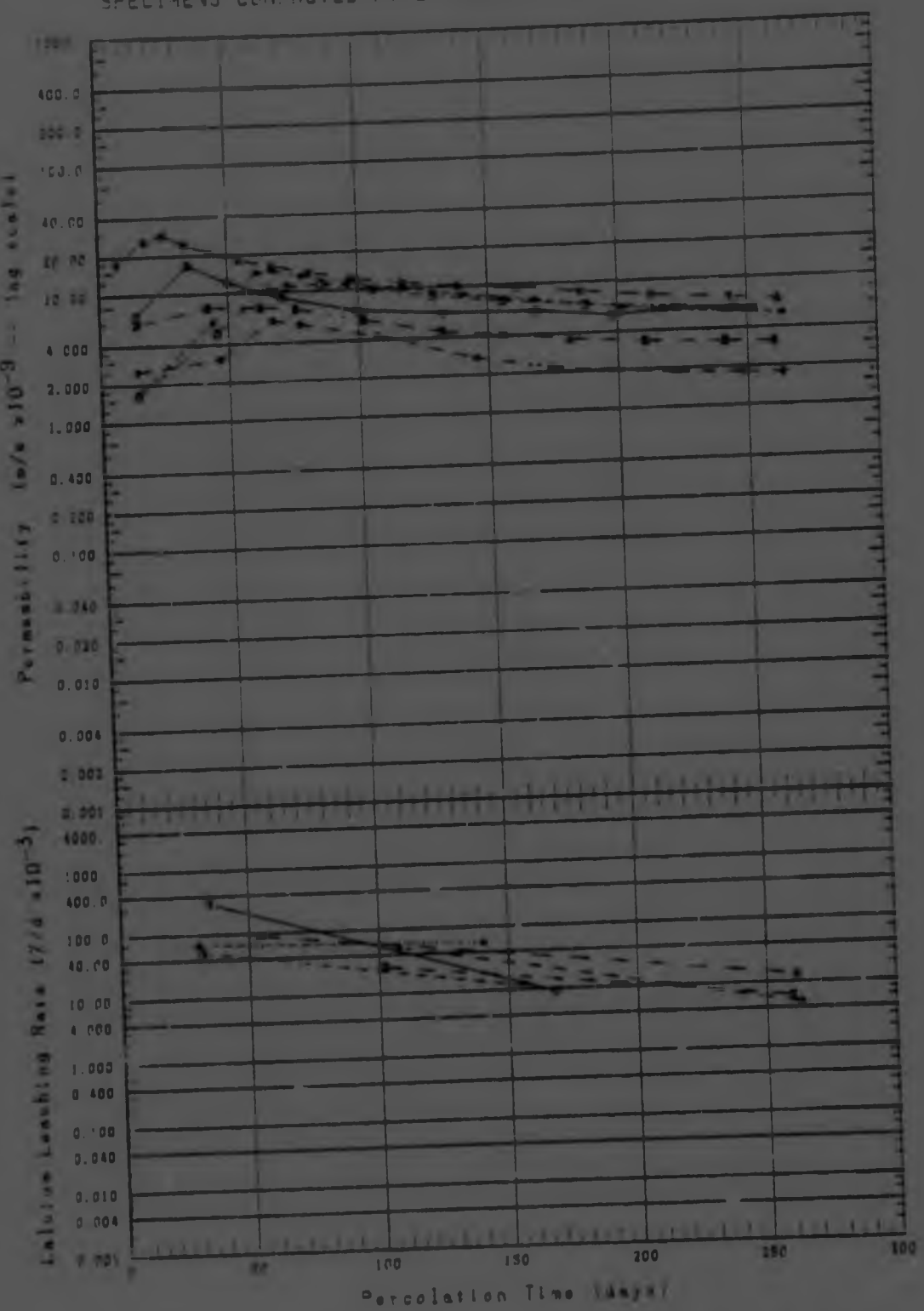
SPECIMENS COMPACTED AT 1% ABOVE PROCTOR O.M.C.




