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A NEW APPROACH IN RESEARCH INTO DRAINAGE MATERIALS

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C O N T E N T S

ABSTRACT

A research project started recently at the Institute for Land and Water Management Research is described. The aim is to define criteria for the manufacturing of synthetic drainage envelope materials. Laboratory apparatus is developed for testing existing envelope materials under conditions constrained to narrow limits to ensure reproducibility. As a first step, the occurrence of chemical phenomena has been excluded from the research. Particle size and shape are introduced as design parameters. In due course, mathematical modeling of the filtering process in drainage envelope materials is planned. Testing started only recently so no experimental data is yet available.

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1. INTRODUCTION

In the past decades in many countries installation of agricultural drainage systems has evolved into an almost completely mechanized operation. Introduction of corrugated tubing had a major influence on the development of sophisticated installation machines and has prompted the use of cheaper and labour-saving drainage envelope materials. Apart from technical improvements in applying granular envelope materials and introduction of pre-wrapped organic envelopes, there is a rapid development in synthetic ones.

Progress in technology has been remarkable and drainage engineers obviously could not keep pace with enhanced research requirements: introduction of new techniques and materials was followed by laboratory- and field research, instead of the reverse.

In fine sandy soils and light clay soils, drainage systems often demonstrate poor operation only shortly after installation. If envelopes are used, system failure is generally caused by clogging of these. The character of clogging is complicated and is ascribed to mechanical and/or chemical processes. This problem is world-wide and no satisfactory solution for it has yet been found, although considerable research effort aimed at increasing the knowledge of properties of envelope materials has been paid during the past decades. Most of these experiments were of a mere qualitative character and a more fundamental approach of the problem is severely lacking. For the development of better envelope materials - which is urgently needed as most of the materials of natural origin (peat, flax, cocos etc.) become too expensive or their sources become exhausted - research must be focused on quantifying parameters which are decisive for the envelope's performance.

In 1976, I.L.R.I.* and I.C.W.** started a joint effort to develop design criteria for envelope materials for different soil types.

* I.L.R.I. = International Institute for Land Reclamation and Improvement
**I.C.W. = Institute for Land and Water Management Research

Although research did not allow significant conclusions to be drawn, the provisional results were encouraging enough to start a new study. Recognising the need for specifications on commercially available envelope materials, the Dutch foundation 'KOMO' (Foundation for examination, Research and Assessment of Materials and Constructions) commisioned this study. This paper summarizes research into drainage envelope materials in The Netherlands up to now and the approach to be followed in the new study which started in 1980.

2. DEVELOPMENTS IN ENVELOPE MATERIALS

Until the late fifties, drainage systems were installed mainly manually in Holland. Commonly used envelopes were fibrous peat litter, heather combined with straw, straw alone and flax remnants. Inorganic materials like gravel, lavalite and shells were also used occasionally. In the beginning of the sixties rigid smooth PVC-pipes were introduced together with synthetic envelopes like glass wool, rockwool, styropor and fiberglass sheets. After the introduction of corrugated PVC-pipes, bands of strip-type envelope material were installed underneath and/ or on top of the pipes during installation of the system. These bands or mats were either produced from pure organic material, or from a mixture of organic and synthetic fibres, held together by a network of binding thread. Current systems using pre-wrapped corrugated tubing were introduced in the beginning of the seventies. Available wrappings of organic origin are coconut fibre, fibrous peat, cereal straw and flax. Because the durability of some organic materials is questionable, synthetic materials were offered regularly and advocated for practical use. Due to bad experience with some types of synthetic envelopes in the past hesitation to apply these materials in drainage practise has persisted for a long time. However, price increases of organic materials and problems encountered in the durability prompted the search for synthetic alternatives. Synthetic materials currently available are polypropylene, polystyrene grains, acrylic fibre mats, fiberglass sheets, typar, bidim and nylon 'socks'. In Holland, nowadays almost exclusively factory prewrapped pipes are installed. Envelope materials used are coconut fibres (50%), peat-coconut fibre mixtures (25%) and synthetic materials (5%). No envelope is used in 20% of all cases (NAARDING, 1980).

3. FUNCTIONAL REQUIREMENTS OF ENVELOPE MATERIALS

Two functional requirements of a drain envelope are required:

- 1) Selective filter function. The envelope must prevent the entry of soil particles that can silt up the tube or block its perforations. When soil particles sedimentate in the envelope its permeability will decrease drastically within a short period. Therefore, particles that remain suspended even under low flow conditions may enter the drain as they will generally be washed out again. Hence the envelope must filter out soil particles up to a certain size but let pass smaller ones so that it does not block itself due to the filtering action.
- 2) Hydraulic function. An envelope must create and maintain a relatively high permeable zone around the drain, thus improving the water entry conditions. Whereas fine-structured materials are preferred for the filter function, voluminous coarse-structured materials are preferred for the hydraulic function. Obviously, the requirements are contradictory in their demands on the composition of the envelope.

  The flow of water converges towards the drain whereby the hydraulic gradient rises sharply in its vicinity. The risk of internal erosion is reduced decreasing the hydraulic gradient and consequently high flow velocities by installing a high permeable zone around the drain. Permeability will be adversely affected by blocking and clogging of the envelope. Internal erosion of the soil layer abutting the drain envelope may result in the building up of a natural filter in this layer. Phenomena like these are not yet well quantified and research must be conducted to study the inter-action between envelope and soil material and its effects on envelope permeability as a function of time. It is expected that the inter-action depends on

soil parameters such as texture, structure, particle size (distribution), particle shape, on installation conditions and on the chemical composition of the drainage water (precipitation of complex iron 'ochre', manganese, or magnesium compounds).
It goes without saying that envelopes have to fulfill certain requirements with respect to e.g. tensile strength, tear and puncture resistance, abrasion resistance, chemical and micro-biological resistance and swelling properties.

4. THE NEED FOR ENVELOPES

Studies on envelope materials have been reported from many institutes and institutions. In The Netherlands e.g. by CAVELAARS (1965), BOUMANS (1963), FEDDES (1963), ESKES (1977), DE JONG (1978), SCHOLTEN (1979), KNOPS (1979), MEIJER (1969, 1972, 1973, 1974, 1977), NIEUWENHUIS (1976), SEIJGER (1978), BOERS (1979) and KNOPS et al. (1979). Abroad, work has been reported by VAN DER BEKEN (1968), BRUNS (1977), DIERICKX (1977, 1980a, 1980b), IRWIN (1979), PAUTE (1977), WILLARDSON (1977, 1979), SCHAAL (1980), EGGELSMANN (1980), BENZ (1976), BROUGHTON (1976), KUNTZE (1969).

The aim of all studies was developing specifications for envelope materials, based on their behaviour under field- or laboratory conditions, or based on theories of flow of water towards drains. Materials and methods as well as the theoretical approach differed widely however. Although an insight was gained regarding the general applicability of existing materials no criteria could yet be established for determining when an envelope is required, despite all efforts. The drainage engineer generally bases his decision regarding the use of envelopes on local experience. In some rare occasions this experience can be supported by results of some short term laboratory experiments with envelope material or results from simple field experiments of short duration. Rough guidelines on the need for, and applicability of envelopes currently available have been compiled (KNOPS et al., 1979). These guidelines, however, are only valid for the regional conditions for which they were compiled and are largely based on laboratory experiments. Field conditions cannot be adequatly simulated in a laboratory test. On the other hand, field experiments are laborious, expensive, time consuming and will not yield generally applicable results. Countries like Denmark and Sweden rely largely on field experiments while others like Belgium, France, West Germany and The Netherlands gain their information mainly from laboratory experiments.

5. RESEARCH METHODS FOR TESTING ENVELOPE MATERIALS

In the past two decades, rapid developments have taken place in drainage envelopes. Manufacturers have hardly any knowledge of the properties required and are merely interested in increasing their turnover. The continuous supply of new envelope materials places a heavy burden on research institutions as they have to judge the applicability of the new products. Promising materials can be subjected to laboratory tests, mostly in sand tanks, whereby the groundwater flow in the vicinity of the drain is simulated as closely as possible. This type of research does not render consistent and reproducible results, unless far-reaching precautions are taken. The information is generally not adequate to predict with complete confidence the envelope's performance under field conditions. However, it is recognized that laboratory testing of envelopes is the only feasible type of research available. Materials that proved to be promising in a laboratory test must be subjected to additional field testing to get an indication of their actual applicability in the field.

To simulate groundwater flow conditions in the vicinity of the drain, numerous types of sand-tank models have been developed. Three types used in The Netherlands are described briefly:

- 1) A vertical, cylindrical model with radial flow
- 2) A horizontal model
- 3) A vertical, cylindrical model with one-dimensional flow.

1) Vertical cylindrical models with radial flow

In fig. 1, a tank model used for over 13 years at I.C.W. is shown schematically. This sand tank model is an example of an attempt to combine the acquisition of reliable, reproducible results with easy handling and rapid conduction of routine measurements. The soil samples

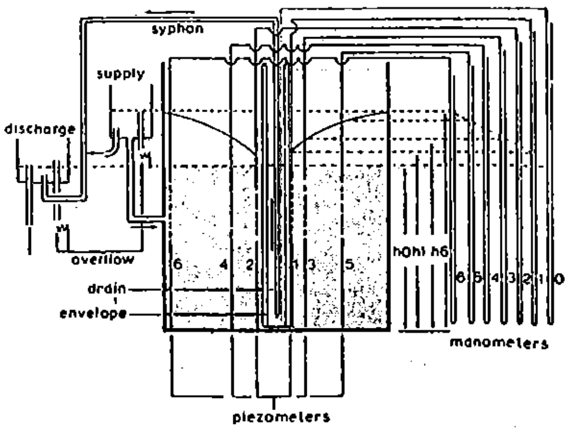


Fig. 1. Laboratory model for investigating envelope materials used by I.C.W.

used are moderately fine sánds with over 80% of the particles in the range from 100 to 300 μm and a permeability of 8 - 10 m/day. A prewrapped pipe is mounted in the centre of the cylinder. The water flows from the outer boundary radially towards the drain and is discharged from the drain by a syphon. Discharge is calculated using the Thiem-Dupuit formula for flow towards a well. Combining discharge data with piezometric head measurements, the permeability of the soil sample is calculated. The entrance resistance of drain plus envelope is derived from the water level inside the drain, the piezometric level just outside the envelope and the flow per unit length of the pipe. Some results of measurements conducted with this model are presented in fig. 2 where entrance resistances are plotted against envelope thickness. The major disadvantage of this model is that the compression of an envelope due to the overburden of the soil (0.2 - 0.3 kg/cm^2) is not simulated. The soil loading influences the porosity-distribution of the envelope decisively.

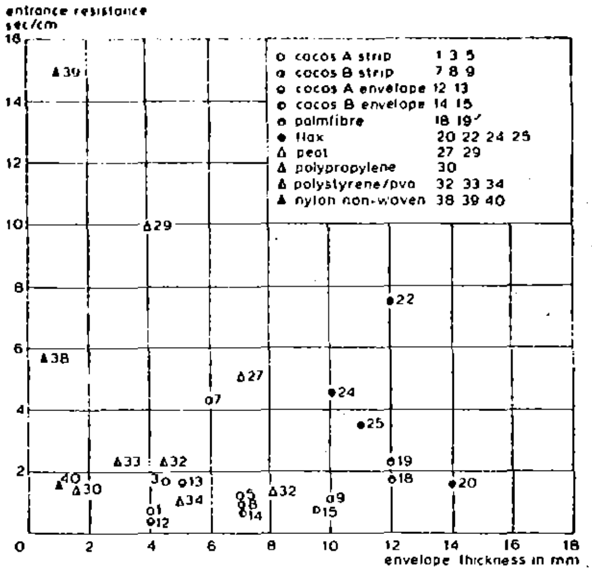


Fig. 2. Entrance resistance plotted against thickness of the envelope material as tested in the vertical cylindrical sand tank

2) H o r i z o n t a l m o d e l s

This type of sand-tank model is used by the Scientific Department of the R.IJ.P., the IJssellake polder Development Authoty in The Netherlands. In the tank, the drain's position is horizontal. Radial flow is approximated by the U-shape of the inner container, see fig. 3. In this model, very fine homogeneous sands are used, comparable to those used in the first model. Discharge is measured plus the piezometric head inside the drain, at the border of the envelope, and at some distance from the drain. Generally, a linear relationship is found between discharge rate and piezometric head difference; thus, a value for the entrance resistance is found. Preparation and operation of this model is more laborious than the model described earlier, but a an advantage of the model that its set-up resembles field conditions.

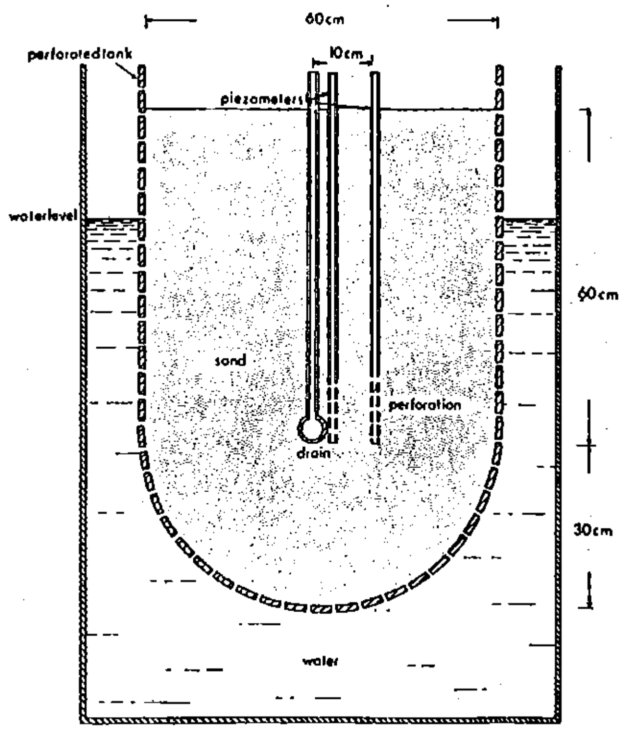


Fig. 3. Cross-section of the horizontal sand tank used by R.IJ.P.

3) Vertical, cylindrical models with one-dimensional flow

This sand-tank model was introduced at I.C.W. in 1977, and is shown in fig. 4. This test-cylinder was designed especially by SEIJGER (1978) for a rapid evaluation and screening of envelope materials. The model consists of a cylindrical plexiglass tank, 15 cm inside diameter by 69 cm long. Water entry takes place near the top of the cylinder. Water flows downward alongside mental weights that simulate the overburden of the soil, through a gravel bed diffuser, and through the sand acquifer. The envelope material sample rests on a bottom plate constructed from a cut portion of corrugated PVC pipe, attached to a perforated support plate. A diagrammatic sketch of the flow system is shown in fig. 5. Water from a supply tank is pumped into an elevated tank in which a constant head is maintained by an overflow back into the supply tank. The hydraulic gradient in the

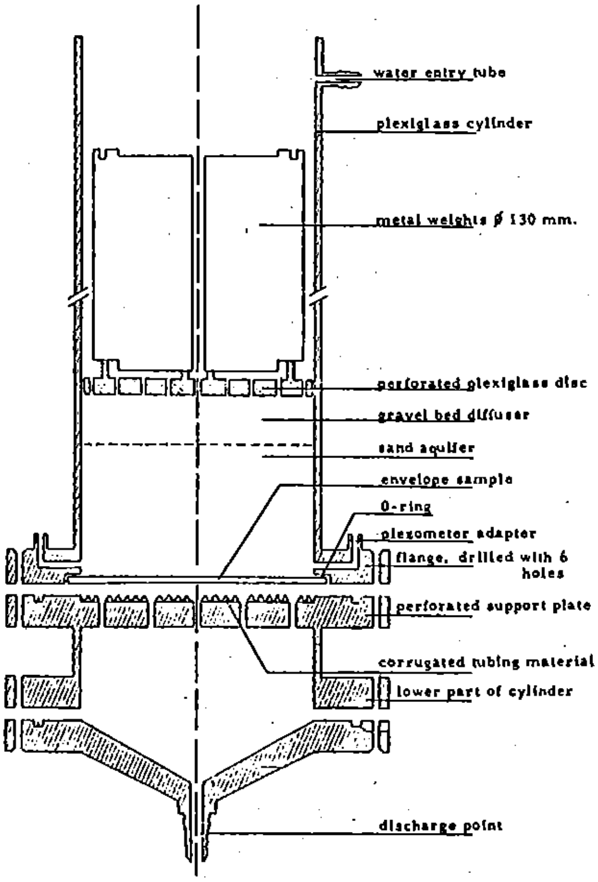


Fig. 4. Vertical plexiglass sand-tank model developed by SEIJGER (1978)

cylinders - four cylinders are in use simultaneously - is adjusted by raising or lowering the elevated overflow tank and/or the collector tank through which percolated water is discharged back into the supply tank. The amount of sand caught in the sediment trap is weighed after termination of each test. Physical loading of the cylinders simulate drain placement at a soil depth of about 1 metre. Eleven soil fractions were tested ranging from 30 to 2 000 μm. Hydraulic head readings are obtained from piezometers installed at several heights in the cylinder wall. Hydraulic gradients applied varied from a value of 1 for fractions larger than 300 μm to 2.75 for fractions smaller than 150 μm.

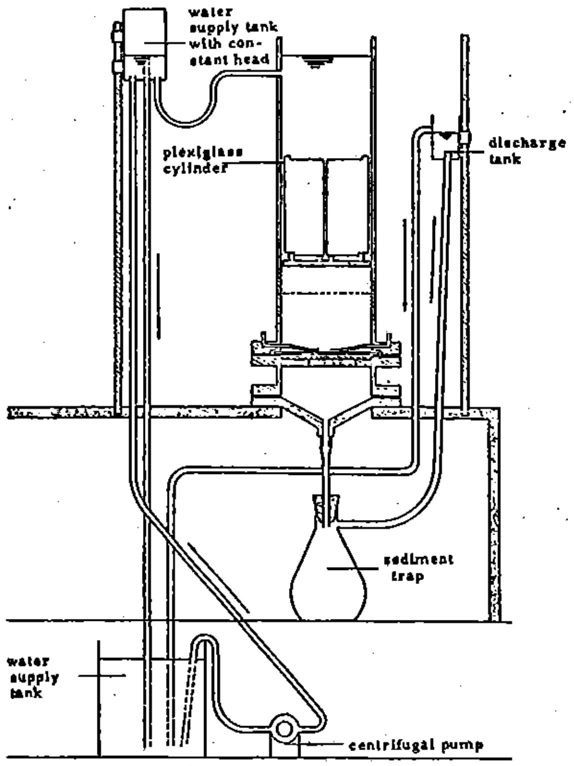


Fig. 5. Laboratory set-up of the sand-tank experiments by SEIJGER (1978)

Pore size distribution of envelopes is determined in two ways. The suction method renders reproducible results with voluminous materials. Saturated samples are subjected to increasing suctions resulting in release of water by the sample. It is assumed that the water is held by capillary forces, the water holding capacity being dependent on the diameter of the pores. The relation between suction Ψ and pore diameter d_p is approximated by the Hagan-Poiseuille relation:

$$\Psi = 0.3 / d_p$$

Pores are divided up into fractions equal to those used in the soil samples. Pore size distribution is determined by the amount of water released in each suction interval (SEIJGER, 1978).

Optical determination of the pore size distribution is used for very thin envelopes like glass fibre sheets, typar etc. Using a 'Quantimet 720' image analyzer, areas of voids are measured and the number of voids having an area within a certain interval is counted. From the number of voids in each interval the pore size distribution is found. Fig. 6 gives pore size distributions of four tested envelope materials. The methods however are inadequate as a tool to characterize size distributions of voids or channels which are essential for the filter function. Anderson and Bouma developed a method for describing the 'necks' in a system of voids of pores (ANDERSON and BOUMA, 1973). Although this method was developed for calculating hydraulic conductivities of clayey, pedal soils, it might also be valuable for characterisation of the pore-system geometry of envelope materials, see fig. 8.

From the study by Seijger, some qualitative conclusions can be drawn. Soil loading has a significant impact on the pore size distribution of envelope materials. The larger pores of the envelope determine its permeability in the long run, provided no chemical clogging occurs. The permeability of acrylic fibre mats under normal load is lower than that of the soil sample. A change of hydraulic gradient had a significant impact on the permeability of some envelopes, see fig. 7. Too little data was obtained, however, to detect significant trends in hydraulic and hydrologic properties of envelope materials. Fig. 7 shows typical permeabilities of coconut fibre and of a soil sample as measured by SEIJGER (1978).

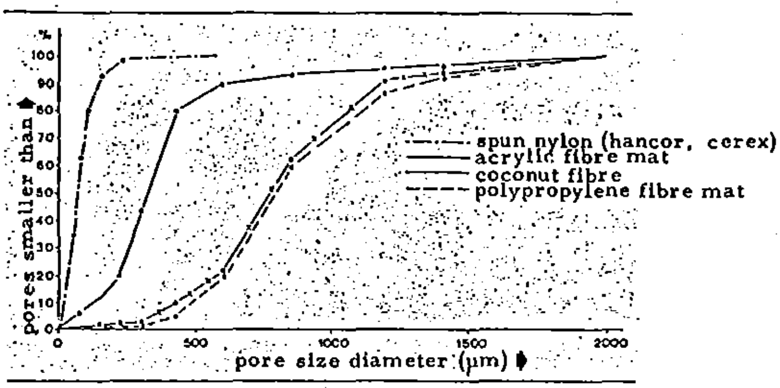


Fig. 6. Pore size distributions of four envelopes as determined by SEIJGER (1978)

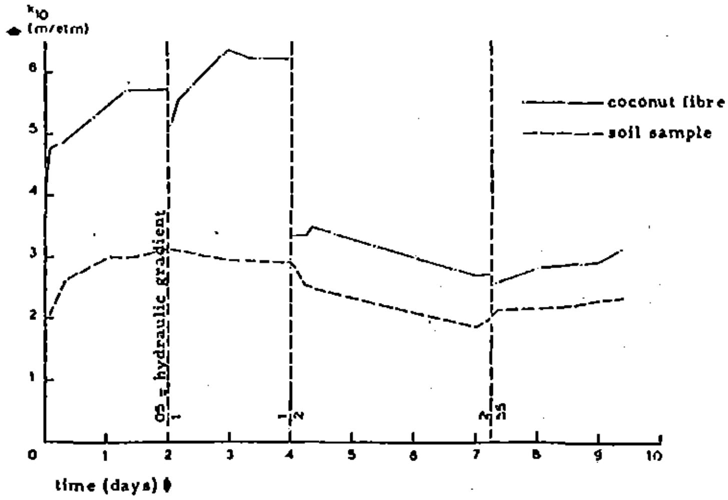


Fig. 7. Permeabilities as a function of time as measured by SEIJGER (1978)

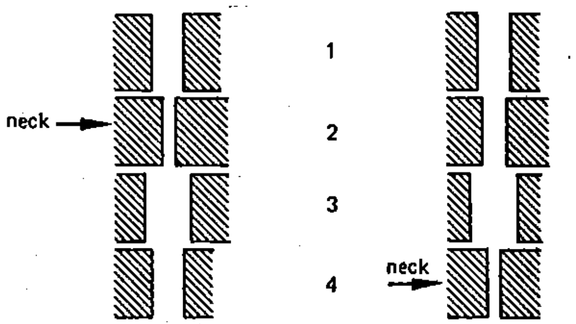


Fig. 8. Schematic diagram illustrating the occurrence of pore 'necks' after ANDERSON and BOUMA (1973)

6. A NEW RESEARCH APPROACH

Reviewing the research methods described above, some tentative conclusions can be drawn:

- 1) Results are of a qualitative nature
- 2) Results obtained with various methods are not comparable
- 3) Boundary conditions in the laboratory are not strictly met

- 4) The influence of chemical phenomena on the data is not assessed
- 5) Data processing is not automated; many tedious calculations are still to be done by hand
- 6) The research approach has hardly changed for a long period of time.

Recognizing these facts it was decided that a new research approach is urgently needed. The aims of the new research project are equal to those of earlier investigations:

- 1) Determination of the pore size distribution of envelope materials
- 2) Investigation of selective filtering properties in relation to pore-size distribution of both envelope material and soil
- 3) Development of a quantitative description of interactions between envelopes and soils.

The methodology to be chosen in the new research program must be sufficiently accurate to render data that is reliable and consistent. Model tests will only allow comparison with respect to the performance of envelopes if testing conditions are well prescribed and the same for all tests. The main prequisite of the laboratory testing apparatus is therefore a very high reproducibility. The equipment must be designed for fast and accurate screening of envelopes, as an extensive measuring program is scheduled.

In fig. 9 the laboratory set-up designed for a quantitative study of mechanical clogging phenomena of envelopes is shown schematically. It is provided with an independent water circulation system; after the system is filled, no water is added anymore. Bacterial activity in the system must be prevented and some measures are taken in this respect. The water used for the tests is demineralized. The system is kept anaerobic by feeding nitrogen gas in either of the two overflow tanks. In this way aerobic phenomena like oxidation of ferric compositions and formation of 'ochre' are counteracted. The centrifugal pump creates an available head ΔH. Hydraulic gradients over the cylinders are adjusted using needle-valves. Flow through the cylinders is recorded by flowmeters. The greater part of the water pumped into the elevated overflow tank will flow back into the water supply tank. This water is heated slightly; its temperature

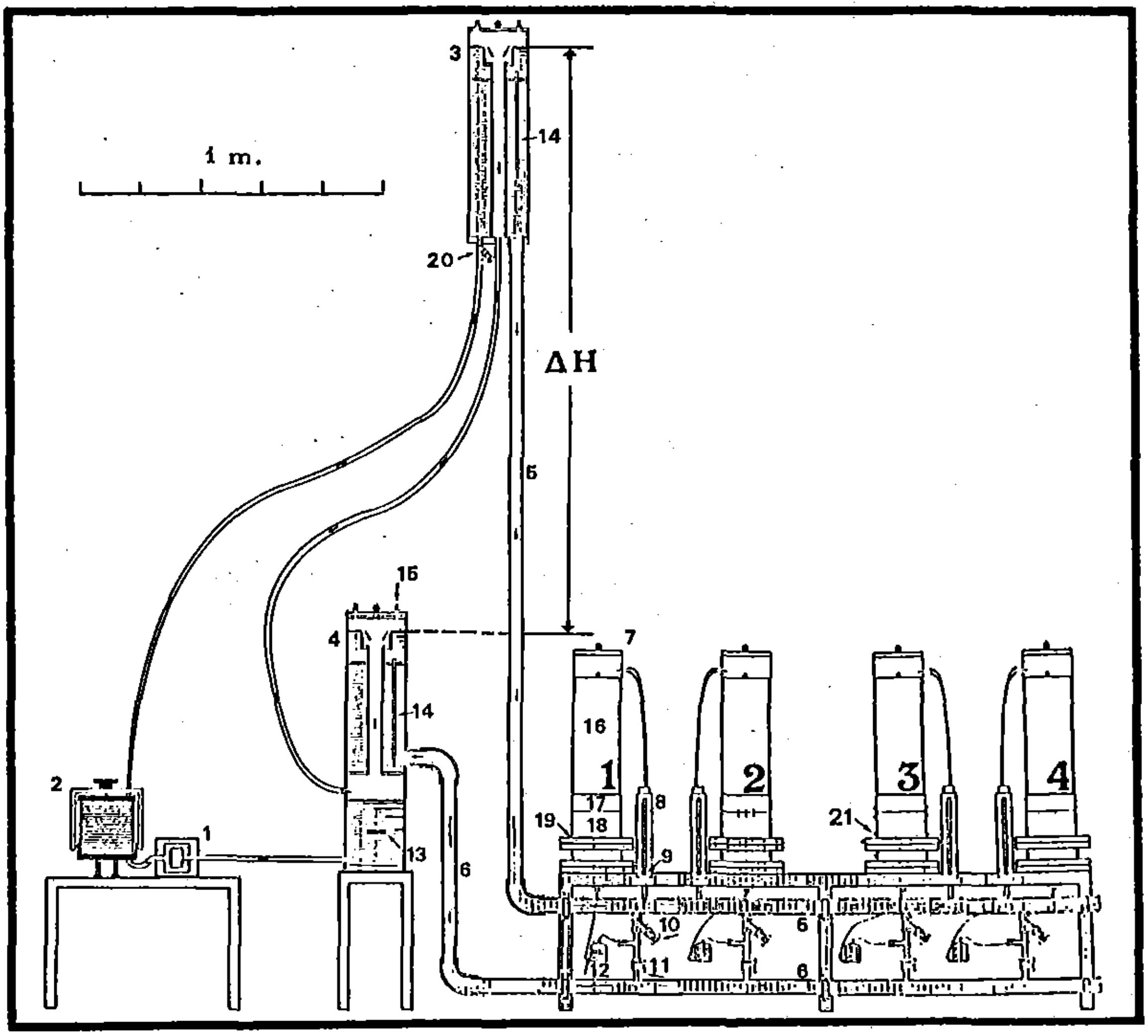


Fig. 9. New laboratory set-up designed for testing of drainage envelope materials at I.C.W.

