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Material Transport Through Porous Media: A Finite-Element Galerkin Model

J. O. Duguid M. Reeves

Environmental Sciences Division Publication 733

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J. O. Duguid and M. Reeves

ABSTRACT

A two-dimensional transient model for flow of a dissolved constituent through porous media has been developed. Mechanisms for advective transport, hydrodynamic dispersion, chemical adsorption, and radioactive decay are included in the mathematical formulation. Implementations of quadrilateral finite elements, bilinear spatial interpolation, and Gaussian elimination are used in the numerical formulation. The programming language FORTRAN IV is used exclusively in the computer implementation. A listing of the program is included. This material-transport model is completely compatible with our moisture-transport model (Reeves and Duguid, 1975) for predicting advective Darcy velocities for porous media which may be partly unsaturated.

In addition to a description of the mathematical formulation, the numerical treatment and the computer implementation results of two computer simulations are included in this document. One is a comparison with a well-known analytical treatment (Lapidus and Amundson, 1952) and is intended as a partial validation. The other simulation, a seepage-pond problem, is a more realistic demonstration of the capabilities of the computer model. Complete listings of input and output are given in the appendices so that this simulation may be used for check-out purposes. This report, thus, is intended to be a comprehensive description of the material-transport computer model.

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I. INTRODUCTION

The transport of a dissolved constituent by ground water is influenced by convective transport, hydrodynamic dispersion, chemical reactions, and decay. Mathematical analysis of the transport is further complicated by transient multidimensional flow of the carrier, which may occur under saturated and unsaturated conditions within the region of interest. The basic equations governing the transport have been formulated for various physical and chemical properties by many investigators. Bredehoeft and Pinder (1973) present an excellent formulation of the mass-transport equation for the saturated flow of a nonreacting, nondecaying pore fluid. Both adsorption and decay of the dissolved constituent are considered in the equations for saturated transport which are presented by Bear (1972). Saturated steady flow was considered by Rubin and James (1973) in their formulation of the transport equation. However, to the authors' knowledge no investigator has considered the combination of saturated-unsaturated transient flow where both adsorption and decay are present in a two-dimensional region. An equation of this complexity is necessary, for example, in the simulation of the long-term movement of toxic materials from a land-disposal site.

Mathematical description of chemical reactions that occur when dissolved constituents flow through porous media may be quite detailed. Both reversible and irreversible chemical reactions may occur. Misra, Nielsen, and Biggar (1974) use first-order kinetics to model irreversible nitrogen reactions within the transported fluid. Lapidus and Amundson (1952) consider two special cases involving reversible adsorption reactions. In one case a chemical-rate equation is coupled to the transport equation, in the other case a local-equilibrium assumption is made in which the solid-phase concentration is a simple linear function of the liquid-phase concentration and is independent of time. Such a function, called an adsorption isotherm, may be nonlinear (Lai and Jurinak, 1972) and hysteretic as applied by Van Genuchten, Davidson and Wierenga (1974). The latter authors also consider a nonlinear chemical-rate equation for the adsorption of pesticide. In addition to the various aspects of reversible and irreversible reactions, there may be several species of dissolved constituents in the solution either reacting irreversibly with each other or competing for available adsorption sites in the soil matrix (Rubin and James, 1973).

The chemistry considered in this document is not general enough to encompass all of the complexities given in the previous paragraph. The reacting species in the soil solution are assumed to be completely independent so that they may be treated one at a time by the computer code. For reversible processes local equilibrium is assumed and a linear isotherm function is employed. Finally, the only irreversible reaction that may be considered is one analogous to radioactive decay; i.e., the rate of increase (or decrease) is proportional to the total quantity of the constituent present in both the solid and the liquid phases. These restrictions are in agreement with the applications currently contemplated by the authors.

Solution of the transport equation may be obtained by analytical means under very severe restrictions for one-dimensional flow (Lapidus and Amundson, 1952). However, for more meaningful application of the equations in regions which approximate conditions that occur in nature, numerical methods of solution are required. Several investigators have employed finite-difference methods for the solution of the convective diffusion equation (Oster, et al., 1970) and of the transport equation where adsorption was considered (Lai and Jurinak, 1971 and 1972). However, as pointed out by Bredehoeft (1971), these methods produce numerical dispersion of the same order as the physical dispersion. To reduce the effect of numerical dispersion, Rubin and James (1973) and Pinder (1973) have used Galerkin finite-element methods. These methods appear to be better suited for numerical simulation of transport because numerical dispersion is small and because multidimensional irregular regions can be treated easily. Galerkin finite-element techniques are employed by the authors in a companion document (Reeves and Duguid, 1975), which treats two-dimensional water flow through saturated-unsaturated porous media.

The purpose of developing a two-dimensional transient model in which both adsorption and decay of the dissolved constituent are considered was twofold: one, the model allows an investigator to simulate the transport of toxic materials through saturated-unsaturated porous media to predict future concentrations in the ground water; and, two, the model provides the toxic-material concentration data necessary for human-dose calculations.

II. THEORETICAL DEVELOPMENT

In the following sections the equations governing mass transport through porous media are formulated and the corresponding Galerkin finite-element solution techniques are developed. In the following formulation the fluid phase carries a dissolved constituent which is adsorbed by the solid. Thus, the constituent is present in both the fluid and the solid phases of the medium. The concentration of the dissolved constituent is assumed to be sufficiently small that changes in concentration do not affect transport of the fluid. The dissolved constituent in the carrier is assumed to be in equilibrium with the concentration of the constituent adsorbed by the solid, and the rate of decay is assumed to be proportional to the concentration.

1. Formulation of the Mass-Transport Equations. Consider an arbitrary material volume element of saturated-unsaturated porous media. The volume element is composed of fluid and solid, both of which are moving. Since the velocity of the solid phase is smaller than the velocity of the fluid, it is convenient to attach the coordinate system to the solid. This requires that no solid grains cross the surface of the volume element as it deforms. The material volume element moves through space with a velocity $\bar{v}_s$, while the fluid phase flows through the surface with a bulk flux $\bar{f}$. Thus, the term $\bar{f}$ is the bulk flux of the fluid relative to the solid. The total amount of the constituent within a volume V at any instant of time is

$$\int_V (\theta c + \rho s')\,dV \qquad (1)$$

where θ is the water content, c is the concentration of the dissolved constituent in the water, ρ is the bulk density of the solid, and s' is the concentration of the constituent that is adsorbed by the solid. The rate of mass transport through the surface of the volume is

$$\oint_S \bar{n} \cdot \bar{f}\,dS \qquad (2)$$

where $\bar{n}$ is an outward-directed unit normal to the surface. The rate of change of the amount of the constituent in the volume due to decay is

$$\lambda \int_V (\theta c + \rho s')\,dV \qquad (3)$$

where λ is the decay constant.

From Eqs. (1-3) conservation of mass may be written as

$$\frac{d}{dt}\int_V (\theta c + \rho s')\,dV + \int_S \bar{n} \cdot \bar{f}\,dS + \lambda\int_V (\theta c + \rho s')\,dV = 0 \qquad (4)$$

where d/dt is the material time derivative

$$\frac{d}{dt} = \left(\frac{\partial}{\partial t} + \bar{v}_S \cdot \nabla \right) \tag{5}$$

When Reynolds transport theorem (Malvern, 1969, p. 210-211) is applied to the first term of Eq. (4), the following equation is obtained:

$$\int_V \left[\frac{\partial}{\partial t} (\theta c + \rho s') + \nabla \cdot (\theta c + \rho s') \bar{v}_S \right] dV + \int_S \bar{n} \cdot \bar{f} \, dS + \lambda \int_V (\theta c + \rho s') \, dV = 0 \tag{6}$$

The divergence theorem is

$$\oint_S \bar{n} \cdot \bar{f} \, dS = \int_V \nabla \cdot \bar{f} \, dV \tag{7}$$

When Eq. (7) is combined with Eq. (6), the resulting equation is

$$\int_V \left[\frac{\partial}{\partial t} (\theta c + \rho s') + \nabla \cdot (\theta c + \rho s') \, \bar{v}_s + \nabla \cdot \bar{f} + \lambda (\theta c + \rho s') \right] dV = 0 \tag{8}$$

Since the integrand, in general, must be zero, conservation of mass becomes

$$\frac{\partial}{\partial t} (\theta c + \rho s') + \nabla \cdot (\theta c + \rho s') \, \bar{v}_s + \nabla \cdot \bar{f} + \lambda (\theta c + \rho s') = 0 \tag{9}$$

The bulk flux of the constituent and carrier relative to the solid may be divided into a diffusive flux and an advective flux:

$$\bar{f} = \bar{f}_d + \bar{f}_a \tag{10}$$

When a concentration gradient within the individual pores is assumed, the diffusive flux is written as

$$\bar{f}_d = \theta \bar{\bar{D}} \cdot \nabla c \tag{11}$$

where $\bar{\bar{D}}$ is the hydrodynamic dispersion tensor. The advective flux of the constituent and carrier may be written in terms of the flux of the carrier as

$$\bar{f}_d = \theta c \bar{V}_{fs} = c\bar{V} \quad (12)$$

where $\bar{V}_{fs}$ is the velocity of the carrier relative to the solid and $\theta V_{fs} = V$ is the Darcy flux. Substitution of Eqs. (10-12) into Eq. (9) yields

$$\frac{\partial}{\partial t}(\theta c + \rho s') + \nabla\cdot(\theta c + \rho s')\bar{v}_s - \nabla\cdot(\theta \bar{\bar{D}}\cdot\nabla c) + \nabla\cdot(\bar{V}c) + \lambda(\theta c + \rho s') = 0 \quad (13)$$

The second term of Eq. (13) may be expressed as

$$\nabla\cdot(\theta c + \rho s')\bar{v}_s = \nabla(\theta c + \rho s')\cdot\bar{v}_s + (\theta c + \rho s')\nabla\cdot\bar{v}_s \quad (14)$$

where the first term on the right-hand side of the equation is the product of two small vectors and will be neglected. If all of the displacement of the medium is assumed to be vertical (e.g., vertical consolidation), the last term of Eq. (14) becomes

$$\nabla\cdot\bar{v}_s = \frac{\partial e}{\partial t} = \alpha\rho_f g\frac{\partial h}{\partial t} = \alpha'\frac{\partial h}{\partial t} \quad (15)$$

where $e = \epsilon_{ii}$ is the dilatation of the medium, α is the coefficient of compressibility of the medium, ρ_f is the density of the fluid, g is the acceleration of gravity, h is the fluid pressure head, and α' is the modified coefficient of compressibility of the medium. A more detailed formulation of Eq. (15) is given by Reeves and Duguid (1975). Substitution of Eqs. (14) and (15) into Eq. (13) yields

$$\frac{\partial}{\partial t}(\theta c + \rho s') + (\theta c + \rho s')\alpha'\frac{\partial h}{\partial t} - \nabla\cdot(\theta\bar{\bar{D}}\cdot\nabla c) + \nabla\cdot(\bar{V}c) + \lambda(\theta c + \rho s') = 0 \quad (16)$$

The adsorption of the constituent by the solid is assumed to occur at a rapid rate (i.e., a fast exchange reaction) such that the dissolved material in the carrier is in equilibrium with the material adsorbed by the solid. This is expressed by the linear equation

$$s' = kc \quad (17)$$

where k is the distribution coefficient for unsaturated porous media. For unsaturated media, k is defined as

$$k = \frac{\text{quantity of adsorbed material/mass of solid}}{\text{quantity of dissolved material/volume of fluid}} \quad (18)$$

where the volume of fluid is equal to the moisture content times the total volume. For saturated media,

$$k_d = \frac{\text{quantity of adsorbed material/mass of solid}}{\text{quantity of dissolved material/volume of fluid}} \quad (19)$$

where the volume of the fluid is equal to the porosity times the total volume. Thus, the relationship between the unsaturated and saturated distribution coefficients may be written as

$$k = \frac{\theta}{n} k_d \quad (20)$$

and the material adsorbed by the solid is expressed as

$$s' = \frac{\theta}{n} k_d c \quad (21)$$

Substitution of Eq. (21) into Eq. (16) yields

$$\frac{\partial}{dt}\left(\theta c + \frac{\rho k_d}{n} \theta c\right) + \left(\theta c + \frac{\rho k_d}{n} \theta c\right)\alpha' \frac{\partial h}{\partial t} \quad \nabla \cdot (\theta \bar{\bar{D}} \cdot \nabla c) + \nabla \cdot (Vc) + \lambda \left(\theta c + \frac{\rho k_d}{n} \theta c\right) = 0 \quad (22)$$

The retardation factor is defined as

$$R_d = \left(1 + \frac{\rho k_d}{n}\right) \quad (23)$$

This term is a measure of the delay or retardation of the breakthrough of the dissolved constituent. Substitution of the retardation factor into Eq. (22) yields

$$R_d \frac{\partial(\theta c)}{\partial t} \quad \nabla \cdot (\theta \bar{\bar{D}} \cdot \nabla c) + \nabla \cdot (\bar{V} c) + \left(\alpha' R_d \frac{\partial h}{\partial t} + \lambda R_d\right)\theta c = 0 \quad (24)$$

which may be expressed in the form

$$\theta R_d \frac{\partial c}{\partial t} - \nabla \cdot (\theta \bar{D} \cdot \nabla c) + \nabla \cdot (\bar{V} c) + \left(R_d \frac{\partial \theta}{\partial t} + \alpha' \theta R_d \frac{\partial h}{\partial t} + \lambda \theta R_d \right) c = 0 \qquad (25)$$

In a porous medium which is assumed to be isotropic with respect to dispersivity, the hydrodynamic dispersion coefficient may be written (Bear, 1972) as

$$\theta D_{ij} = a_T V' \delta_{ij} + (a_L - a_T) \frac{V_i V_j}{V'} + a_m \tau' \delta_{ij} \qquad (26)$$

where double indices denote summation, δ_{ij} is the Kronecker delta, a_T is the transverse dispersivity, a_L is the longitudinal dispersivity, a_m is the molecular diffusion, τ' is the tortuosity, V' is the magnitude of the Darcy velocity, and V_i and V_j are the components of the Darcy velocity.