| Specimen # | Inc % | Dat %/a | Ctl %/a | Pen mm | Flow l |
|---|---|---|---|---|---|
| 1=10m/91 | 13.207 | .0565 | -.09544 | 3.65 | 9.634 |
| 8=10m/91 | 14.013 | .01324 | -.03406 | .65 | 1.964 |
| 15=10m/91 | 14.096 | -.0018 | .04726 | 3.65 | 3.902 |
| 22=10m/91 | 14.087 | .01515 | -.03237 | 2.15 | 2.105 |
| 5=10m/91 | 13.448 | .01564 | -.03194 | 2.20 | 2.076 |
| 12=10m/91 | 12.944 | -.0188 | .06229 | 3.70 | 5.590 |
| Average | 13.700 | -.0081 | -.05104 | 2.73 | 4.212 |

GRAPH D.34

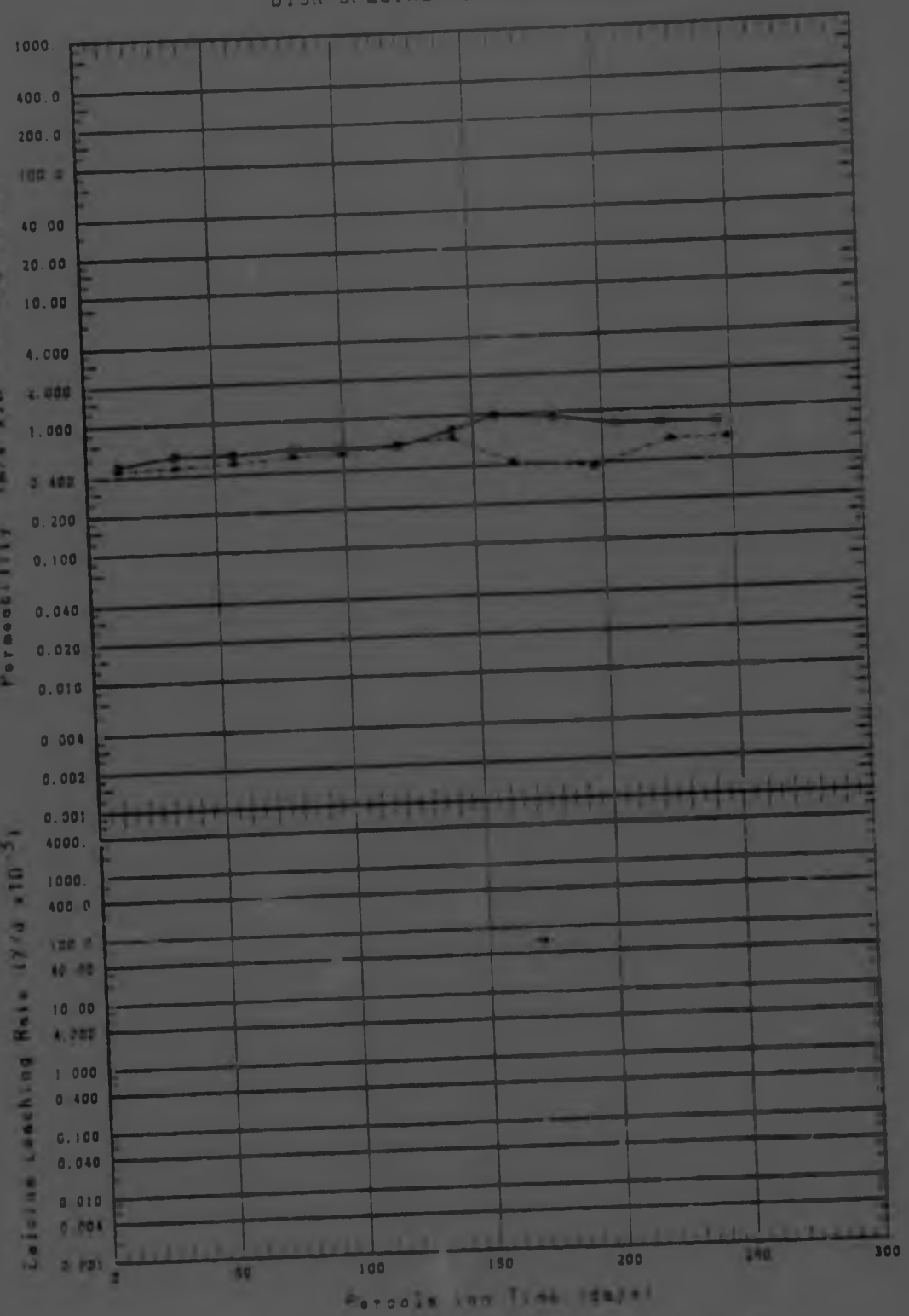
SPECIMENS COMPACTED AT 2% ABOVE PROCTOR MAXIMUM DENSITY




| Specimen # | Imc % | Int %/d | Ctl %/d | Pen mm | Flow l |
|---|---|---|---|---|---|
| 19=10h/95 | 12.953 | -.0410 | -.08138 | 5.30 | 9.294 |
| 2=10h/95 | 12.436 | -.0524 | -.09140 | 4.90 | 9.361 |
| 9=10h/95 | 12.402 | -.046 | .08622 | 4.05 | 8.591 |
| 16=10h/95 | 12.647 | .00803 | -.03918 | 3.65 | 3.681 |
| 23=10h/95 | 12.681 | -.0253 | -.06755 | 2.55 | 6.319 |
| 6=10h/95 | 12.466 | -.0881 | -.12282 | 6.30 | 15.876 |
| Average | 12.594 | -.0409 | -.08125 | 4.43 | 8.854 |