1=centrifugal pump
2=active-carbon water filter
3=overflow tank
4=constant head- and water supply tank
5=water supply tube
6=water discharge tube
7=cylindrical plexiglass tank
8=flowmeter
9=needle valve
10,11=taps regulating flow directions on installing envelope and soil sample
12=sediment trap (cont.10 litres)
13=water heating device (60 watts)
14=thermometer
15=supply valve nitrogen gas
16=metal weights in PVC cyliner casing
17=gravel bed diffuser (height 5 cm)
18=soil sample (height 10 cm)
19=envelope sample disc
20=tap regulating pump flow
21=piezometer (10 for each vertical cylinder)

exceeds that of the air-conditioned laboratory by a few degrees centigrade. On its way through the supply tube and the cylinders the water will be cooling slightly. Consequently, gasses dissolved in it cannot be released in the soil sample and the envelope. In this way a saturated flow is safeguarded all the time. Small piezometers consisting of perforated brass tubing are installed at ten different heights in the cylinder wall to obtain hydraulic head readings. Plastic tubing connects the piezometers to manometer boards. Water is discharged via sediment traps (contents 10 litres) in which the flow is upward.

In order to check reproducibility all tests are replicated four times (i.e. all cylinders contain the same envelope and the same soil sample during the test). Installing of envelopes and soil samples is done following strictly defined procedures as the installation method is decisive for the outcome of the tests.

The so-called problem soils in The Netherlands that tend to cause silting of drains and envelopes have particle size distributions in a range indicated as the shaded area in fig. 10. On choosing the soil

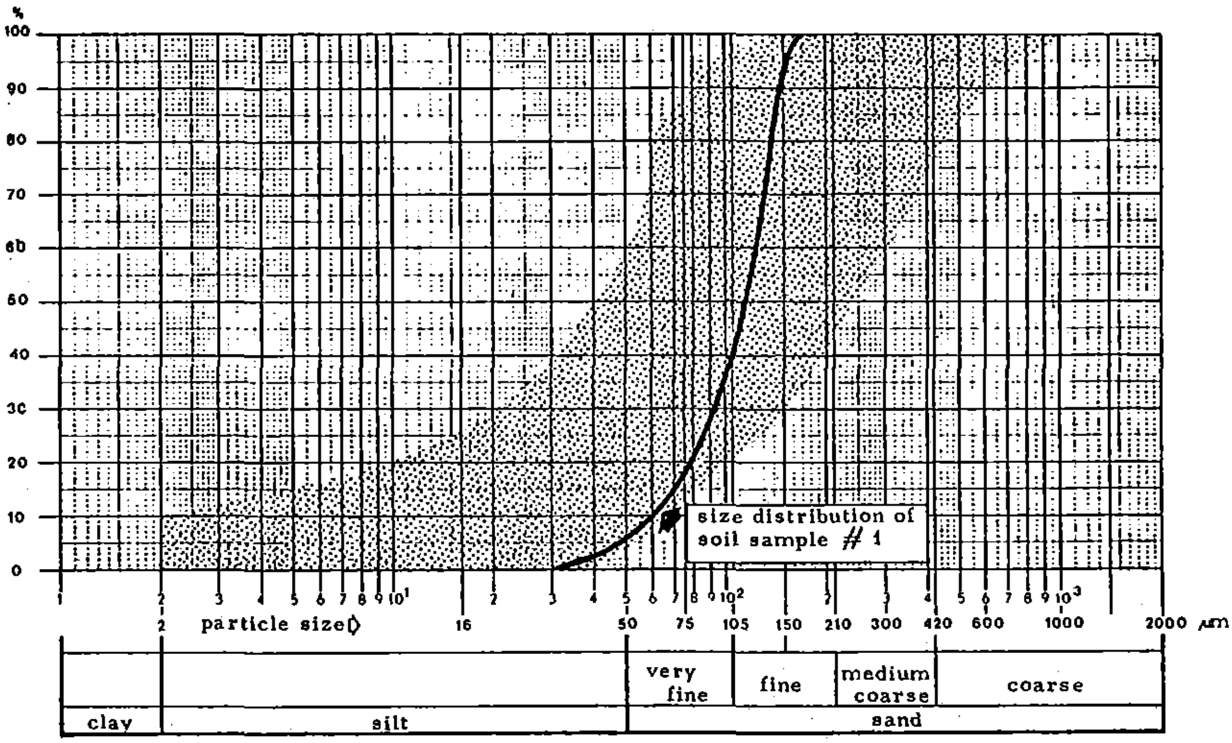


Fig. 10. Range of particle size distribution for problem soils

sample two contradicting demands must be met; similarity to field conditions on the one hand, and reproducibility of the testing procedure on the other hand. Reproducibility cannot be guaranteed if field samples are used due to unavoidable spatial variability in sample composition. Using merely soil fractions in the model like SEIJGER (1978) did safeguard reproducibility of the tests but resemblance to field conditions was poor. As a compromise, in the present project well-defined, artificial soil samples are used, being composed of six fractions of the original soil material. These soil fractions strongly resemble the original 'problem soils' but can be composed easily in a soil laboratory so reproducibility demands are met, as far as the soil sample is concerned. The particle size distribution of the first starting material used in the laboratory is shown in fig. 10. Its distribution lies completely inside the shade area indicating problem soils. Following this methodology several artificial soils can be composed using the same starting material, see table 1 and fig. 11. The impact of particle size distribution on envelope behaviour can thus be investigated for several soil-materials.

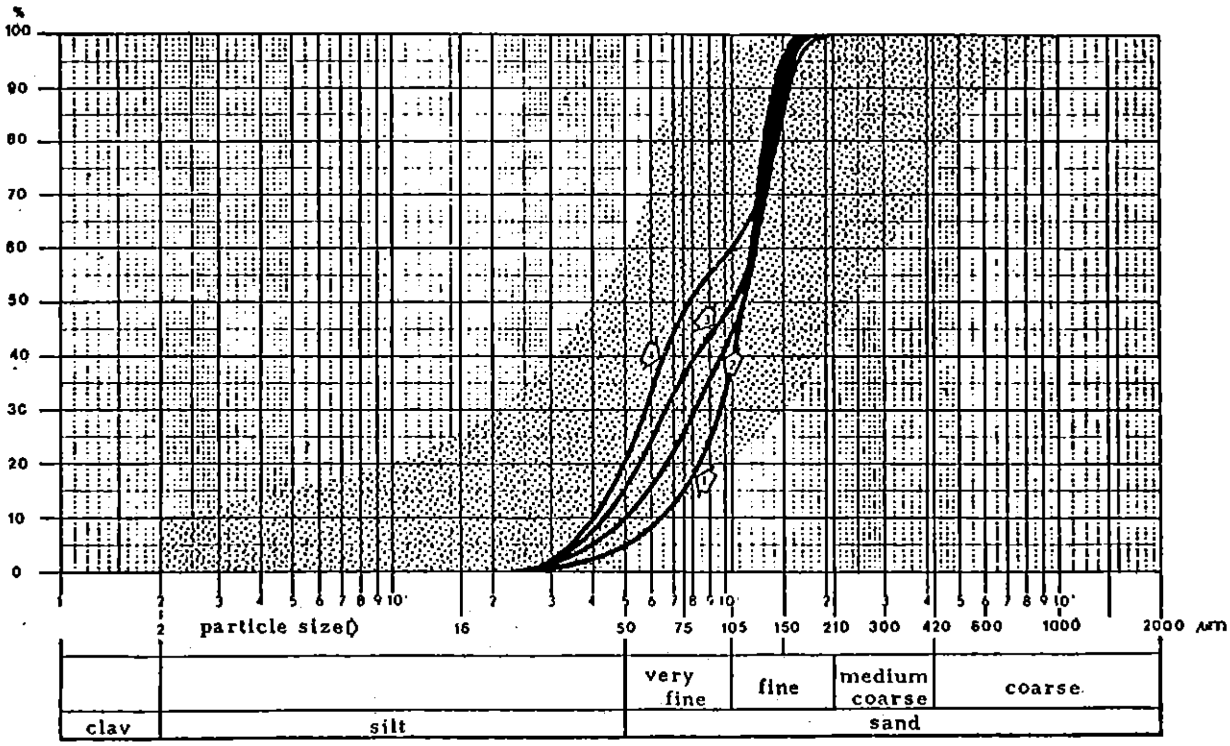


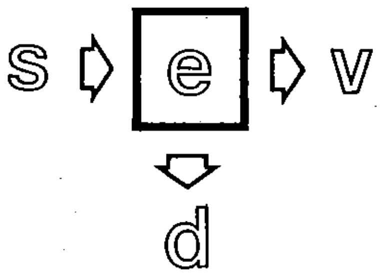
Fig. 11. Possible sample compositions to be used in the laboratory

Table 1. Possible sample compositions to be used in the tests

Soil Fraction (μm)	Weight Percentages (dry sieving)				
	starting material	sample 1	sample 2	sample 3	sample 4
<38	2.62	2	4	6	8
38 - 35	4.48	4	8	12	16
53 - 75	9.46	9	14	19	24
75 -106	23.75	24	18	12	12
106 -150	55.97	58	50	42	28
>150	3.72	3	6	9	12

Often, a decrease in flowrate in sand-tank models is due to iron and/or calcareous compositions (SEIJGER, 1978, BENZ, 1976, DE JONG, 1978, ESKES, 1977). This problem can be avoided using chemically treated soils from which these components have been removed. Soil structure, however can be modified significantly by this kind of treatment.

If the envelope's behaviour is considdred as a black-box operation, it may be presented as follows:



S = the particle size distribution of the soil sample (a vector)

E = the envelope operator, depending on envelope characteristics (parameters)

D = the particle size distribution of the soil washed into the envelope

V = some variable (e.g. envelope permeability)

The envelope's performance is thus considered being an input-output process and black-box modelling techniques must be applied aiming at describing this process empirically. The random movement of washed out soil particles in an envelope and its clogging can also be treated as a stochastic process (SILVEIRA, 1965, THANIKACHALAM, 1975).

Stochastic modelling in filter design is not yet widely applied but might be a possible solution.

Particle size distributions of the soil sample, the particles entrapped in the envelope and the particles washed through it are determined. Due to the extensive measuring program mentioned earlier, reliable and swift analysing methods are required. Therefore, the Coulter principle of particle size analysis will be used (McCAVE and JARVIS, 1973). The particles are suspended in electrolytic liquid and their number and size determined by forcing the suspension through a small orifice on either side of which an electrode is placed. Each time a particle passes the orifice the electrical resistance of the circuit changes, giving rise to a voltage pulse. The magnitude of the pulses is to some extent proportional to the volumes of the particles. Pulses are counted, sized, sorted and integrated and the size distribution can be derived. Provided the equipment is calibrated well, this method yields consistent and reliable results (VAN DER PLAATS, 1980). The equipment used is a computerized Elzone system by Particle Data Inc.. Particles entrapped in the envelope material are released using an ultra-sonic cleaning device.

Apart from the particle size parameters, parameters describing particle shape can be used because in cohesionless soils particle shape might be a relevant characteristic for internal erosion and transport of soil material. Some partical shape parameters are proposed by BARRETT (1980). The shape of a particle can be expressed in terms of three independent properties: form (overall shape), roundness (large-scale smoothness) and surface texture, see fig. 12. These form a three-stage hierarchy in the observational scale. Parameters expressing aspects of form are the maximum projection sphericity (SNEED and FOLK, 1958), oblate-prolate index (DOBKINS and FOLK, 1970) and degree of angularity (LEES, 1964), see fig. 13. Roundness measures to be used are the Wadell roundness (WADELL, 1932), the Modified Wentworht roundness (DOBKINS and FOLK, 1970) or the roundness of the sharpest corner (WENTWORTH, 1922). Shape parameters will be derived using a Quantimet 720 image analyzer coupled with a PDP-11 computer.

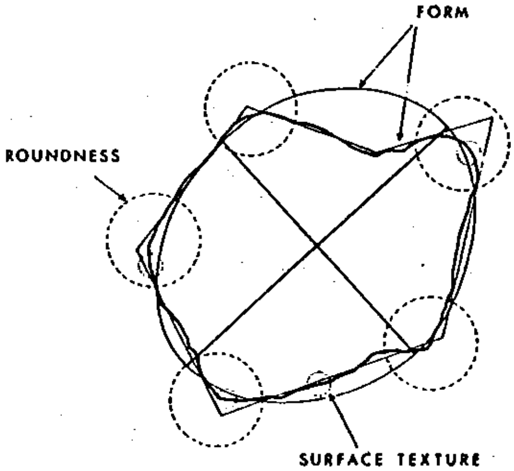


Fig. 12. A particle outline (heavy solid line) with its component elements of form (light solid lines, two approximations shown), roundness (dashed circles) and texture (dotted circles) identified. After BARRETT (1980)

The parameter values will be computed from digitized data using a DEC-10 computer. Regression analysis will indicate which shape parameters are relevant for internal erosion of the soil and clogging of the envelope.

An extensive software for data processing has been developed. It is compatible with DEC-10 computer systems and written in FORTRAN-10. Included is graphical output of recorded and computed variables as a function of time, see fig. 14.

Regression analysis is facilitated by printing of scatterdiagrams of variables that have been detected to be significantly correlated, see fig. 15.

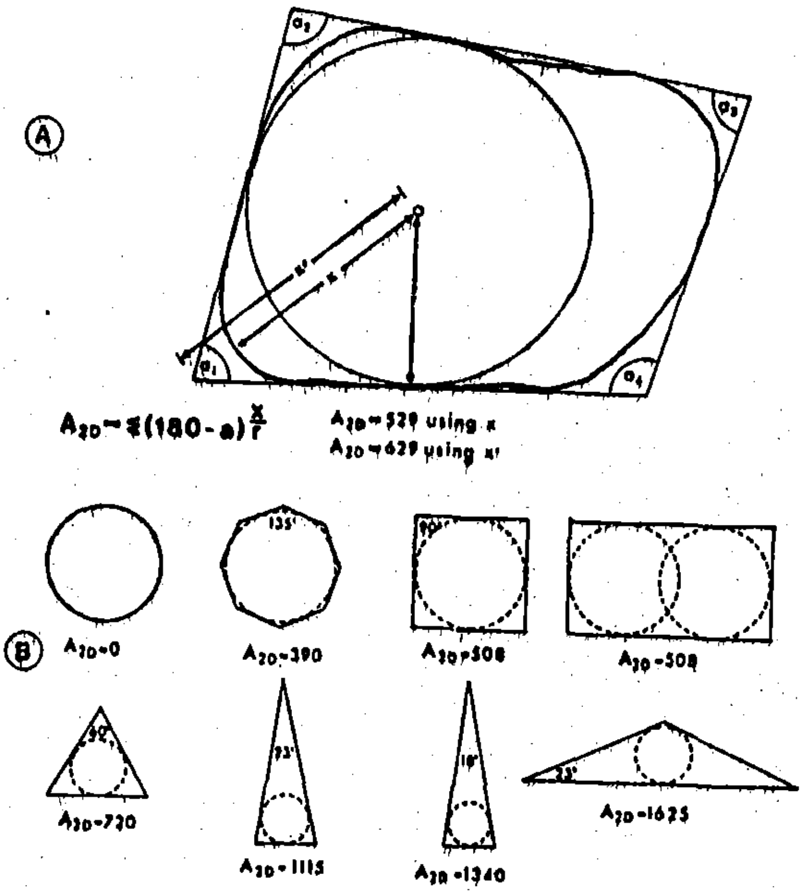


Fig.13. Construction and formula for determining 2D angularity of a particle. Values for degree of angularity (A_{2D}) for various regular figures.
After LEES (1964)

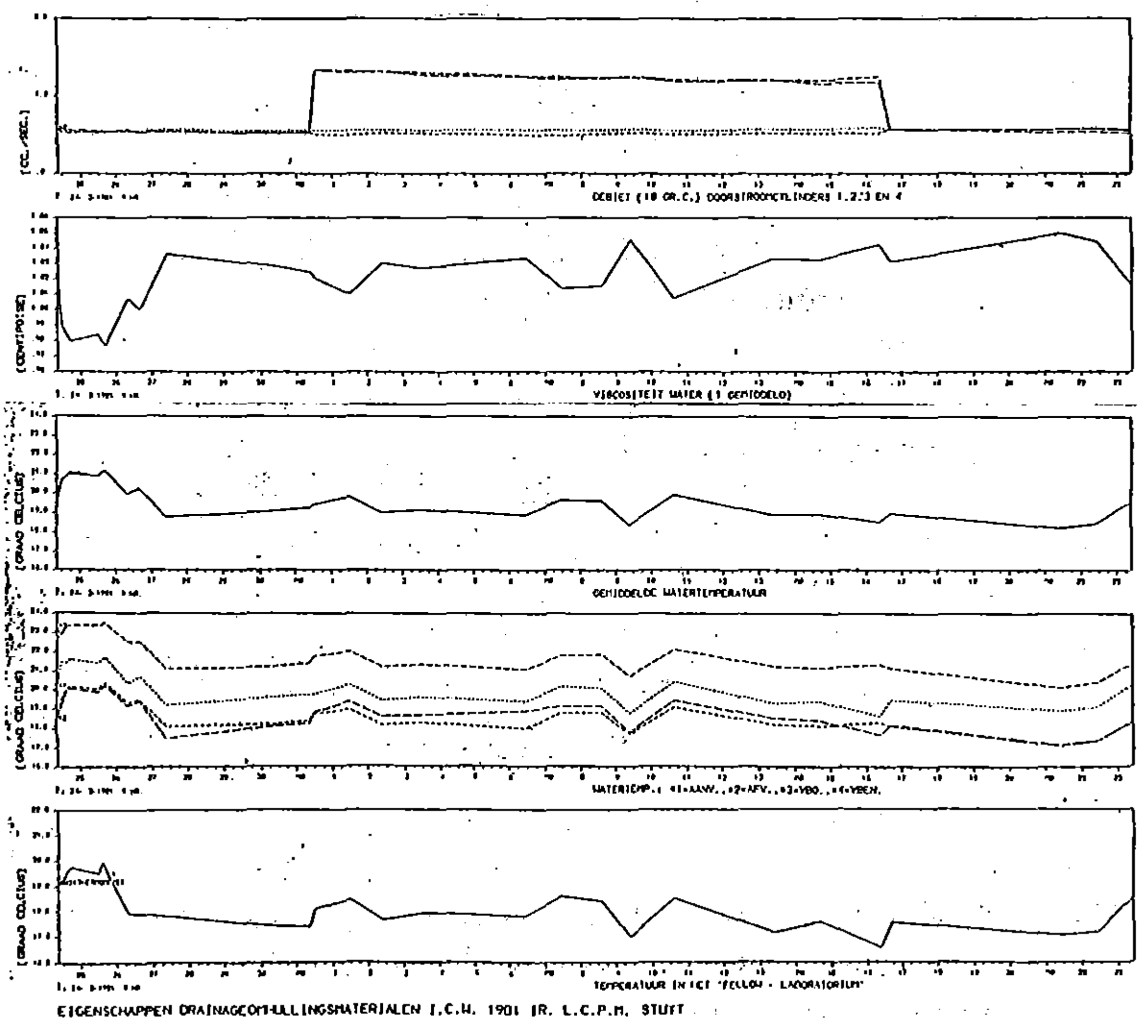
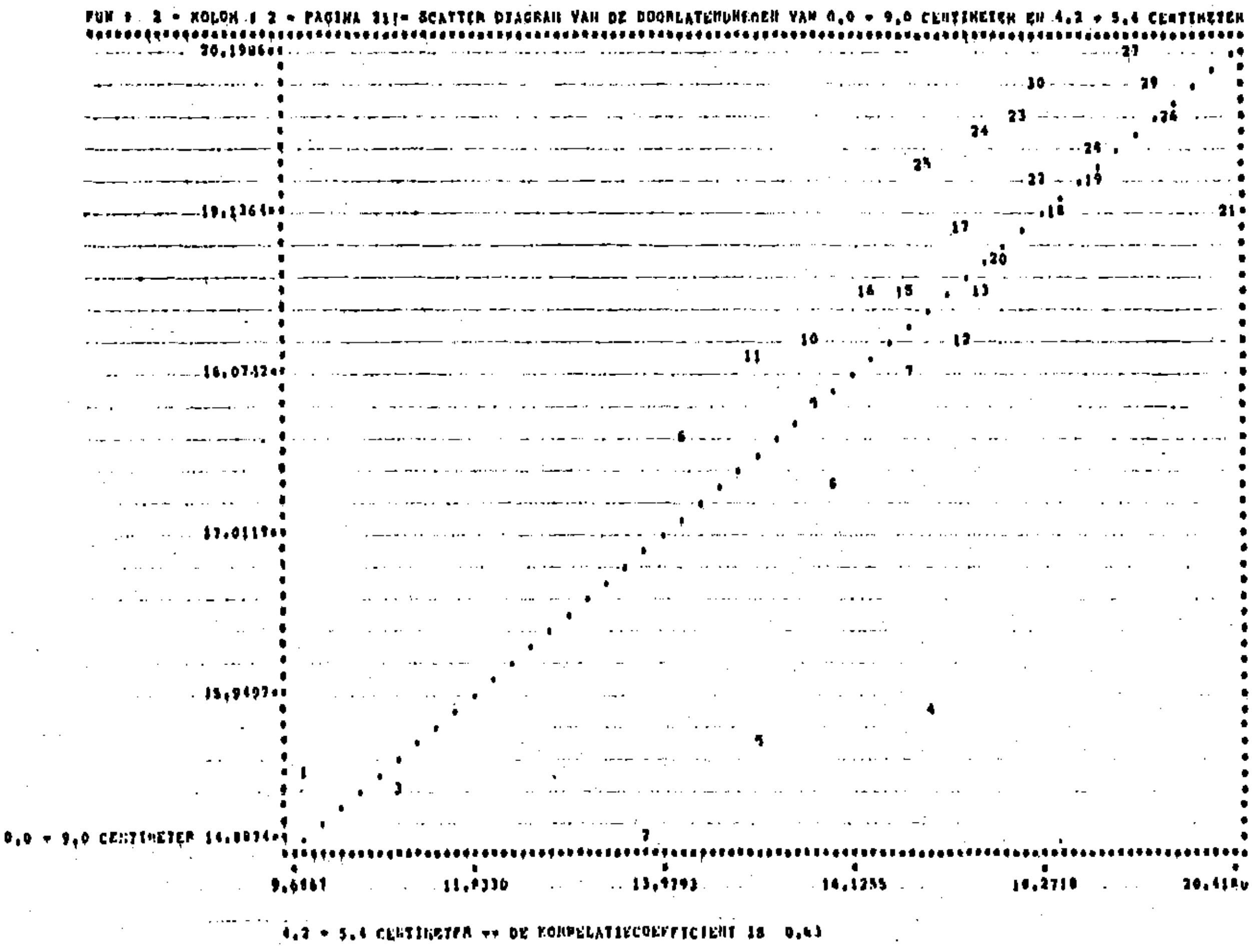


Fig. 14. Possible graphical output of computed and recorded variables. Shown are (top to bottom) flow through plexiglass cylinders, water viscosity, mean water temperature, water temperatures at four different places in the laboratory apparatus, temperature in the laboratory. Not shown are plots of permeabilities of envelope samples and individual layers in the soil samples (40 in total)



Fig, 15. Scatter diagram of permeabilities of different sections of the soil sample in the plexiglass cylinder. Figures correspond to sample-time sequence numbers. Scaling is linear and automatic

7. CONCLUSIONS

Up to date, research into drainage materials did not yield design criteria for envelope materials, optimally suited for local conditions. Apparently simple, the operation of an envelope is complex, not well understood and hard to investigate fundamentally. Any laboratory investigation has built-in constraints, the impact of which cannot be assessed. Yet, laboratory testing is the only feasible way and therefore it is the type of research chosen for the current study.

Unlike earlier studies, many new parameters are introduced and their possible significance will be investigated. All data processing is automated, thus enabling an extensive measurement program to be implemented.