2. Spatial Integration by the Galerkin Finite-Element Method. The method used in the spatial integration of Eq. (25) is a special case of the broad category called weighted-residual methods. These methods, in their classical form, approximate the solution to the differential equations and satisfy the boundary conditions exactly. The differential equation may be written in the general form

$$L(\Phi) = 0 \qquad (27)$$

where L is a differential operator and Φ is the dependent variable. The weighted-residual approximate solution Φ' over the region V is obtained from the equation

$$\int_V W_j \, L(\Phi') dV = 0 \qquad (28)$$

The W_j comprise a set of p weighting functions, and Φ', the trial solution, has the form

$$\Phi' = \sum_{i=1}^{m} N_i \phi_i \qquad (29)$$

where the N_i are trial functions, the ϕ_i are unknown amplitudes of the trial solutions, and $L(\Phi') \neq 0$ is the residual. The special case in which the weighting functions W_j are chosen as the trial functions N_j is the Galerkin method. In effect, the equations for the Galerkin method

$$\int_V N_j \, L\left(\sum_{i=1}^{m} N_i \phi_i \right) dV = 0 \qquad j = 1(1)N \qquad (30)$$

require that the residual of the differential equation be made orthogonal to each term in the trial series. (In Eq. (30) index j ranges over the values 1,2,...,N.) As m becomes large, Φ' approaches Φ. Coefficients ϕ may be obtained by integration and solution of the above equations, and the approximate solution Φ' is obtained by substituting these coefficients into the trial solution summation (Finlayson, 1972).

In the classical Galerkin method, each of the trial solutions N, extends over the entire domain V and must satisfy all boundary conditions. Hence, the method is restricted to simply shaped, simply connected regions with homogeneous material properties. However, the power and generality of the Galerkin method can be extended considerably by combining it with a finite-element discretization in which the region of integration is represented by an assemblage of subdomains. In two-dimensional space these elements would be polygons, and in three-dimensional space they would be polyhedra. These subdomains are called elements, and their corners, or connection points, are called nodes. In this approach, the family of trial solutions consists of subfamilies of very simple functions. The ϕ satisfy the boundary conditions, and not the basis functions N, which are nonzero on only one of the subdomains. The coefficients ϕ, become the amplitudes of the unknown function at the nodes. This finite-element approach, in effect, is a piecewise Galerkin approximation which permits the application of the Galerkin method to complex geometries and nonhomogeneous media. A more detailed discussion of the Galerkin finite-element method is given by Hutton and Anderson (1971). The formulation and use of the finite-element Galerkin method in ground water transport is presented by Pinder (1973).

In such a formulation it is convenient to introduce one basis function $\{N(x)\}$ for each element r. This combination weighting-trial function is, however, a column vector that has a separate $N_i(x)$ for each node i of the element. Each of these bilinear interpolation functions extends across the entire element in a two-dimensional space. Each has a magnitude of unity at node i and a magnitude of zero at all other nodes. Because of the latter property, coefficients $_r c$ of the trial solution

$$_r\Phi' = {}_r c(x,t) = \{N(x)\}^T \{_r c(t)\} \tag{31}$$

are identical to the concentration at each node as anticipated by the new notation for expansion of the coefficients ϕ on the right-hand side of Eq. (31). When Galerkin's method is applied to Eq. (25) in the r-th element, the equations are

$$\int_{_r V} \{N\} \cdot [A^* \dot{c} + B^* c] \, d_r V = 0 \tag{32}$$

where $\dot{c} = dc/dt$ and

$$A^* = R_d \theta$$
$$B^* = \nabla \cdot (\theta \bar{D} \cdot \nabla) + \nabla \cdot \bar{V} + \left(R_d \frac{\partial \theta}{\partial t} + \alpha' \theta R_d \frac{\partial h}{\partial t} + \lambda \theta R_d \right) \tag{33}$$

Equation (31) combined with Eq. (32) gives

$$\int_{_r V} \{N\} \, [A^* \{N\}^T \{\dot{c}\} + B^* \{N\}^T \{c\}] \, d_r V = 0 \tag{34}$$

where the notation $\{{}_r c\}$ has been changed to $\{c\}$. Equation (34) may be simplified to

$$\int_{{}_rV} \left([{}_rA'] \{\dot{c}\} + [{}_rB'] \{c\} \right) d_rV = 0 \tag{35}$$

where

$$[{}_rA'] = \{N\} A'' \{N\}^T \tag{36}$$

and

$$[{}_rB'] = \{N\} B'' \{N\}^T = \{N\} \left(-\frac{\partial}{\partial x_i} \theta D_{ij} \frac{\partial}{\partial x_j} + \frac{\partial}{\partial x_i} V_i \right.$$
$$\left. + R_d \frac{\partial \theta}{\partial t} + \alpha' \theta R_d \frac{\partial h}{\partial t} + \lambda \theta R_d \right) \{N\}^T \tag{37}$$

When Green's theorem is applied to the integral over the element volume of the first two terms of Eq. (37), it follows that

$$\int_{{}_rV} \{N\} \left(-\frac{\partial}{\partial x_i} \theta D_{ij} \frac{\partial}{\partial x_j} + \frac{\partial}{\partial x_i} V_i \right) \{N\}^T d_rV = \oint_{{}_rS} n_i \{N\} \left(-\theta D_{ij} \frac{\partial}{\partial x_j} + V_i \right) \{N\}^T d_rS$$
$$- \int_{{}_rV} \frac{\partial}{\partial x_i} \{N\} \left(-\theta D_{ij} \frac{\partial}{\partial x_j} + V_i \right) \{N\}^T d_rV \tag{38}$$

and Eq. (35) may be written as

$$[{}_rA] \{\dot{c}\} + [{}_rB] \{c\} + \{{}_rQ\} = 0 \tag{39}$$

where

$$[{}_rA] = \int_{{}_rV} \{N\} (R_d \theta) \{N\}^T d_rV \tag{40}$$

$$[_rB] = \int_{_rV} \left(\frac{\partial}{\partial x_i} \{N\} \, \theta D_{ij} \frac{\partial}{\partial x_j} \{N\}^T - \frac{\partial}{\partial x_i} \{N\} V_i \{N\}^T \right.$$

$$\left. + \{N\} \left(R_d \frac{\partial \theta}{\partial t} + \alpha' \theta R_d \frac{\partial h}{\partial t} + \lambda \theta R_d \right) \{N\}^T \right) d_rV \qquad (41)$$

and

$$\{_rQ\} = \oint_{_rS} n_i \{N\} \left[-\theta D_{ij} \frac{\partial}{\partial x_j} + V_i \right] \{N\}^T \{c\} \, d_rS \qquad (42)$$

The term in square brackets in Eq. (42) is defined by Eqs. (10-12) and may be expressed as

$$\{_rQ\} = \oint_{_rS} \{N\} \, n \cdot f \, d_rS \qquad (43)$$

Thus, Eq. (43) expresses the bulk flow of the dissolved constituent across the boundary of the element.

3. **Time Integration by the Finite-Difference Method**. Equation (39) is written for an arbitrary increment of time Δt:

$$[_rA] \{_r\dot{c}\}_{t+\omega\Delta t} + [_rB] \{c\}_{t+\omega\Delta t} + \{_rQ\} = 0 \qquad (44)$$

In the Crank-Nicholson centered-in-time approach $\omega = 1/2$, and in the backward-difference approximation $\omega = 1$. The Crank-Nicholson algorithm has a truncation error of $O(\Delta t^2)$, but its propagation-of-error characteristics frequently lead to oscillatory instabilities. The backward-difference scheme, on the other hand, has a truncation error of $O(\Delta t)$ but is quite resistant to oscillatory instabilities. An arbitrary ω allows an investigator to find the appropriate balance for the problem being considered. The time derivative of the concentration is expressed as

$$\{_r\dot{c}\}_{t+\omega\Delta t} \approx (\{_rc\}_{t+\Delta t} - \{_rc\}_t)/\Delta t \qquad (45)$$

and the value of this quantity at an arbitrary point in time is taken as

$$\{_rc\}_{t+\omega\Delta t} = \omega \{_rc\}_{t+\Delta t} + (1 - \omega) \{_rc\}_t \qquad (46)$$

Substitution of Eqs. (45) and (46) into Eq. (44) yields the following relationships:

$$[{}_rC^1]\{{}_rc\}_{t+\Delta t} = \{{}_rR^1\} \quad \{{}_rR^2\} \qquad (47)$$

where

$$[{}_rC^1] = [{}_rA^1]\,\Delta t + \omega[{}_rB^1] \qquad (48)$$

and

$$\{{}_rR^1\} = ([{}_rA^1]\,\Delta t \quad (1 \quad \omega)[{}_rB^1])\{{}_rc\}_t \quad \{{}_rD^1\} \qquad (49)$$

It should be understood that matrices $[{}_rA]$ and $[{}_rB]$, and, hence, $[{}_rC]$ and $\{{}_rR\}$, are evaluated at time $t+\Delta t$.

4. Numerical Implementation. For a quadrilateral element with four corner nodes, a bilinear polynomial basis function for the j-th node may be written in terms of local normalized coordinates as

$$N_j = \frac{1}{4}(1 + ss_j)(1 + rr_j) \qquad j = 1(1)4 \qquad (50)$$

where s and r are the local coordinates of the corner nodes, which are numbered 1 to 4 progressing around the element in a counterclockwise direction (Fig. 1). In the local coordinate system the element is square regardless of the shape of the quadrilateral in global coordinates. The global coordinates at any point within element r are given in terms of local coordinates by the relations

$$\begin{aligned} {}_rx &= \{N\}^T\{{}_rx\} \\ {}_rz &= \{N\}^T\{{}_rz\} \end{aligned} \qquad (51)$$

where $\{x\}$ and $\{z\}$ are column vectors whose elements are the global coordinates of the nodes of the r-th element. The quantity $\{N\}^T$ is the transpose of $\{N\}$ which depends on the local coordinates s and r given in Eq. (51). The shape function $\{N\}$ of the coordinate transformation is the same as the basis function; hence this element formulation is termed *isoparametric*. The Jacobian for the transformation from global to local coordinates is expressed as

$$[{}_rJ] = \begin{bmatrix} \dfrac{\partial_r x}{\partial s} & \dfrac{\partial_r z}{\partial s} \\ \dfrac{\partial_r x}{\partial r} & \dfrac{\partial_r z}{\partial r} \end{bmatrix} \qquad (52)$$

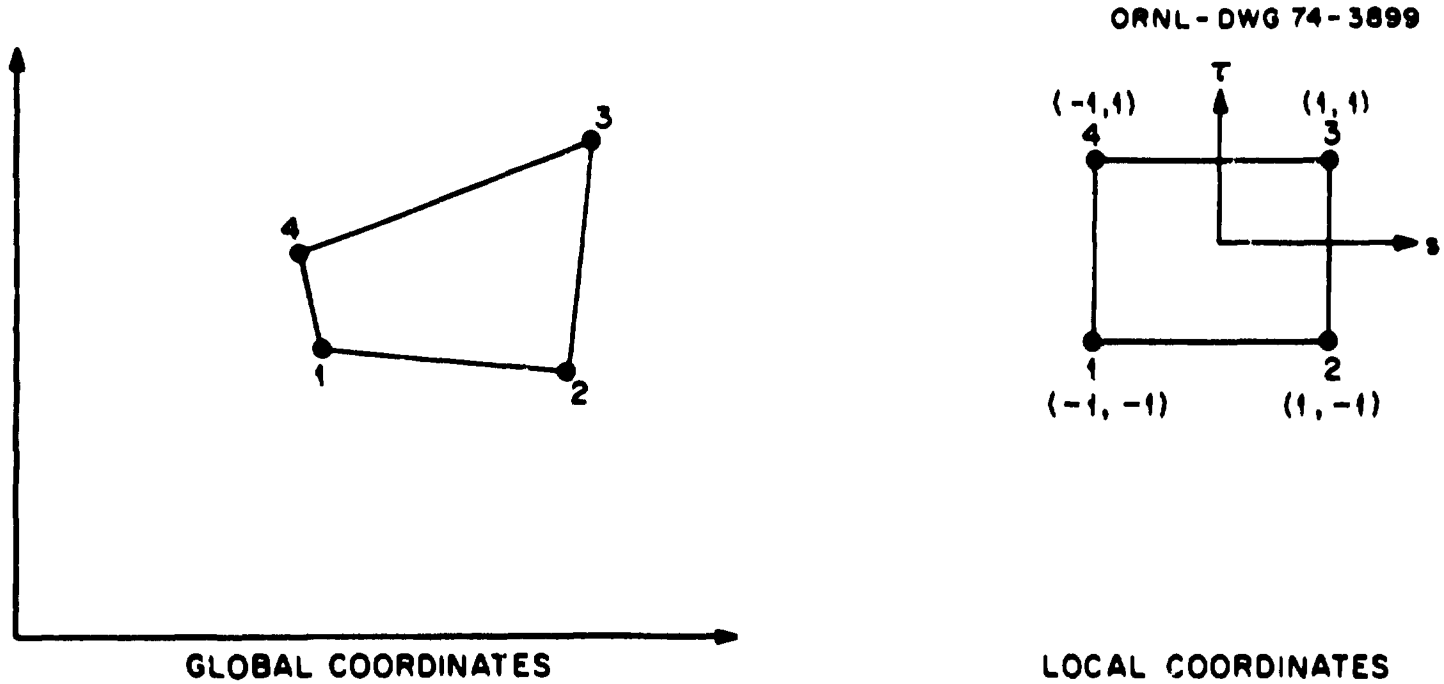

Fig. 1. The r-th Finite Element in Global and Local Coordinates.