GRAPH D.35

DISK SPECIMENS, UNSTABILIZED

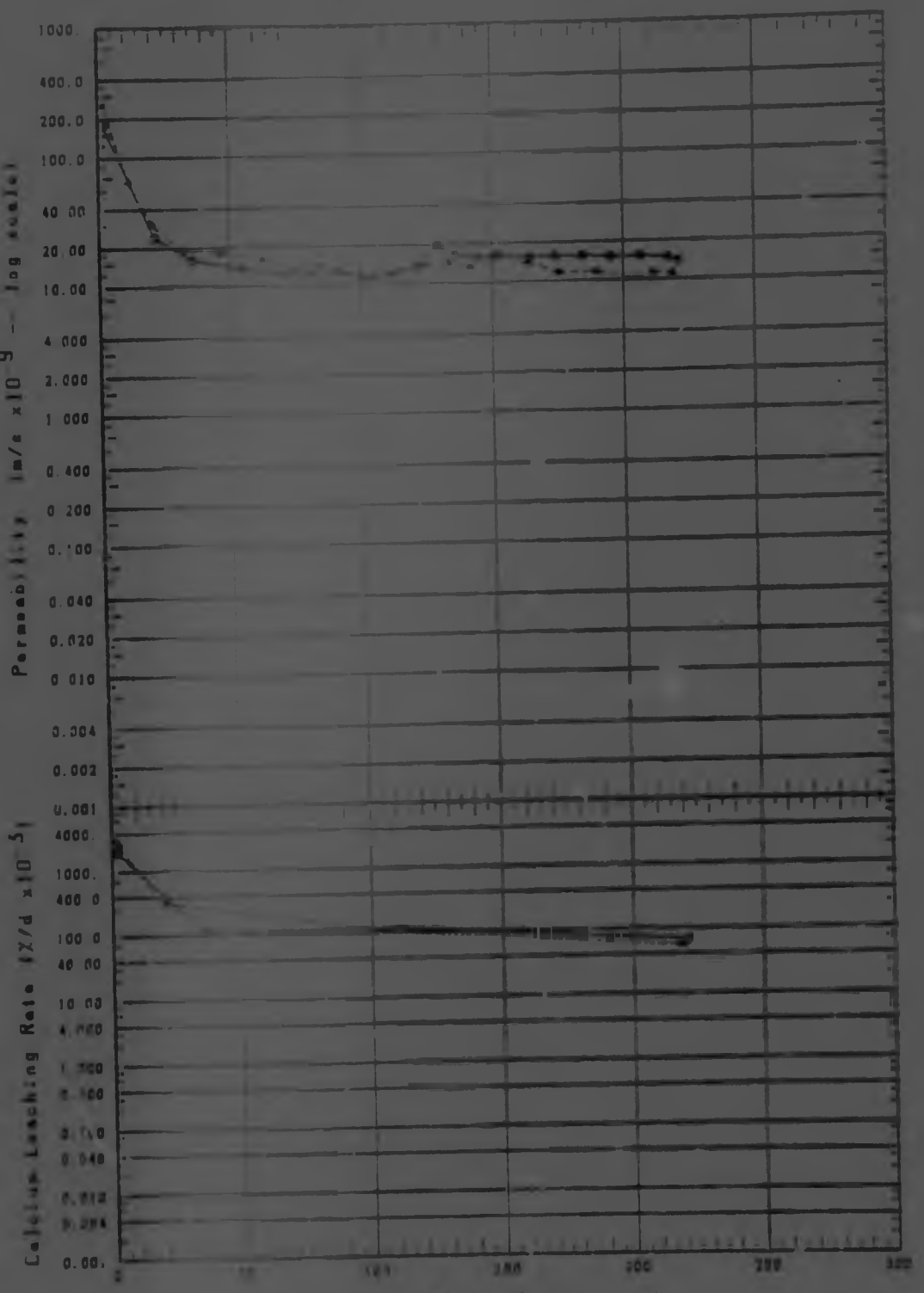



| Specimen # | Isc Z | Isc Y/A | Clc Y/A | Pen mm | Flow l |
|---|---|---|---|---|---|
| 1-00/780 | 13.278 | | | N/A | 3.111 |
| 4-00/780 | 13.169 | | | N/A | 2.264 |
| Average | 13.223 | | | | 2.688 |