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APPENDIX

DATA PROCESSING

On the next pages, listings of a datafile, 'DRAIN.DAT', the computer program developed for processing, 'DREPRO.F10', and lineprinter output are found as well as graphical output.

```
 TY DRAIN.DAT
I
MA+APR '81
28
BIDIM 270 GRS.
0.20
HALSEMA [GRONINGEN]
02 04 09 24 58 03 6. 15. 25. 0.18
 1   240381 09.00 19.10 20.10 18.40 23.20 18.45
 2   240381 12.00 19.10 21.45 19.40 22.83 19.06
 3   240381 14.38 19.52 21.40 19.90 23.20 19.75
 4   240381 17.34 19.75 21.60 20.15 23.35 20.05
 5   250381 12.16 19.50 21.40 20.00 23.38 19.84
 6   250381 14.31 20.00 21.55 20.20 23.38 20.05
 7   250381 16.48 19.65 21.69 20.34 23.52 20.20
 8   260381 08.18 17.90 20.32 19.30 22.49 19.15
 9   260381 16.18 17.90 20.70 19.45 22.49 19.40
10   270381 09.24 17.80 19.20 18.06 21.10 17.40
11   300381 09.02 17.42 19.62 18.20 21.24 18.10
12   310381 09.13 17.40 19.77 18.39 21.43 18.26
13   310381 12.08 18.08 19.80 18.75 21.79 18.83
14   010481 12.15 18.45 20.31 19.00 22.04 19.41
15   020481 09.57 17.62 19.49 18.21 21.25 18.65
16   030481 12.31 17.90 19.63 18.32 21.36 18.70
17   060481 10.58 17.79 19.41 18.01 21.10 18.91
18   070481 11.13 18.60 20.20 18.80 21.82 19.15
19   080481 14.18 18.41 20.10 18.81 21.85 19.15
20   090481 09.47 16.99 18.79 17.70 20.74 17.80
21   100481 15.10 18.51 20.43 19.10 22.14 19.45
22   130481 09.41 17.12 19.30 18.20 21.24 18.53
23   140481 16.52 17.55 19.40 18.12 21.16 18.41
24   160481 08.48 16.55 18.62 18.30 21.34 17.66
25   160481 16.37 17.52 19.49 18.12 21.16 18.20
26   210481 10.16 17.05 18.93 17.10 20.14 17.15
27   220481 10.03 17.17 19.11 17.37 20.41 17.40
28   230481 09.12 18.52 20.32 18.39 21.43 18.41
 1  20.00  3.50  3.65  5.30 10.15 12.70 15.15 17.70 19.10 21.45 24.35
 2  20.00  3.50  3.70  5.40 10.60 12.30 14.50 16.75 18.10 20.35 22.75
 3  20.00  3.50  3.70  5.40 10.35 11.90 13.75 15.75 17.35 19.50 21.90
 4  20.00  3.50  3.65  5.40 10.00 11.50 13.30 15.75 17.15 19.30 21.70
 5  19.50  3.40  3.55  5.40  9.85 10.85 12.95 15.55 16.95 19.05 21.75
 6  20.00  3.40  3.60  5.25  9.35 10.85 12.82 15.40 16.85 19.15 21.75
 7  19.70  3.40  3.60  5.30  9.41 10.81 12.89 15.45 16.95 19.00 21.85
 8  20.00  3.40  3.70  5.40  9.65 11.00 13.15 15.80 17.40 19.55 22.50
 9  19.80  3.55  3.70  5.35  9.60 10.95 13.20 15.80 17.35 19.65 22.41
10  20.00  3.60  3.72  5.38  9.81 11.25 13.35 16.15 17.25 20.08 22.90
11  19.60  3.60  3.70  5.40 10.08 11.60 13.85 16.65 18.42 22.18 24.85
12  19.80  3.48  3.69  5.42 10.04 11.62 13.75 16.68 18.52 21.38 26.50
13  19.80  3.48  3.62  5.35 10.05 11.52 13.80 16.65 18.42 21.38 25.95
14  19.90  3.48  3.62  5.38 10.22 11.70 14.06 16.86 18.78 21.71 26.08
15  19.90  3.46  3.63  5.38 10.65 12.12 14.62 17.61 19.72 22.71 26.75
16  19.90  3.48  3.68  5.42 11.21 12.65 15.05 18.12 20.32 23.38 27.35
17  19.90  3.42  3.63  5.50 12.21 13.58 16.00 19.32 21.86 25.25 29.06
18  20.00  3.46  3.65  5.48 12.22 13.52 15.95 19.29 21.92 25.31 29.12
19  20.00  3.47  3.63  5.50 12.41 13.66 16.16 19.52 22.32 25.90 29.81
20  20.00  3.46  3.65  5.52 12.60 13.83 16.41 19.82 22.71 26.28 30.24
21  20.00  3.46  3.60  5.50 12.61 13.78 16.35 19.82 22.71 26.18 30.12
22  20.10  3.46  3.58  5.50 13.11 14.25 16.91 20.43 23.70 27.41 31.65
23  20.10  3.46  3.61  5.55 13.30 14.48 17.15 20.81 24.12 27.74 32.25
24  20.50  3.46  3.60  5.51 13.41 14.66 17.40 21.12 24.52 28.30 32.90
25  20.00  3.45  3.60  5.35 12.63 13.82 16.20 19.62 22.75 26.10 30.32
26  20.10  3.46  3.57  5.41 12.90 14.15 16.89 20.40 23.56 27.25 31.85
27  20.30  3.49  3.62  5.48 12.91 14.18 16.88 20.34 23.50 27.18 31.80
28  20.20  3.50  3.63  5.41 12.68 13.82 16.42 19.85 22.85 26.45 30.92
 1  20.00  3.70  4.10  5.85  9.40 12.95 15.70 17.75 21.25 23.40 25.70
```

3	20.00	3.70	4.00	5.90	9.40	12.60	15.40	16.65	18.85	21.50	22.75
4	20.00	3.70	3.95	5.90	9.40	11.80	14.30	15.50	17.70	20.25	21.10
5	19.50	3.65	3.95	5.50	8.65	11.10	13.40	14.80	16.95	19.45	21.45
6	20.00	3.62	3.95	5.50	8.60	11.06	13.35	14.75	16.85	19.35	21.70
7	19.80	3.61	3.91	5.50	8.60	11.10	13.45	14.90	17.00	19.51	21.85
8	19.80	3.62	3.95	5.62	8.65	11.15	13.65	15.00	17.15	19.80	22.31
9	19.50	3.70	3.90	5.55	8.60	11.20	13.60	14.95	17.12	19.80	22.30
10	19.20	3.69	3.91	5.55	8.55	11.15	13.70	15.08	17.25	20.10	22.72
11	18.80	3.69	3.92	5.50	8.62	11.20	14.02	15.22	17.55	20.95	23.81
12	19.20	3.68	3.95	5.49	8.59	11.12	13.92	15.21	17.42	20.82	23.98
13	18.50	3.68	3.91	5.52	8.56	11.15	13.92	15.18	17.42	20.80	23.92
14	18.30	3.61	3.95	5.45	8.61	11.20	14.05	15.32	17.62	21.05	24.07
15	18.70	3.65	3.88	5.52	8.81	11.50	14.81	16.10	18.50	22.08	25.12
16	18.80	3.61	3.96	5.55	8.89	11.76	15.05	16.71	19.15	22.75	25.75
17	18.20	3.61	3.94	5.70	9.09	12.02	16.45	17.58	20.11	24.00	26.57
18	18.10	3.66	3.95	5.74	9.11	12.02	16.43	17.63	20.25	23.60	26.68
19	18.60	3.62	3.96	5.72	9.11	12.21	16.84	18.05	20.81	24.92	27.48
20	18.70	3.65	3.97	5.75	9.22	12.39	17.11	18.23	21.18	25.35	27.81
21	18.70	3.66	3.95	5.70	9.13	12.31	17.00	18.20	21.03	25.16	27.52
22	18.70	3.60	3.95	5.73	9.19	12.38	17.27	18.41	21.98	25.71	28.09
23	18.80	3.62	3.92	5.72	9.12	12.31	17.39	18.48	21.55	25.86	28.10
24	18.50	3.65	3.93	5.72	9.10	12.12	17.20	18.35	21.40	25.60	27.80
25	20.00	3.62	3.96	6.05	10.15	13.91	19.90	21.86	25.08	29.90	32.62
26	19.90	3.62	4.00	6.15	10.30	14.11	20.21	21.75	25.45	30.62	33.22
27	20.00	3.62	4.02	6.13	10.31	14.13	20.00	21.76	25.41	30.51	33.02
28	20.00	3.63	4.02	6.08	10.26	13.85	19.54	21.25	24.78	29.85	32.17
1	20.00	3.40	3.65	5.10	8.10	11.55	14.85	16.80	18.60	20.75	22.15
2	19.50	3.50	3.65	5.10	8.00	11.35	14.65	16.25	17.50	19.35	21.05
3	19.50	3.45	3.65	5.05	7.75	10.95	13.95	15.50	16.65	18.50	20.25
4	19.50	3.35	3.62	5.00	7.32	10.60	13.40	14.95	16.11	17.90	19.60
5	20.00	3.40	3.65	4.80	6.95	10.40	13.05	14.55	15.75	17.75	19.46
6	20.00	3.35	3.62	4.84	7.21	10.72	13.50	15.11	16.40	18.45	20.05
7	20.00	3.40	3.61	4.81	7.25	10.75	13.50	15.15	16.35	18.40	20.11
8	20.20	3.35	3.65	5.10	7.61	11.05	13.91	15.45	16.85	19.00	20.75
9	19.20	3.45	3.58	5.05	7.45	10.80	13.65	15.20	16.45	18.75	20.40
10	19.50	3.48	3.62	5.10	7.61	10.95	13.90	15.58	16.82	19.15	20.95
11	19.00	3.40	3.60	5.02	7.80	11.12	14.20	15.90	17.35	20.00	21.95
12	19.00	3.38	3.61	5.08	7.85	11.15	14.20	15.95	17.45	20.80	22.10
13	40.00	3.40	3.92	6.75	13.30	20.00	26.40	30.08	33.25	38.50	42.76
14	39.30	3.32	3.91	6.85	13.62	20.28	26.82	30.62	33.82	39.27	43.55
15	39.00	3.40	3.98	6.97	14.21	21.81	28.31	32.35	35.61	41.41	46.01
16	38.80	3.40	4.00	7.00	15.03	22.05	29.62	33.81	36.98	43.00	47.95
17	37.50	3.42	4.00	7.12	16.45	24.00	31.81	36.52	39.55	46.35	51.91
18	37.80	3.41	4.02	7.11	17.32	24.33	32.03	36.81	39.86	46.86	52.68
19	37.10	3.32	3.95	7.00	17.40	24.43	32.13	37.29	40.40	47.62	53.56
20	37.00	3.45	4.00	7.20	17.71	24.90	32.25	37.95	40.92	48.42	54.72
21	37.00	3.40	3.98	7.14	17.61	24.81	32.25	37.90	40.70	48.00	54.31
22	36.20	3.40	4.00	7.15	18.02	25.41	33.28	39.26	41.66	49.26	56.11
23	36.10	3.34	3.99	7.14	18.30	25.18	33.75	39.85	42.14	49.82	56.75
24	36.90	3.31	4.00	7.10	18.60	26.00	34.25	40.71	42.82	51.34	58.03
25	20.00	3.27	3.71	5.60	11.52	16.63	23.65	25.51	28.32	37.61	39.72
26	19.80	3.26	3.63	5.52	11.47	16.71	21.65	25.60	26.72	31.68	35.65
27	20.00	3.31	3.70	5.54	11.35	16.59	21.49	25.40	26.65	31.31	35.35
28	19.90	3.30	3.64	5.46	10.90	16.17	20.91	24.70	25.87	30.42	34.33
1	20.00	67.45	67.05	65.45	61.60	57.40	55.20	52.50	47.50	44.20	43.40
2	20.50	67.70	67.25	65.25	61.45	57.30	55.15	52.60	48.05	47.25	46.80
3	21.00	67.85	67.40	65.40	61.65	58.15	56.25	54.00	49.60	48.75	48.35
4	20.50	67.70	67.25	65.60	62.20	59.00	57.40	54.95	50.45	49.80	49.20
5	20.00	67.80	67.40	65.75	62.70	60.15	58.55	56.20	52.60	50.00	49.85
6	20.00	67.80	67.40	65.65	62.66	59.89	58.28	55.55	52.15	50.00	49.60
7	20.00	67.90	67.50	65.70	62.65	59.85	58.25	55.50	52.10	50.00	49.56
8	19.90	67.80	67.50	65.55	62.60	59.75	58.25	55.18	51.95	49.38	49.25
9	19.40	67.70	67.50	65.56	62.65	59.75	58.12	55.28	51.95	49.55	49.10
10	19.20	67.75	67.50	65.60	62.65	59.65	57.92	55.05	51.88	49.10	49.68
11	19.00	67.85	67.55	65.50	62.65	59.28	57.62	54.25	51.40	47.00	46.90

13	40.00	67.90	67.31	63.36	57.28	50.60	47.39	41.89	34.48	25.97	25.93
14	39.90	67.80	67.12	63.35	57.05	50.15	46.86	40.68	33.18	24.78	24.62
15	39.00	67.82	67.10	63.28	56.62	49.45	46.03	39.12	31.25	22.95	22.92
16	38.00	67.80	67.10	63.28	56.29	48.75	45.32	37.85	30.00	21.80	21.78
17	37.20	67.72	67.10	63.15	55.54	47.20	43.66	34.71	26.50	17.90	17.88
18	37.00	67.74	67.12	63.13	55.55	47.06	43.61	34.35	26.03	17.26	17.25
19	37.60	67.81	67.15	63.00	55.20	46.07	43.00	33.10	25.02	15.22	15.21
20	36.80	67.75	67.20	63.10	55.30	46.68	43.18	33.20	25.35	15.35	15.34
21	36.50	67.80	67.20	63.12	55.47	46.92	43.55	33.42	25.95	15.81	15.80
22	36.10	67.75	67.14	63.09	55.18	46.13	42.81	31.63	24.22	12.40	12.31
23	35.00	67.80	67.10	63.18	55.30	46.42	43.12	31.90	24.96	12.53	12.51
24	35.20	67.80	67.20	63.12	55.10	45.13	42.82	31.41	24.69	11.39	11.38
25	20.00	67.90	67.45	65.02	59.83	54.61	52.70	39.95	37.36	34.00	33.99
26	18.90	67.85	67.60	65.05	60.35	55.00	53.02	46.00	42.27	34.50	34.48
27	19.00	67.84	67.50	65.15	60.38	55.18	53.18	46.17	42.64	34.90	34.87
28	19.00	67.85	67.50	65.16	60.58	55.44	53.58	46.58	43.38	35.92	35.89

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C***************************************************************
C-----  PROGRAM VOOR DATA PROCESSING ONDERZOEK 'FUNKTIONEEL EN KWAN-
C-----  TITATIEF ONDERZOEK DRAINAGEOMHULLINGSMATERIALEN'.  DEZE PRO-
C-----  GRAMMATUUR WERD ONTWORPEN VOOR GEBRUIK VAN HET 'DEC-10' SYS-
C-----  TEEM VAN DE LANDBOUWHOGESCHOOL WAGENINGEN; HET LABORATORIUM-
C-----  ONDERZOEK VINDT PLAATS OP HET INSTITUUT VOOR CULTUURTECHNIEK
C-----  EN WATERHUISHOUDING TE WAGENINGEN (IR. L.C.P.M. STUYT)  1981
C***************************************************************
C@@@@@  LOUIS STUYT - PROJECT 30.6 I.C.W. #4 11 JUN 81 DO NOT DELETE
C***************************************************************
C-IMSL  DIT PROGRAM GEBRUIKT IMSL-ROUTINE 'SECORT'; MEELADEN BIJ @EX
C***************************************************************
        DIMENSION GEMDAT(30,9),CD1(30,12),CD2(30,12),CD3(30,12),CD4(
       130,12),FR(6),IMA(12),IHOUR(30),IMIN(30),ICD(30),TIMCU(30),S
       2AFTV(30),RATL(2,975),TGEM(30),VISC(30),X(30,5),XM(5),S(5),R
       3(15),FL01(30),FL02(30),FL03(30),FL04(30),F10L1(30),F10L2(30
       4),F10L3(30),F10L4(30),FX(30,4),FXM(4),FS(4),RF(10),AFV1(30)
       5,AFV2(30),AFV3(30),AFV4(30),A1F10(30),A2F10(30),A3F10(30),A
       64F10(30),FLPR1(30),FLPR2(30),FLPR3(30),FLPR4(30),F10P1(30),
       7F10P2(30),F10P3(30),F10P4(30),IH(10),FRAK(6),DSOIL(10),XDL(
       830,4),SDL(4),SPDL(4,30),XPDL(4),XPPDL(4,30),RDL(10),RPDL(10
       90),XDK(30,10),RDK(55),RPDK(220),PREPL(975),DATU(2),IPLU(30)
       1,FTIM(30),PSAT(30),CRMS(6),IGNDT(30),DATI(3),WRAP(4),SOIL(4
       2),IFRA(6),XPDK(10),SDK(10),DNOM(40),ISIG(55),VDAT(30),HDAT(
       330),IPOL(55),IRY(55),NOMVER(4),NOMHOR(4),ISG(55),KAANT(4),I
       4PPE(975),IAFT(975),RATIOL(975),RATIOR(975),F10L(30),CD(30),
       5ILLOM(49),IMGCUM(55),TLGCUM(10)
        DOUBLE PRECISION PUNCH
        REAL NOMVER,NOMHOR
        COMMON IRUN,INUM,IPAG,ISCKOL,SCKOR,VDAT,HDAT,NOMVER,NOMHOR
        DATA FRAK / 30.,15.,22.,31.,44.,63. /
        DATA PH / 1.,11.,9.,2*1.5,5*1.2 /
        DATA IMA / 0,31,59,90,120,151,181,212,243,273,304,334 /
        DATA GRAS / 8.,38.,53.,75.,106.,150. /
        DATA DNOM / 5HOMHUL,5HLINGS,5HMATER,5HIAAL ,5HOMHUL,5HLINGS,
       15H + DO,5HDEMM.,5H0.0 -,5H 9.0 ,5HCENTI,5HMETER,5H0.0 -,5H
       21.5 ,5HCENTI,5HMETER,5H1.5 -,5H 3.0 ,5HCENTI,5HMETER,5H3.0
       3-,5H 4.2 ,5HCENTI,5HMETER,5H4.2 -,5H 5.4 ,5HCENTI,5HMETER,5
       4H5.4 -,5H 6.6 ,5HCENTI,5HMETER,5H6.6 -,5H 7.8 ,5HCENTI,5HME
       5TER,5H7.8 -,5H 9.0 ,5HCENTI,5HMETER /
        DATA PUNCH / 8HTIFEL.DAT,8HTAMB.DAT,8HTAFR.DAT,8HTHIV.DAT,8HT
       1LUV.DAT,8HDEB1.DAT,8HDEB2.DAT,8HDEB3.DAT,8HDEB4.DAT,9HKFIL1
       2.DAT,9HKFIL2.DAT,9HKFIL3.DAT,9HKFIL4.DAT,9HKTOT1.DAT,9HKTOT
       32.DAT,9HKTOT3.DAT,9HKTOT4.DAT,9HKSOL1.DAT,9HKSOL2.DAT,9HKSO
       4L3.DAT,9HKSOL4.DAT,9HKL1K4.DAT,9HKL2K4.DAT,9HKL3K4.DAT,9HKL
       54K4.DAT,9HKL1K5.DAT,9HKL2K5.DAT,9HKL3K5.DAT,9HKL4K5.DAT,9HK
       6L1K6.DAT,9HKL2K6.DAT,9HKL3K6.DAT,9HKL4K6.DAT,9HKL1K7.DAT,9H
       7KL2K7.DAT,9HKL3K7.DAT,9HKL4K7.DAT,9HKL1K8.DAT,9HKL2K8.DAT,9
       8HKL3K8.DAT,9HKL4K8.DAT,9HKL1K9.DAT,9HKL2K9.DAT,9HKL3K9.DAT,
       99HKL4K9.DAT,10HKL1K10.DAT,10HKL2K10.DAT,10HKL3K10.DAT,10HKL
       14K10.DAT /
        OPEN(UNIT=20,ACCESS='SEQIN',FILE='DRAIN.DAT')
        CALL DATE(DATU)
C***************************************************************
C-----  LIST RUN-PECULIARITIES & PRINT HEADING CONTAINING TIME; DATA
C-----  MOET OP DSK(C) STAAN ONDER FILENAME 'DRAIN.DAT'
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```
            READ(20,100)IRUN,DATI,INUM,WRAP,BUR,SOIL,(IFRA(I),I=1,6),DIA
     1N,EL,PERF,DIKTE
            WRITE(3,200)DATU,IRUN,DATI,INUM,WRAP,BUR,SOIL,(IFRA(I),I=1,6
     1),DIAM,EL,PERF
            WRITE(3,201)DIKTE
C*****************************************************************
C-----     LEES 'GENERAL DATA' VANAF DSK (FILE 'DRAIN.DAT') ---> GENDAT
            READ(20,101)((GENDAT(I,J),J=1,8),I=1,INUM)            !@PLOT
C-----     LEES NU DE GEGEVENS VAN DE VIER DOORSTROOMCYLINDERS IN VANAF
C-----     DSKC (FILE 'DRAIN.DAT') ---> CD1, CD2, CD3 & CD4
            READ(20,102)((CD1(I,J),J=1,12),I=1,INUM)
            READ(20,102)((CD2(I,J),J=1,12),I=1,INUM)
            READ(20,102)((CD3(I,J),J=1,12),I=1,INUM)
            READ(20,102)((CD4(I,J),J=1,12),I=1,INUM)
C-----     CORRIGEER DATA AFKOMSTIG VAN MANOMETERBORD # 4:  DE  AFLEES-
C-----     SCHAAL IS "ONDERSTEBOVEN" GEMONTEERD!
            DO 3 I=1,INUM
              DO 3 J=3,12
3             CD4(I,J)=71.-CD4(I,J)
C*****************************************************************
C@@@@@     **** U I T W E R K I N G   V A N   D E   G E G E V E N S ****
C*****************************************************************
C-----     BEREKEN EERST GEMIDDELDE SAMPLING-INTERVAL,  STANDAARDAFWIJ-
C-----     KING ALSMEDE DE DUUR VAN DE RUN IN DAGEN, UREN,  EN  MINUTEN
            DO 4 I=1,INUM
4           IGENDT(I)=GENDAT(I,2)
            DO 5 I=1,INUM
C-----     GOOI HET JAAR ERUIT
            IDAY=IGENDT(I)/100
C-----     TRANSFORMEER MINUTEN NAAR HONDERDTALLEN
            IHOUR(I)=GENDAT(I,3)
            IMIN(I)=(GENDAT(I,3)-IHOUR(I))*166.667
C-----     TRANSFORMEER # DAGEN INTO # UREN M.B.V. DATA-ARRAY 'IMA'
            IDAG=IDAY/100.
            IMAN=IDAY-(IDAG*100)
            ICD(I)=IDAG+IMA(IMAN)
C-----     BEPAAL NU DE TIJD CUMULATIEF IN UREN NA START RUN
            IHC=IHOUR(I)+ICD(I)*24
            HMIN=IMIN(I)/100.
5           TIMCU(I)=IHC+HMIN
C-----     RE-SET START TIME RUN TO ZERO
            DO 6 I=2,INUM
6           TIMCU(I)=TIMCU(I)-TIMCU(1)
            TIMCU(1)=0.
            SAITV(1)=0.
            DO 10 I=INUM,2,-1
10          SAITV(I)=TIMCU(I)-TIMCU(I-1)
C-----     SAMPLING-INTERVAL STATISTICS
            SAIGEM=TIMCU(INUM)/(INUM-1)     !GEMIDDELDE INTERVALDUUR
C-----     BEREKEN DE STANDAARDAFWIJKING
            CSL=0.
            CSQ=0.
            DO 15 I=2,INUM
            CSL=CSL+SAITV(I)
15          CSQ=CSQ+SAITV(I)**2
            STSA=SQRT((CSQ-(CSL**2)/(INUM-1))/(INUM-2))
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C-----  BEREKEN OMREKENINGSFAKTOREN (LINEAIRE INTERPOLATIE) IVM AAN-
C-----  MAAK VAN PLOTFILES (CONSTANTE INTERVALDUUR VEREIST)
        ITCUM=TIMCU(INUM)
        J=1                ! J = PLOT-INTERVAL (HOURLY)
        DO 20 I=1,INUM-1   ! I = SAMPLING-TIJDSTIP TIMCU(I)
 30     HPJ=J
        IF(HPJ.GT.TIMCU(I).AND.HPJ.LE.TIMCU(I+1))GOTO 25
        GOTO 20
 25     DSL=HPJ-TIMCU(I)
        DST=SAITV(I+1)
        RATL(1,J)=I
        RATL(2,J)=1.-(DSL/DST)
        J=J+1
        IF(J.GT.ITCUM)GOTO 35
        GOTO 30
 20     CONTINUE
C-----  GA NU WEER TERUG VAN HONDERDTALLEN NAAR MINUTEN (UITVOER)
 35     DO 40 I=1,INUM
        ITC=TIMCU(I)
 40     TIMCU(I)=ITC+(TIMCU(I)-ITC)*.6      !TIJDSTIP
C-----  'ONTRAFEL' TIMCU(INUM) T.B.V. UITVOER 'DUUR VAN DE PROEF'
        IXMIN=(TIMCU(INUM)-ITC)*100
        DC=ITC/24.
        IDC=DC                        !AANTAL DAGEN
        VDC=DC-IDC
        UDC=VDC*24.
        IUDC=UDC                      !AANTAL UREN
        VUDC=UDC-IUDC
        IMC=VUDC*60+IXMIN    !AANTAL MINUTEN
        IF(IMC.GE.60)IUDC=IUDC+1
        IF(IMC.GE.60)IMC=IMC-60
        IF(IUDC.GE.24)IDC=IDC+1
        IF(IUDC.GE.24)IUDC=IUDC-24
        DO 45 I=2,INUM
        ITC=SAITV(I)
 45     SAITV(I)=ITC+(SAITV(I)-ITC)*.6      !INTERVALDUUR
        ITC=STSA
        STSA=ITC+(STSA-ITC)*.6   !STANDAARDAFWIJKING INTERVALDUUR
        ITC=SAIGEM
        SAIGEM=ITC+(SAIGEM-ITC)*.6      !GEMIDDELDE INTERVALDUUR
C-----  RE-ARRANGE  ARRAYS TIMCU(I) EN SAITV(I) TO FACILITATE OUTPUT
        J=1
        DO 46 I=1,30
        IPLJ(I)=J
        PTIM(I)=TIMCU(J)
        PSAI(I)=SAITV(J)
        J=J+10
        IF(I.EQ.3.OR.I.EQ.6.OR.I.EQ.9.OR.I.EQ.12.OR.I.EQ.15.OR.I.EQ.
        118.OR.I.EQ.21.OR.I.EQ.24.OR.I.EQ.27)J=J-29
 46     CONTINUE
        DO 31 I=ITCUM+1,2,-1
        RATL(1,I)=RATL(1,I-1)
 31     RATL(2,I)=RATL(2,I-1)
        RATL(1,1)=1.
        RATL(2,1)=1.
C***********************************************************************
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C*****  UITVOER GEREGISTREERDE GEGEVENS PER KOLOM
C***********************************************************************
        ICYL=1
        WRITE(3,202)ICYL,((I,IGMDT(I),(GENDAT(I,J),J=3,8),(CD1(I,K),
       1K=2,12)),I=1,INUM)
        ICYL=2
        WRITE(3,202)ICYL,((I,IGMDT(I),(GENDAT(I,J),J=3,8),(CD2(I,K),
       1K=2,12)),I=1,INUM)
        ICYL=3
        WRITE(3,202)ICYL,((I,IGMDT(I),(GENDAT(I,J),J=3,8),(CD3(I,K),
       1K=2,12)),I=1,INUM)
        ICYL=4
        WRITE(3,202)ICYL,((I,IGMDT(I),(GENDAT(I,J),J=3,8),(CD4(I,K),
       1K=2,12)),I=1,INUM)
C***********************************************************************
C*****  DATA-PROCESSING ** EERST ALGEMEEN: WATERTEMP. EN VISCOSITEIT
C***********************************************************************
C-----  BEREKEN VISCOSITEIT NA LINEARISATIE TABEL V-2 PAG. V-13 COL-
C-----  LEGEDICTAAT 'AGROHYDROLOGIE' LANDBOUWHOGESCHOOL (CENTIPOISE)
        DO 50 I=1,INUM
        TGEM(I)=GENDAT(I,5)*.6+GENDAT(I,6)*.4                    !@PLOT
  50    VISC(I)=1.13-(TGEM(I)-15.)/42.                           !@PLOT
C-----  BEREKEN GEMIDDELDE TEMPERATUUR PER MEETPUNT GEDURENDE DE GE-
C-----  HELE RUN, DE STANDAARDAFWIJKING + KORRELATIEKOEFFICIENTEN M.
C-----  B.V. IMSL-SUBROUTINE 'BECORI'. - TEMP.DATA GAAT IN ARRAY 'X'
        N=INUM
        DO 55 I=1,N
          DO 55 J=1,5
  55      X(I,J)=GENDAT(I,J+3)
        CALL BECORI(X,N,5,30,XM,S,R,IER)                         !@IMSL
C***********************************************************************
C*****  DATA-PROCESSING ** NU DE GEGEVENS VAN DE VIER KOLOMMEN *****
C***********************************************************************
C-----  BEREKEN 'RATIO' I.V.M. AFVOER PER METER DRAINLENGTE =F(DIAM)
        RAT=DIAM*314.1593/176.715*86.4/EL
C-----  BEREKEN 'RATIO' I.V.M. GEMIDDELDE STROOMSNELHEID PERFORATIES
        RAP=314.1593*DIAM/(PERF*176.7)
C-----  BEREKEN DEBIET VIER  KOLOMMEN MBV IJKCURVE BROOKS FLOWMETERS
C-----  EERST DEBIETEN BIJ GEMETEN TEMPERATUREN, IJKCURVE ANALYTISCH
        DO 60 I=1,INUM
        FLO1(I)=(3.44+.367*(CD1(I,2)-15.)*EXP(CD1(I,2)**3/(143.375*1
       10**6)))*.136667                     !CC PER SECONDE
        FLO2(I)=(3.44+.367*(CD2(I,2)-15.)*EXP(CD2(I,2)**3/(143.375*1
       10**6)))*.136667                     !CC PER SECONDE
        FLO3(I)=(3.44+.367*(CD3(I,2)-15.)*EXP(CD3(I,2)**3/(143.375*1
       10**6)))*.136667                     !CC PER SECONDE
        FLO4(I)=(3.44+.367*(CD4(I,2)-15.)*EXP(CD4(I,2)**3/(143.375*1
       10**6)))*.136667                     !CC PER SECONDE
C-----  DEBIETEN GENORMEERD OP TIEN GRAAD CELCIUS
        F10L1(I)=FLO1(I)*VISC(I)/1.31                            !@PLOT
        F10L2(I)=FLO2(I)*VISC(I)/1.31                            !@PLOT
        F10L3(I)=FLO3(I)*VISC(I)/1.31                            !@PLOT
  60    F10L4(I)=FLO4(I)*VISC(I)/1.31                            !@PLOT
C-----  BEREKEN GEMIDDELD DEBIET (TIEN GR.) VIER KOLOMMEN  GEDURENDE
C-----  DE GEHELE RUN, STANDAARDAFWIJKING +  KORRELATIEKOEFFICIENTE.
C-----  M.B.V. IMSL-SUBROUTINE 'BECORI', FLOWDATA GAAT IN ARRAY 'FX'
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            N=INUM
            DO 65 I=1,N
            FX(I,1)=F10L1(I)
            FX(I,2)=F10L2(I)
            FX(I,3)=F10L3(I)
 65         FX(I,4)=F10L4(I)
            CALL BECORI(FX,N,4,30,FXM,FS,RF,IER)                 !@IMSL
C-----      BIJ LABORATORIUMTEMPERATUUR EVENALS BIJ TIEN  GRADEN CELCIUS
C-----      BEREKENING AFVOER PER METER DRAINLENGTE BIJ GEGEVEN DIAMETER
C-----      VAN DE DRAINBUIS EN DRAINAFSTAND
            DO 70 I=1,INUM
            AFV1(I)=FL01(I)*RAT
            AFV2(I)=FL02(I)*RAT
            AFV3(I)=FL03(I)*RAT
            AFV4(I)=FL04(I)*RAT
            A1F10(I)=F10L1(I)*RAT
            A2F10(I)=F10L2(I)*RAT
            A3F10(I)=F10L3(I)*RAT
            A4F10(I)=F10L4(I)*RAT
C-----      BEREKENING VAN DE GEMIDDELDE STROOMSNELHEID DOOR DE PERFORA-
C-----      TIES IN CM./SEC. BIJ GEGEVEN PERFORATIEGRAAD [CM.**2/M.BUIS]
            FLPR1(I)=FL01(I)*RAP
            FLPR2(I)=FL02(I)*RAP
            FLPR3(I)=FL03(I)*RAP
            FLPR4(I)=FL04(I)*RAP
            F10P1(I)=F10L1(I)*RAP
            F10P2(I)=F10L2(I)*RAP
            F10P3(I)=F10L3(I)*RAP
 70         F10P4(I)=F10L4(I)*RAP
C*****************************************************************
C+++++      BEREKENING DOORLATENDHEID BIJ 10 GRADEN CELCIUS; DIT GEBEURT
C+++++      OP DE VOLGENDE PUNTEN:-
C+++++      - 1) DOORLATENDHEID OMHULLINGSMATERIAAL; PIEZOMETERS # 1 & 2
C+++++      - 2) DOORLATENDHEID BODEMMONSTER A: PIEZOMETERS # 2 EN 3
C+++++      - 3)     "          "         "       B: PIEZOMETERS # 3 EN 4
C+++++      - 4)     "          "         "       C:     "       # 4 EN 5
C+++++      - 5)     "          "         "       D:     "       # 5 EN 6
C+++++      - 6)     "          "         "       E:     "       # 6 EN 7
C+++++      - 7)     "          "         "       F:     "       # 7 EN 8
C+++++      - 8)     "          "         "       G:     "       # 8 EN 9
C+++++      - 9)     "          "    GRONDKOLOM TOTAAL;  "       # 2 EN 9
C+++++      -10)     "          "    BODEMMATERIAAL + OMHULLING # 1 EN 10
C*****************************************************************
C-----      BEREKENDE DOORLATENDHEDEN GAAN IN ARRAYS CD1, CD2, CD3 & CD4
            DO 75 I=1,INUM
C-----      DOORLATENDHEDEN VAN HET OMHULLINGSMATERIAAL
            CD1(I,1)=4.8896*F10L1(I)*DIKTE/(CD1(I,4)-CD1(I,3))      !@PLOT
            CD2(I,1)=4.8896*F10L2(I)*DIKTE/(CD2(I,4)-CD2(I,3))      !@PLOT
            CD3(I,1)=4.8896*F10L3(I)*DIKTE/(CD3(I,4)-CD3(I,3))      !@PLOT
            CD4(I,1)=4.8896*F10L4(I)*DIKTE/(CD4(I,4)-CD4(I,3))      !@PLOT
C-----      DOORLATENDHEDEN VAN DE KOLOM ALS GEHEEL
            CD1(I,2)=4.8896*F10L1(I)*PH(2)/(CD1(I,12)-CD1(I,3))     !@PLOT
            CD2(I,2)=4.8896*F10L2(I)*PH(2)/(CD2(I,12)-CD2(I,3))     !@PLOT
            CD3(I,2)=4.8896*F10L3(I)*PH(2)/(CD3(I,12)-CD3(I,3))     !@PLOT
            CD4(I,2)=4.8896*F10L4(I)*PH(2)/(CD4(I,12)-CD4(I,3))     !@PLOT
C-----      DOORLATENDHEDEN VAN HET BODEMMONSTER ALS GEHEEL
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              CD1(I,3)=4.8896*F10L1(I)*PH(3)/(CD1(I,11)-CD1(I,4))     !@PLOT
              CD2(I,3)=4.8896*F10L2(I)*PH(3)/(CD2(I,11)-CD2(I,4))     !@PLOT
              CD3(I,3)=4.8896*F10L3(I)*PH(3)/(CD3(I,11)-CD3(I,4))     !@PLOT
        75    CD4(I,3)=4.8896*F10L4(I)*PH(3)/(CD4(I,11)-CD4(I,4))     !@PLOT
        C-----  DOORLATENDHEDEN VAN DE OPEENVOLGENDE SECTIES VH BODEMMONSTER
              DO 80 I=1,INUM
                DO 80 J=4,10
                CD1(I,J)=4.8896*F10L1(I)*PH(J)/(CD1(I,J+1)-CD1(I,J))!@PLOT
                CD2(I,J)=4.8896*F10L2(I)*PH(J)/(CD2(I,J+1)-CD2(I,J))!@PLOT
                CD3(I,J)=4.8896*F10L3(I)*PH(J)/(CD3(I,J+1)-CD3(I,J))!@PLOT
        80      CD4(I,J)=4.8896*F10L4(I)*PH(J)/(CD4(I,J+1)-CD4(I,J))!@PLOT
        C*********************************************************************
        C*****  BEREKENING UNIFORMITY - COEFFICIENTS  VAN  HET  BODEMMONSTER
        C*********************************************************************
              DO 71 I=1,6
        71    FR(I)=IFRA(I)
              J=1
              CBAR=0.
              DO 85 I=1,6
              CBR=CBAR
              CBAR=CBAR+FR(I)
        90    JJ=J*10
              IF(FLOAT(JJ).LE.CBAR)DSOIL(J)=GRNS(I)+(((FLOAT(JJ)-CBR)/(CBA
             1R-CBR))*FRAK(I))
              IF(FLOAT(JJ).LE.CBAR)J=J+1
              IF(J.EQ.10)GOTO 95
              IF(FLOAT(JJ).LE.CBAR)GOTO 90
        85    CONTINUE
        95    D91=DSOIL(9)/DSOIL(1)
              D61=DSOIL(6)/DSOIL(1)
              D82=DSOIL(8)/DSOIL(2)
              D73=DSOIL(7)/DSOIL(3)
              D64=DSOIL(6)/DSOIL(4)
        C*********************************************************************
        C*****  **** BEREKEN  KORRELATIEMATRICES VAN DE DOORLATENDHEDEN ****
        C*********************************************************************
        C-----  TEVENS GEMIDDELDEN EN STANDAARDAFWIJKINGEN [PRINTED EARLIER]
        C-----  PERMEABILITY-DATA IS INPUT TO SCRATCH-ARRAY FIRST
        C-----  I = NIVEAU IN KOLOM, J = # OF READINGS
              N=INUM
              DO 81 I=1,10
                DO 82 J=1,INUM
                XDL(J,1)=CD1(J,I)
                XDL(J,2)=CD2(J,I)
                XDL(J,3)=CD3(J,I)
        82      XDL(J,4)=CD4(J,I)
              CALL BECORI(XDL,N,4,30,XMDL,SDL,RDL,IER)                !@IMSL
        C-----  STATISTICAL DATA FROM IMSL- & SCRATCHARRAYS TO PRINTINGFILES
                DO 83 J=1,4
                SDDL(J,I)=SDL(J)
        83      XMDDL(J,I)=XMDL(J)
                IP=(I-.99)*10
        C-----  KORRELATIEDATA SEQUENTIEEL IN PRINTINGVECTOR, J =MATRIXCOORD
                DO 84 J=1,10
                IPP=IP+J
        84      RPDL(IPP)=RDL(J)      !PRINTING VECTOR KORRELATIEDATA
```