Substitution of Eq. (51) into the determinant of this expression yields

$$ {}_{r}J = \mathrm{Det}[{}_{r}J] = \{{}_{r}x\}^{T}\left(\frac{\partial\{N\}}{\partial s}\frac{\partial\{N\}}{\partial t}^{T} - \frac{\partial\{N\}}{\partial t}\frac{\partial\{N\}}{\partial s}^{T}\right)\{{}_{r}z\} = \{{}_{r}x\}^{T}[P]\{{}_{r}z\} \tag{53} $$

where [P] is defined as

$$ [P] = \left(\frac{\partial\{N\}}{\partial s}\frac{\partial\{N\}}{\partial t}^{T} - \frac{\partial\{N\}}{\partial t}\frac{\partial\{N\}}{\partial s}^{T}\right) \tag{54} $$

When the expression for $\{N\}$, Eq. (50), is used, it may be shown that

$$ [P] = \begin{bmatrix} 0 & 1-t & -s+t & -1+s \\ -1+t & 0 & 1+s & -s-t \\ s-t & -1-s & 0 & 1+t \\ 1-s & s+t & -1-t & 0 \end{bmatrix} \tag{55} $$

which is a skew-symmetric matrix. Equation (55) is combined with the column matrix $\{z\}$ to yield

$$ [P]\{{}_{r}z\} = \frac{1}{8}\begin{Bmatrix} z_{24} - z_{34}s + z_{23}t \\ -z_{13} + z_{14}s + z_{14}t \\ -z_{24} + z_{12}s - z_{14}t \\ z_{13} - z_{12}s + z_{23}t \end{Bmatrix} \tag{56} $$

and the determinant of the Jacobian is

$$ {}_{r}J = \frac{1}{8}\left((x_{13}z_{24} - x_{24}z_{13}) + s(x_{34}z_{12} - x_{12}z_{34}) + t(x_{23}z_{14} - x_{14}z_{23})\right) \tag{57} $$

Terms x_{ij} and z_{ij} are defined as

$$ \begin{aligned} x_{ij} &= {}_{r}x_{i} - {}_{r}x_{j} \\ z_{ij} &= {}_{r}z_{i} - {}_{r}z_{j} \end{aligned} \tag{58} $$

Equation (57) is used for numerical evaluation of the determinant of the Jacobian. The integrals of Eqs. (40) and (41) taken over the volume of the r-th finite element may now be written in local coordinates using the determinant of the Jacobian to transform the elemental area:

$$[{}_rA] = \int_{-1}^{1}\int_{-1}^{1} \{N\}(R_d\,\theta)\{N\}^T\,{}_rJ\,ds\,dr \tag{59}$$

$$[{}_rB] = \int_{-1}^{1}\int_{-1}^{1} \Big(\frac{\partial}{\partial x_i}\{N\}\,\theta D_{ij}\,\frac{\partial}{\partial x_j}\{N\}^T - \frac{\partial}{\partial x_i}\{N\}V_i\{N\}^T + \{N\}\Big(R_d\,\frac{\partial\theta}{\partial t} + \alpha'\theta\,R_d\,\frac{\partial h}{\partial t} + \lambda\theta\,R_d\Big)\{N\}^T\Big)\,{}_rJ\,ds\,dr \tag{60}$$

Integration of these equations is easily carried out using 2 x 2 Gaussian integration. A linear algebraic equation, Eq. (47), results since $\{{}_rc\}$ is a function of time only and the matrices $[{}_rA]$, $[{}_rB]$, and $\{{}_rR\}$ are evaluated for the previous time step.

In order to evaluate $[{}_rB]$, Eq. (60), expressions for the spatial derivative of the interpolation function are necessary. The chain rule

$$\begin{Bmatrix} \dfrac{\partial}{\partial s} \\[2ex] \dfrac{\partial}{\partial r} \end{Bmatrix} = [{}_rJ] \begin{Bmatrix} \dfrac{\partial}{\partial_r x} \\[2ex] \dfrac{\partial}{\partial_r z} \end{Bmatrix} \tag{61}$$

may be inverted to yield

$$\begin{Bmatrix} \dfrac{\partial}{\partial_r x} \\[2ex] \dfrac{\partial}{\partial_r z} \end{Bmatrix} = \frac{1}{{}_rJ} \begin{bmatrix} \dfrac{\partial_r z}{\partial r} & \dfrac{\partial_r z}{\partial s} \\[2ex] \dfrac{\partial_r x}{\partial r} & \dfrac{\partial_r x}{\partial s} \end{bmatrix} \begin{Bmatrix} \dfrac{\partial}{\partial s} \\[2ex] \dfrac{\partial}{\partial r} \end{Bmatrix} \tag{62}$$

using the definition of $[{}_rJ]$, Eq. (52). When the top row of Eq. (62) is applied to the basis function $\{N\}$, the following is obtained:

$$\frac{\partial\{N\}}{\partial_r x} = \frac{1}{{}_rJ}\left(\frac{\partial\{N\}}{\partial s}\,\frac{\partial\{N\}^T}{\partial r} \quad \frac{\partial\{N\}}{\partial r}\,\frac{\partial\{N\}^T}{\partial s} \right)\{{}_rz\} \tag{63}$$

where the transformation equation (51) has been used to express z as a function of x and r. The term enclosed in parentheses is readily identified as [P] from Eq (54). Thus,

$$\frac{\partial\{N\}}{\partial_r x} = \frac{[P]\{_r z\}}{_r J} \tag{64}$$

in an entirely analogous way it may also be shown that

$$\frac{\partial\{N\}}{\partial_r z} = \frac{-[P]\{_r x\}}{_r J} \tag{65}$$

Equations (64) and (65) are in a form suitable for numerical evaluation. These equations and their transposed counterparts are used to evaluate the integrand of $[_rB]$, Eq. (60).

5. **Assembly of Elements.** Up to this point the Galerkin-finite-element formulation has been presented for the r-th element in the collection of elements which comprise a region. Within this formulation only coupling between the nodes of the r-th element has been considered. However, in the region a node may be coupled via the several elements in which it is contained. The assembly process, which is a special type of summation, imbeds each element matrix in a larger global matrix such that the appropriate coupling is established. In order to understand the assembly of the elements that form a system of algebraic equations, a simple example will be used. The example selected is that of a two-dimensional space that is divided into twelve rectangular elements (Fig. 2). Iteration superscripts are dropped for convenience. Both global and local subscripting of the $[_rC]$ matrix are shown in Fig. (2b). Expansion of matrix $[_rC]$ into a composite-matrix form is shown in Fig. 3. Assembly consists of summing over the expanded form of each $[_rC]$ to form the composite matrix [C]. The complete [C] matrix will be sparse and banded. The band width may be calculated from the equation

$$\text{IBAND}=2(\text{MAXDIF})+1 \tag{66}$$

where MAXDIF is the maximum nodal difference in any element of the system and IBAND is the band width. Thus, for the example problem the band width is 11. For more economical use of computer storage, only the band portion need be stored. The most economical form of storage of the banded matrix is shown in the lower portion of Figure 3. A more detailed discussion of the assembly of finite elements is presented by Desai and Abel (1972).

At this point it is interesting to note that the band width is controlled by the global nodal numbering system. A reduction in computer core storage is achieved by reducing the magnitude of the term MAXDIF. This reduction is obtained by numbering in the direction in which there are the least nodes in a given row or column. In the example, if the nodes were numbered in a horizontal direction, the band width would be 13. This represents a significant increase in the core storage required.

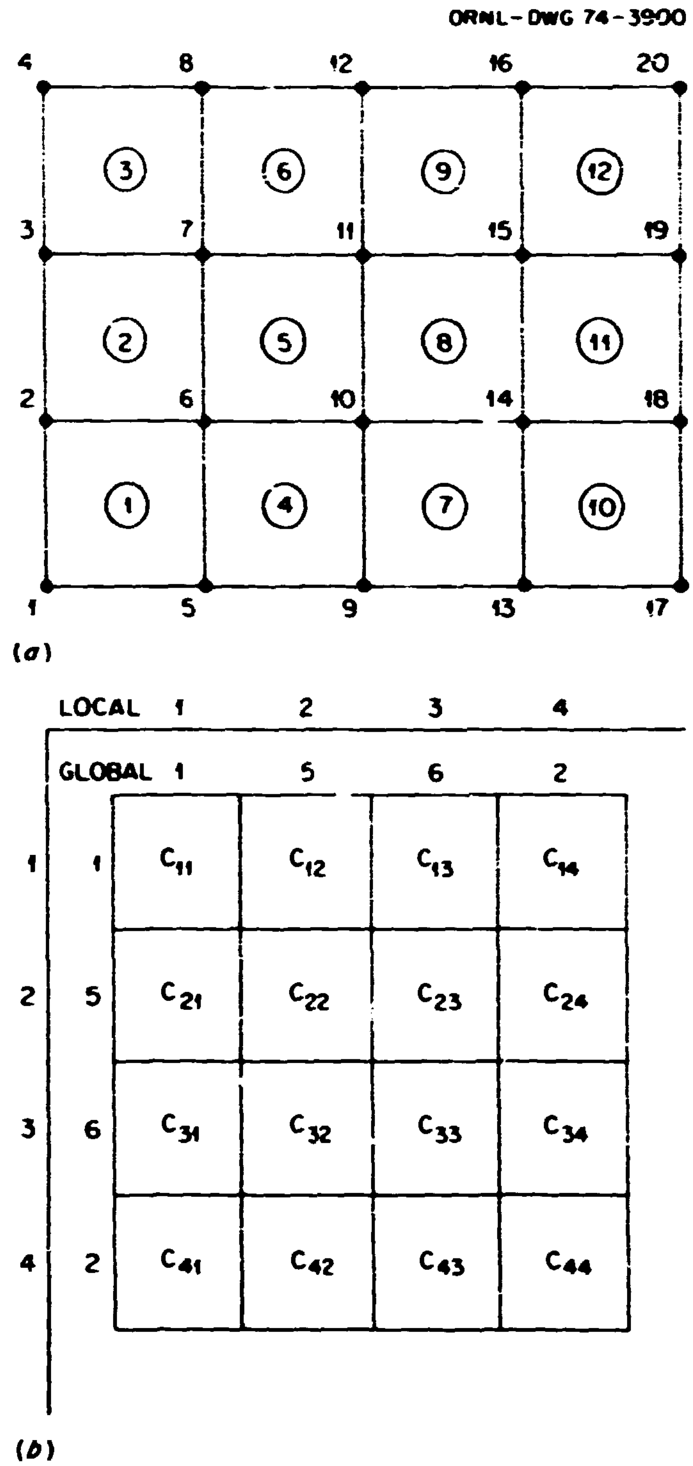

Fig. 2. Example Problem. (a) Element representation of the space using global numbering system. (b) Local and global numbering schemes for element matrix [$_i$C].

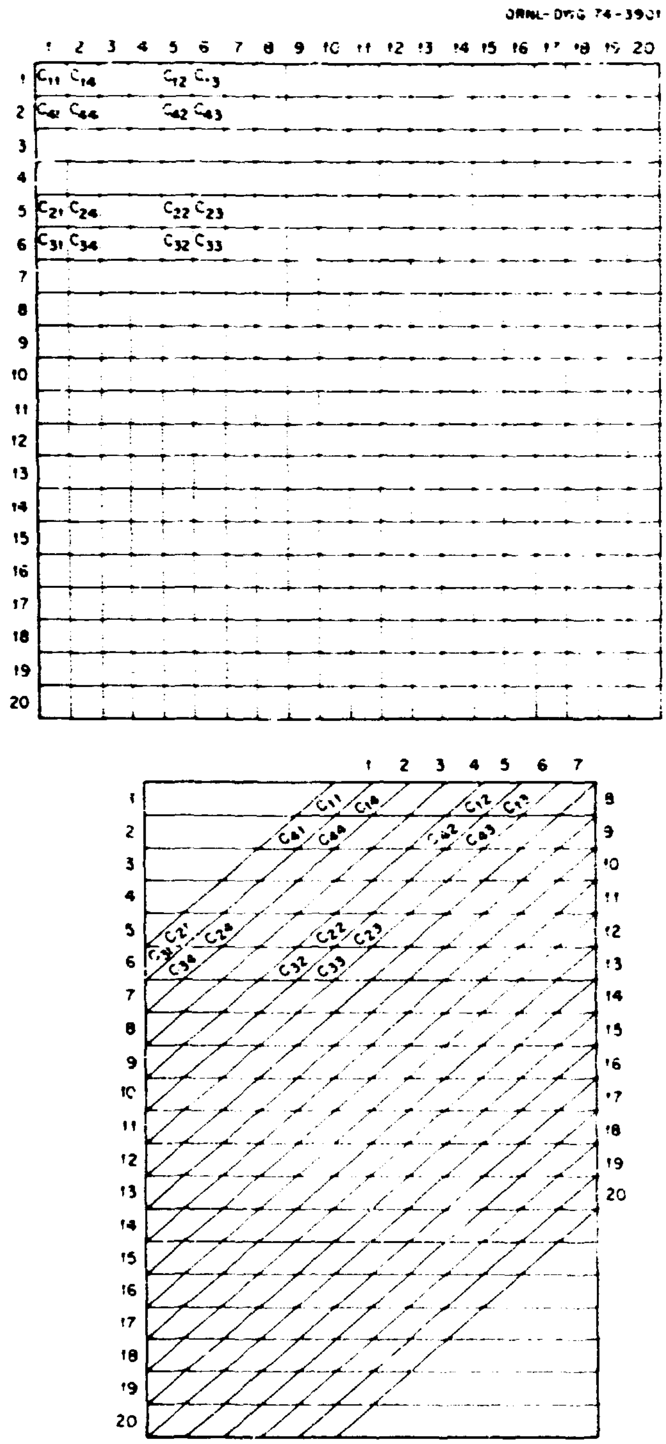

Fig. 3. Complete and Banded Matrix [C] for the Example Problem.