PLT -- 22/03/84-8-1205-v 1.1 LC1-CONF ORT. 2 1

GRAPH D.36

D SK SPECIMENS, 5% CEMENT

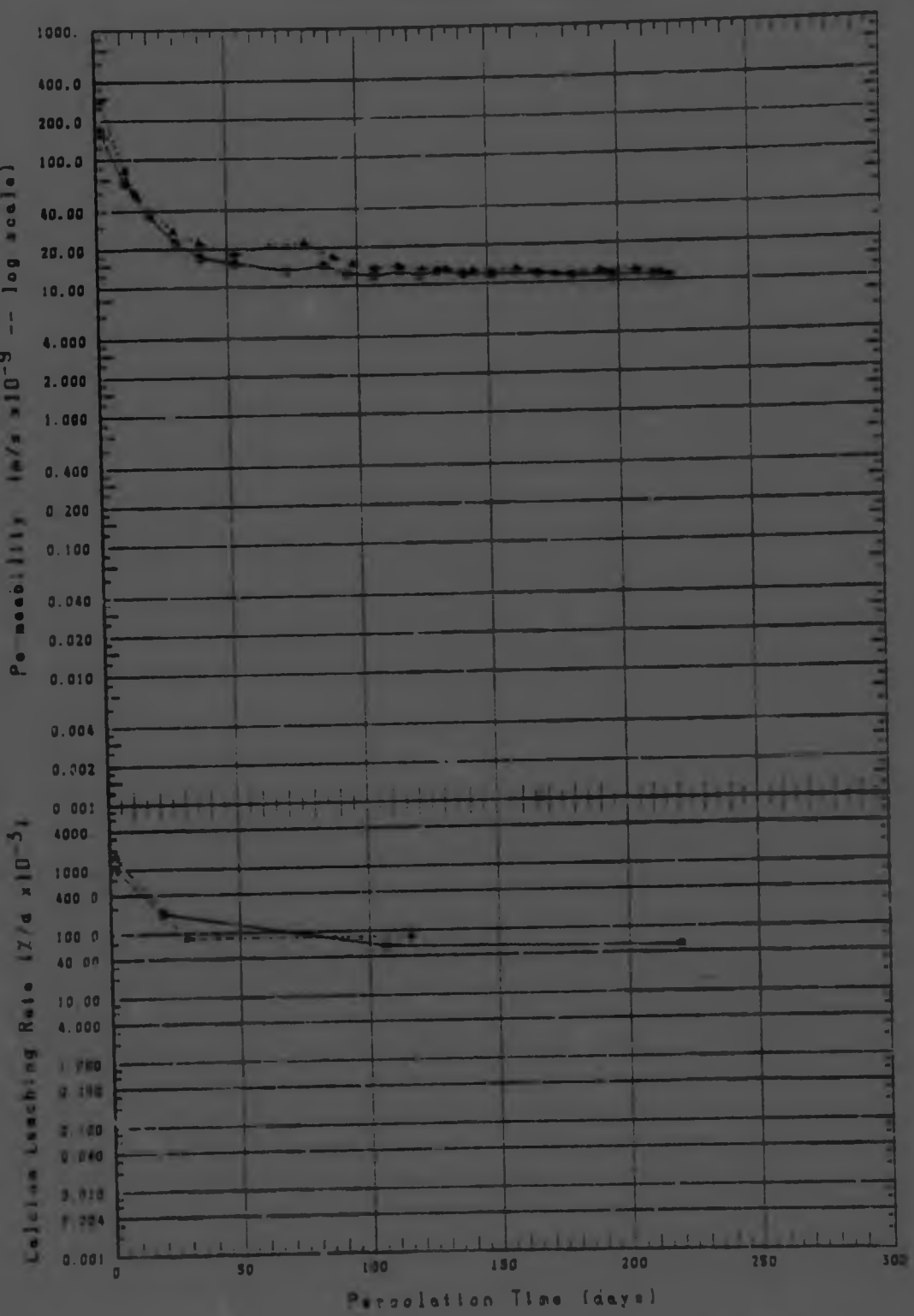



| Specimen # | Inc % | Int %/√d | Ctl %/d | Pen mm | Flow ↓ |
|---|---|---|---|---|---|
| 3=C5/28D | 13.548 | -.5049 | -.49868 | N/A | N/A |
| 4=C5/28D | 12.980 | -.4541 | -.45339 | N/A | N/A |
| Average | 13.263 | -.4795 | -.47445 | | |