```
        81      CONTINUE
        C-----  NU VERGELIJKING VAN ALLE TIEN NIVEAUS PER KOLOM AFZONDERLIJK
        C-----  PERMEABILITY-DATA IS INPUT TO SCRATCH-ARRAY FIRST
        C-----  ARRAYS SDK EN XMDK WORDEN VOORLOPIG NIET GEBRUIKT  J = LEVEL
        C-----  KOLOM = 1
                DO 86 I=1,INUM
                  DO 86 J=1,10
        86        XDK(I,J)=CD1(I,J)
                CALL BECORI(XDK,N,10,30,XMDK,SDK,RDK,IER)          !@IMSL
        C-----  FILL PRINTING VECTOR KORRELATIEDATA
                DO 87 I=1,55
        87      REDK(I)=RDK(I)          !PRINTING VECTOR KORRELATIEDATA
        C-----  KOLOM = 2
                DO 89 I=1,INUM
                  DO 88 J=1,10
        88        XDK(I,J)=CD2(I,J)
                CALL BECORI(XDK,N,10,30,XMDK,SDK,RDK,IER)          !@IMSL
                DO 89 I=56,110
        89      REDK(I)=RDK(I-55)       !PRINTING VECTOR KORRELATIEDATA
        C-----  KOLOM = 3
                DO 76 I=1,INUM
                  DO 76 J=1,10
        76        XDK(I,J)=CD3(I,J)
                CALL BECORI(XDK,N,10,30,XMDK,SDK,RDK,IER)          !@IMSL
                DO 77 I=111,165
        77      REDK(I)=RDK(I-110)      !PRINTING VECTOR KORRELATIEDATA
        C-----  KOLOM = 4
                DO 78 I=1,INUM
                  DO 78 J=1,10
        78        XDK(I,J)=CD4(I,J)
                CALL BECORI(XDK,N,10,30,XMDK,SDK,RDK,IER)          !@IMSL
                DO 79 I=166,220
        79      REDK(I)=RDK(I-165)      !PRINTING VECTOR KORRELATIEDATA
        C***************************************************************
        C*****  VUL PLOT-ARRAYS EN UITVOER PLOTFILES NAAR DSKE; DE PLOTFILES
        C*****  MOETEN DATA BEVATTEN MET CONSTANTE SAMPLING-INTERVALDUUR OM-
        C*****  DAT HET GEBRUIKTE PLOTPROGRAMMA (ONTWERP: IR. C. VAN DRECHT)
        C*****  DEZE INPUT VEREIST. HIERTOE WORDEN DE OP ONREGELMATIGE TIJD-
        C*****  STIPPEN GEREGISTREERDE WAARNEMINGEN M.B.V. LINEAIRE INTERPO-
        C*****  LATIE OMGEWERKT TOT 1-UURS INTERVALLEN; DE HIERTOE BENODIGDE
        C*****  RATIO'S WERDEN AL EERDER IN HET PROGRAM BEREKEND (RATL(2,J))
        C-----  DE VOLGENDE GROOTHEDEN ZULLEN IN DE VORM VAN PLOTFILES NAAR
        C-----  DSKE WORDEN UITGEVOERD:-
        C-----  DE TEMPERATUUR IN HET 'FELLOW-LABORATORIUM'; DSKFILE: 'TEEL'
        C-----  DE WATERTEMPERATUREN: - 1) IN DE AANVOERBUIS           'TANB'
        C-----                        - 2) IN DE AFVOERBUIS            'TAFB'
        C-----                        - 3) HET BOVENSTE OVERSTORTVAT   'THIV'
        C-----                        - 4) HET ONDERSTE OVERSTORTVAT   'TLOV'
        C-----  DE GEMIDDELDE WATERTEMPERATUUR                         'TGEM'
        C-----  DE VISCOSITEIT VAN HET WATER ALS FUNKTIE VAN T GEM     'VISC'
        C-----  DE LEBIETEN BIJ TIEN GRAAD CELCIUS (VIER MAAL)  'LEB1,2,3,4'
        C-----  DE TIEN DOORLATENDHEDEN EN KOMBINATIES HIERVAN, ZOALS EERDER
        C-----  IN HET PROGRAMMA BEREKEND (F*) 'KFIL, KTOT, KSOL, K4 T/M 10'
        C+++++  GEBRUIK VOOR IEDERE WEG TE SCHRIJVEN DATAFILE DEZELFDE ARRAY
        C+++++  (PREPL(975)) OM GEINTERPOLEERDE DATA TIJDELIJK OP TE SLAAN
        C+++++  HET AANTAL TE PLOTTEN PUNTEN WORDT GEGEVEN DOOR 'IPLOT'
```

```
C*******************************************************************
C-----  VUL SCRATCH-ARRAY 'PREPL' -- WE DOEN DIT IN TOTAAL 51 MAAL
C-----  'IPLOT' IS HET AANTAL TE PLOTTEN, GEINTERPOLEERDE PUNTEN DAT
C-----  NAAR DSK(E) WORDT WEGGESCHREVEN. -- 'IPRE' = SEQUENCE # VAN
C-----  DE DIRECT VOORAFGAANDE METING, 'IAFT' = SEQUENCE # VD DIRECT
C-----  DAAROP VOLGENDE METING. 'RATIOL' EN 'RATIOR' ZIJN DE RATIO'S
C-----  WAARMEE ELKE GEINTERPOLEERDE  PLOTWAARDE WORDT BEREKEND
C*******************************************************************
        IPLOT=ITCUM+1
C-----  BEREKEN DE INTERPOLATIERATIO'S & SEQUENCE #'S BEFORE & AFTER
        DO 500 I=1,IPLOT
        IPRE(I)=RATL(1,I)
        IAFT(I)=IPRE(I)+1
        RATIOL(I)=RATL(2,I)
 500    RATIOR(I)=1.-RATIOL(I)
C-----  EERST DE VIJF TEMPERATUREN 'GENDAT(I,J)'
        DO 505 I=4,8
          DO 510 J=1,IPLOT
 510      PREPL(J)=RATIOL(J)*GENDAT(IPRE(J),I)+RATIOR(J)*GENDAT(IAFT
        1 (J),I)
C-----  SCHRIJF DE DATAFILE WEG NAAR DSKE
        OPEN (UNIT=1,DEVICE='DSKE',ACCESS='SEQOUT',FILE=PLNCM(I-3))
        WRITE(1,222)IPLOT,IPLOT
        WRITE(1,223)(PREPL(N),N=1,IPLOT)
 505    CLOSE(UNIT=1)
C-----  DE GEMIDDELDE WATERTEMPERATUUR 'TGEM(I)'
        DO 515 J=1,IPLOT
 515    PREPL(J)=RATIOL(J)*TGEM(IPRE(J))+RATIOR(J)*TGEM(IAFT(J))
        OPEN(UNIT=1,DEVICE='DSKE',ACCESS='SEQOUT',FILE='TGEM.DAT')
        WRITE(1,222)IPLOT,IPLOT
        WRITE(1,223)(PREPL(I),I=1,IPLOT)
        CLOSE(UNIT=1)
C-----  DE VISCOSITEIT VAN HET WATER BIJ GEM. TEMPERATUUR  'VISC(I)'
        DO 520 J=1,IPLOT
 520    PREPL(J)=RATIOL(J)*VISC(IPRE(J))+RATIOR(J)*VISC(IAFT(J))
        OPEN(UNIT=1,DEVICE='DSKE',ACCESS='SEQOUT',FILE='VISC.DAT')
        WRITE(1,222)IPLOT,IPLOT
        WRITE(1,223)(PREPL(I),I=1,IPLOT)
        CLOSE(UNIT=1)
C-----  DE DEBIETEN, GENORMEERD OP 10 GRAAD CELCIUS 'F10L1/2/3/4(I)'
        DO 525 I=1,4
          DO 530 K=1,INUM
          IF(I.EQ.1)F10L(K)=F10L1(K)
          IF(I.EQ.2)F10L(K)=F10L2(K)
          IF(I.EQ.3)F10L(K)=F10L3(K)
 530      IF(I.EQ.4)F10L(K)=F10L4(K)
          DO 535 J=1,IPLOT
 535      PREPL(J)=RATIOL(J)*F10L(IPRE(J))+RATIOR(J)*F10L(IAFT(J))
        OPEN(UNIT=1,DEVICE='DSKE',ACCESS='SEQOUT',FILE=PLNCM(I+5))
        WRITE(1,222)IPLOT,IPLOT
        WRITE(1,223)(PREPL(N),N=1,IPLOT)
 525    CLOSE(UNIT=1)
C-----  DE AFGELEIDE DOORLATENDHEDEN BIJ 10 GRAAD CELCIUS (TOT. 40 STUKS)
        K=9
        DO 545 I=1,10
          DO 545 J=1,4
```

```
          DO 550 L=1,INUM
          IF(K.EQ.1)CD(L)=CD1(L,I)
          IF(K.EQ.2)CD(L)=CD2(L,I)
          IF(K.EQ.3)CD(L)=CD3(L,I)
550       IF(K.EQ.4)CD(L)=CD4(L,I)
          DO 555 J=1,IPLOT
555       PREPL(J)=RATIOL(J)*CD(IPRE(J))+RATIOP(J)*CD(IAFT(J))
        M=M+1
        OPEN(UNIT=1,DEVICE='DSKE',ACCESS='SEQOUT',FILE=PLNOM(M))
        WRITE(1,222)IPLOT,IPLOT
        WRITE(1,223)(PREPL(N),N=1,IPLOT)
545     CLOSE(UNIT=1)
C*****************************************************************
C*************** * * UITVOER VAN DE VERWERKTE GEGEVENS * * ********
C*****************************************************************
C-----  UITVOER VERWERKTE GEGEVENS PER KOLOM
      ICYL=1
      WRITE(3,203)ICYL,EL,DIAM,PERF,((I,TGEM(I),VISC(I),FLC1(I),F1
     1OL1(I),AFV1(I),A1F10(I),FLPR1(I),F10P1(I),CD1(I,1),(CD1(I,J
     2),J=4,10),CD1(I,3),CD1(I,2)),I=1,INUM)
C-----  GEMIDDELDEN EN STANDAARDAFWIJKINGEN, BEREKEND MET 'BECORI'
      WRITE(3,204)XMPDL(1,1),(XMPDL(1,J),J=4,10),XMPDL(1,3),XMPDL(
     11,2),SPDL(1,1),(SPDL(1,J),J=4,10),SPDL(1,3),SPDL(1,2)
      ICYL=2
      WRITE(3,203)ICYL,EL,DIAM,PERF,((I,TGEM(I),VISC(I),FLC2(I),F1
     1OL2(I),AFV2(I),A2F10(I),FLPR2(I),F10P2(I),CD2(I,1),(CD2(I,J
     2),J=4,10),CD2(I,3),CD2(I,2)),I=1,INUM)
      WRITE(3,204)XMPDL(2,1),(XMPDL(2,J),J=4,10),XMPDL(2,3),XMPDL(
     12,2),SPDL(2,1),(SPDL(2,J),J=4,10),SPDL(2,3),SPDL(2,2)
      ICYL=3
      WRITE(3,203)ICYL,EL,DIAM,PERF,((I,TGEM(I),VISC(I),FLC3(I),F1
     1OL3(I),AFV3(I),A3F10(I),FLPR3(I),F10P3(I),CD3(I,1),(CD3(I,J
     2),J=4,10),CD3(I,3),CD3(I,2)),I=1,INUM)
      WRITE(3,204)XMPDL(3,1),(XMPDL(3,J),J=4,10),XMPDL(3,3),XMPDL(
     13,2),SPDL(3,1),(SPDL(3,J),J=4,10),SPDL(3,3),SPDL(3,2)
      ICYL=4
      WRITE(3,203)ICYL,EL,DIAM,PERF,((I,TGEM(I),VISC(I),FLC4(I),F1
     1OL4(I),AFV4(I),A4F10(I),FLPR4(I),F10P4(I),CD4(I,1),(CD4(I,J
     2),J=4,10),CD4(I,3),CD4(I,2)),I=1,INUM)
      WRITE(3,204)XMPDL(4,1),(XMPDL(4,J),J=4,10),XMPDL(4,3),XMPDL(
     14,2),SPDL(4,1),(SPDL(4,J),J=4,10),SPDL(4,3),SPDL(4,2)
C-----  UITVOER 'SAMENVATTING RESULTATEN'
      WRITE(3,205)IRUN,WFAP,DATI,IRUN,DATU,INUM,IDC,IUDC,IMC,SAIGE
     1R,STSA,(XM(I),I=1,5),R(1),(S(I),I=1,5),(R(I),I=2,15),(FXM(I
     2),I=1,4),RF(1),(FS(I),I=1,4),(RF(I),I=2,10)
      WRITE(3,206)((IPL(I),PTIM(I),PSAI(I)),I=1,30),(DSOIL(I),I=1
     1,9),D91,D61,D82,D73,D64
C-----  UITVOER ALLE KORRELATIEMATRICES VAN DE DOORLATENDHEDEN BODEM
      WRITE(3,207)IRUN
      WRITE(3,208)
      WRITE(3,209)(RPDL(1+I),I=0,40,10),((RPDL(2+I),RPDL(3+I)),I=0
     1,40,10),((RPDL(4+I),RPDL(5+I),RPDL(6+I)),I=0,40,10),((RPDL(
     27+I),RPDL(8+I),RPDL(9+I),RPDL(10+I)),I=0,40,10)
      WRITE(3,210)
      WRITE(3,209)(RPDL(51+I),I=0,40,10),((RPDL(52+I),RPDL(53+I)),
     1I=0,40,10),((RPDL(54+I),RPDL(55+I),RPDL(56+I)),I=0,40,10),(
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```
              2(RPDL(57+I),RPDL(58+I),RPDL(59+I),RPDL(60+I)),I=0,40,10)
              WRITE(3,211)
              WRITE(3,212)RPDK(1),RPDK(56),RPDK(2),RPDK(3),RPDK(57),RPDK(5
             18),(RPDK(I),I=4,6),(RPDK(I),I=59,61),(RPDK(I),I=7,10),(RPDK
             2(I),I=62,65),(RPDK(I),I=11,15),(RPDK(I),I=66,70),(RPDK(I),I
             3=16,21),(RPDK(I),I=71,76),(RPDK(I),I=22,28),(RPDK(I),I=77,8
             43),(RPDK(I),I=29,36),(RPDK(I),I=84,91),(RPDK(I),I=37,45),(R
             5PDK(I),I=92,100),(RPDK(I),I=46,55),(RPDK(I),I=101,110)
              WRITE(3,215)IRUN
              WRITE(3,213)
              WRITE(3,212)RPDK(111),RPDK(166),RPDK(112),RPDK(113),RPDK(167
             1),RPDK(168),(RPDK(I),I=114,116),(RPDK(I),I=169,171),(RPDK(I
             2),I=117,120),(RPDK(I),I=172,175),(RPDK(I),I=121,125),(RPDK(
             31),I=176,180),(RPDK(I),I=126,131),(RPDK(I),I=181,186),(RPDK
             4(I),I=132,138),(RPDK(I),I=187,193),(RPDK(I),I=139,146),(RPD
             5K(I),I=194,201),(RPDK(I),I=147,155),(RPDK(I),I=202,210),(RP
             6DK(I),I=156,165),(RPDK(I),I=211,220)
              WRITE(3,218)
              DO 61 I=1,10
              II=(I-1)*4+1
 61           WRITE(3,219)(I,(DNON(J),J=II,II+3))
C***********************************************************************
C** *SCATTERDIAGRAMS DOORLATENDHEDEN MET SIGNIFICANTE KORRELATIE* **
C***********************************************************************
C------ CHECK PER KOLOM WELKE DOORLATENDHEDEN  SIGNIFICANT  GEKORRE-
C------ LEERD ZIJN ( > 0.85 OF < -0.25 ) EN PRINT DEZE GEVALLEN; MET
C------ BEHULP VAN SUBROUTINE 'SCAT' ZETTEN WE DE DOORLATENDHEDEN IN
C------ X- EN Y-RICHTING UIT OP DE REGELDRUKKER (AUTOMATIC SCALING).
C------ I = SEQUENCE # KOLOM, J = PLAATS IN KORRELATIEVECTOR
              IPAG=12
              DO 21 I=1,4
              K=1
              IP=(I-1)*55
C------ HAAL SIGNIFICANTE KORRELATIES ERUIT
                DO 22 J=1,55
                JJ=J+IP
                IF(RPDK(JJ).EQ.1.) GOTO 22
                IF(RPDK(JJ).GE.0.85.OR.RPDK(JJ).LE.-0.85)ISIG(K)=J
                IF(RPDK(JJ).GE.0.85.OR.RPDK(JJ).LE.-0.85)ISG(K)=JJ
                IF(RPDK(JJ).GE.0.85.OR.RPDK(JJ).LE.-0.85)K=K+1
 22             CONTINUE
C------ BEPAAL KOLOM- EN RIJ # IN MATRIX BIJ SIGNIFICANTE KORRELATIE
              KAANT(I)=K-1
              IF(K.EQ.1)GOTO 425
                DO 23 J=1,K-1
                  DO 24 L=1,10
                  ISIG(J)=ISIG(J)-L
                  IRY(J)=L
                  IKOL(J)=ISIG(J)+L
 24               IF(ISIG(J).LE.0)GOTO 23
 23             CONTINUE
C------ PRINT DE GEVALLEN MET SIGNIFICANTE KORRELATIE
 425          IPAG=IPAG+1
              WRITE(3,220)IRUN,IPAG
              IF(K.EQ.1)WRITE(3,224)I
              IF(K.EQ.1)GOTO 21
```