Equation (47) is evaluated and assembled for each element, and the assembled system of algebraic equations may be written as

$$[C]\ \{c\}_{t+\Delta t} = \{R\} - \{Q\} = \{Y\} \tag{67}$$

providing $\{Q\}$ is not a function of the concentrations.

6. **Application of Boundary Conditions**. Surfaces on which Neumann constant-flux conditions are imposed, of course, yield concentration-independent entries in the column matrix $\{Q\}$. These entries are evaluated by direct application of Eq. (43) to give normal flux vectors f followed by assembly over all boundary elements whose sides have constant-flux conditions. The results are then subtracted from $\{R\}$ to form $\{Y\}$ as shown in Eq. (67).

Neumann variable-flux conditions are employed, however, to simulate seepage surfaces. The corresponding entries in $\{Q\}$ are then linear functions of the unknown concentrations. Such terms must therefore be incorporated into the [C] matrix in Eq. (67). Advection, Eq. (12), is assumed to be the dominant transport mechanism at the seepage surface. In this case Eq. (43) becomes

$$\{_rQ\} = \int_{_rS} \{N\}\ \vec{n} \cdot c\vec{V}\ d_rS \tag{68}$$

where the surface integral covers only those sides of element r which bound the entire system. (Integrals over internal element surfaces add to zero during assembly and need not be considered.) Expanding c using Eq. (31) yields

$$\{_rQ\} = [_rE]\ \{_rc\} \tag{69}$$

wh[illegible]

$$[_rE] = \int_{_rS} \{N\}\ \vec{n} \cdot \vec{V}\ \{N\}^T\ d_rS \tag{70}$$

Application of the time-integration algorithm, Eq. (46), yields

$$\{_rQ\} = \omega[_rE]\ \{_rc\}_{t+\Delta t} + (1-\omega)\ [_rE]\ \{_rc\}_t \tag{71}$$

The term $\omega[.E]$, after assembly over all boundary elements r, is added to matrix $[C]$, whereas the term $(1-\omega)[.E]\{.c\}$, after a similar assembly process, is subtracted from $\{R\}$. A matrix equation having the same form as Eq. (67) results.

At nodes where Dirichlet (constant) boundary conditions are encountered, an identity equation is generated for each such node and included in the matrices of Eq. (67). As an example, take a one-element system with the concentration at node 1 constrained to the value of b at all times, i.e.,

$$c_1 = b \qquad \text{and} \qquad b \neq b(t) \tag{72}$$

Equation (67) then takes the form

$$\begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & C_{22} & C_{23} & C_{24} \\ 0 & C_{32} & C_{33} & C_{34} \\ 0 & C_{42} & C_{43} & C_{44} \end{bmatrix} \begin{Bmatrix} c_1 \\ c_2 \\ c_3 \\ c_4 \end{Bmatrix} = \begin{Bmatrix} b \\ Y_2 \quad C_{21}b \\ Y_3 \quad C_{31}b \\ Y_4 \quad C_{41}b \end{Bmatrix} \tag{73}$$

This result may easily be generalized to an arbitrary number of equations with an arbitrary number of Dirichlet boundary nodes.

7. Solution of the Assembled Equations. In solving the assembled equations expressed in Eq. (67), the matrix $[C]$ is decomposed into the product of upper and lower triangular matrices using the Gauss technique. The lower triangular matrix is used to modify the right-hand side $\{Y\}$ for back-substitution into the upper triangular matrix to obtain a solution. If the matrix $[C]$ and the time step Δt do not change with time, the decomposition needs to be performed only once.

III. COMPUTER IMPLEMENTATION

The computer program consists of the 12 different subprograms shown in Fig. 4. As is implied by its central location, the routine MAIN performs the control function for the program. In it, input-output operations are coordinated with primary and support computations as the calculation is stepped sequentially over the time variable.

Figure 5 is a block diagram showing how the primary computations are ordered. First, moisture-transport variables, pressure H, moisture content TH, and Darcy fluxes VX and VZ are input if these quantities have time variations; and time derivatives of H and TH are determined as required by the transport Eq. (25). Then, using parameters characteristic of both the dissolved constituent and the soil types, element integrals are evaluated in subroutine Q4 in the following manner: Each quadrilateral element is transformed to a local coordinate system where it becomes a square with a side length of 2. Jacobians [Eq. (53)], Galerkin basis functions [Eq. (50)], and derivatives of these functions [Eqs. (64) and (65)] are determined; and a 2 × 2 Gauss quadrature is employed to yield element matrices [,A], Eq. (59), and [,B], Eq. (60). In subroutine ASEMBL, these matrices are combined in accordance with the time-integration algorithm, Eqs. (48) and (49), to form matrix [,C] and vector {,R}, subscripts are adjusted, and a sum over all elements r is effected as required by the assembly process (see Chapter II, Section 5). Since the assembled matrix [C] is asymmetric, its entire band must be stored.

Next, using routine BC, boundary conditions are incorporated into the systems equations, Eq. (67). Neumann constant-flux conditions require only a change in the load vector {Y}. For Neumann variable-flux (seepage) and Dirichlet boundary conditions, however, it is necessary to modify both coefficient matrix [C] and load vector {Y} as discussed in Chapter II, Section 6. Boundary integrals [,E], Eq. (70), appropriate for the seepage conditions are evaluated in Q4SP and assembled in BC. (The FORTRAN variable corresponding to [,E] is DFLXQ.) Finally, the resulting banded system, Eq. (67), is solved in routine SOLVE. Matrix [C] is decomposed into lower and upper triangular forms, and solutions of the two resulting matrix equations are obtained by forward and backward substitution.

Supporting calculations are carried out in subroutines SURF, FLUX, Q4D, SFLOW, Q4S, and Q4R. Subroutine SURF identifies boundary sides, which are then specified in terms of the elements to which they belong and the nodes that subtend them. Side lengths and direction cosines of outwardly directed normal vectors are calculated. Subroutines FLUX and Q4D are used to determine flux vectors at all nodes from the predetermined concentration distribution. With SFLOW, Q4S, and Q4R, flows are determined in two different ways. First, the surface integral of Eq. (43) is evaluated for each boundary element in routine Q4S using two-point Gauss quadrature. Resulting element flow rates are assembled over all boundary elements, and trapezoidal time integration is used in SFLOW to obtain the quantity of material passing through the boundary since the last time step. These flows are classified according to the boundary condition on the surface from which they originate. Second, space integrals over concentrations are evaluated in subroutine Q4R for each element. By performing appropriate sums in SFLOW, quantities of material in liquid and solid phases and losses through radioactive decay are determined. Thus, boundary flows may be compared with internal changes in material content to see that a balance has been achieved.

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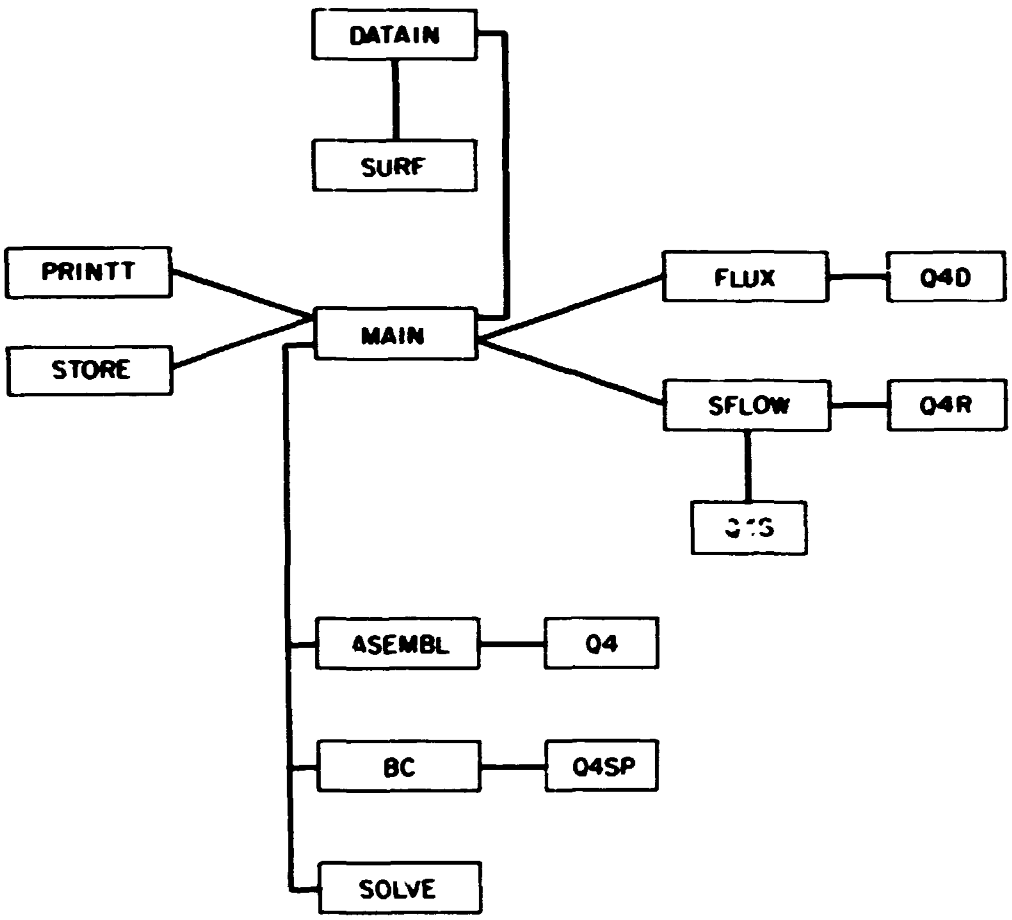

Fig. 4. Flow Chart of Dissolved-Constituent Transport Program.

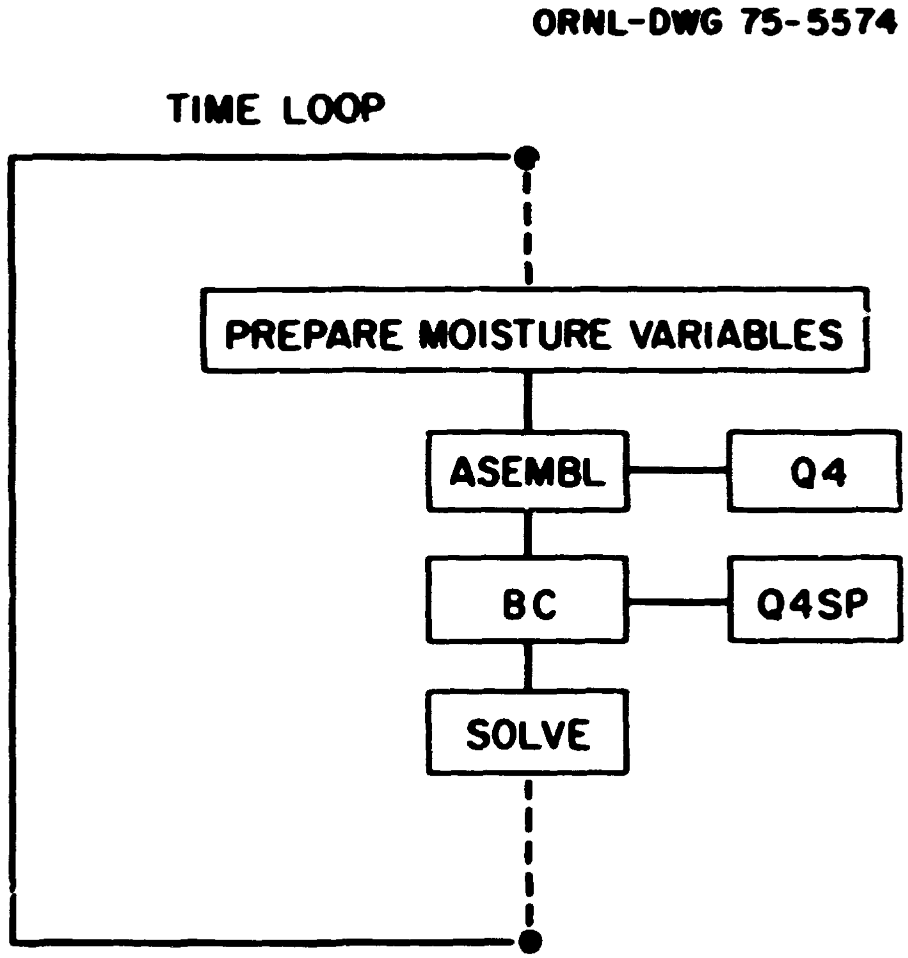

Fig. 5. Flow Chart for the Time-Iteration Loop.

Finally, input-output functions are performed almost exclusively in routines DATAIN, PRINTT, and STORE. Variables pertaining to discretization of the geometry of the system and the simulation time are read in DATAIN. Other parameters relating to soil and dissolved-constituent properties, boundary-initial conditions, and numerical convergence are also read. These input quantities are checked for consistency whenever possible and are printed out to give a complete record of the simulation. A thorough description of the input for DATAIN is given in Appendix D. Output of calculated variables occurs in PRINTT and STORE. Routine PRINTT prints flow information, concentrations, fluxes, and distributions of moisture-transport variables as specified by parameter KPR. Routine STORE writes the same information, in addition to nodal-point element descriptors, on an auxiliary storage device, such as a magnetic tape. Its operation is controlled by variable KSTR. The stored information could then be used, for example, as input to a plotting program.

IV. RESULTS

In this chapter, two simulations of idealized flow systems are described. The first provides a comparison with results obtained analytically by Lapidus and Amundson (1952). The second typifies a class of problems to which our computer model may be applied. In the latter, a seepage pond, situated entirely in the unsaturated zone above the water table, provides a source of soil contamination which migrates toward a nearby stream.