D5X-05.PLT — 22/03/84 9=1204-v1.0 (LCH-CONF JAN. 2 1

GRAPH D.37

DISK SPECIMENS, 10% CEMENT

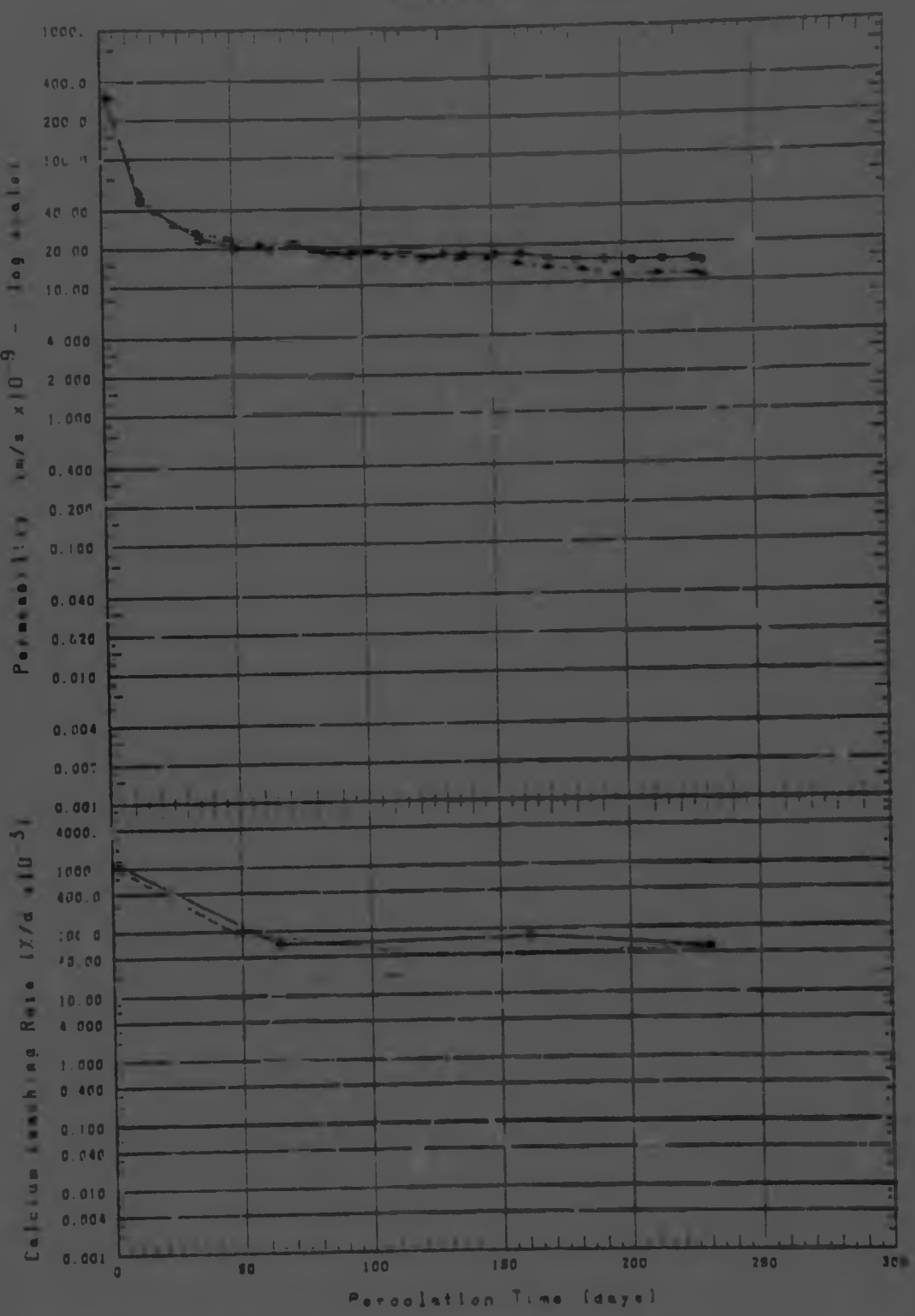



| Specimen # | I c % | Int %/d | Ctl %/d | Pen mm | Flow l |
|---|---|---|---|---|---|
| 1=10/28D | 13.077 | -.3226 | -.33728 | N/A | N/A |
| 5=10/28D | 13.178 | N/A | N/A | N/A | N/A |
| Average | 13.127 | -.3226 | -.33817 | - | - |