```
              WRITE(3,216)I
                DO 26 J=1,K-1
                IDR=IRY(J)*4-3
                IDK=IKOL(J)*4-3
      26        WRITE(3,217)J,(DNOM(IID),IID=IDR,IDR+3),(DNOM(IID),IID=IDK
              1 ,IDK+3),RPDK(ISG(J))
              IF(I.EQ.1)IPAG=IPAG+1
              IF(L.EQ.1)WRITE(3,221)
      C-----  DE BEREKENDE DOORLATENDHEDEN (2 DATA-SETS) ALSMEDE  DE IDEN-
      C-----  TIFICATIE VAN DE DESBETREFFENDE HORIZONTEN WORDEN IN SCRATCH
      C-----  ARRAYS GEPLAATST, WAARNA HET SCATTERDIAGRAM  WORDT  GETEKEND
                DO 27 J=1,K-1
      C-----  IDENTIFICATIE HORIZONTEN; 'VERTICAAL' EN 'HORIZONTAAL'
                IDR=(IRY(J)-1)*4
                IDK=(IKOL(J)-1)*4
                 DO 29 MM=1,4
                  HORVER(MM)=DNOM(IDK+MM)
      29          HORHOR(MM)=DNOM(IDR+MM)
      C-----  PERMEABILITY-DATA IS INPUT TO SCRATCH-ARRAYS
                  DO 28 L=1,INUM
      C-----  DE VERTIKALE SCHAAL
                  IF(I.EQ.1)VDAT(L)=CD1(L,IKOL(J))
                  IF(I.EQ.2)VDAT(L)=CD2(L,IKOL(J))
                  IF(I.EQ.3)VDAT(L)=CD3(L,IKOL(J))
                  IF(I.EQ.4)VDAT(L)=CD4(L,IKOL(J))
      C-----  DE HORIZONTALE SCHAAL
                  IF(I.EQ.1)HDAT(L)=CD1(L,IRY(J))
                  IF(I.EQ.2)HDAT(L)=CD2(L,IRY(J))
                  IF(I.EQ.3)HDAT(L)=CD3(L,IRY(J))
      28          IF(I.EQ.4)HDAT(L)=CD4(L,IRY(J))
      C-----  TEKEN HET SCATTERDIAGRAM OP DE REGELDRUKKER
              SCRUR=RPDK(ISG(J))
              ISCKOL=I
              IPAG=IPAG+1
      27      CALL SCAT                                                !@SCAT
      21      CONTINUE
      C******************************************************************
      C*****  BEREKEN CUMULATIEF # OCCURRENCES SIGNIFICANTE KORRELATIES **
      C******************************************************************
      C-----  1). VERGELIJKING ALLE NIVEAUS PER KOLOM
              DO 600 I=1,55
              IKGCUM(I)=0
                DO 600 J=0,3
                ICK=I+55*J
      600       IF(RPDK(ICK).GE.0.85.OR.RPDK(ICK).LE.-0.85)IKGCUM(I)=IKGCU
              1  M(I)+1
      C-----  2).VERGELIJKING VIER KOLOMMEN PER NIVEAU
              DO 605 I=1,10
              ILGCUM(I)=0
                DO 605 J=0,9
                ICK=I+10*J
      605       IF(RPDL(ICK).GE.0.85.OR.RPDL(ICK).LE.-0.85)ILGCUM(I)=ILGCU
              1  M(I)+1
      C-----  GOOI BEIDE DIAGONALES MET DE "ENEN" ERUIT
      C-----  1). ALLE NIVEAUS PER KOLOM
              IKGCUM(1)=0
```

```
              ICC=3
              DO 610 I=3,11
              ILGCUM(ICC)=0
610           ICC=ICC+I
C-----        2). VIER KOLOMMEN PER NIVEAU
              ILGCUM(1)=0
              ILGCUM(3)=0
              ILGCUM(5)=0
              ILGCUM(10)=0
C-----        UITVOER
              IPAG=IPAG+1
              WRITE(3,220)IRUN,IPAG
              WRITE(3,225)ILGCUM,IPGCUM
              WRITE(3,214)MAAND
              STOP
C***************************************************************************
C************************* * * FORMAT - STATEMENTS * * *****************
C***************************************************************************
100           FORMAT(I/3A5/I/4A5/F/4A5/6I,4F)
101           FORMAT(8F)
102           FORMAT(12F)
200           FORMAT(1H1///2(5X,70(1H*)/1,5X,3H***,64X,3H***/5X,3H***,7X,'
              1INSTITUUT VOOR CULTUURTECHNIEK EN WATERHUISHOUDING',7X,3H**
              2*/5X,3H***,11X,'PROJECT 30.6: DRAINAGEOMHULLINGSMATERIALEN'
              3,11X,3H***/5X,3H***,7X,'IR. L.C.P.M. STUYT - ING. H.J. MEIJ
              4ER - H.P. SEITS',7X,3H***/5X,3H***,64X,3H***/5X,3H***,14X,3
              57HWITHER THICKER CHEWY OR THINNER CRISPY,13X,3H***/5X,3H***,
              614X,36HTHE NATURE OF WRAPPING REMAINS MISTY,14X,3H***/5X,3H
              7***,14X,32HLET'S HOPE IT'S DOING A GOOD JOB,18X,3H***/5X,3H
              8***,14X,36HOR DRAINAGE MIGHT COMPLETELY STOP !!,14X,3H***/5
              9X,3H***,64X,3H***,2(/5X,70(1H*))/////17X,38(1H*)/17X,1H*,36
              1X,1H*/17X,'* DATUM PROCESSING: ',2A5,6X,1H*/17X,'* RUN #
              2:',I3,24X,1H*/17X,'* RUN TIJDSTIP: ',3A5,5X,1H*/17X,'* AA
              3NTAL AARNEMINGEN:',I3,11X,1H*/17X,'* WRAPPING: ',4A5,4X,1
              4H*/17X,'* BELASTING:',F6.3,' KG./CM.**2',7X,1H*/17X,'* BO
              5DEMMONSTER: ',4A5,1H*/17X,'* VERDELING FRAKTIES:-',14X,1H*
              6/17X,'*       < 38 MU  :',I5,' GEW. %',9X,1H*/17X,'*    38 -
              753 MU:',I5,' GEW. %',9X,1H*/17X,'*   53 - 75 MU:',I5,' GEW
              8. %',9X,1H*/17X,'*   75 - 106 MU:',I5,' GEW. %',9X,1H*/17X,
              9'*  106 - 150 MU:',I5,' GEW. %',9X,1H*/17X,'*      > 150 MU
              1:',I5,' GEW. %',9X,1H*/17X,'* BUISDIAMETER:',F4.1,' CM.',1
              23X,1H*/17X,'* DRAINAFSTAND:',F5.1,' M.',13X,1H*/17X,'* PE
              3RFORATIEGRAAD: ',F4.1,' CM.**2/M.',3X,1H*/17X,1H*,36X,1H*/1
              47X,38(1H*))
201           FORMAT(1H0//' DE DIKTE VAN HET OMHULLINGSMATERIAAL NA ZETTIN
              1G [SEPARAAT GEMETEN] BEDRAAGT ',F5.2,' CM.')
202           FORMAT(1H1/' GEREGISTREERDE GEGEVENS DOORSTROMINGSPROEVEN KO
              1LOM #',I2/X,54(1H=)//22X,'TEMPERATUREN [GRAAD CELCIUS]',7X,
              2'READOUTS'/26X,36(1H-),3X,'FLOW-',5X,'AFLEZING NIVEAU PIEZOME
              3TERS OP MANOMETERBORDEN [CM.]:-'/26X,'FELL. AANVOER- AFVOER
              4- VAT   VAT',5X,'METER   ',59(1H-)/' METING #   DAG   TIJDS
              5TIP  LAB.   BUIS     BUIS    BOVEN BENEDEN   [MM.]   H 0   H
              6B  H 1.5 H 3.0 H 4.2 H 5.4 H 6.6 H 7.8 H 9.0 H 11.'/X,8(1H-
              7),X,5(1H-),X,8(1H-),X,5(1H-),X,8(1H-),X,7(1H-),X,5(1H-),X,7
              8(1H-),2X,5(1H-),X,10(X,5(1H-))//30(X,I5,I10,F8.2,2(F7.2),2X
              9,3(F7.2),F9.2,X,10(F6.2)/))
```

```
203     FORMAT(1H1/' UITWERKING GEGEVENS DOORSTROMINGSPROEVEN KOLOM
       1#',I2/X,50(1H=)//6X,'GEM.    VIS-    DEBIET KOLOM    KORRELSPON
       2DERENDE    STROOMSNELHEID    BEREKENDE DOORLATENDHEID, GENOR
       3MEERD OP 10 GR. C. [M./ETM.]'/5X,'WATER  COSI-    [CC./SEC.
       4]    WATERSCHIJF [L =    PERFORATIES [PG',3X,59(1H-)/5X,'TEM
       5P.   TEIT   FELL.   TIEM',F7.0,'M.,D',F4.1,' CM.]',F7.1,' C
       6M.**2/M.]    WRAP= >0.0= >1.5= >3.0= >4.2= >5.4= >6.6= >7.8-
       7 >6.0- WRAP+'/2X,'#   [C.]   [C.P]   LAB.   GR.C.   LAB. [MM
       8/DAG] 10    LAB. [CM/SEC]10    PING -1.5< -3.0< -4.2< -5.4<
       9-6.6< -7.8< -9.0< -9.0<  SOIL'/X,'--',2(2X,5(1H-)),3X,5(1H-
       1),2X,5(1H-),3X,5(1H-),6X,5(1H-),3X,5(1H-),5X,5(1H-),2X,10(X
       2,5(1H-))//30(I3,2F7.2,F8.3,F7.3,E8.2,3X,2F8.2,F10.2,2X,10(F
       36.2)/))
204     FORMAT(//52X,'GEMIDDELDE WAARDEN:',10(F6.2)//52X,'STANDAARDA
       1FWIJKING:',10(F6.2))
205     FORMAT(1H1/' SAMENVATTING RESULTATEN RUN #',I3,' MET OMHULLI
       1NGSMATERIAAL ',4A5/X,77(1H=)//X,'RUN TIJDSTIP: ',3A5,'  RUN
       2 #',I4,'  DATUM PROCESSING: ',2A5,'  AANTAL METINGEN:',I3,'
       3  DUUR VAN DE PROEF:',I3,' D',I3,' H',I3,' M'//X,'GEMIDDELD
       4E INTERVALDUUR TUSSEN TWEE METINGEN:',F10.2,' [H.M.], EN DE
       5 STANDAARDAFWIJKING VAN DE INTERVALDUUR:',F10.2,' [H.M.]'//
       6/27X,'FELLOW-  AANVOER-  AFVOER-   VAT',5X,'VAT',8X,'KORREL
       7ATIEMATRIX'/29X,'LAB',6X,'BUIS',5X,'BUIS',4X,'BOVEN  BENEDE
       8N',7X,'TEMPERATUREN:-'/27X,7(1H-),2X,8(1H-),2X,7(1H-),2X,5(
       91H-),2X,7(1H-)/78X,'1',4X,'2',4X,'3',4X,'4',4X,'5'/X,'GEMID
       1DELDE TEMPERATUUR:',F9.2,F10.2,F9.2,2(F8.2)/75X,'1',F5.2/X,
       2'STANDAARDAFWIJKING:',3X,2(F10.2),F9.2,2F8.2,7X,'2',2F5.2/7
       35X,'3',3F5.2/75X,'1',4F5.2/75X,'5',5F5.2//28X,'KOLOM 1  KOL
       4OM 2  KOLOM 3  KOLOM 4',13X,'KORRELATIEMATRIX'/28X,4(7(1H-)
       5,2X),14X,'DEBIETEN:-'//X,'GEMIDDELD DEBIET',61X,'1',4X,'2',
       64X,'3',4X,'4'/X,'GEHELE PERIODE [10 GR.]:',4F9.2/75X,'1',F5
       7.2/X,'STANDAARDAFWIJKING:',5X,4F9.2,14X,'2',2F5.2/75X,'3',3
       8F5.2/75X,'4',4F5.2//)
206     FORMAT(1H0,' TIJDSTIPPEN GEGEVENSREGISTRATIE [GEMETEN VANAF
       1BEGINTIJDSTIP DOORSTROMINGSPROEF] PLUS INTERVALDUUR [# UREN
       2 EN MINUTEN]:-'//X,3(6X,'#  TIJDSTIP    INTERVAL ')//X,3(5X
       3,'--   ',8(1H-),4X,8(1H-),X)//10((3(6X,I2,F9.2,F12.2,X))/)//
       4X,'D-WAARDEN VAN HET GEBRUIKTE BODEMMONSTER [GEWICHTSPERCEN
       5TAGES]:-'/X,64(1H-)//X,'D10 = ',F6.2,', D20 = ',F6.2,', D30
       6= ',F6.2,', D40 = ',F6.2,', D50 = ',F6.2,', D60 = ',F6.2,',
       7 D70 = ',F6.2,', D80 = ',F6.2,', D90 = ',F6.2//X,'D90/D10 =
       8 ',F5.2,', D60/D10 = ',F5.2,', D30/D20 = ',F5.2,', D70/D30
       9= ',F5.2,', D60/D40 = ',F5.2,44H [D-WAARDEN IN MICRON, RATI
       1O'S DIMENSIELOOS])
207     FORMAT(1H1/' VERVOLG RUN #',I3,', PAGINA 11'/X,27(1H-))
208     FORMAT(1H0/' KORRELATIEMATRICES VAN DE BEREKENDE DOORLATENDH
       1EDEN; VERGELIJKING VIER KOLOMMEN PER NIVEAU:-'/X,92(1H=)///
       22X,'OMHULLINGSMATERIAAL',8X,'0.0 - 1.5 CM.',11X,'1.5 - 3.0
       3CM.',11X,'3.0 - 4.2 CM.',11X,'4.2 - 5.4 CM.'/2X,19(1H-),8X,
       44(13(1H-),11X)/)
209     FORMAT(1H0,3X,5('1',4X,'2',4X,'3',4X,'4',8X)//X,5('1',F5.2,1
       18X),/X,5('2',2F5.2,13X)/X,5('3',3F5.2,8X)/X,5('4',4F5.2,3X)
       2//)
210     FORMAT(1H0/4X,'5.4 - 6.6 CM.',11X,'6.6 - 7.8 CM.',11X,'7.8 -
       1 9.0 CM.',11X,'0.0 - 9.0 CM.',11X,'OMHULLING + BODEM'/4X,4(
       213(1H-),11X),17(1H-)/)
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211   FORMAT(1H0/' KORRELATIEMATRICES VAN DE BEREKENDE DOORLATENDH
     1EDEN; VERGELIJKING ALLE NIVEAUS PER KOLOM:-'/X,90(1H=)///24
     2X,'KOLOM # 1',56X,'KOLOM # 2'/24X,9(1H-),56X,9(1H-)/)
212   FORMAT(1H0,4X,'1',4X,'2',4X,'3',4X,'4',4X,'5',4X,'6',4X,'7',
     14X,'8',4X,'9',4X,'10',18X,'1',4X,'2',4X,'3',4X,'4',4X,'5',4
     2X,'6',4X,'7',4X,'8',4X,'9',4X,'10'//2X,'1',F5.2,59X,'1',F5.
     32/2X,'2',2F5.2,54X,'2',2F5.2/2X,'3',3F5.2,49X,'3',3F5.2/2X,
     4'4',4F5.2,44X,'4',4F5.2/2X,'5',5F5.2,39X,'5',5F5.2/2X,'6',6
     5F5.2,34X,'6',6F5.2/2X,'7',7F5.2,29X,'7',7F5.2/2X,'8',8F5.2,
     624X,'8',8F5.2/2X,'9',9F5.2,19X,'9',9F5.2/X,'10',10F5.2,13X,
     7'10',10F5.2/)
213   FORMAT(1H0/24X,'KOLOM # 3',56X,'KOLOM # 4'/24X,9(1H=),56X,9(
     11H=)/)
214   FORMAT(1H1/X,132(1H=)/X,'= AANTAL SCATTERDIAGRAMMEN KOLOM #
     11,2,3 EN 4 RESPECTIEVELIJK ',I2,',',I2,',',I2,' EN ',I2,'.
     2--- DE UITVOER VAN DE HOUSTON-PLOTTER AL OPGEHAALD ? ='/X,1
     332(1H=)//X,132(1H=)/X,1H=,130X,1H=/X,'= AANTEKENINGEN',115
     4X,1H=/X,'=   ',13(1H=),115X,1H=,14(2(/X,1H=,130X,1H=)/X,1H=,
     5130(1H.),1H=)/X,132(1H=)//X,132(1H=)/X,132H= STUYT'S APPLIE
     6D SOFTWARE "FINGER LICKIN' GOOD"  -- RUNNING ON THE DEC-10
     7SYSTEM OF THE LANDBOUWHOGESCHOOL [512K CORE] APRIL 1981 =/X
     8,132(1H=))
215   FORMAT(1H1/' VERVOLG RUN #',I3,', PAGINA 12'/X,27(1H-))
216   FORMAT(//' IN KOLOM #',I2,' IS HET VERLOOP VAN DE VOLGENDE D
     1OORLATENDHE-'/' DEN ALS  FUNCTIE VAN DE  TIJD SIGNIFICANT
     2GEKORRELEERD:-'/X,57(1H=)/)
217   FORMAT(1H0,'- ',I3,': KORRELATIE TUSSEN ',4A5,' EN ',4A5,'
     1IS',F6.2)
218   FORMAT(//' DE CIJFERS CORRESPONDEREN MET DE VOLGENDE HORIZON
     1TEN:-'/X,54(1H=)/)
219   FORMAT(1H0,I3,': ',4A5/)
220   FORMAT(1H1/' VERVOLG RUN #',I3,', PAGINA',I3/X,27(1H-))
221   FORMAT(1H1/X,58(1H=)/X,1H=,56X,1H=/X,1H=,' IN DE NU VOLGENDE
     1SCATTERDIAGRAMMEN KORRESPONDEREN DE ='/X,'= GETALLEN WELKE
     2 DE WAARDEN VAN DE METINGEN AANGEVEN MET ='/X,'= DE VOLGORD
     3E VAN DE VERRICHTE METINGEN. INDIEN BEPAALDE ='/X,'= GETALL
     4EN ONTBREKEN ZIJN DE DESBETREFFENDE  MEETWAARDEN ='/X,'= OP
     5 EEN LATER TIJDSTIP WEER GEREALISEERD EN ZIJN  VRCE- ='/X,'
     6= GERE MEETWAARDEN DOOR LATER GEREALISEERDE OVERSCHREVEN ='
     7/X,1H=,56X,1H=/X,58(1H=))
222   FORMAT(I4/I4)
223   FORMAT(10F9.5)
224   FORMAT(//' IN KOLOM #',I2,' BESTAAT GEEN SIGNIFIKANTE  KORRE
     1LATIE TUSSEN'/' DE BEREKENDE DOORLATENDHEDEN ALS FUNKTIE VA
     2N DE TIJD.'/X,57(1H=))
225   FORMAT(//' HET AANTAL KEREN DAT SIGNIFICANTE KORRELATIE WERD
     1 GEKONSTATEERD IS HIERONDER WEERGEGEVEN:'/X,89(1H=)///X,'1.
     2 VERGELIJKING VIER KOLOMMEN PER NIVEAU:-'/X,42(1H-)/////4X,
     3'1    2    3    4'//X,'1',I3/X,'2',I3,I5/X,'3',I3,2I5/X,'4'
     4,I3,3I5///X,'2. VERGELIJKING ALLE NIVEAUS PER KOLOM:-'/X,40
     5(1H-)/////5X,'1',4X,'2',4X,'3',4X,'4',4X,'5',4X,'6',4X,'7',
     64X,'8',4X,'9',4X,'10'//2X,'1',I3/2X,'2',I3,I5/2X,'3',I3,2I5
     7/2X,'4',I3,3I5/2X,'5',I3,4I5/2X,'6',I3,5I5/2X,'7',I3,6I5/2X
     8,'8',I3,7I5/2X,'9',I3,8I5/X,'10',I3,9I5////X,'[1. MAXIMALE
     9AANTAL = 10, 2. MAXIMALE AANTAL = 4]')
      F..r
```

```
C
      SUBROUTINE SCAT
C*****************************************************************
C*** PROGRAM OM EEN SCATTERDIAGRAM TE PLOTTEN OP DE REGELDRUKKER ***
C*****************************************************************
C----- LINEAR- & AUTOMATIC SCALING - EEN 30(MAX) * 2 MATRIX MET SI-
C----- MULTAAN GEMETEN DOORLATENDHEDEN IS VIA COMMON-TRANSFER OVER-
C----- GEBRACHT ALSMEDE DE IDENTIFICATIE VAN DE HORIZONTEN.02-07-79
C*****************************************************************
      COMMON IRUN,INUM,IPAS,ISCKOL,SCKOR,VDAT,HDAT,NOMVER,NOMHOR
      DIMENSION ISCAT(50,50),SCT(32),VDAT(30),HDAT(30),SCAHOR(6),S
     1CAVER(6),SCAT(50),NOMVER(4),NOMHOR(4)
      REAL NOMVER,NOMHOR
      DATA SCT / 2H 1,2H 2,2H 3,2H 4,2H 5,2H 6,2H 7,2H 8,2H 9,2H10
     1,2H11,2H12,2H13,2H14,2H15,2H16,2H17,2H18,2H19,2H20,2H21,2H2
     22,2H23,2H24,2H25,2H26,2H27,2H28,2H29,2H30,2H  ,2H . /
C----- BEREKEN DE HOOGSTE EN DE LAAGSTE REALISATIE
      UPVER=0.
      UPHOR=0.
      DOVER=1000.
      DOHOR=1000.
      DO 5 I=1,INUM
      IF(VDAT(I).GE.UPVER)UPVER=VDAT(I)
      IF(VDAT(I).LE.DOVER)DOVER=VDAT(I)
      IF(HDAT(I).GE.UPHOR)UPHOR=HDAT(I)
5     IF(HDAT(I).LE.DOHOR)DOHOR=HDAT(I)
C----- BEREKEN DE HORIZONTALE EN VERTIKALE SCHAALPUNTEN
      VSVER=(UPVER-DOVER)/5.
      VSHOR=(UPHOR-DOHOR)/5.
      DO 10 I=1,6
      SCAVER(I)=UPVER-VSVER*(I-1)
10    SCAHOR(I)=DOHOR+VSHOR*(I-1)
C----- FILLING ARRAY SCATTERDIAGRAM
      DO 15 I=1,50
        DO 15 J=1,50
15      ISCAT(I,J)=0
      DO 20 I=1,INUM
      IVER=((VDAT(I)-DOVER)*49./(VSVER*5.))+1.
      IHOR=((HDAT(I)-DOHOR)*49./(VSHOR*5.))+1.
20    ISCAT(IVER,IHOR)=1
C----- VULLEN EN PRINTEN VAN (50 KEER) EENDIMENSIONALE ARRAY
      WRITE(3,200)IRUN,ISCKOL,IPAS,NOMVER,NOMHOR
      DO 25 K=50,1,-1
        DO 30 L=1,50
        SCAT(L)=SCT(31)
          DO 35 M=1,INUM
          IF(ISCAT(K,L).EQ.0) GOTO 30
          IF(ISCAT(K,L).EQ.M) SCAT(L)=SCT(M)
          IF(ISCAT(K,L).EQ.M) GOTO 30
35        CONTINUE
30      CONTINUE
      IF(SCKOR.GT.0.AND.SCAT(K).EQ.SCT(31))SCAT(K)=SCT(32)
      IF(SCKOR.LT.0.AND.SCAT(51-K).EQ.SCT(31))SCAT(51-K)=SCT(32)
      IF(K.NE.50.AND.K.NE.40.AND.K.NE.30.AND.K.NE.20.AND.K.NE.10.A
     1ND.K.NE.1)WRITE(3,201)SCAT
      IF(K.EQ.50)WRITE(3,202)SCAVER(1),SCAT
```

```
            IF(K.EQ.40)WRITE(3,202)SCAVER(2),SCAT
            IF(K.EQ.30)WRITE(3,202)SCAVER(3),SCAT
            IF(K.EQ.20)WRITE(3,202)SCAVER(4),SCAT
            IF(K.EQ.10)WRITE(3,202)SCAVER(5),SCAT
25          IF(K.EQ. 1)WRITE(3,203)NUMVER,SCAVER(6),SCAT
            WRITE(3,204)SCALOR,NUMHOR,SCKOR
C-----      FORMAT-STATEMENTS
200         FORMAT(1H1,10X,'RUN #',I3,' - KOLOM #',I2,' - PAGINA',I3,' -
           1 SCATTER DIAGRAM VAN DE DOORLATENDHEDEN VAN ',4A5,' EN ',4A
           25/11X,122(1H*))
201         FORMAT(1H ,30X,'*',50A2,'*')
202         FORMAT(1H ,22X,F7.4,'**',50A2,'*')
203         FORMAT(1H ,X,4A5,F8.4,'**',50A2,'*')
204         FORMAT(1H ,30X,102(1H*)/32X,'*',16X,'*',4(19X,'*')/29X,F7.4,
           112X,F7.4,3(13X,F7.4),11X,F7.4///31X,4A5,' -- DE KORRELATIEC
           2OEFFICIENT IS ',F5.2)
            RETURN
            END
```

COMMON BLOCKS

```
/.COMM./(+111)
IRUN    +0      INUM    +1      IPAG    +2      ISCKOL  +3      SCKOR   +4
VDAT    +5      HDAT    +43     NUMVER  +101    NUMHOR  +105
```

SUBPROGRAMS CALLED

SCALARS AND ARRAYS ["*" NO EXPLICIT DEFINITION - "%" NOT REFERENCED]

```
 SCAHOR 1        *LOVER  7       *K      10      *UPVER  11      *IHOR   12
*VSVER  13       *M      14      *J      15       SCAT   16      .S0007  100
.S0006  101      .S0005  102     .S0004  103     .S0003  104     .S0002  105
.S0001  106      .S0000  107      ISCAT  110      SCT    5014    *DCHOR  5054
*UPHOR  5055     *L      5056     SCAVER 5057    *I      5065    *VSHOR  5066
*IVER   5067
```

TEMPORARIES