1. Lapidus and Amundson's Equilibrium Case. A frequently cited paper in the literature is that of Lapidus and Amundson (1952). Here the effects of longitudinal dispersion in an ion-exchange column are considered. These authors suppose a one-dimensional flow of the carrier fluid at a constant pore velocity within a medium having a uniform water content throughout. Since there is no radioactive decay, Eq. (16) may be written

$$D \frac{\partial^2 c}{\partial z^2} = V_{fs} \frac{\partial c}{\partial z} + R_d \frac{\partial c}{\partial t} + \frac{1}{\theta} \frac{\partial}{\partial t} (\rho s') \tag{74}$$

where the compressibility term is neglected and the pore velocity $V_{fs} = V'/\theta$ is used rather than the Darcy velocity V'. Aside from notation, Eq. (74) is identicial to Lapidus and Amuncson's Eq. (1). For the case of pointwise equilibrium and linearity, we use the relation

$$s' = \frac{\theta}{n} k_d c \tag{21}$$

Lapidus and Amundson add an arbitrary constant to the right-hand side of Eq. (21) for increased generality. This is of no consequence, however, in the determination of c since s' enters into Eq. (74) only through a time derivative term. (Bulk density ρ is, of course, independent of time.) Combining Eqs. (21) and (74) yields

$$D \frac{\partial^2 c}{\partial z^2} = V_{fs} \frac{\partial c}{\partial z} + R_d \frac{\partial c}{\partial t} \tag{75}$$

in which R_d is the retardation defined in Eq. (23).

With constant initial-boundary conditions

$$c(z, t = 0) = 0 \tag{76}$$

and

$$c(z = 0, t) = c_0 \tag{77}$$

the solution to Eq. (75) for $0 \leq z \leq \infty$ is

$$c/c_0 = \frac{1}{2}\left[1 + \mathrm{erf}\left(\sqrt{a_1 q} - z\sqrt{a_2/q}\right) + \exp(V_{fs}/D)\,\mathrm{erfc}\left(\sqrt{a_1 q} + z\sqrt{a_2/q}\right)\right] \tag{78}$$

In this equation q is the solution volume which has entered the ion-exchange column since time $t = 0$

$$q = V_{fs} t \theta \tag{79}$$

and the a's are constants defined by

$$a_1 = (V_{fs}/D)/4(R_d\theta) \tag{80}$$

and

$$a_2 = (R_d\theta)(V_{fs}/D)/4 \tag{81}$$

From Eqs. (78) through (81) Lapidus and Amundson determine the reduced concentration c/c_0 as a function of the solution volume q at depth $z = 50$ for seven different combinations of values of the parameters $R_d\theta$ and V_{fs}/D. Results from two of these analytical calculations, which they label as Curves A and E, are reproduced in Fig. 6 along with results obtained from our computer simulation. In both cases the reduced concentration remains at or near zero until breakthrough is achieved, during which time it rises to a value approaching unity. Obviously, the agreement of analytical and numerical results is quite good.

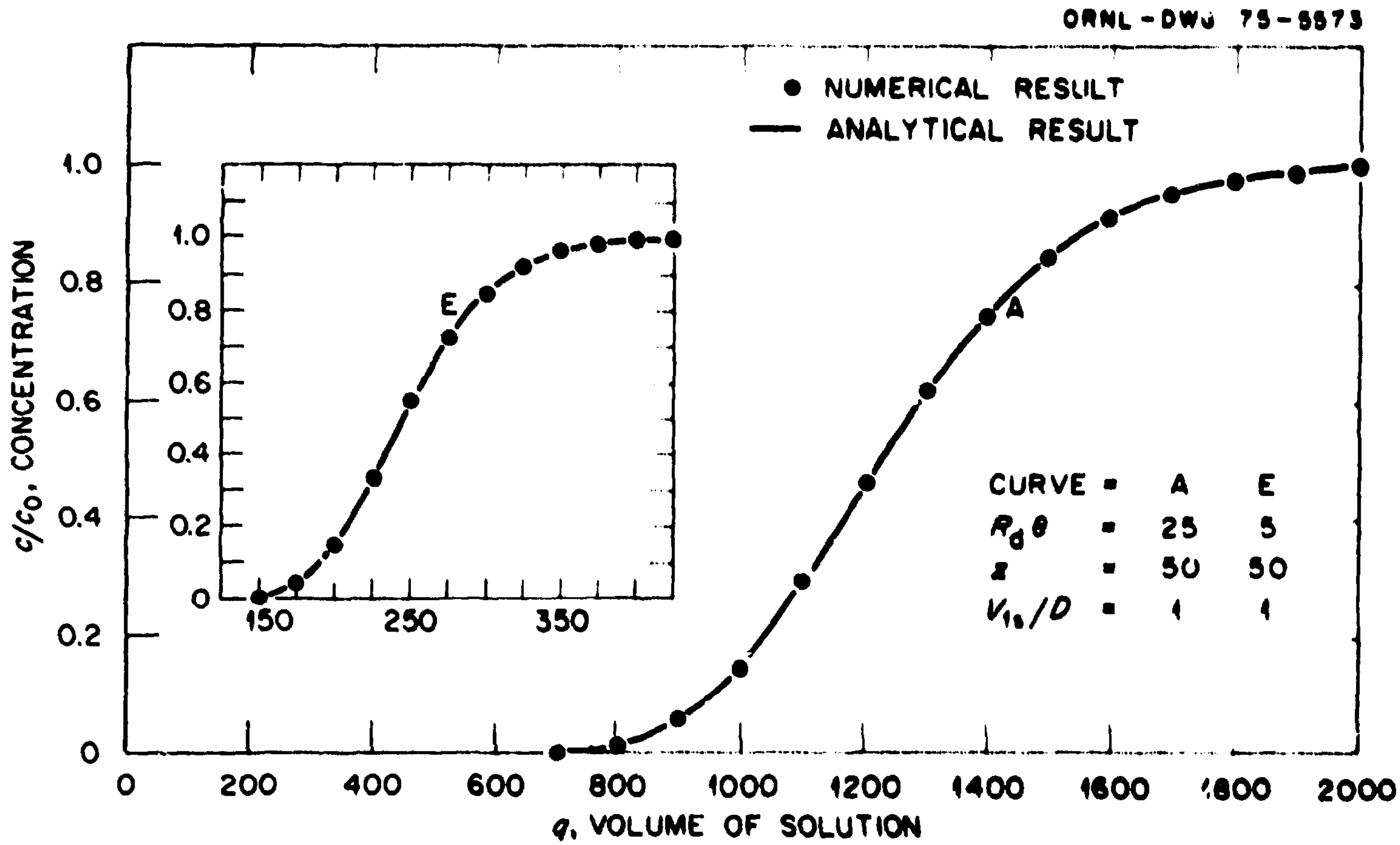

Fig. 6. Plots Comparing Numerical and Analytical Results. Numerical values were obtained using the computer code described in this report, whereas analytical values were obtained from the formula given by Lapidus and Amundson.

2. Contaminant Transport from a Seepage Pond. In this section we consider a seepage pond situated near a stream as shown in Fig. 7a. The system is composed of a highly permeable sand with soil properties as shown in Fig. 8. A flux of $4.0 \times 10^{[illegible]}$ cm[illegible] cm[illegible] sec. directed vertically downward from the bottom of the pit, provides the only driving force for moving contaminants toward the stream since precipitation is taken to be negligible. This flux is substantially lower than the saturated ($h = 0$) conductivity K given in Fig. 8 due to clogging by fine sediments contained in the effluent entering the pond.

The resulting steady-state water-table position, as determined by our moisture-transport code (Reeves and Duguid, 1975) is 4 m below the bottom of the pit (Fig. 7b). Thus the contaminant is buffered from the relatively rapidly moving water beneath the water table by the unsaturated soil-moisture zone. The coupling of saturated and unsaturated soil-moisture zones, a situation for which our moisture-transport model was specifically designed, is quite important here. Water-flow patterns may easily be discerned from the equipotential lines of Fig. 7b. Moisture fluxes are perpendicular to these contours with magnitudes which are roughly inversely proportional to their separations. The finite-element spatial discretization is shown in Fig. 7a.

Figure 9 shows contaminant concentration contours which were obtained by applying our dissolved-constituent transport code for a k_d of 100 cm[illegible] gm. Longitudinal and transverse dispersivities were taken from Pinder's (1973) study of chromium transport on Long Island, New York:

$$a_L = 21.3 \text{m} \tag{82}$$

and

$$a_T = 4.27 \text{m} \tag{83}$$

The buffering effect of the unsaturated soil-moisture zone is apparent from the shapes of these contours.

As has been mentioned, two computer models have been used to analyze the seepage-pond problem. The moisture-transport code (Reeves and Duguid, 1975) was used to obtain the Darcy velocities, which were output on magnetic tape. These quantities were then input into the contaminant-transport computer model described in this report. Appendix A contains input to and output from the steady-state moisture-transport calculation, whereas Appendix B contains such information for the transient-state contaminant-transport calculation.

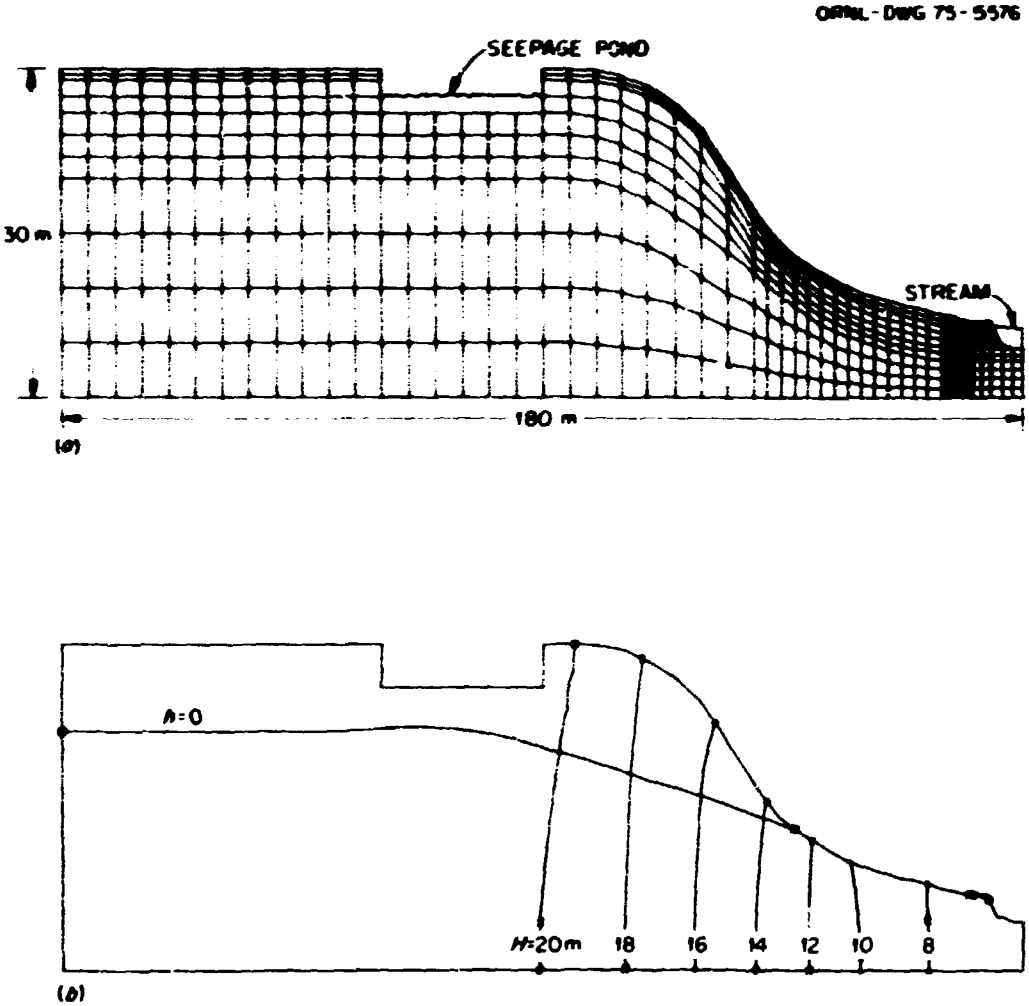

Fig. 7. (a) Spatial Discretization. (b) Water Table (h=0) and Total Head (H) Configurations for Moisture Transport from a Seepage Pond to a Stream.