DSK-10.PLT -- 22/33/8x-8=1208-v 1.0 (LCH-CBNF DAT. 7 1

GRAPH D.58

DISK SPECIMENS 15% CEMENT

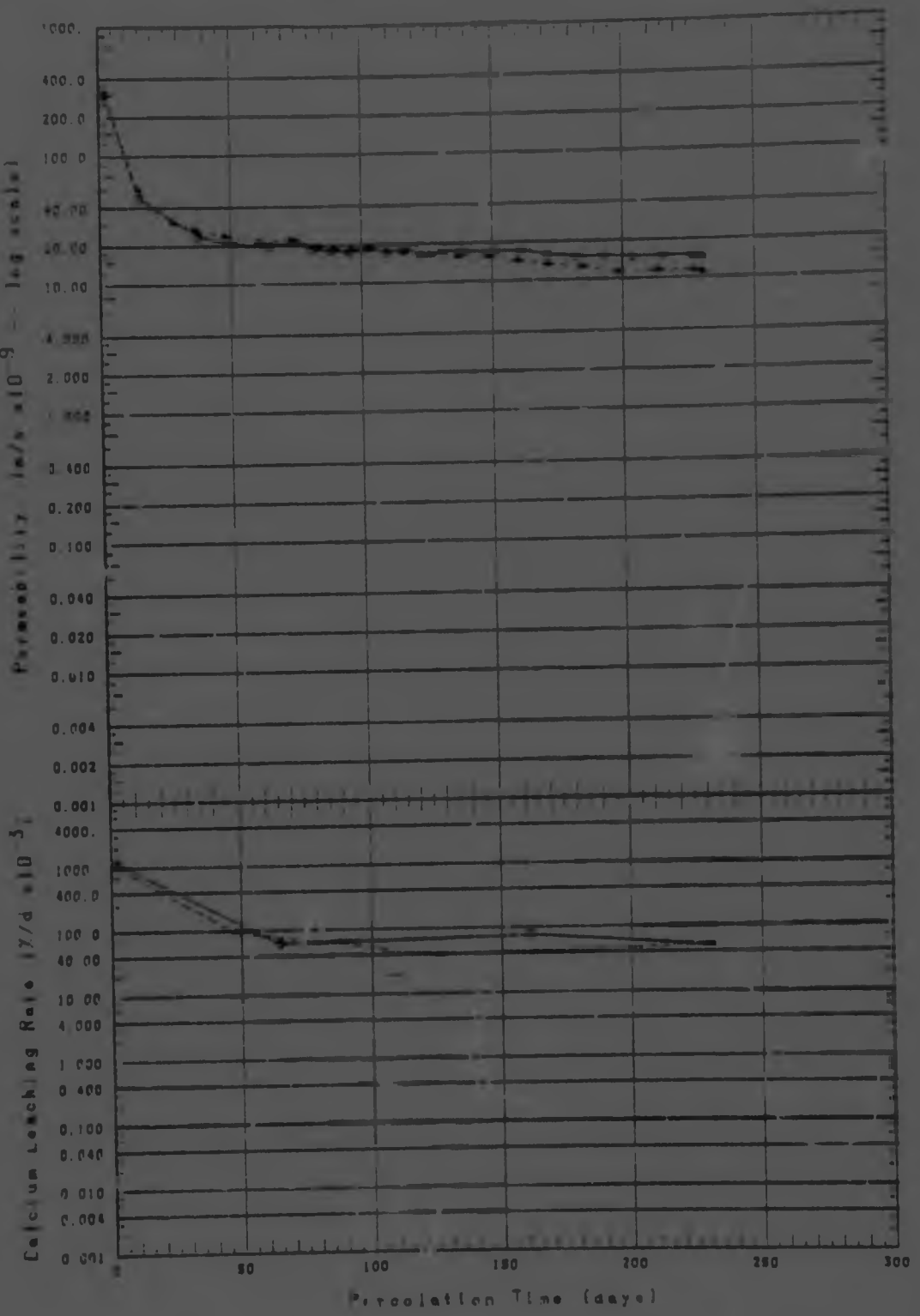



| Specimen # | Inc % | Tot %/d | Ctl % d | Pen mm | Flow l |
|---|---|---|---|---|---|
| 3=15/920 | 12.981 | -.3284 | -.34791 | 7.15 | N/A |
| 12=15/920 | 13.276 | -.2585 | -.28027 | 8.80 | N/A |
| Average | 13.129 | -.2750 | -.29455 | 7.98 | |

DSK 15 PLT - 14/03/84-9=1130-v 1.1 [illegible]

GRAPH D.58

DISK SPECIMENS 15% CEMENT




| Specimen # | Ime % | Int %/d | Ctl %/d | Pen mm | Flow l |
|---|---|---|---|---|---|
| 3=15/920 | 12.981 | -.3284 | -.34791 | [illegible]15 | N/A |
| 12=13/920 | 13.276 | -.2585 | -.28027 | 8.80 | N/A |
| Average | 13.129 | -.2750 | -.29455 | [illegible]80 | |

DSK S PLT - 14/03/84-9=1138-v 1.1 (LCH-CONF.CHT. 2

**Author** Robertson J A
**Name of thesis** The use of stabilized soil as a material in dam construction 1984

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**Name of thesis** The use of stabilized soil as a material in dam construction 1984

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