```
.A0016  5176
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*******************************************************************
*******************************************************************
***                                                             ***
***        INSTITUUT VOOR CULTUURTECHNIEK EN WATERHUISHOUDING   ***
***            PROJECT 3[illegible].6: DRAINAGEOMHULLINGSMATERIALEN          ***
***        IR. L.C.P.M. STUYT - ING. H.J. MEIJER - H.F. SPITS   ***
***                                                             ***
***               EITHER THICK'N CHEWY OR THIN'N CRISPY          ***
***               THE NATURE OF WRAPPING REMAINS MISTY           ***
***               LET'S HOPE IT'S DOING A GOOD JOB               ***
***               OR DRAINAGE MIGHT COMPLETELY STOP !!           ***
***                                                             ***
*******************************************************************
*******************************************************************


************************************
*                                  *
*  DATUM PROCESSING: 22-Jun-81     *
*  RUN NR : 1                      *
*  RUN TIJDSTIP: MA+APR '81        *
*  AANTAL WAARNEMINGEN: 28         *
*  WRAPPING: BIDIM 270 GPS.        *
*  BELASTING: 0.200 KG./CM.**2     *
*  BODEMMONSTER: HALSEMA [GRONINGEN] *
*  VERDELING FRACTIES:-            *
*     < 38 MU  :    2 GEW. %       *
*   38 -  53 MU:    4 GEW. %       *
*   53 -  75 MU:    9 GEW. %       *
*   75 - 106 MU:   24 GEW. %       *
*  106 - 150 MU:   58 GEW. %       *
*     > 150 MU :    3 GEW. %       *
*  BUISDIAMETER: 6.0 CM.           *
*  DRAINAFSTAND: 15.0 M.           *
*  PERFORATIEGRAAD: 25.0 CM.**2/M. *
*                                  *
************************************


DE DIKTE VAN HET OMHULLINGSMATERIAAL NA ZETTING [SEPARAAT GEMETEN] BEDRAAGT  0.18 CM.
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GEREGISTREERDE GEGEVENS DOORSTROMINGSPROEVEN KOLOM # 3

METING #	DAG	TIJDSTIP	TEMPERATUREN (GRAAD CELCIUS) FELL. LAF.	AANVOER-BUIS	AFVOER-BUIS	VAT BOVEN	VAT BENEDEN	BROOKS FLOW-METER (HM.)	AFLEZING NIVEAU PIEZOMETERS OP MANOMETERBORDEN (CM.): H 0	H B	H 1.5	H 3.0	H 4.2	H 5.4	H 6.6	H 7.8	H 9.0	H 11.
1	240361	9.00	19.10	20.10	18.40	23.20	18.45	20.00	3.40	3.65	5.10	8.10	11.55	14.85	16.80	18.60	20.75	22.15
2	240361	12.00	19.10	21.45	19.40	22.83	19.06	19.50	3.50	3.65	5.10	8.00	11.35	14.65	16.25	17.50	19.35	21.05
3	240361	14.38	19.52	21.40	19.90	23.20	19.75	19.50	3.45	3.65	5.05	7.75	10.95	13.95	15.50	16.65	18.50	20.25
4	240361	17.33	19.75	21.60	20.15	23.35	20.05	19.50	3.35	3.62	5.00	7.32	10.60	13.40	14.95	16.11	17.90	19.60
5	250361	12.16	19.50	21.40	20.00	23.38	19.84	20.00	3.40	3.65	4.80	6.95	10.40	13.05	14.55	15.75	17.75	19.46
6	250361	14.31	20.00	21.55	20.20	23.38	20.05	20.00	3.35	3.62	4.84	7.21	10.72	13.50	15.11	16.40	18.45	20.05
7	250361	16.47	19.65	21.69	20.34	23.52	20.20	20.00	3.40	3.61	4.81	7.25	10.75	13.50	15.15	16.35	18.40	20.11
8	260361	8.16	17.90	20.32	19.30	22.49	19.15	20.20	3.35	3.65	5.10	7.61	11.05	13.91	15.45	16.85	19.00	20.75
9	260361	16.18	17.90	20.70	19.45	22.49	19.40	19.20	3.45	3.58	5.05	7.45	10.30	13.65	15.20	16.45	18.75	20.40
10	270361	9.23	17.80	19.20	18.06	21.10	17.40	19.30	3.46	3.62	5.10	7.61	10.95	13.90	15.58	16.82	19.15	20.95
11	300361	9.02	17.42	19.62	18.20	21.24	18.10	19.00	3.40	3.60	5.02	7.80	11.12	14.20	15.90	17.35	20.00	21.95
12	310361	9.13	17.40	19.77	18.39	21.43	18.26	19.00	3.38	3.61	5.08	7.85	11.15	14.20	15.95	17.45	20.80	22.10
13	310361	12.08	18.08	19.80	18.75	21.79	18.83	40.00	3.40	3.92	6.75	13.30	20.00	26.40	30.08	33.25	39.50	42.76
14	10461	12.15	19.45	20.31	19.00	22.04	19.41	39.30	3.32	3.91	6.85	13.62	20.28	26.82	30.62	33.82	39.27	43.55
15	20461	9.57	17.62	19.49	18.21	21.25	18.65	39.00	3.40	3.98	6.97	14.21	21.81	28.31	32.35	35.61	41.41	46.01
16	30461	12.31	17.90	19.63	18.32	21.36	18.70	36.80	3.40	4.00	7.00	15.03	22.05	29.67	33.61	36.98	43.00	47.95
17	60461	10.58	17.79	19.41	18.01	21.10	18.91	37.50	3.42	4.00	7.12	16.45	24.00	31.81	36.52	39.55	46.35	51.91
18	70461	11.13	18.60	20.20	18.80	21.82	19.15	37.80	3.41	4.02	7.11	17.32	24.33	32.03	36.81	39.86	46.86	52.68
19	80461	14.16	19.41	20.10	18.81	21.85	19.15	37.10	3.32	3.95	7.00	17.40	24.43	32.13	37.29	40.40	47.62	53.56
20	90461	9.47	16.99	18.79	17.70	20.74	17.80	37.00	3.45	4.00	7.20	17.71	24.90	32.25	37.95	40.92	48.42	54.72
21	100461	15.10	17.51	20.43	19.10	22.14	19.45	37.00	3.40	3.98	7.14	17.61	24.81	32.25	37.90	40.70	48.00	54.31
22	130461	9.41	17.12	19.30	18.20	21.24	18.53	36.20	3.40	4.00	7.15	18.02	25.41	33.28	39.26	41.66	49.26	56.11
23	140461	10.52	17.55	19.40	18.12	21.16	18.41	36.10	3.34	3.99	7.14	18.30	25.18	33.75	39.65	42.14	49.82	56.75
24	150461	8.48	16.55	18.62	18.30	21.34	17.66	36.90	3.31	4.00	7.10	18.50	26.00	34.25	40.71	42.92	51.34	58.03
25	160461	10.37	17.52	19.49	18.12	21.16	18.20	20.00	3.27	3.71	5.60	11.52	16.63	23.65	25.51	28.32	37.61	39.72
26	210461	10.16	17.05	18.93	17.10	20.14	17.15	19.80	3.26	3.63	5.52	11.47	16.71	21.65	25.60	26.72	31.68	35.65
27	220461	10.03	17.17	19.11	17.37	20.41	17.40	20.00	3.31	3.70	5.54	11.35	16.59	21.40	25.40	26.65	31.31	35.35
28	230461	9.12	18.52	20.32	18.39	21.43	18.41	19.90	3.30	3.64	5.46	10.90	16.17	20.91	24.70	25.87	30.42	34.33

GEREGISTREERDE GEGEVENS DOORSTROMINGSPROEVEN KOLOM # 4

			TEMPERATUREN [GRAAD CELCIUS]					BROOKS FLOW-METER	AFLEZING NIVEAU PIEZOMETERS OP MANOMETERBORDEN [CM.]:-									
METING	DAG	TIJDSTIP	FELL. LAB.	AANVOER-BUIS	AFVOER-BUIS	VAT BOVEN	VAT BENEDEN	[MM.]	H 0	H B	H 1.5	H 3.0	H 4.2	H 5.4	H 6.6	H 7.8	H 9.0	H 11.
1	240361	9.00	19.10	20.10	18.40	23.20	19.45	20.00	3.55	3.95	5.55	9.40	13.60	15.80	18.50	23.50	26.80	27.60
2	240361	12.00	19.10	21.45	19.40	22.63	19.06	20.50	3.30	3.75	5.75	9.55	13.70	15.85	18.40	22.95	23.75	24.20
3	240361	11.38	19.52	21.40	19.90	23.20	19.75	21.00	3.15	3.60	5.60	9.35	12.85	14.75	17.00	21.40	22.25	22.65
4	240361	17.34	19.75	21.60	20.15	23.35	20.05	20.50	3.30	3.75	5.40	8.80	12.90	13.60	16.05	20.55	21.20	21.80
5	250361	12.16	19.50	21.40	20.00	23.38	19.84	20.00	3.20	3.60	5.25	8.30	10.85	12.45	14.90	18.40	21.00	21.15
6	250361	14.31	20.00	21.55	20.20	23.38	20.05	20.00	3.20	3.60	5.35	8.34	11.11	12.72	15.45	18.85	21.00	21.40
7	250361	10.19	19.65	21.69	20.34	23.52	20.20	20.00	3.10	3.50	5.30	8.35	11.15	12.75	15.50	18.90	21.00	21.44
8	260361	8.18	17.90	20.32	19.30	22.49	19.15	19.90	3.20	3.50	5.15	8.40	11.25	12.75	15.82	19.05	21.62	21.75
9	260361	10.16	17.90	20.70	19.45	22.49	19.40	19.40	3.30	3.50	5.44	8.35	11.25	12.88	15.72	19.05	21.45	21.90
10	270361	9.24	17.80	19.20	18.06	21.10	17.40	19.20	3.25	3.50	5.40	8.35	11.35	13.08	15.95	19.12	21.90	21.32
11	300361	9.02	17.42	19.62	18.20	21.24	18.10	19.00	3.15	3.45	5.50	9.35	11.72	13.38	16.75	19.60	24.00	24.10
12	310361	9.13	17.40	19.77	18.39	21.43	18.26	19.00	3.10	3.40	5.38	8.32	11.72	13.27	16.19	19.62	23.92	24.00
13	310361	12.06	19.08	19.80	18.75	21.79	18.83	40.00	3.10	3.69	7.64	13.72	20.40	23.61	29.11	36.52	45.03	45.07
14	10461	12.15	19.45	20.31	19.00	22.04	19.41	39.90	3.20	3.88	7.55	13.95	20.85	24.14	30.32	37.82	46.22	46.38
15	20461	9.57	17.62	19.49	18.21	21.25	18.65	39.00	3.18	3.90	7.72	14.38	21.55	24.27	31.88	39.75	48.05	48.08
16	30461	12.31	17.90	19.63	18.32	21.36	18.70	38.00	3.20	3.90	7.72	14.71	22.25	25.69	33.15	41.00	49.20	49.22
17	60461	10.58	17.79	19.41	18.01	21.10	18.91	37.20	3.26	3.90	7.85	15.46	23.80	27.34	36.29	44.50	53.10	53.12
18	70461	11.13	18.60	20.20	18.80	21.82	19.15	37.00	3.26	3.88	7.67	15.45	23.94	27.39	36.65	44.97	53.74	53.75
19	80461	14.15	18.41	20.10	18.81	21.85	19.15	37.60	3.19	3.85	8.00	15.80	24.93	28.00	37.90	45.76	55.76	55.79
20	90461	9.47	16.99	18.79	17.70	20.74	17.80	36.60	3.25	3.90	7.90	15.76	24.32	27.82	37.80	45.65	55.65	55.66
21	100461	15.10	18.51	20.43	19.10	22.14	19.45	36.50	3.20	3.80	7.86	15.53	24.08	27.45	37.58	45.05	55.19	55.20
22	130461	9.41	17.12	19.30	18.20	21.24	18.53	36.10	3.25	3.96	7.91	15.82	24.87	28.19	39.37	46.76	58.60	58.69
23	140461	10.52	17.55	19.40	18.12	21.16	18.41	35.00	3.20	3.90	7.82	15.70	24.58	27.88	39.10	46.04	58.47	58.49
24	160461	8.46	16.55	18.62	18.30	21.34	17.66	35.20	3.20	3.80	7.86	15.99	25.87	28.19	39.59	46.31	59.61	59.62
25	160461	16.37	17.52	19.49	18.12	21.16	18.20	20.00	3.10	3.55	5.96	11.17	16.39	18.30	31.05	33.64	37.00	37.01
26	210461	10.15	17.05	18.93	17.10	20.14	17.15	18.90	3.15	3.40	5.95	10.65	16.00	17.98	25.06	26.73	36.50	36.52
27	220461	10.03	17.17	19.11	17.37	20.41	17.40	19.00	3.16	3.50	5.85	10.62	15.82	17.82	24.83	28.36	36.10	36.13
28	230461	9.12	18.52	20.32	18.39	21.43	18.41	19.00	3.15	3.50	5.94	10.42	15.56	17.42	24.42	27.62	35.06	35.11

UITWERKING GEGEVENS DOORSTROMINGSPROEVEN KOLOM : 1

#	GEM. WATER TEMP. [C.]	VIS-COSI-TEIT [C.P]	DEBIET KOLOM [CC./SEC.] FELL. LAB.	DEBIET KOLOM [CC./SEC.] TIEN GR.C.	KORRESPONDERENDE WATERSCHIJF [L = 15.M., D 6.0 CM.] LAB. [MM/DAG]	KORRESPONDERENDE WATERSCHIJF 10	STROOMSNELHEID PERFORATIES [PC 25.0 CM.**2/M.] LAB. [CM/SEC]	STROOMSNELHEID 10	BEREKENDE DOORLATENDHEID, GENORMEERD OP 10 GR. C. [M./ETM.] WRAP-PING	>0.0- -1.5<	>1.5- -3.0<	>3.0- -4.2<	>4.2- -5.4<	>5.4- -6.6<	>6.6- -7.8<	>7.8- -9.0<	>0.0- -9.0<	WRAP+ SOIL
1	19.42	1.02	0.721	0.561	44.29	34.47	0.31	0.24	3.29	2.49	0.65	1.29	1.34	1.29	2.35	1.40	1.39	1.45
2	20.33	0.99	0.721	0.544	44.29	33.45	0.31	0.23	2.40	2.35	0.77	1.96	1.45	1.42	2.37	1.42	1.44	1.52
3	20.60	0.95	0.721	0.542	44.29	33.31	0.31	0.23	2.39	2.34	0.80	2.05	1.72	[illegible]	1.99	1.48	1.51	1.58
4	21.02	0.96	0.721	0.539	44.29	33.12	0.31	0.23	3.16	2.26	0.86	2.11	1.76	[illegible]	2.26	1.47	1.52	1.59
5	20.44	0.98	0.696	0.523	42.75	32.11	0.30	0.22	3.07	2.07	0.86	3.07	1.46	1.13	2.19	1.46	1.48	1.53
6	21.01	0.98	0.721	0.539	44.29	33.13	0.31	0.23	2.37	2.40	0.96	2.11	1.61	1.23	2.16	1.38	1.53	1.58
7	21.15	0.98	0.706	0.526	43.37	32.32	0.30	0.22	2.31	2.27	0.94	2.20	1.48	1.21	2.00	1.51	1.50	1.53
8	19.91	1.01	0.721	0.554	44.29	34.06	0.31	0.24	1.63	2.39	[illegible]	2.41	1.51	1.23	2.03	1.51	1.54	1.56
9	20.29	1.00	0.711	0.543	43.63	33.34	0.30	0.23	3.18	2.31	0.94	2.36	1.42	1.22	2.05	1.38	1.50	1.55
10	18.74	1.04	0.721	0.570	44.29	35.04	0.31	0.24	4.18	2.52	0.94	2.32	1.59	1.20	3.04	1.16	1.53	1.59
11	19.05	1.03	0.701	0.550	43.06	33.81	0.30	0.23	4.84	2.37	0.86	2.12	1.44	1.15	1.82	0.86	1.31	1.39
12	19.22	1.02	0.711	0.556	43.69	34.16	0.30	0.24	2.33	2.36	0.86	2.06	1.53	1.11	1.77	1.14	1.38	1.30
13	19.36	1.02	0.711	0.554	43.68	34.03	0.30	0.24	3.48	2.35	0.66	2.21	1.43	[illegible]	1.84	1.10	1.37	1.33
14	19.79	1.01	0.716	0.552	43.99	33.92	0.31	0.24	3.47	2.30	0.84	2.19	1.37	1.16	1.69	1.11	1.34	1.31
15	18.98	1.03	0.716	0.563	43.99	34.60	0.31	0.24	2.92	2.36	0.78	2.25	1.32	1.11	1.57	1.11	1.30	1.30
16	19.11	1.03	0.716	0.561	43.99	34.50	0.31	0.24	2.47	2.37	0.71	2.29	1.37	1.07	1.59	1.08	1.25	1.27
17	18.65	1.03	0.716	0.565	43.99	34.71	0.31	0.24	2.37	2.22	0.62	2.42	1.37	1.00	1.31	0.98	1.15	1.19
18	19.64	1.01	0.721	0.558	44.29	34.29	0.31	0.24	2.58	2.24	0.61	2.52	1.35	0.98	1.24	0.97	1.13	1.17
19	[illegible]	1.02	0.721	0.559	44.29	34.33	0.31	0.24	3.07	2.19	0.59	2.62	1.31	0.95	1.17	0.92	1.10	1.14
20	18.35	1.05	0.721	0.576	44.29	35.37	0.31	0.25	2.67	2.26	0.60	2.75	1.31	0.97	1.17	0.95	1.12	1.16
21	[illegible]	1.01	0.721	0.554	44.29	34.07	0.31	0.24	3.49	2.14	0.57	2.76	1.27	0.91	1.13	0.94	1.08	1.12
22	[illegible]	1.03	0.726	0.573	44.60	35.19	0.31	0.24	4.20	2.19	0.55	2.95	1.26	0.95	1.03	0.91	1.06	1.09
23	18.69	1.03	0.726	0.572	44.60	35.16	0.31	0.24	3.36	2.16	0.54	2.85	1.26	0.92	1.01	0.93	1.04	1.07
24	18.49	1.04	0.746	0.594	45.63	36.46	0.32	0.25	3.73	2.28	0.55	2.79	1.27	0.94	1.02	0.92	1.06	1.08
25	18.94	1.03	0.721	0.568	44.29	34.88	0.31	0.24	3.33	2.38	0.57	2.80	1.40	0.97	1.06	0.99	1.11	1.14
26	18.20	1.05	0.726	0.582	44.60	35.75	0.31	0.25	4.66	2.32	0.57	2.73	1.25	0.97	1.08	0.93	1.08	1.10
27	18.41	1.04	0.736	0.587	45.22	36.06	0.31	0.25	3.97	2.31	0.56	2.71	1.28	1.00	1.09	0.94	1.10	1.12
28	19.55	1.02	0.731	0.567	44.91	34.84	0.31	0.24	3.84	2.34	0.57	2.92	1.28	0.97	1.11	0.92	1.09	1.11

	WRAP-PING	>0.0- -1.5<	>1.5- -3.0<	>3.0- -4.2<	>4.2- -5.4<	>5.4- -6.6<	>6.6- -7.8<	>7.8- -9.0<	>0.0- -9.0<	WRAP+ SOIL
GEMIDDELDE WAARDEN:	3.17	2.31	0.74	2.42	1.41	[illegible]	1.65	1.14	1.29	1.32
STANDAARDAFWIJKING:	0.78	0.10	0.16	0.39	0.14	0.16	0.55	0.23	0.19	0.20

UITWERKING GEGEVENS DOORSTROMINGSPROEVEN KOLOM # 2

#	GEM. WATER TEMP. [C.]	VIS-COSI-TEIT [C.P]	DEBIET KOLOM [CC./SEC.] FELD. LAB.	DEBIET KOLOM [CC./SEC.] TIEN GR.C.	KORRESPONDERENDE WATERSCHIJF [L = 15.?.?.D 6.0 CM.] LAB. [CM/DAG]	KORRESPONDERENDE WATERSCHIJF 10	STROOMSNELHEID PERFORATIES [CM 25.? CM.**2/?.] LAB. [CM/SEC]	STROOMSNELHEID PERFORATIES 10	BEREKENDE DOORLATENDHEID, GENORMEERD OP 10 GR. C. [M./ETM.] WRAP-PING	>0.0- -1.5<	>1.5- -3.0<	>3.0- -4.2<	>4.2- -5.4<	>5.4- -6.6<	>6.6- -7.8<	>7.8- -9.0<	>0.0- -9.0<	WRAP+ SOIL
1	19.42	1.02	0.721	0.561	44.29	34.47	0.31	0.24	1.23	2.35	1.16	0.93	1.20	1.61	0.94	1.53	1.28	1.37
2	20.63	0.99	0.721	0.544	44.29	33.45	0.31	0.23	1.92	2.28	1.11	0.88	0.96	1.94	1.21	1.28	1.26	1.42
3	20.80	0.96	0.721	0.542	44.29	33.31	0.31	0.23	1.59	2.09	1.14	0.99	1.14	2.51	1.45	1.20	1.36	1.53
4	21.02	0.96	0.721	0.539	44.29	33.12	0.31	0.23	1.90	2.03	1.13	1.32	1.27	2.64	1.44	1.24	1.46	1.67
5	20.84	0.98	0.696	0.523	42.75	32.11	0.30	0.22	1.53	2.47	1.22	1.25	1.33	2.19	1.43	1.23	1.46	1.58
6	21.01	0.90	0.721	0.539	44.29	33.13	0.31	0.23	1.44	2.55	1.26	1.29	1.38	2.26	1.51	1.27	1.54	1.60
7	21.15	0.98	0.711	0.530	43.68	32.55	0.30	0.23	1.55	2.44	1.25	1.24	1.32	2.14	1.48	1.24	1.49	1.56
8	19.91	1.01	0.711	0.547	43.68	33.56	0.30	0.23	1.46	2.40	1.32	1.26	1.26	2.39	1.49	1.21	1.52	1.57
9	20.20	1.00	0.696	0.531	42.75	32.64	0.30	0.23	2.34	2.36	1.28	1.20	1.30	2.31	1.44	1.16	1.47	1.54
10	18.74	1.04	0.681	0.539	41.83	33.09	0.29	0.23	2.15	2.41	1.32	1.22	1.24	2.29	1.46	1.11	1.46	1.52
11	19.05	1.03	0.661	0.519	40.60	31.86	0.28	0.22	1.99	2.41	1.22	1.18	1.06	2.54	1.31	0.96	1.34	1.39
12	19.22	1.02	0.681	0.532	41.83	32.71	0.29	0.23	1.74	2.54	1.26	1.23	1.12	2.42	1.41	0.92	1.39	1.41
13	19.38	1.02	0.646	0.503	39.07	30.99	0.28	0.21	1.92	2.29	1.21	1.14	1.07	2.34	1.32	0.87	1.31	1.34
14	19.79	1.01	0.636	0.490	39.05	30.12	0.27	0.21	1.27	2.40	1.14	1.11	1.01	2.27	1.25	0.94	1.26	1.29
15	18.98	1.03	0.656	0.516	40.29	31.69	0.28	0.22	1.97	2.31	1.15	1.13	0.91	2.35	1.26	0.85	1.25	1.29
16	19.11	1.03	0.661	0.518	40.60	31.64	0.28	0.22	1.30	2.39	1.14	1.06	0.92	1.83	1.25	0.94	1.21	1.26
17	18.85	1.03	0.631	0.498	36.75	30.58	0.27	0.21	1.33	2.07	1.08	1.00	0.66	2.59	1.15	0.75	1.09	1.17
18	19.64	1.01	0.626	0.484	36.44	29.75	0.27	0.21	1.47	1.98	1.05	0.98	0.64	2.37	1.08	0.85	1.08	1.13
19	19.58	1.02	0.651	0.504	39.98	30.99	0.28	0.22	1.31	2.10	1.09	0.95	0.64	2.45	1.07	0.72	1.06	1.14
20	18.35	1.05	0.656	0.524	40.29	32.17	0.26	0.22	1.44	2.16	1.11	0.97	0.65	2.74	1.04	0.74	1.06	1.17
21	19.90	1.01	0.656	0.504	40.29	30.99	0.26	0.22	1.53	2.11	1.08	0.93	0.63	2.47	1.05	0.72	1.05	1.14
22	18.86	1.03	0.655	0.517	40.29	31.78	0.26	0.22	1.30	2.13	1.10	0.95	0.62	2.66	0.85	0.81	1.05	1.14
23	18.69	1.03	0.661	0.521	40.60	32.01	0.26	0.22	1.53	2.12	1.12	0.96	0.60	2.80	1.06	0.71	1.04	1.14
24	18.49	1.04	0.646	0.514	39.67	31.58	0.26	0.22	1.62	2.11	1.12	1.00	0.59	2.67	0.99	0.72	1.04	1.14
25	18.94	1.03	0.721	0.568	44.29	34.88	0.31	0.24	1.47	1.99	1.02	0.89	0.56	1.72	1.03	0.69	0.96	1.05
26	18.20	1.05	0.716	0.574	43.99	35.26	0.31	0.24	1.33	1.96	1.01	0.88	0.55	2.19	0.91	0.65	0.95	1.04
27	18.41	1.04	0.721	0.575	44.29	35.32	0.31	0.25	1.26	2.00	1.01	0.86	0.57	1.92	0.92	0.66	0.96	1.05
28	19.55	1.02	0.721	0.559	44.29	34.36	0.31	0.24	1.26	1.99	0.98	0.91	0.58	1.92	0.93	0.65	0.95	1.05
								GEMIDDELDE WAARDEN:	1.58	2.23	1.15	1.06	0.92	2.30	1.20	0.94	1.23	1.31
								STANDAARDAFWIJKING:	0.30	0.19	0.09	0.15	0.30	0.31	0.21	0.25	0.20	0.20