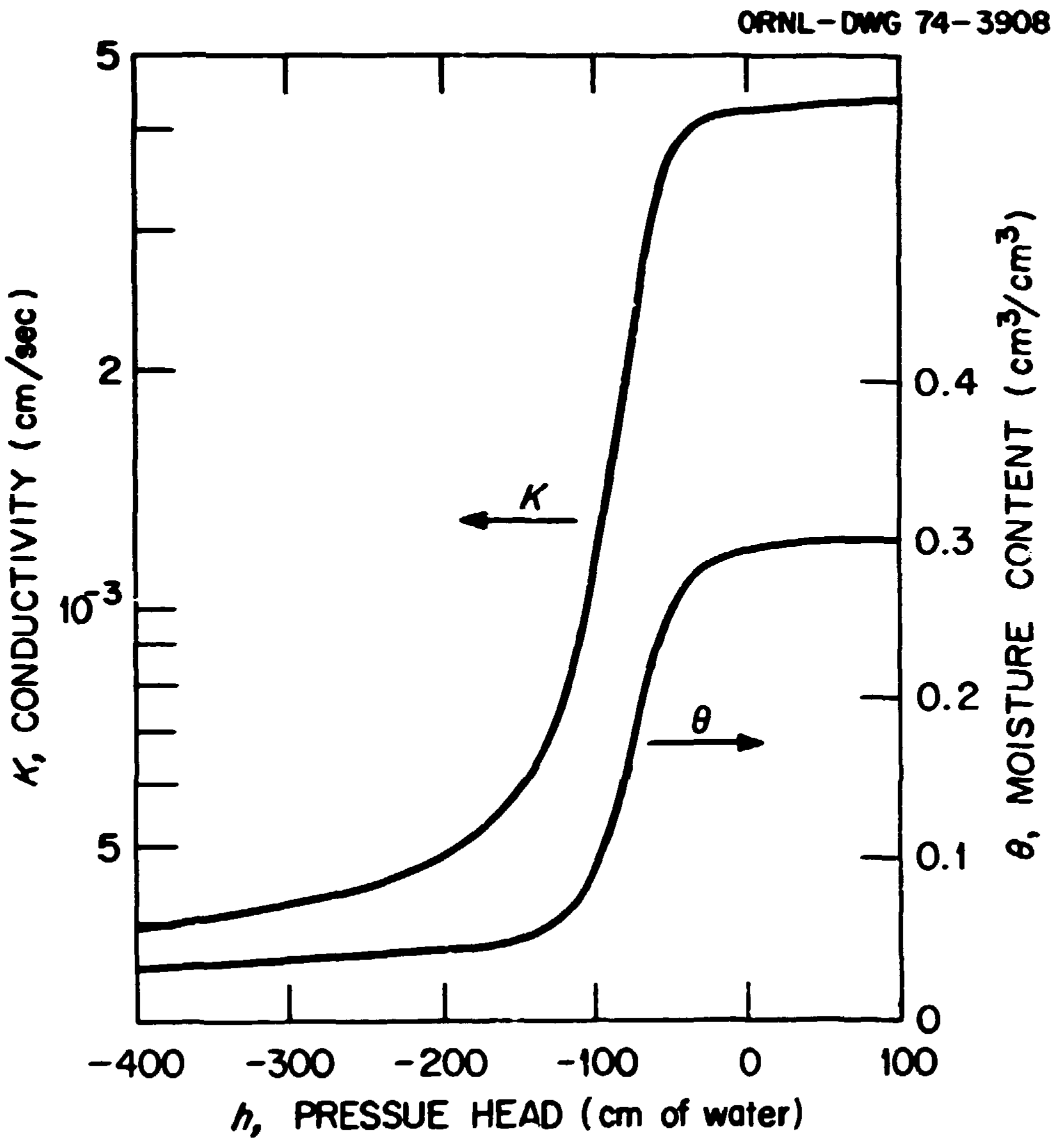

Fig. 8. Hydraulic Conductivity and Soil-Moisture Characteristics of a Hypothetical Sandy Soil.

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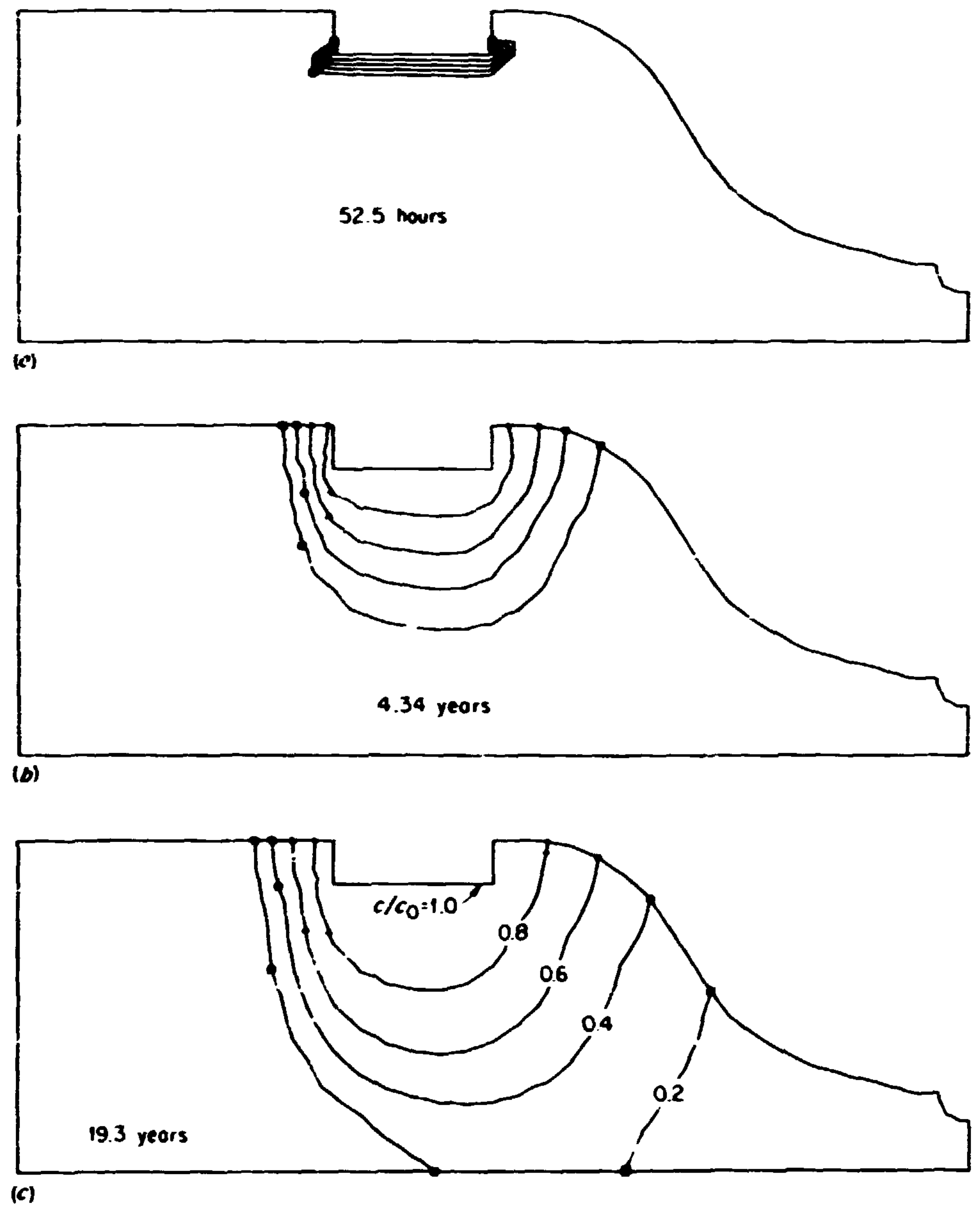

Fig. 9. Dispersion in Highly Permeable Sand of a Dissolved Constituent with a Distribution Coefficient of 100 cm^3/gm.

NOTATION

A''	Coefficient of the time derivative in the transport equation
$[_rA]$	Integral of A'' over the volume of the r-th element
$[_rA']$	Coefficients of the time-derivative terms for the r-th element
a_l	Longitudinal dispersivity
a_m	Molecular diffusion coefficient
a_t	Transverse dispersivity
B''	Coefficient of the concentration in the transport equation
$[_rB]$	Integral of B'' over the volume of the r-th element
$[_rB']$	Coefficients of the concentration terms for the r-th element
b	Dirichlet boundary condition
$[C]$	Assembled operator matrix for all elements
$[_rC]$	Combination of $[_rA]$ and $[_rB]$ including the time-integration algorithm
c	Concentration of the dissolved constituent
$\dot{c}$	Time derivative of the concentration
$\{c\}$	Assembled values of the unknown coefficients
$\{_rc\}$	Unknown coefficients for the r-th element
$\{_r\dot{c}\}$	Time derivative of c
$\overline{\overline{D}}, D_{ij}$	Hydrodynamic dispersion tensor
$[_rE]$	Element matrix containing surface integrals appropriate for seepage boundary conditions
e	Dilatation of the medium

f	Bulk flux of the dissolved constituent
f_a	Advective bulk flux
f_d	Diffusive bulk flux
g	Acceleration of gravity
h	Fluid pressure head
J	Determinant of [J]
[J]	Jacobian matrix
K	Hydraulic conductivity
k	Unsaturated distribution coefficient
k_d	Saturated distribution coefficient
L	Differential operator
m	Number of basis functions
$\{N\}, N_i$	Basis functions
n	Porosity
$\bar{n}, n_i$	Unit normal vector
[P]	Matrix used in the numerical evaluation of the Jacobian
p	Number of weighting functions W_i
$\{Q\}$	Assembled values of $\{_rQ\}$
$\{_rQ\}$	Bulk flow of the carrier across the boundary of the r-th element
R_d	Retardation factor
$\{R\}$	Assembled values of $\{_rR\}$
$\{_rR\}$	Time-integration components for the r-th element

r	Refers to the r-th finite element
${}_rS$	Surface area of the r-th element
s, t	Local coordinates
s_j, t_j	Local coordinates of the nodes j = 1,2,3, and 4
s'	Solid-phase concentration of adsorbed constituent
t	Time
V	Volume of the system
${}_rV$	Volume of the r-th element
$\bar{V}_{rs}$	Pore velocity of the carrier relative to the solid
$\bar{V}, V_i$	Darcy Velocity of the carrier
V'	Magnitude of Darcy velocity
$\bar{v}_s$	Velocity of the solid
W_j	Weighting function
$\bar{x}, x_i$	Position vector
x	Lateral coordinate
${}_rx$	Global coordinate of a point within the r-th element
x_{ij}	$x_i - x_j$
$\{{}_rx\}$	Global coordinates of the nodes of the r-th element
$\{Y\}$	Assembled load vector containing boundary fluxes and time-integration components
z	Vertical coordinate
${}_rz$	Global coordinate of a point within the r-th element
z_{ij}	$z_i - z_j$

$\{_r z\}$	Global coordinates of the nodes of the r-th element
α	Coefficient of compressibility of the medium
α'	Modified coefficient of compressibility of the medium
Δt	Time increment
ϵ_{ij}	Strain tensor for the medium
θ	Moisture content
λ	Radioactive decay constant
ρ	Bulk density of the medium
ρ_f	Density of the carrier fluid
τ'	Tortuosity
Φ	Unknown solution to the equation $L(\Phi) = 0$
Φ'	Trial solution
$_r\Phi$	Trial solution for the r-th element
ϕ_i	Expansion coefficients relative to the basis functions N_i
ω	Time-integration parameter

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APPENDIX A

INPUT AND OUTPUT FOR SEEPAGE-PIT MOISTURE TRANSPORT

This appendix presents input to and output from the computer program documented in [Reeves and Duguid, 1975]. The moisture-transport variables obtained in this calculation were printed on magnetic tape by subroutine STORE and then read as input for the dissolved-constituent-transport determination (Appendix B). Subroutine STORE of the above-mentioned program has been modified to be more compatible with the dissolved-constituent code. An updated listing is therefore included at the last of the section on input.