UITWERKING GEGEVENS DOORSTROMINGSPROEVEN KOLOM # 3

#	GEM. WATER TEMP. [C.]	VIS-COSI-TEIT [C.P]	DEBIET KOLOM [CC./SEC.] EERL. LAB.	DEBIET KOLOM [CC./SEC.] TIEN GR.C.	KORRESPONDERENDE WATERSCHIJF [L = 15 CM, D 6.0 CM] LAB. [MM/DAG]	KORRESPONDERENDE WATERSCHIJF 10	STROOMSNELHEID PERFORATIES [PG 25.0 CM**2/M.] LAB. [CM/SEC]	STROOMSNELHEID PERFORATIES 10	WRAP-PING	>0.0-1.5<	>1.5-3.0<	>3.0-4.2<	>4.2-5.4<	>5.4-6.6<	>6.6-7.8<	>7.8-9.0<	>0.0-9.0<	WRAP+SOIL
									BEREKENDE DOORLATENDHEID, GECORRIGEERD OP 10 GR. C. (M./ETM.)									
1	19.42	1.02	0.721	0.561	44.29	34.47	0.31	0.24	1.98	2.84	1.37	0.95	1.00	1.69	1.63	1.53	1.44	1.61
2	20.63	0.99	0.696	0.525	42.75	32.29	0.30	0.22	3.08	2.66	1.33	0.92	0.93	1.93	2.47	1.67	1.47	1.61
3	20.80	0.98	0.696	0.523	42.75	32.15	0.30	0.22	2.30	2.74	1.42	0.96	1.02	1.93	2.67	1.66	1.55	1.68
4	21.02	0.98	0.696	0.520	42.75	31.97	0.30	0.22	1.70	2.77	1.64	0.93	1.09	1.97	2.63	1.71	1.60	1.72
5	20.61	0.99	0.721	0.542	44.29	33.27	0.31	0.23	1.91	3.45	1.85	0.92	1.20	2.12	2.65	1.59	1.69	1.81
6	21.01	0.98	0.721	0.539	44.29	33.13	0.31	0.23	1.76	3.24	1.67	0.90	1.14	1.97	2.45	1.54	1.60	1.74
7	21.15	0.98	0.721	0.537	44.29	33.01	0.31	0.23	2.25	3.28	1.61	0.90	1.15	1.91	2.63	1.54	1.60	1.73
8	19.91	1.01	0.731	0.562	44.91	34.53	0.31	0.24	1.65	2.84	1.64	0.96	1.15	2.14	2.36	1.53	1.61	1.74
9	20.20	1.00	0.681	0.520	41.83	31.93	0.29	0.22	3.52	2.59	1.59	0.91	1.07	1.97	2.44	1.33	1.51	1.65
10	18.74	1.04	0.696	0.551	42.75	33.82	0.30	0.23	3.46	2.73	1.61	0.97	1.09	1.92	2.60	1.39	1.56	1.69
11	19.05	1.03	0.671	0.527	41.21	32.36	0.29	0.22	2.32	2.72	1.39	0.93	1.00	1.80	2.13	1.17	1.41	1.53
12	19.22	1.02	0.671	0.525	41.21	32.23	0.29	0.22	2.01	2.62	1.39	0.93	1.01	1.76	2.05	0.92	1.34	1.51
13	19.38	1.02	1.725	1.343	105.96	82.54	0.74	0.57	2.27	3.46	1.50	1.18	1.23	2.14	2.49	1.50	1.71	1.84
14	19.79	1.01	1.689	1.303	103.80	80.06	0.72	0.56	1.94	3.25	1.41	1.15	1.17	2.01	2.39	1.40	1.62	1.74
15	18.98	1.03	1.674	1.317	102.87	80.93	0.71	0.56	2.00	3.23	1.33	1.02	1.19	1.91	2.37	1.33	1.55	1.66
16	19.11	1.03	1.664	1.305	102.26	80.19	0.71	0.56	1.91	3.19	1.19	1.09	1.01	1.83	2.42	1.27	1.47	1.58
17	18.85	1.03	1.599	1.262	98.25	77.53	0.68	0.54	1.91	2.97	0.99	0.98	0.95	1.57	2.44	1.09	1.31	1.40
18	19.64	1.01	1.614	1.249	99.17	76.76	0.69	0.53	1.80	2.97	0.90	1.05	0.95	1.53	2.40	1.05	1.28	1.36
19	19.58	1.02	1.579	1.224	97.01	75.20	0.67	0.52	1.71	2.94	0.86	1.02	0.93	1.30	2.31	0.99	1.23	1.31
20	18.35	1.05	1.574	1.257	96.70	77.23	0.67	0.54	2.01	2.88	0.88	1.03	1.00	1.29	2.48	0.98	1.25	1.32
21	19.90	1.01	1.574	1.211	96.70	74.38	0.67	0.52	1.84	2.81	0.85	0.99	0.95	1.26	2.54	0.97	1.21	1.28
22	18.65	1.03	1.534	1.210	94.24	74.35	0.65	0.52	1.78	2.82	0.82	0.96	0.90	1.17	2.96	0.93	1.18	1.23
23	18.69	1.03	1.529	1.205	93.93	74.05	0.65	0.51	1.63	2.81	0.79	1.03	0.83	1.16	3.09	0.92	1.16	1.21
24	18.49	1.04	1.569	1.249	96.10	76.73	0.67	0.53	1.59	2.95	0.80	0.99	0.89	1.13	3.47	0.86	1.16	1.23
25	18.94	1.03	0.721	0.568	44.29	34.88	0.31	0.24	1.14	2.20	0.70	0.65	0.47	1.70	1.19	0.36	0.74	0.84
26	18.20	1.05	0.711	0.570	43.68	35.01	0.30	0.24	1.36	2.21	0.70	0.64	0.68	0.85	2.99	0.67	0.89	0.95
27	18.41	1.04	0.721	0.575	44.29	35.32	0.31	0.25	1.30	2.29	0.73	0.64	0.69	0.86	2.70	0.72	0.92	0.97
28	19.55	1.02	0.716	0.555	43.99	34.12	0.31	0.24	1.44	2.24	0.75	0.62	0.69	0.86	2.79	0.72	0.91	0.96
								GEMIDDELDE WAARDEN:	1.98	2.85	1.20	0.94	0.98	1.64	2.50	1.19	1.36	1.46
								STANDAARDAFWIJKING:	0.57	0.35	0.37	0.14	0.18	0.41	0.41	0.36	0.26	0.29

UITWERKING GEGEVENS DOORSTROMINGSPROEVEN KOLOM * 4

#	GEM. WATER TEMP. [C.]	VIS-COSI-TEIT [C.P]	DEBIET KOLOM [CC./SEC.] PELL. LAB.	DEBIET KOLOM [CC./SEC.] TIEG GR.C.	KORRESPONDERENDE WATERSCHIJF [L = 15.M.,D 6.0 CM.] LAB. [MM/DAG]	10	STROOMSNELHEID PERFORATIES [PG 25.0 CM.**2/M.] LAB. [CM/SEC]	10	BEREKENDE DOORLATENDHEID, GENORMEERD OP 10 GR. C. [M./ETM.] WRAP-PING	>0.0- -1.5<	>1.5- -3.0<	>3.0- -4.2<	>4.2- -5.4<	>5.4- -6.6<	>6.6- -7.8<	>7.8- -9.0<	>0.0- -9.0<	WRAP+ SOIL
1	19.42	1.02	0.721	0.561	44.29	34.47	0.31	0.24	1.23	2.57	1.07	0.78	1.50	1.22	0.66	1.00	1.06	1.25
2	20.63	0.99	0.746	0.563	45.83	34.61	0.32	0.24	1.10	2.07	1.09	0.80	1.54	1.30	0.73	4.13	1.24	1.45
3	20.80	0.98	0.771	0.580	47.39	35.62	0.33	0.25	1.13	2.13	1.13	0.97	1.79	1.51	0.77	4.00	1.37	1.60
4	21.02	0.98	0.746	0.558	45.83	34.27	0.32	0.24	1.09	2.48	1.20	1.02	2.05	1.34	0.73	5.04	1.41	1.62
5	20.64	0.96	0.721	0.542	44.29	33.27	0.31	0.23	1.19	2.41	1.30	1.25	1.99	1.35	0.88	1.22	1.37	1.62
6	21.01	0.98	0.721	0.539	44.29	33.13	0.31	0.23	1.19	2.26	1.32	1.14	1.97	1.16	0.93	1.47	1.36	1.59
7	21.15	0.98	0.721	0.537	44.29	33.01	0.31	0.23	1.18	2.19	1.29	1.13	1.97	1.15	0.93	1.50	1.35	1.56
8	19.91	1.01	0.716	0.550	13.99	33.82	0.31	0.23	1.61	2.07	1.37	1.13	2.15	1.05	1.00	1.26	1.34	1.60
9	20.20	1.00	0.691	0.527	42.44	32.40	0.29	0.23	2.32	1.99	1.33	1.07	1.90	1.09	0.93	1.29	1.29	1.52
10	18.74	1.04	0.681	0.539	41.83	33.09	0.29	0.23	1.90	2.08	1.34	1.05	1.83	1.10	1.00	1.14	1.29	1.60
11	19.05	1.03	0.671	0.527	41.21	32.36	0.29	0.22	1.55	1.98	1.36	0.92	1.86	0.92	1.08	0.70	1.13	1.35
12	19.22	1.02	0.671	0.525	41.21	32.23	0.29	0.22	1.54	1.94	1.31	0.91	1.97	1.06	0.90	0.72	1.13	1.35
13	19.36	1.02	1.725	1.343	105.96	62.54	0.74	0.57	2.00	2.49	1.62	1.18	2.46	1.43	1.06	0.93	1.43	1.72
14	19.79	1.01	1.720	1.326	105.65	81.48	0.73	0.57	1.72	2.58	1.54	1.13	2.37	1.26	1.04	0.93	1.38	1.65
15	18.98	1.03	1.674	1.317	102.87	80.93	0.71	0.56	1.61	2.53	1.45	1.08	2.26	1.12	0.98	0.93	1.31	1.58
16	19.11	1.03	1.624	1.274	99.79	78.76	0.69	0.54	1.60	2.45	1.34	0.99	2.18	1.00	0.95	0.91	1.24	1.49
17	19.85	1.03	1.564	1.250	97.32	76.60	0.68	0.53	1.77	2.32	1.20	0.88	2.07	0.82	0.89	0.85	1.12	1.35
18	19.64	1.01	1.574	1.218	96.70	74.85	0.67	0.52	1.73	2.24	1.18	0.84	2.07	0.77	0.86	0.82	1.08	1.30
19	19.58	1.02	1.604	1.243	98.56	76.39	0.68	0.53	1.66	2.20	1.17	0.80	2.38	0.74	0.90	0.74	1.05	1.27
20	18.35	1.05	1.564	1.249	96.09	76.73	0.67	0.53	2.00	2.23	1.17	0.55	2.09	0.73	0.93	0.73	1.06	1.28
21	19.20	1.01	1.545	1.191	95.16	73.19	0.66	0.51	1.75	2.14	1.14	0.82	2.07	0.69	0.94	0.69	1.02	1.23
22	18.86	1.03	1.524	1.206	93.93	74.10	0.65	0.51	1.74	2.18	1.12	0.76	2.13	0.63	0.96	0.60	0.97	1.17
23	18.69	1.03	1.474	1.162	90.54	71.38	0.63	0.50	1.46	2.17	1.06	0.77	2.07	0.61	0.98	0.55	0.94	1.13
24	18.49	1.04	1.484	1.181	91.15	72.55	0.63	0.50	1.73	2.12	1.06	0.69	3.00	0.61	1.03	0.52	0.93	1.13
25	18.94	1.03	0.721	0.568	44.29	34.88	0.31	0.24	1.11	1.71	0.80	0.64	1.74	0.26	1.29	0.99	0.75	0.90
26	18.20	1.05	0.666	0.534	40.90	32.79	0.28	0.23	1.88	1.53	0.83	0.59	1.58	0.45	0.84	0.40	0.71	0.86
27	18.41	1.04	0.671	0.535	41.21	32.86	0.29	0.23	1.38	1.67	0.82	0.60	1.57	0.45	0.89	0.41	0.72	0.87
28	19.55	1.02	0.671	0.520	41.21	31.97	0.29	0.22	1.31	1.63	0.83	0.59	1.64	0.44	0.95	0.41	0.73	0.88
GEMIDDELDE WAARDEN:									1.55	2.15	1.20	0.91	2.01	0.94	0.93	1.25	1.13	1.36
STANDAARDAFWIJKING:									0.32	0.28	0.21	0.19	0.32	0.34	0.12	1.16	0.23	0.26

SAMENVATTING RESULTATEN RUN # 1 MET OMHULLINGSMATERIAAL BIDIM 270 GRS.

RUN TIJDSTIP: MA+APR '81 RUN # 1 DATUM PROCESSING: 22-JUN-81 AANTAL METINGEN: 28 DUUR VAN DE PROEF: 30 D 0 U 12 M

GEMIDDELDE INTERVALDUUR TUSSEN TWEE METINGEN: 26.40 [U.M.], EN DE STANDAARDAFWIJKING VAN DE INTERVALDUUR: 26.12 [U.M.]

	FILTER-LAB	AANVOER-BUIS	AFVOER-BUIS	VAT BOVEN	VAT BENEDEN
GEMIDDELDE TEMPERATUUR:	18.17	20.08	18.72	21.88	18.77
STANDAARDAFWIJKING:	0.94	0.92	0.86	0.97	0.84

KORRELATIEMATRIX TEMPERATUREN:-

	1	2	3	4	5
1	1.00				
2	0.93	1.00			
3	0.85	0.94	1.00		
4	0.89	0.91	0.94	1.00	
5	0.83	0.89	0.93	0.86	1.00

	KOLOM 1	KOLOM 2	KOLOM 3	KOLOM 4
GEMIDDELD DEBIET GEHELE PERIODE [10 CR.]:	0.56	0.53	0.85	0.85
STANDAARDAFWIJKING:	0.02	0.02	0.36	0.36

KORRELATIEMATRIX DEBIETEN:-

	1	2	3	4
1	1.00			
2	0.16	1.00		
3	0.37	-0.76	1.00	
4	0.32	-0.78	1.00	1.00

TIJDSTIPPEN GEGEVENSREGISTRATIE [GEMETEN VANAF BEGINTIJDSTIP DOORSTROMINGSPROEF] PLUS INTERVALDUUR [: UREN EN MINUTEN]:-

#	TIJDSTIP	INTERVAL	#	TIJDSTIP	INTERVAL	#	TIJDSTIP	INTERVAL
1	0.00	0.00	11	144.02	71.38	21	414.10	29.23
2	3.00	3.00	12	168.13	24.11	22	480.41	66.31
3	5.38	2.38	13	171.08	2.55	23	511.52	31.11
4	8.34	2.56	14	195.15	24.07	24	551.48	39.56
5	27.16	18.42	15	216.57	21.42	25	559.37	7.49
6	29.31	2.15	16	243.31	26.34	26	673.16	113.39
7	31.48	2.17	17	313.58	70.27	27	697.03	23.47
8	47.18	15.30	18	338.13	24.15	28	720.12	23.09
9	55.18	8.00	19	365.18	27.05	29	0.00	0.00
10	72.24	17.06	20	384.47	19.29	30	0.00	0.00

D-WAARDEN VAN HET GEBRUIKTE BODEMMONSTER [GEWICHTSPERCENTAGES]:-

D10 = 62.78, D20 = 81.46, D30 = 94.38, D40 = 106.76, D50 = 114.34, D60 = 121.93, D70 = 129.52, D80 = 137.10, D90 = 144.69

D90/D10 = 2.30, D60/D10 = 1.94, D50/D20 = 1.68, D70/D30 = 1.37, D60/D40 = 1.14 [D-WAARDEN IN MICRON, RATIO'S DIMENSIELOOS]

VERVOLG RUN # 1, PAGINA 11

KORRELATIEMATRICES VAN DE BEREKENDE DOORLATENDHEDEN; VERGELIJKING VIER KOLOMMEN PER NIVEAU:-

OMHULLINGSMATERIAAL

	1	2	3	4
1	1.00			
2	0.08	1.00		
3	-0.07	0.79	1.00	
4	0.24	0.25	0.31	1.00

0.0 - 1.5 CM.

	1	2	3	4
1	1.00			
2	0.96	1.00		
3	0.62	0.86	1.00	
4	0.77	0.82	0.97	1.00

1.5 - 3.0 CM.

	1	2	3	4
1	1.00			
2	0.96	1.00		
3	0.83	0.67	1.00	
4	0.93	0.87	0.98	1.00

3.0 - 4.2 CM.

	1	2	3	4
1	1.00			
2	0.33	1.00		
3	-0.24	0.55	1.00	
4	-0.13	0.38	0.84	1.00

4.2 - 5.4 CM.

	1	2	3	4
1	1.00			
2	0.88	1.00		
3	0.96	0.94	1.00	
4	0.66	0.73	0.71	1.00

5.4 - 6.6 CM.

	1	2	3	4
1	1.00			
2	-0.27	1.00		
3	-0.29	0.30	1.00	
4	-0.33	0.84	0.59	1.00

6.6 - 7.8 CM.

	1	2	3	4
1	1.00			
2	0.76	1.00		
3	0.47	0.76	1.00	
4	-0.13	-0.10	0.37	1.00

7.8 - 9.0 CM.

	1	2	3	4
1	1.00			
2	-0.15	1.00		
3	0.70	-0.09	1.00	
4	0.83	0.04	0.83	1.00

0.0 - 9.0 CM.

	1	2	3	4
1	1.00			
2	0.76	1.00		
3	-0.20	-0.16	1.00	
4	-0.32	-0.02	-0.22	1.00

OMHULLING + BODEM

	1	2	3	4
1	1.00			
2	0.92	1.00		
3	0.82	0.94	1.00	
4	0.66	0.59	0.63	1.00

KORRELATIEMATRICES VAN DE BEREKENDE DOORLATENDHEDEN; VERGELIJKING ALLE NIVEAUS PER KOLOM:-

KOLOM # 1

	1	2	3	4	5	6	7	8	9	10
1	1.00									
2	-0.37	1.00								
3	-0.41	0.98	1.00							
4	0.02	0.42	0.44	1.00						
5	-0.32	0.91	0.96	0.50	1.00					
6	0.30	-0.61	-0.02	-0.63	-0.64	1.00				
7	-0.39	0.84	0.83	0.31	0.73	-0.49	1.00			
8	-0.37	0.86	0.86	0.42	0.73	-0.71	0.78	1.00		
9	-0.22	0.94	0.93	0.51	0.89	-0.66	0.75	0.80	1.00	
10	-0.56	0.96	0.90	0.26	0.73	-0.53	0.73	0.84	0.79	1.00

KOLOM # 2

	1	2	3	4	5	6	7	8	9	10
1	1.00									
2	0.52	1.00								
3	0.52	0.98	1.00							
4	0.32	0.69	0.80	1.00						
5	0.54	0.82	0.90	0.86	1.00					
6	0.46	0.83	0.89	0.71	0.84	1.00				
7	0.47	0.97	0.98	0.79	0.85	0.83	1.00			
8	0.22	0.06	0.04	-0.11	[illegible]	0.23	-0.09	1.00		
9	0.55	0.90	0.93	0.69	0.92	0.88	0.86	0.11	1.00	
10	0.31	0.87	0.82	0.59	0.61	0.53	0.87	-0.02	0.62	1.00

VERVOLG RUN : 1, PAGINA 12

KOLOM : 3

	1	2	3	4	5	6	7	8	9	10
1	1.00									
2	0.58	1.00								
3	0.56	1.00	1.00							
4	0.17	0.73	0.76	1.00						
5	0.55	0.93	0.91	0.53	1.00					
6	0.34	0.65	0.67	0.75	0.34	1.00				
7	0.49	0.95	0.96	0.92	0.62	0.72	1.00			
8	0.59	0.86	0.83	0.55	0.67	0.47	0.72	1.00		
9	-0.02	-0.07	-0.01	0.11	-0.16	0.07	0.07	-0.44	1.00	
10	0.54	0.94	0.94	0.61	0.87	0.51	0.84	0.77	0.03	1.00

KOLOM : 4

	1	2	3	4	5	6	7	8	9	10
1	1.00									
2	0.03	1.00								
3	-0.03	1.00	1.00							
4	0.01	0.71	0.71	1.00						
5	0.32	0.89	0.86	0.68	1.00					
6	0.06	0.95	0.94	0.64	0.89	1.00				
7	0.39	0.29	0.26	0.47	0.49	0.30	1.00			
8	-0.16	0.91	0.93	0.65	0.72	0.81	0.06	1.00		
9	0.26	-0.13	-0.17	-0.22	0.14	0.03	0.37	-0.39	1.00	
10	-0.50	0.45	0.50	0.22	0.06	0.26	-0.20	0.59	-0.51	1.00

DE CIJFERS CORRESPONDEREN MET DE VOLGENDE HORIZONTEN:-

1: OMHULLINGSMATERIAAL

2: OMHULLINGS + PORERM.

3: 0.0 - 9.0 CENTIMETER

4: 0.0 - 1.5 CENTIMETER

5: 1.5 - 3.0 CENTIMETER

6: 3.0 - 4.2 CENTIMETER

7: 4.2 - 5.4 CENTIMETER

8: 5.4 - 6.6 CENTIMETER

9: 6.6 - 7.8 CENTIMETER

10: 7.8 - 9.0 CENTIMETER

VERVOLG RUN # 1, PAGINA 13

IN KOLOM # 1 IS HET VERLOOP VAN DE VOLGENDE DOORLATENDHE-
DEN ALS FUNCTIE VAN DE TIJD SIGNIFICANT GECORRELEERD:-
===

- # 1: KORRELATIE TUSSEN 0.0 - 9.0 CENTIMETER EN OMHULLINGS + BODEMM. IS 0.98
- # 2: KORRELATIE TUSSEN 1.5 - 3.0 CENTIMETER EN OMHULLINGS + BODEMM. IS 0.91
- # 3: KORRELATIE TUSSEN 1.5 - 3.0 CENTIMETER EN 0.0 - 9.0 CENTIMETER IS 0.96
- # 4: KORRELATIE TUSSEN 5.4 - 6.6 CENTIMETER EN OMHULLINGS + BODEMM. IS 0.88
- # 5: KORRELATIE TUSSEN 5.4 - 6.6 CENTIMETER EN 0.0 - 9.0 CENTIMETER IS 0.66
- # 6: KORRELATIE TUSSEN 6.6 - 7.8 CENTIMETER EN OMHULLINGS + BODEMM. IS 0.94
- # 7: KORRELATIE TUSSEN 6.6 - 7.8 CENTIMETER EN 0.0 - 9.0 CENTIMETER IS 0.93
- # 8: KORRELATIE TUSSEN 6.6 - 7.8 CENTIMETER EN 1.5 - 3.0 CENTIMETER IS 0.89
- # 9: KORRELATIE TUSSEN 7.8 - 9.0 CENTIMETER EN OMHULLINGS + BODEMM. IS 0.90
- # 10: KORRELATIE TUSSEN 7.8 - 9.0 CENTIMETER EN 0.0 - 9.0 CENTIMETER IS 0.90

GEREGISTREERDE GEGEVENS DOORSTROMINGSPROEVEN KOLOM # 1

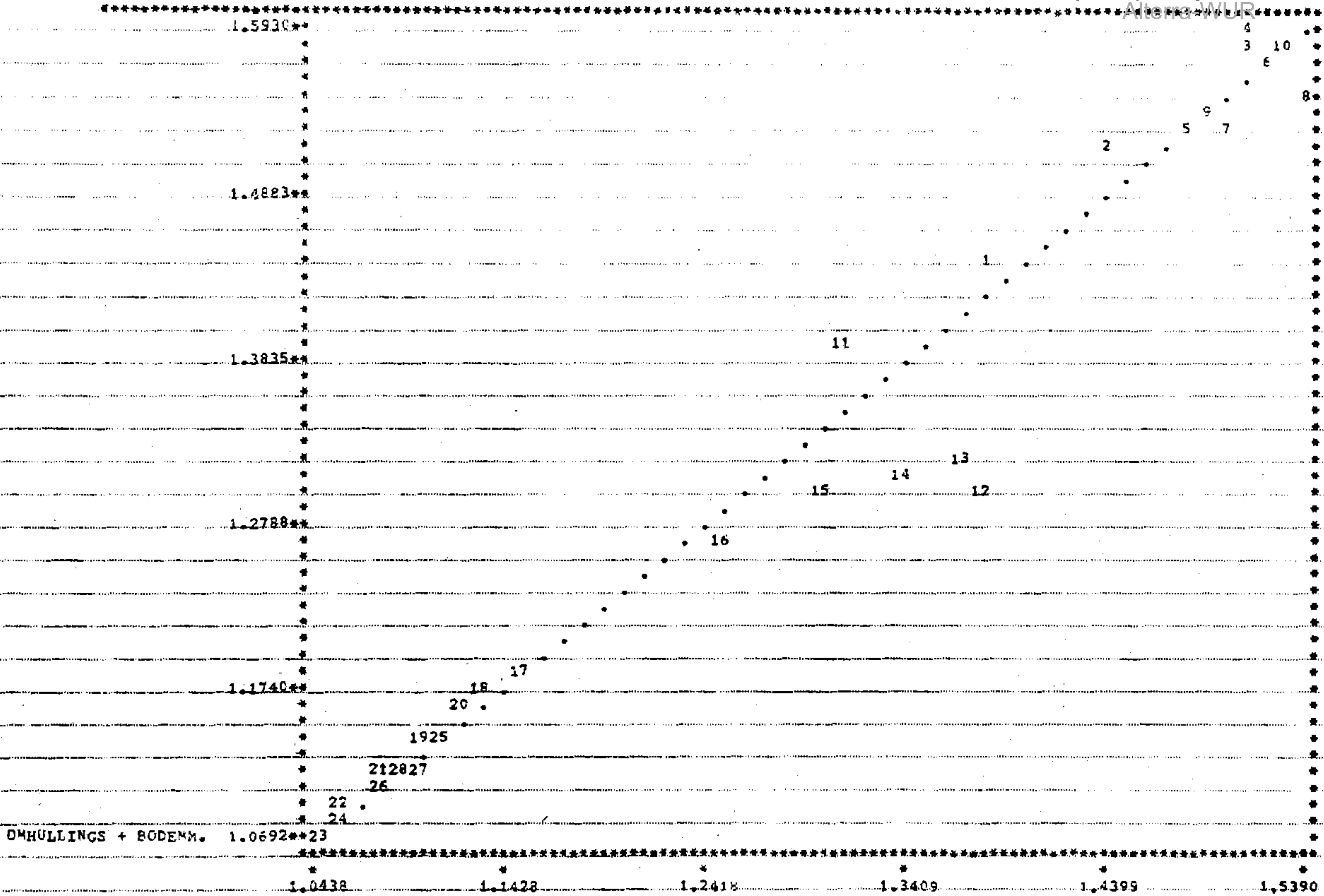
METING #	DAG	TIJDSTIP	TEMPERATUREN (GRAAD CELCIUS) FELL. LAB.	AANVOER-BUIS	AFVOER-BUIS	VAT BOVEN	VAT BENEDEN	BROOKS FLOW-METER (MM.)	AFLEZING NIVEAU PIEZOMETERS OP MANOMETERBORDEN (CM.):- H 0	H 8	H 1.5	H 3.0	H 4.2	H 5.4	H 6.6	H 7.8	H 9.0	H 11.
1	240381	9.00	19.10	20.10	18.40	23.20	18.45	20.00	3.50	3.65	5.30	10.15	12.70	15.15	17.70	19.10	21.45	24.35
2	240381	12.00	19.10	21.45	19.40	22.83	19.06	20.00	3.50	3.70	5.40	10.60	12.30	14.50	16.75	18.10	20.35	22.75
3	240381	14.38	19.52	21.40	19.90	23.20	19.75	20.00	3.50	3.70	5.40	10.35	11.90	13.75	15.75	17.35	19.50	21.90
4	240381	17.34	19.75	21.60	20.15	23.35	20.05	20.00	3.50	3.65	5.40	10.00	11.50	13.30	15.75	17.15	19.30	21.70
5	250381	12.16	19.50	21.40	20.00	23.38	19.84	19.50	3.40	3.55	5.40	9.85	10.85	12.97	15.55	16.95	19.05	21.75
6	250381	14.31	20.00	21.55	20.20	23.38	20.05	20.00	3.40	3.60	5.25	9.35	10.65	12.67	15.40	16.85	19.15	21.75
7	250381	16.40	19.65	21.69	20.34	23.52	20.20	19.70	3.40	3.60	5.30	9.41	10.81	12.92	15.45	16.95	19.00	21.85
8	260381	8.15	17.90	20.32	19.30	22.49	19.15	20.00	3.40	3.70	5.40	9.65	11.00	13.15	15.80	17.40	19.55	22.50
9	260381	16.18	17.90	20.72	19.45	22.49	19.40	19.80	3.55	3.70	5.35	9.60	10.95	13.20	15.80	17.35	19.65	22.41
10	270381	9.24	17.60	19.20	18.06	21.10	17.40	20.00	3.60	3.72	5.38	9.81	11.25	13.35	16.15	17.25	20.08	22.90
11	300381	9.02	17.42	19.62	18.20	21.24	18.10	19.60	3.60	3.70	5.40	10.08	11.60	13.85	16.65	18.42	22.18	24.85
12	310381	9.13	17.40	19.77	18.39	21.43	18.26	19.80	3.48	3.69	5.42	10.04	11.62	13.75	16.66	18.52	21.36	26.50
13	310381	12.08	18.08	19.60	18.75	21.79	18.83	19.80	3.46	3.62	5.35	10.05	11.52	13.20	16.65	18.42	21.38	25.95
14	10481	12.15	19.45	20.31	19.00	22.04	19.41	19.90	3.48	3.62	5.38	10.22	11.70	14.06	16.85	18.78	21.71	26.06
15	20481	9.57	17.92	19.49	18.21	21.25	18.65	19.90	3.46	3.63	5.36	10.65	12.12	14.62	17.61	19.72	22.71	26.75
16	30481	12.31	17.90	19.63	18.32	21.36	18.70	19.90	3.46	3.66	5.42	11.21	12.65	15.05	18.12	20.32	23.38	27.35
17	60481	10.56	17.79	19.41	18.01	21.10	18.91	19.90	3.42	3.63	5.50	12.21	13.58	16.00	19.32	21.86	25.25	29.06
18	70481	11.13	18.60	20.20	18.80	21.82	19.15	20.00	3.16	3.65	5.48	12.22	13.52	15.95	19.29	21.92	25.31	29.12
19	80481	14.18	18.41	20.10	18.81	21.85	19.13	20.00	3.47	3.63	5.50	12.41	13.66	16.15	19.52	22.32	25.90	29.81
20	90481	9.47	16.99	18.79	17.70	20.74	17.60	20.00	3.46	3.65	5.52	12.60	13.83	16.41	19.82	22.71	26.26	30.24
21	100481	15.10	18.51	20.43	19.10	22.14	19.45	20.00	3.46	3.60	5.50	12.61	13.78	16.35	19.82	22.71	26.16	30.12
22	130481	9.41	17.12	19.30	18.20	21.24	18.53	20.10	3.46	3.56	5.50	13.11	14.25	16.91	20.43	23.70	27.41	31.65
23	140481	10.52	17.55	19.40	18.12	21.16	18.41	20.10	3.46	3.61	5.55	13.30	14.48	17.15	20.81	24.12	27.74	32.25
24	160481	8.48	16.55	18.67	16.30	21.34	17.66	20.50	3.46	3.60	5.51	13.41	14.66	17.40	21.12	24.52	28.30	32.90
25	160481	16.37	17.52	19.49	18.12	21.16	18.20	20.00	3.45	3.60	5.35	12.63	13.82	16.22	19.62	22.75	26.10	30.32
26	210481	10.16	17.05	18.93	17.10	20.14	17.15	20.10	3.46	3.57	5.41	12.90	14.15	16.89	20.40	23.56	27.25	31.85
27	220481	10.03	17.17	19.11	17.37	20.41	17.40	20.30	3.49	3.62	5.48	12.91	14.16	16.37	20.34	23.50	27.18	31.80
28	230481	9.12	18.52	20.32	18.39	21.43	18.41	20.20	3.50	3.63	5.41	12.66	13.82	16.42	19.85	22.85	26.45	30.92