INPUT

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```
 1273   SEEPAGE-PIT MOISTURE TRANSPORT
  595  528    1     0     0     0     1    16     1     1     0     0    20     5
300.       .5         86400.    0.          0.          .01         .1          1.
980.6      .013       1.
1
0.         0.         .3                  .58E-7      .58E-7
-900.      -400.      -200.     -175.     -150.       -125.       -100.       -62.5
-50.       -37.5      -25.      -12.5     0.          50.         100.        2000.
.028       .032       .0425     .045      .050        .0625       .09         .21
.25        .275       .285      .290      .2925       .2975       .2995       .3
    .48E-8     .52E-8     .65E-8     .70E-8     .80E-8     .95E-8     .16E-7     .40E-7
    .48E-7     .53E-7     .55E-7     .56E-7     .56E-7     .57E-7     .58E-7     .58E-7
    0.         .52E-4     .10E-3     .20E-3     .50E-3     .11E-2     .32E-2     .32E-2
    .20E-2     .80E-3     .40E-3     .20E-3     .10E-3     .40E-4     .26E-6     0.
    1       0.0         0.0
    2       0.0       500.000
    3       0.0      1000.000
    4       0.0      1500.000
    5       0.0      2000.000
    6       0.0      2200.000
    7       0.0      2400.000
    8       0.0      2600.000
    9       0.0      2750.000
   10       0.0      2900.000
   11       0.0      2950.000
   12       0.0      3000.000
   13     500.000       0.0
   14     500.000     500.000
   15     500.000    1000.000
   16     500.000    1500.000
   17     500.000    2000.000
   18     500.000    2200.000
   19     500.000    2400.000
   20     500.000    2600.000
   21     500.000    2750.000
   22     500.000    2900.000
   23     500.000    2950.000
   24     500.000    3000.000
   25    1000.000       0.0
   26    1000.000     500.000
   27    1000.000    1000.000
   28    1000.000    1500.000
   29    1000.000    2000.000
   30    1000.000    2200.000
   31    1000.000    2400.000
   32    1000.000    2600.000
   33    1000.000    2750.000
   34    1000.000    2900.000
   35    1000.000    2950.000
   36    1000.000    3000.000
   37    1500.000       0.0
   38    1500.000     500.000
   39    1500.000    1000.000
   40    1500.000    1500.000
   41    1500.000    2000.000
   42    1500.000    2200.000
   43    1500.000    2400.000
   44    1500.000    2600.000
   45    1500.000    2750.000
   46    1500.000    2900.000
   47    1500.000    2950.000
   48    1500.000    3000.000
   49    2000.000       0.0
   50    2000.000     500.000
   51    2000.000    1000.000
   52    2000.000    1500.000
   53    2000.000    2000.000
   54    2000.000    2200.000
   55    2000.000    2400.000
   56    2000.000    2600.000
   57    2000.000    2750.000
   58    2000.000    2900.000
   59    2000.000    2950.000
   60    2000.000    3000.000
```

61	2500.000	0.0
62	2500.000	500.000
63	2500.000	1000.00
64	2500.000	1500.000
65	2500.000	2000.000
66	2500.000	2200.000
67	2500.000	2400.000
68	2500.000	2600.000
69	2500.000	2750.000
70	2500.000	2900.000
71	2500.000	2950.000
72	2500.000	3000.000
73	3000.000	0.0
74	3000.000	500.000
75	3000.000	1000.000
76	3000.000	1500.000
77	3000.000	2000.000
78	3000.000	2200.000
79	3000.000	2400.000
80	3000.000	2600.000
81	3000.000	2750.000
82	3000.000	2900.000
83	3000.000	2950.000
84	3000.000	3000.000
85	3500.000	0.0
86	3500.000	500.000
87	3500.000	1000.000
88	3500.000	1500.000
89	3500.000	2000.000
90	3500.000	2200.000
91	3500.000	2400.000
92	3500.000	2600.000
93	3500.000	2750.000
94	3500.000	2900.000
95	3500.000	2950.000
96	3500.000	3000.000
97	4000.000	0.0
98	4000.000	500.000
99	4000.000	1000.000
100	4000.000	1500.000
101	4000.000	2000.000
102	4000.000	2200.000
103	4000.000	2400.000
104	4000.000	2600.000
105	4000.000	2750.000
106	4000.000	2900.000
107	4000.000	2950.000
108	4000.000	3000.000
109	4500.000	0.0
110	4500.000	500.000
111	4500.000	1000.000
112	4500.000	1500.000
113	4500.000	2000.000
114	4500.000	2200.000
115	4500.000	2400.000
116	4500.000	2600.000
117	4500.000	2750.000
118	4500.000	2900.000
119	4500.000	2950.000
120	4500.000	3000.000
121	5000.000	0.0
122	5000.000	500.000
123	5000.000	1000.000
124	5000.000	1500.000
125	5000.000	2000.000
126	5000.000	2200.000
127	5000.000	2400.000
128	5000.000	2600.000
129	5000.000	2750.000
130	5000.000	2900.000
131	5000.000	2950.000
132	5000.000	3000.000
133	5500.000	0.0
134	5500.000	500.000
135	5500.000	1000.000

136	5500.000	1500.000
137	5500.000	2000.000
138	5500.000	2200.000
139	5500.000	2400.000
140	5500.000	2600.000
141	5500.000	2750.000
142	5500.000	2900.000
143	5500.000	2950.000
144	5500.000	3000.000
145	6000.000	0.0
146	6000.000	500.000
147	6000.000	1000.000
148	6000.000	1500.000
149	6000.000	2000.000
150	6000.000	2200.000
151	6000.000	2400.000
152	6000.000	2600.000
153	6000.000	2750.000
154	6000.000	2900.000
155	6000.000	2950.000
156	6000.000	3000.000
157	6500.000	0.0
158	6500.000	500.000
159	6500.000	1000.000
160	6500.000	1500.000
161	6500.000	2000.000
162	6500.000	2200.000
163	6500.000	2400.000
164	6500.000	2600.000
165	7000.000	0.0
166	7000.000	500.000
167	7000.000	1000.000
168	7000.000	1500.000
169	7000.000	2000.000
170	7000.000	2200.000
171	7000.000	2400.000
172	7000.000	2600.000
173	7500.000	0.0
174	7500.000	500.000
175	7500.000	1000.000
176	7500.000	1500.000
177	7500.000	2000.000
178	7500.000	2200.000
179	7500.000	2400.000
180	7500.000	2600.000
181	8000.000	0.0
182	8000.000	500.000
183	8000.000	1000.000
184	8000.000	1500.000
185	8000.000	2000.000
186	8000.000	2200.000
187	8000.000	2400.000
188	8000.000	2600.000
189	8500.000	0.0
190	8500.000	500.000
191	8500.000	1000.000
192	8500.000	1500.000
193	8500.000	2000.000
194	8500.000	2200.000
195	8500.000	2400.000
196	8500.000	2600.000
197	9000.000	0.0
198	9000.000	500.000
199	9000.000	1000.000
200	9000.000	1500.000
201	9000.000	2000.000
202	9000.000	2200.000
203	9000.000	2400.000
204	9000.000	2600.000
205	9000.000	2750.000
206	9000.000	2900.000
207	9000.000	2950.000
208	9000.000	3000.000
209	9500.000	0.0
210	9500.000	500.000

211	9500.000	1000.000
212	9500.000	1500.000
213	9500.000	2000.000
214	9500.000	2200.000
215	9500.000	2400.000
216	9500.000	2600.000
217	9500.000	2750.000
218	9500.000	2900.000
219	9500.000	2950.000
220	9500.000	3000.000
221	10000.000	0.0
222	10000.000	480.000
223	10000.000	990.000
224	10000.000	1500.000
225	10000.000	1979.999
226	10000.000	2179.999
227	10000.000	2379.999
228	10000.000	2559.999
229	10000.000	2739.999
230	10000.000	2889.999
231	10000.000	2939.999
232	10000.000	2969.999
233	10500.000	0.0
234	10500.000	460.000
235	10500.000	960.000
236	10500.000	1469.000
237	10500.000	1920.000
238	10500.000	2129.999
239	10500.000	2320.000
240	10500.000	2520.000
241	10500.000	2700.000
242	10500.000	2850.000
243	10500.000	2900.000
244	10500.000	2950.000
245	11000.000	0.0
246	11000.000	450.000
247	11000.000	910.000
248	11000.000	1359.999
249	11000.000	1809.999
250	11000.000	2020.000
251	11000.000	2230.000
252	11000.000	2369.999
253	11000.000	2570.000
254	11000.000	2750.000
255	11000.000	2800.000
256	11000.000	2850.000
257	11500.000	0.0
258	11500.000	400.000
259	11500.000	850.000
260	11500.000	1250.000
261	11500.000	1659.999
262	11500.000	1859.999
263	11500.000	2059.999
264	11500.000	2250.000
265	11500.000	2439.999
266	11500.000	2589.999
267	11500.000	2639.999
268	11500.000	2689.999
269	12000.000	0.0
270	12000.000	360.000
271	12000.000	750.000
272	12000.000	1140.000
273	12000.000	1500.000
274	12000.000	1730.000
275	12000.000	1859.999
276	12000.000	2020.000
277	12000.000	2200.000
278	12000.000	2370.000
279	12000.000	2620.000
280	12000.000	2670.000
281	12500.000	0.0
282	12500.000	300.000
283	12500.000	650.000
284	12500.000	950.000
285	12500.000	1330.000

286	12500.000	1490.000
287	12500.000	1639.999
288	12500.000	1759.999
289	12500.000	1879.999
290	12500.000	2000.000
291	12500.000	2050.000
292	12500.000	2100.000
293	13000.000	0.0
294	13000.000	270.000
295	13000.000	570.000
296	13000.000	850.000
297	13000.000	1180.000
298	13000.000	1210.000
299	13000.000	1300.000
300	13000.000	1400.000
301	13000.000	1510.000
302	13000.000	1620.000
303	13000.000	1670.000
304	13000.000	1720.000
305	13250.000	0.0
306	13250.000	250.000
307	13250.000	530.000
308	13250.000	770.000
309	13250.000	1030.000
310	13250.000	1120.000
311	13250.000	1200.000
312	13250.000	1300.000
313	13250.000	1370.000
314	13250.000	1450.000
315	13250.000	1500.000
316	13250.000	1550.000
317	13500.000	0.0
318	13500.000	220.000
319	13500.000	460.000
320	13500.000	700.000
321	13500.000	920.000
322	13500.000	1010.000
323	13500.000	11[illegible].000
324	13500.000	1180.000
325	13500.000	1250.000
326	13500.000	1300.000
327	13500.000	1350.000
328	13500.000	1400.000
329	13750.000	0.0
330	13750.000	200.000
331	13750.000	440.000
332	13750.000	650.000
333	13750.000	830.000
334	13750.000	910.000
335	13750.000	1000.000
336	13750.000	1090.000
337	13750.000	1140.000
338	13750.000	1200.000
339	13750.000	1250.000
340	13750.000	1300.000
341	14000.000	0.0
342	14000.000	190.000
343	14000.000	400.000
344	14000.000	590.000
345	14000.000	750.000
346	14000.000	830.000
347	14000.000	900.000
348	14000.000	980.000
349	14000.000	1050.000
350	14000.000	1120.000
351	14000.000	1170.000
352	14000.000	1220.000
353	14250.000	0.0
354	14250.000	170.000
355	14250.000	350.000
356	14250.000	540.000
357	14250.000	670.000
358	14250.000	750.000
359	14250.000	820.000
360	14250.000	900.000

361	14250.000	960.000
362	14250.000	1050.000
363	14250.000	1100.000
364	14250.000	1150.000
365	14500.000	0.0
366	14500.000	150.000
367	14500.000	320.000
368	14500.000	470.000
369	14500.000	610.000
370	14500.000	690.000
371	14500.000	760.000
372	14500.000	830.000
373	14500.000	900.000
374	14500.000	980.000
375	14500.000	1030.000
376	14500.000	1080.000
377	14750.000	0.0
378	14750.000	140.000
379	14750.000	270.000
380	14750.000	430.000
381	14750.000	560.000
382	14750.000	630.000
383	14750.000	700.000
384	14750.000	760.000
385	14750.000	840.000
386	14750.000	910.000
387	14750.000	960.000
388	14750.000	1010.000
389	15000.000	0.0
390	15000.000	120.000
391	15000.000	250.000
392	15000.000	390.000
393	15000.000	520.000
394	15000.000	590.000
395	15000.000	650.000
396	15000.000	720.000
397	15000.000	800.000
398	15000.000	860.000
399	15000.000	910.000
400	15000.000	960.000
401	15250.000	0.0
402	15250.000	110.000
403	15250.000	230.000
404	15250.000	370.000
405	15250.000	480.000
406	15250.000	550.000
407	15250.000	610.000
408	15250.000	680.000
409	15250.000	750.000
410	15250.000	820.000
411	15250.000	870.000
412	15250.000	920.000
413	15500.000	0.0
414	15500.000	100.000
415	15500.000	210.000
416	15500.000	330.000
417	15500.000	440.000
418	15500.000	500.000
419	15500.000	560.000
420	15500.000	640.000
421	15500.000	710.000
422	15500.000	790.000
423	15500.000	840.000
424	15500.000	890.000
425	15750.000	0.0
426	15750.000	100.000
427	15750.000	200.000
428	15750.000	300.000
429	15750.000	400.000
430	15750.000	470.000
431	15750.000	540.000
432	15750.000	610.000
433	15750.000	690.000
434	15750.000	750.000
435	15750.000	800.000

436	15750.000	853.000
437	16000.000	0.0
438	16000.000	100.000
439	16000.000	200.000
440	16000.000	290.000
441	16000.000	390.000
442	16000.000	450.000
443	16000.000	510.000
444	16000.000	590.000
445	16000.000	660.000
446	16000.000	730.000
447	16000.000	780.000
448	16000.000	830.000
449	16250.000	0.0
450	16250.000	99.600
451	16250.000	190.000
452	16250.000	280.000
453	16250.000	360.000
454	16250.000	440.000
455	16250.000	490.000
456	16250.000	560.000
457	16250.000	630.000
458	16250.000	700.000
459	16250.000	750.000
460	16250.000	800.000
461	16500.000	0.0
462	16500.000	90.000
463	16500.000	190.000
464	16500.000	270.000
465	16500.000	350.000
466	16500.000	410.000
467	16500.000	480.000
468	16500.000	540.000
469	16500.000	600.000
470	16500.000	660.000
471	16500.000	710.000
472	16500.000	760.000
473	16600.000	0.0
474	16600.000	90.000
475	16600.000	180.000
476	16600.000	270.000
477	16600.000	350.000
478	16600.000	400.000
479	16600.000	460.000
480	16600.000	520.000
481	16600.000	590.000
482	16690.000	650.000
483	16600.000	700.000
484	16600.000	750.000
485	16700.000	0.0
486	16700.000	99.000
487	16700.000	180.000
488	16700.000	260.000
489	16700.000	380.000
490	16700.000	400.000
491	16700.000	460.000
492	16700.000	510.000
493	16700.000	570.000
494	16700.000	680.000
495	16700.000	690.000
496	16700.000	780.000
497	16800.000	0.0
498	16800.000	90.000
499	16800.000	180.000
500	16800.000	260.000
501	16800.000	340.000
502	16900.000	400.000
503	16800.000	450.000
504	16800.000	500.000
505	16800.000	560.000
506	16800.000	620.000
507	16800.000	670.000
508	16800.000	720.000
509	16900.000	0.0
510	16900.000	90.000

511	16900.000	180.000
512	16900.000	260.000
513	16900.000	340.000
514	16900.000	390.000
515	16900.000	450.000
516	16900.000	500.000
517	16900.000	550.000
518	16900.000	610.000
519	16900.000	660.000
520	16900.000	710.000
521	17000.000	0.0
522	17000.000	90.000
523	17000.000	180.000
524	17000.000	260.000
525	17000.000	340.000
526	17000.000	390.000
527	17000.000	450.000
528	17000.000	500.000
529	17000.000	550.000
530	17000.000	600.000
531	17000.000	650.000
532	17000.000	700.000
533	17100.000	0.0
534	17100.000	90.000
535	17100.000	180.000
536	17100.000	260.000
537	17100.000	340.000
538	17100.000	390.000
539	17100.000	450.000
540	17100.000	500.000
541	17100.000	550.000
542	17100.000	600.000
543	17100.000	650.000
544	17100.000	700.000
545	17250.000	0.0
546	17250.000	90.000
547	17250.000	180.000
548	17250.000	260.000
549	17250.000	340.000
550	17250.000	390.000
551	17250.000	450.000
552	17250.000	500.000
553	17200.000	550.000
554	17200.000	600.000
555	17200.000	650.000
556	17200.000	700.000
557	17400.000	0.0
558	17400.000	90.000
559	17400.000	180.000
560	17400.000	260.000
561	17400.000	340.000
562	17400.000	390.000
563	17400.000	450.000
564	17400.000	500.000
565	17350.000	550.000
566	17300.000	600.000
567	17300.000	650.000
568	17300.000	700.000
569	17600.000	0.0
570	17600.000	90.000
571	17600.000	180.000
572	17600.000	260.000
573	17600.000	340.000
574	17600.000	390.000
575	17600.000	450.000
576	17550.000	500.000
577	17500.000	550.000
578	17450.000	600.000
579	17400.000	650.000
580	17400.000	700.000
581	17800.000	0.0
582	17800.000	90.000
583	17800.000	180.000
584	17800.000	260.000
585	17800.000	340.000