GEREGISTREERDE GEGEVENS DOORSTROMINGSPROEVEN KOLOM # 2

METING NR	DAG	TIJDSTIP	TEMPERATUREN (GRAAD CELCIUS) FELL. LAB.	AANVOER-BUIS	AFVOER-BUIS	VAT BOVEN	VAT BENEDEN	DRUKKS FLOW-METER (CP.)	AFLEZING NIVEAU PIEZOMETERS OF MANOMETERBORDEN (CM.): H 0	H 8	H 1.5	H 3.0	H 4.2	H 5.?	H 6.?	H 7.6	H 9.0	H 11.
1	240381	9.00	19.10	20.10	18.40	23.20	18.45	20.10	3.70	4.10	5.85	9.40	12.95	15.70	17.75	21.25	23.40	25.70
2	240381	12.00	19.10	21.45	19.40	22.83	19.00	20.00	3.75	4.00	5.75	9.35	13.00	16.25	17.90	20.55	23.05	24.40
3	210381	14.38	19.52	21.40	19.90	23.20	19.75	20.00	3.70	4.00	5.90	9.40	12.60	15.40	16.65	19.85	21.50	22.75
4	240381	17.34	19.75	21.60	20.15	23.35	20.05	20.00	3.70	3.95	5.90	9.10	11.80	14.35	15.50	17.70	20.25	21.10
5	250381	12.15	19.50	21.40	20.00	23.39	19.84	19.50	3.65	3.95	5.50	8.65	11.10	13.40	14.80	16.95	19.45	21.45
6	250381	14.31	20.00	21.55	20.20	23.38	20.05	20.00	3.62	3.95	5.50	8.60	11.06	13.35	14.75	16.85	19.35	21.70
7	250381	16.48	19.65	21.69	20.34	23.52	20.20	19.80	3.61	3.91	5.50	8.60	11.10	13.45	14.90	17.00	19.51	21.85
8	260381	8.18	17.90	20.32	19.30	22.49	19.15	19.80	3.62	3.95	5.62	8.65	11.15	13.65	15.00	17.15	19.80	22.31
9	260381	10.18	17.90	20.70	19.45	22.49	19.40	19.50	3.70	3.90	5.55	8.60	11.20	13.60	14.95	17.12	19.80	22.30
10	270381	9.24	17.80	19.20	18.00	21.10	17.40	19.20	3.69	3.91	5.55	8.55	11.15	13.70	15.08	17.25	20.10	22.72
11	300381	9.02	17.42	19.62	18.20	21.24	18.10	18.80	3.69	3.92	5.50	8.62	11.20	14.02	15.22	17.55	20.95	23.81
12	310381	9.13	17.40	19.77	18.39	21.43	18.20	19.20	3.68	3.95	5.49	8.59	11.12	13.97	15.21	17.42	20.92	23.98
13	310381	12.08	18.08	19.80	18.75	21.79	18.83	18.50	3.68	3.91	5.52	8.56	11.15	13.92	15.18	17.42	20.80	23.92
14	10481	12.15	18.45	20.31	19.00	22.04	19.41	18.30	3.61	3.95	5.45	8.61	11.20	14.05	15.32	17.62	21.05	24.07
15	20481	9.57	17.62	19.49	18.21	21.25	18.65	18.70	3.65	3.88	5.52	8.81	11.50	14.81	16.10	18.50	22.06	25.12
16	30481	12.31	17.90	19.63	18.32	21.36	18.70	18.80	3.61	3.96	5.55	8.89	11.76	15.05	16.71	19.15	22.75	25.75
17	60481	10.58	17.79	19.41	18.01	21.10	18.91	18.20	3.61	3.94	5.70	9.09	12.02	16.45	17.58	20.11	24.00	26.57
18	70481	11.13	18.60	20.20	18.80	21.32	19.15	18.10	3.66	3.95	5.74	9.11	12.02	16.43	17.63	20.25	23.60	26.68
19	80481	12.18	18.41	20.10	18.81	21.65	19.15	18.60	3.62	3.96	5.72	9.11	12.21	16.83	18.05	20.81	24.92	27.48
20	90481	9.47	16.99	18.79	17.70	20.74	17.80	18.70	3.65	3.97	5.75	9.22	12.39	17.11	18.23	21.18	25.35	27.81
21	100481	15.10	18.51	20.43	19.10	22.14	19.45	18.70	3.66	3.95	5.70	9.13	12.31	17.00	18.20	21.03	25.16	27.52
22	130481	9.41	17.12	19.30	18.20	21.24	18.53	18.70	3.60	3.95	5.73	9.19	12.38	17.27	18.41	21.98	25.71	28.09
23	140481	10.52	17.55	19.40	18.12	21.16	18.41	18.80	3.62	3.92	5.72	9.12	12.31	17.39	18.48	21.55	25.86	28.10
24	160481	8.48	16.55	18.62	18.30	21.34	17.66	18.50	3.65	3.93	5.72	9.10	12.12	17.28	18.35	21.40	25.60	27.80
25	160481	10.37	17.52	19.49	18.12	21.16	18.20	20.00	3.62	3.96	6.05	10.15	13.91	19.90	21.86	25.08	29.90	32.62
26	210481	10.16	17.05	18.93	17.10	20.14	17.15	19.90	3.62	4.00	6.15	10.30	14.11	20.21	21.75	25.45	30.62	33.22
27	220481	10.03	17.17	19.11	17.37	20.41	17.40	20.00	3.62	4.02	6.13	10.31	14.13	20.05	21.70	25.41	30.51	33.02
28	230481	9.17	19.52	20.32	18.39	21.43	18.41	20.00	3.63	4.02	6.08	10.26	13.85	19.54	21.25	24.78	29.65	32.17

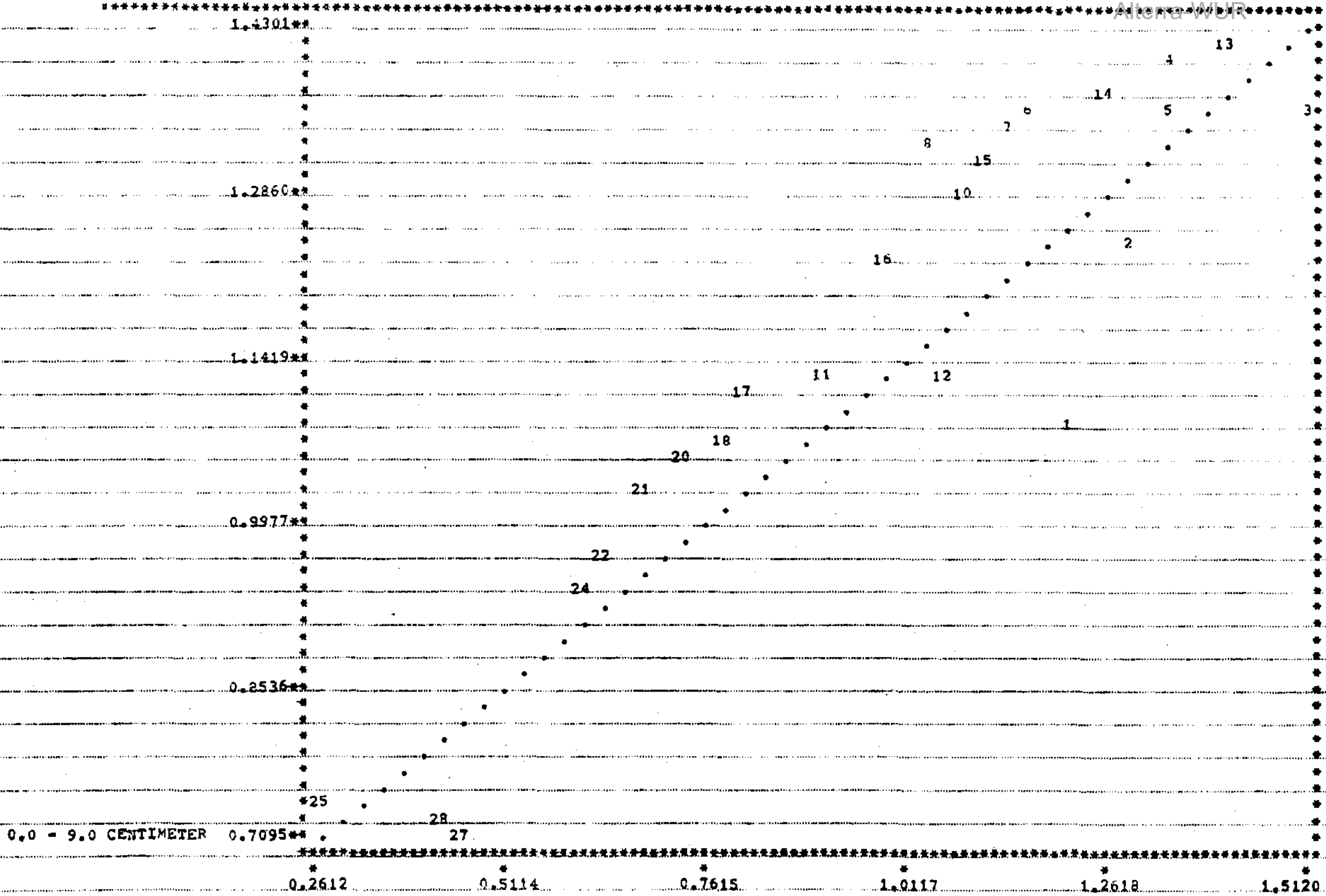
IN DE NU VOLGENDE SCATTERDIAGRAMMEN KORRESPONDEREN DE GETALLEN WELKE DE WAARDEN VAN DE METINGEN AANGEVEN MET DE VOLGORDE VAN DE VERRICHTE METINGEN. INDIEN BEPAALDE GETALLEN ONTBREKEN ZIJN DE DESBETREFFENDE MEETWAARDEN OP EEN LATER TIJDSTIP WEER GEREALISEERD EN ZIJN VROEGERE MEETWAARDEN DOOR LATER GEREALISEERDE OVERSCHREVEN

RUN # 1 - KOLOM # 1 - PAGINA 15 - SCATTER DIAGRAM VAN DE DOORLATENDHEDEN VAN OMHULLINGS + BODEMM. EN 0.0 - 9.0 CENTIMETER



0.0 - 9.0 CENTIMETER -- DE KORRELATIECOEFFICIENT IS 0.98

PAGINA 56 - SCATTER DIAGRAM VAN DE DOORLATENDHEDEN VAN 0.0 - 9.0 CENTIMETER EN 5.4 - 6.6 CENTIMETER



5.4 - 6.6 CENTIMETER -- DE KORRELATIECOEFFICIENT IS 0.93

HET AANTAL KEREN DAT SIGNIFICANTE KORRELATIE WERD GEKONSTATEERD IS HIERONDER WEERGEGEVEN:

1. VERGELIJKING VIER KOLOMMEN PER NIVEAU:-

	1	2	3	4
1	0			
2	4	0		
3	1	2	0	
4	0	1	2	0

2. VERGELIJKING ALLE NIVEAUS PER KOLOM:-

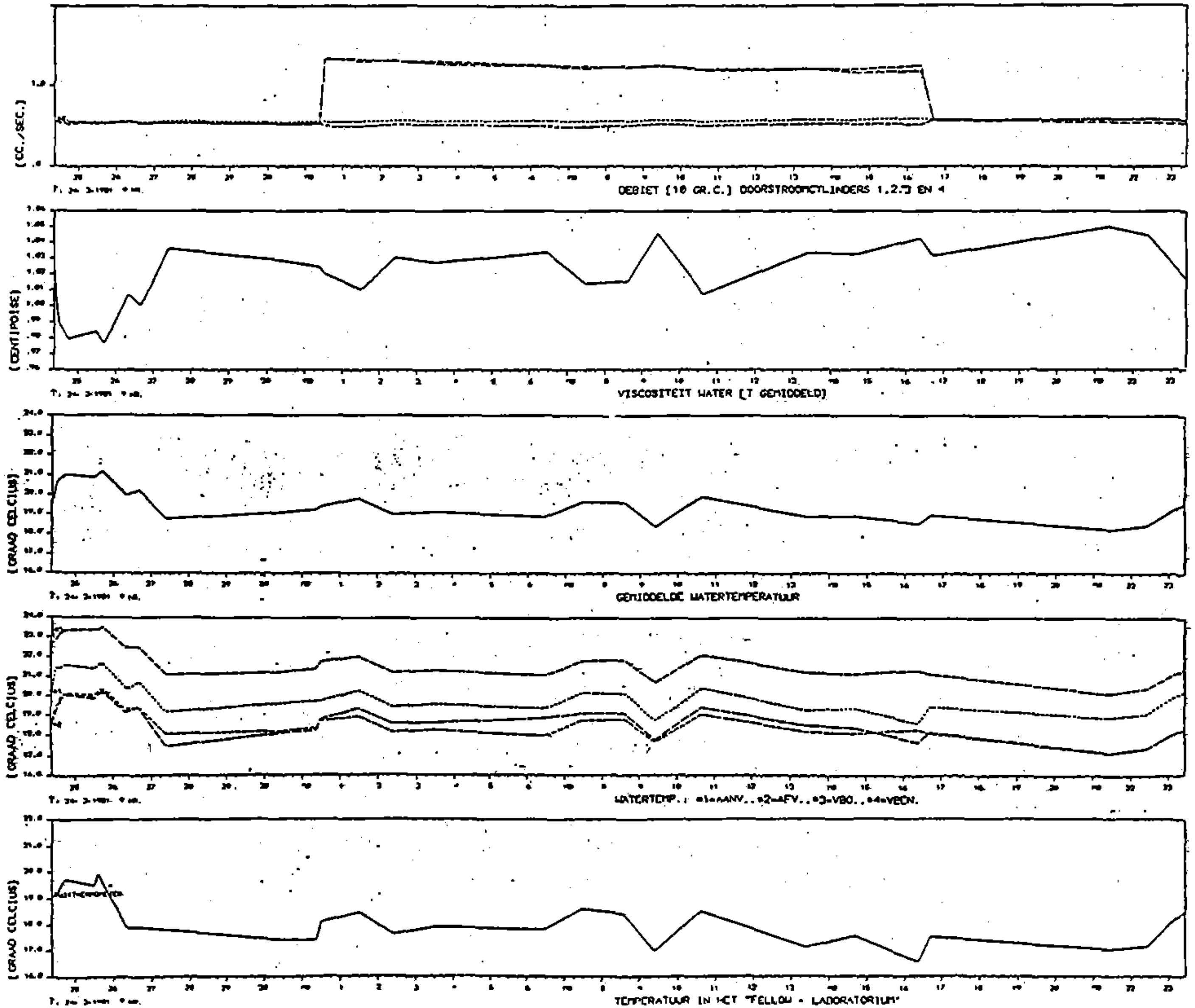
	1	2	3	4	5	6	7	8	9	10
1	0									
2	0	0								
3	0	4	0							
4	0	0	0	0						
5	0	3	4	1	0					
6	0	1	2	0	1	0				
7	0	2	2	0	1	0	0			
8	0	3	2	0	1	0	0	0		
9	0	2	2	0	1	1	1	0	0	
10	0	3	2	0	1	0	1	0	0	0

[1. MAXIMALE AANTAL = 10, 2. MAXIMALE AANTAL = 4]

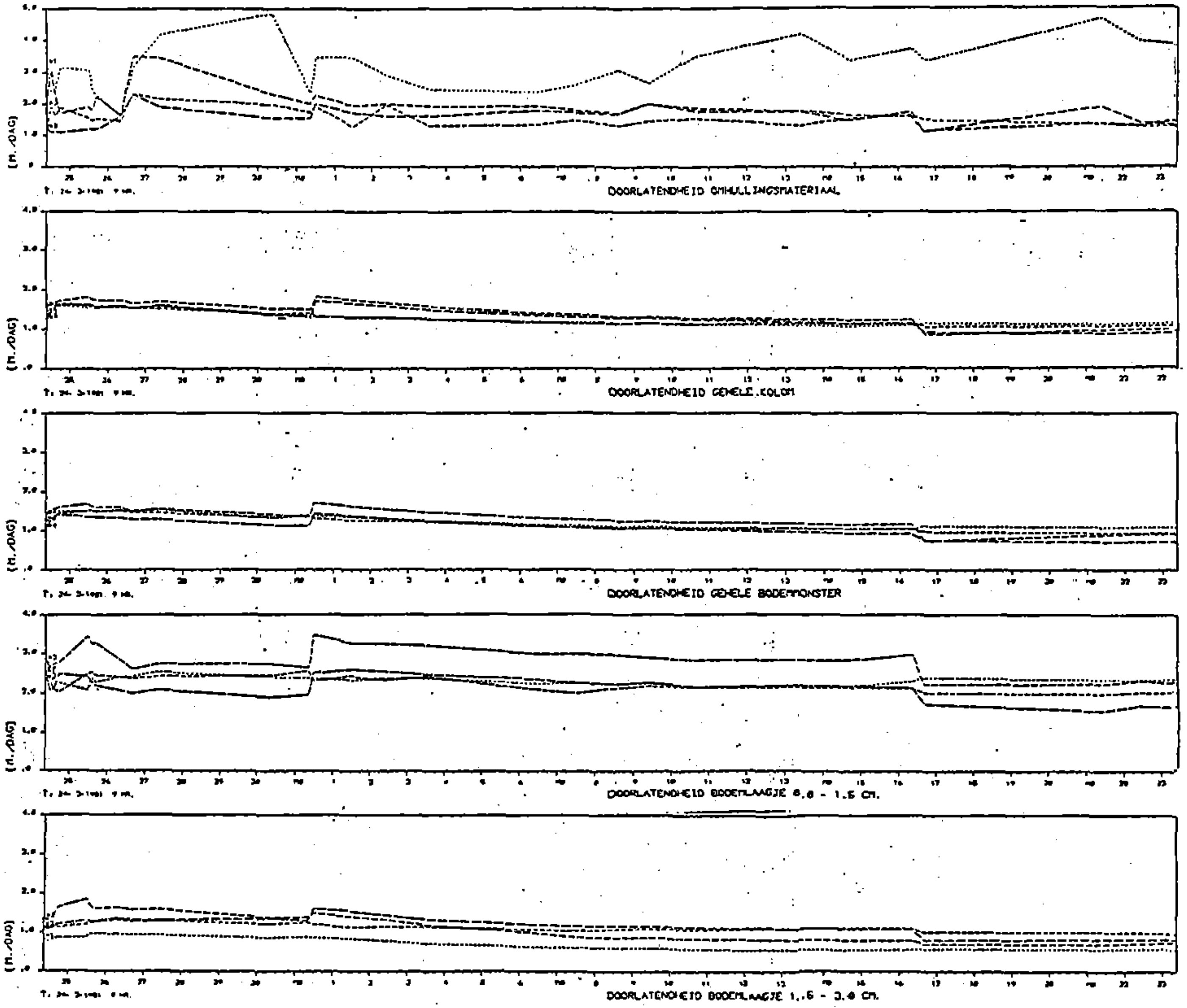
AANTAL SCATTERDIAGRAMMEN KOLOM = 1,2,3 EN 4 RESPECTIEVELIJK 10,13,10 EN 8. --- DE UITVOER VAN DE HOUSTON-PLOTTER AL OPGEHAALD ?

AANTEKENINGEN

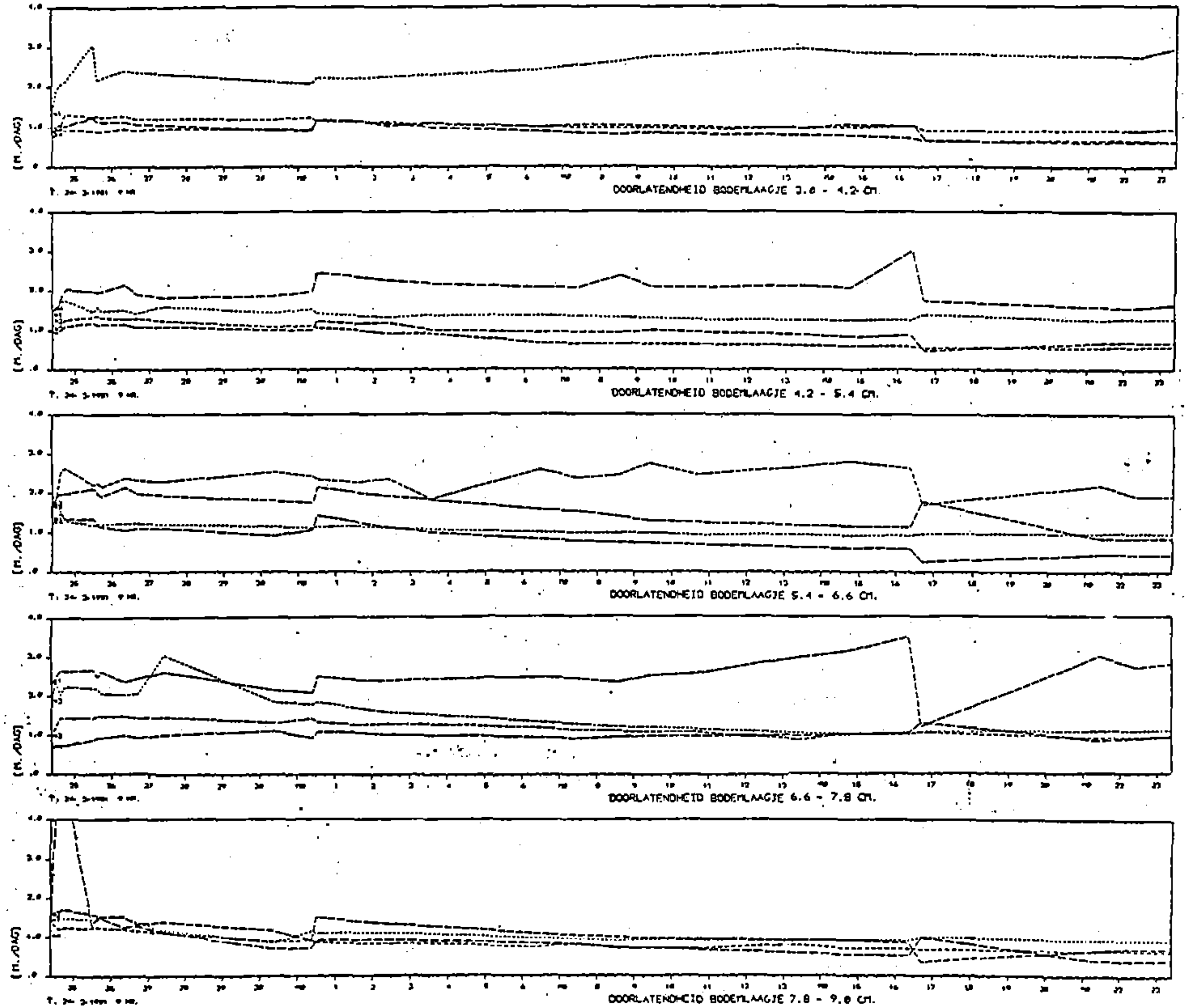
STUYT'S APPLIED SOFTWARE "FINGER LICKIN' GOOD" -- RUNNING ON THE DEC-10 SYSTEM OF THE LANDBOUWHOGESCHOOL (512K CORE) APRIL 1981



EIGENSCHAPPEN DRAINAGEOMHULLINGSMATERIALEN I.C.W. 1981 IR. L.C.P.M. STUYT



KOMO KWALITEITSCOMMISSIE E 23 "DRAINEERBUIZEN"



RUN • 1. BIDIM 270 GR./M**2. APRIL + MEI 1981