```
586 17800.000    390.000
587 17800.000    450.000
588 17650.000    490.000
589 18000.000      0.0
590 18000.000     90.090
591 18000.000    190.000
592 18000.000    260.090
593 19000.090    340.090
594 18000.000    390.300
595 14300.000    450.009
  1    1   13   18    2    1   11   12
153  185  157  158  186    1
179  151  163  168  152    1
180  157  165  166  158    1    7    5
175  197  209  219  198    1   11   31
516  569  581  582  570    1
522  575  587  588  576    1
523  581  589  599  592    1
529  586  598  595  587    1
  1     0.
595     0.
  7    6    0    0   29   29
288               3.
580       12      3.
218  288  256    0
515  568  580   11
515  579  580    0
579         0.0
578        50.0
577       100.0
576       150.0
588       160.0
587       200.0
595       200.0
152  168    0          -8.2-8    -8.2-8
196  208    1          -8.2-8    -8.2-8
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      SUBROUTINE STORE(NPROB,MAXNP,MAXEL,H,HT,VX,VZ,TH,TIME,TITLE)
C
C
C  FUNCTION OF SUBROUTINE--TO STORE PERTINENT QUANTITIES ON AUXILIARY
C  DEVICE FOR FUTURE USE BY EITHER PLOTTING OR MATERIAL-TRANSPORT
C  CODES.  WHAT DEVICE IS TO BE USED MUST BE SPECIFIED BY APPROPRIATE
C  JOB-CONTROL CARDS.
C
C
      IMPLICIT REAL*8 (A-H,O-Z)
      COMMON/GEOM/X(595),Z(595),BB(595),DCOSXB(528),DCOSZB(528),
     > DLB(528),DELT,CHNG,DELMAX,TMAX,SNPE,CSPE,NN(595),NPST(595),
     > NBE(528),IE(528,5),ISB(528,4),NNP,NEL,NMAT,IBAND,NBC,NST,NTI,
     > NBEL,NSTN,NSTRT
      COMMON/RPSP/DCTFLX(595),HCON(595),FLX(595),DCOSX(528),DCOSZ(528),
     > DL(528),TRF(2,20),RF(2,20),RFALL(2),IRPTYP(595),NPRS(595),
     > NPCON(595),NPFLX(595),NRSE(528),IS(528,4),NRFPR,NRFPAR,NRSEL,NRSN
      DIMENSION H(MAXNP),HT(MAXNP),VX(MAXEL,4),VZ(MAXEL,4),TITLE(9),
     > TH(MAXEL,4)
      DATA NPPROB/-1/
      IF (NSTRT.GT.0) GO TO 10
      IF (NPPROB.EQ.(-1)) REWIND 1
      IF (NPPROB.EQ.NPROB) GO TO 10
      WRITE(1)  (TITLE(I),I=1,9),NPROB,NNP,NEL,NTI,MAXNP
      WRITE(1)  (X(NP),NP=1,NNP),(Z(NP),NP=1,NNP),((IE(M,IQ),M=1,NEL),IQ=
     >  1,4)
      NPPROB=NPROB
C
C           **********CORRECTION TO ORNL-4927***********
C
C  DUE TO CHANGES IN THE MATERIAL-TRANSPORT CODE, DARCY VELOCITIES MAY
C  BE USED DIRECTLY, AND IT IS UNNECESSARY TO COMPUTE PORE QUANTITIES
C
   10 WRITE(1) TIME,(H(NP),NP=1,NNP),(HT(NP),NP=1,NNP),((TH(M,IQ),M=1,
C           ******************************************
     > NEL),IQ=1,4),((VX(M,IQ),M=1,NEL),IQ=1,4),((VZ(M,IQ),M=1,NEL), IQ=
     > 1,4),(NPCON(NP),NP=1,MAXNP),(NPFLX(NP),NP=1,MAXNP)
      RETURN
      END
```

OUTPUT

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PROBLEM 1273.. SEEPAGE-PIT MOISTURE TRANSPORT

INPUT TABLE 1.. BASIC PARAMETERS

NUMBER OF NODAL POINTS.	595
NUMBER OF ELEMENTS.	520
NUMBER OF DIFFERENT MATERIALS	1
NUMBER OF CONDUCTION MATERIALS.	0
NUMBER OF TIME INCREMENTS	0
STEADY-STATE I.C. CONTROL	0
SOIL-PROPERTY CONTROL	1
NUMBER OF SOIL PARAMETERS	16
AUXILIARY STORAGE CONTROL	1
CONDUCTIVITY-PERMEABILITY CONTROL . . .	1
GRAVITY CONTROL	0
RESTART PARAMETER	0
MAXIMUM ITERATIONS PER CYCLE.	20
MAXIMUM CYCLES PER TIME STEP.	5
TIME INCREMENT.	300.000000
MULTIPLIER FOR INCREASING DELT.	0.500000
MAXIMUM VALUE OF DELT	0.86400D 05
MAXIMUM VALUE OF TIME	0.10000D 51
DEGREES OF THIS-AXIS INCLINATION. . . .	0.0
STEADY-STATE TOLERANCE.	0.010000
TRANSIENT-STATE TOLERANCE	0.100000
DENSITY OF WATER.	1.000000
ACCELERATION OF GRAVITY	980.600
VISCOSITY OF WATER.	0.013000
TIME-INTEGRATION PARAMETER.	1.000000

OUTPUT CONTROL
10

INPUT TABLE 2.. MATERIAL PROPERTIES

MAT. NO.	ALP	BETAP	POR	KX	KZ
1	0.0	0.0	0.30000D 00	0.50000D-07	0.50000D-07

INPUT TABLE 3.. SOIL-PROPERTIES INTERPOLATION VALUES

MAT. NO.	PRESSURE	MOISTURE CONTENT	CONDUCTIVITY/PERMEABILITY	WATER CAPACITY
1	-0.80000D 03	0.20000D-01	0.40000D-08	0.0
	-0.40000D 03	0.32000D-01	0.52000D-08	0.52000D-04
	-0.20000D 03	0.42500D-01	0.65000D-08	0.10000D-03
	-0.17500D 03	0.45000D-01	0.70000D-08	0.20000D-03
	-0.15000D 03	0.50000D-01	0.80000D-08	0.50000D-03
	-0.12500D 03	0.62500D-01	0.95000D-08	0.11000D-02
	-0.10000D 03	0.90000D-01	0.16000D-07	0.32000D-02
	-0.62500D 02	0.21000D 00	0.30000D-07	0.32000D-02
	-0.50000D 02	0.25000D 00	0.40000D-07	0.20000D-02
	-0.37500D 02	0.27500D 00	0.53000D-07	0.80000D-03
	-0.25000D 02	0.28500D 00	0.55000D-07	0.40000D-03
	-0.12500D 02	0.29000D 00	0.56000D-07	0.20000D-03
	0.0	0.29250D 00	0.56000D-07	0.10000D-03
	0.50000D 02	0.29750D 00	0.57000D-07	0.40000D-04
	0.10000D 03	0.29950D 00	0.58000D-07	0.26000D-06
	0.20000D 00	0.30000D 00	0.50000D-07	0.0

INPUT TABLE 5.. NODAL POINT DATA

NODE	X	Z
1	0.0	0.0
2	0.0	0.5000D 03
3	0.0	0.1000D 04
4	0.0	0.1500D 04
5	0.0	0.2000D 04
6	0.0	0.2200D 04
7	0.0	0.2400D 04
8	0.0	0.2600D 04
9	0.0	0.2750D 04
10	0.0	0.2900D 04
11	0.0	0.2950D 04
12	0.0	0.3000D 04
13	0.5000D 03	0.0
14	0.5000D 03	0.5000D 03
15	0.5000D 03	0.1000D 04
16	0.5000D 03	0.1500D 04
17	0.5000D 03	0.2000D 04
18	0.5000D 03	0.2200D 04
19	0.5000D 03	0.2400D 04
20	0.5000D 03	0.2600D 04
21	0.5000D 03	0.2750D 04
22	0.5000D 03	0.2900D 04
23	0.5000D 03	0.2950D 04
24	0.5000D 03	0.3000D 04
25	0.1000D 04	0.0
26	0.1000D 04	0.5000D 03
27	0.1000D 04	0.1000D 04
28	0.1000D 04	0.1500D 04
29	0.1000D 04	0.2000D 04
30	0.1000D 04	0.2200D 04
31	0.1000D 04	0.2400D 04
32	0.1000D 04	0.2600D 04
33	0.1000D 04	0.2750D 04
34	0.1000D 04	0.2900D 04
35	0.1000D 04	0.2950D 04
36	0.1000D 04	0.3000D 04
37	0.1500D 04	0.0
38	0.1500D 04	0.5000D 03
39	0.1500D 04	0.1000D 04
40	0.1500D 04	0.1500D 04
41	0.1500D 04	0.2000D 04
42	0.1500D 04	0.2200D 04
43	0.1500D 04	0.2400D 04
44	0.1500D 04	0.2600D 04
45	0.1500D 04	0.2750D 04
46	0.1500D 04	0.2900D 04
47	0.1500D 04	0.2950D 04
48	0.1500D 04	0.3000D 04
49	0.2000D 04	0.0
50	0.2000D 04	0.5000D 03
51	0.2000D 04	0.1000D 04
52	0.2000D 04	0.1500D 04
53	0.2000D 04	0.2000D 04
54	0.2000D 04	0.2200D 04
55	0.2000D 04	0.2400D 04
56	0.2000D 04	0.2600D 04
57	0.2000D 04	0.2750D 04
58	0.2000D 04	0.2900D 04
59	0.2000D 04	0.2950D 04
60	0.2000D 04	0.3000D 04
61	0.2500D 04	0.0
62	0.2500D 04	0.5000D 03
63	0.2500D 04	0.1000D 04
64	0.2500D 04	0.1500D 04
65	0.2500D 04	0.2000D 04
66	0.2500D 04	0.2200D 04
67	0.2500D 04	0.2400D 04

68	0.25000D 04	0.26000D 04
69	0.25000D 04	0.27500D 04
70	0.25000D 04	0.29000D 04
71	0.25000D 04	0.29500D 04
72	0.25000D 04	0.30000D 04
73	0.30000D 04	0.0
74	0.30000D 04	0.50000D 03
75	0.30000D 04	0.10000D 04
76	0.30000D 04	0.15000D 04
77	0.30000D 04	0.20000D 04
78	0.30000D 04	0.22000D 04
79	0.30000D 04	0.24000D 04
80	0.30000D 04	0.26000D 04
81	0.30000D 04	0.27500D 04
82	0.30000D 04	0.29000D 04
83	0.30000D 04	0.29500D 04
84	0.30000D 04	0.30000D 04
85	0.35000D 04	0.0
86	0.35000D 04	0.50000D 03
87	0.35000D 04	0.10000D 04
88	0.35000D 04	0.15000D 04
89	0.35000D 04	0.20000D 04
90	0.35000D 04	0.22000D 04
91	0.35000D 04	0.24000D 04
92	0.35000D 04	0.26000D 04
93	0.35000D 04	0.27500D 04
94	0.35000D 04	0.29000D 04
95	0.35000D 04	0.29500D 04
96	0.35000D 04	0.30000D 04
97	0.40000D 04	0.0
98	0.40000D 04	0.50000D 03
99	0.40000D 04	0.10000D 04
100	0.40000D 04	0.15000D 04
101	0.40000D 04	0.20000D 04
102	0.40000D 04	0.22000D 04
103	0.40000D 04	0.24000D 04
104	0.40000D 04	0.26000D 04
105	0.40000D 04	0.27500D 04
106	0.40000D 04	0.29000D 04
107	0.40000D 04	0.29500D 04
108	0.40000D 04	0.30000D 04
109	0.45000D 04	0.0
110	0.45000D 04	0.50000D 03
111	0.45000D 04	0.10000D 04
112	0.45000D 04	0.15000D 04
113	0.45000D 04	0.20000D 04
114	0.45000D 04	0.22000D 04
115	0.45000D 04	0.24000D 04
116	0.45000D 04	0.26000D 04
117	0.45000D 04	0.27500D 04
118	0.45000D 04	0.29000D 04
119	0.45000D 04	0.29500D 04
120	0.45000D 04	0.30000D 04
121	0.50000D 04	0.0
122	0.50000D 04	0.50000D 03
123	0.50000D 04	0.10000D 04
124	0.50000D 04	0.15000D 04
125	0.50000D 04	0.20000D 04
126	0.50000D 04	0.22000D 04
127	0.50000D 04	0.24000D 04
128	0.50000D 04	0.26000D 04
129	0.50000D 04	0.27500D 04
130	0.50000D 04	0.29000D 04
131	0.50000D 04	0.29500D 04
132	0.50000D 04	0.30000D 04
133	0.55000D 04	0.0
134	0.55000D 04	0.50000D 03
135	0.55000D 04	0.10000D 04
136	0.55000D 04	0.15000D 04

137	0.55000D 04	0.20000D 04
138	0.55000D 04	0.22000D 04
139	0.55000D 04	0.24000D 04
140	0.55000D 04	0.26000D 04
141	0.55000D 04	0.27500D 04
142	0.55000D 04	0.29000D 04
143	0.55000D 04	0.29500D 04
144	0.55000D 04	0.30000D 04
145	0.60000D 04	0.0
146	0.60000D 04	0.50000D 03
147	0.60000D 04	0.10000D 04
148	0.60000D 04	0.15000D 04
149	0.60000D 04	0.20000D 04
150	0.60000D 04	0.22000D 04
151	0.60000D 04	0.24000D 04
152	0.60000D 04	0.26000D 04
153	0.60000D 04	0.27500D 04
154	0.60000D 04	0.29000D 04
155	0.60000D 04	0.29500D 04
156	0.60000D 04	0.30000D 04
157	0.65000D 04	0.0
158	0.65000D 04	0.50000D 03
159	0.65000D 04	0.10000D 04
160	0.65000D 04	0.15000D 04
161	0.65000D 04	0.20000D 04
162	0.65000D 04	0.22000D 04
163	0.65000D 04	0.24000D 04
164	0.65000D 04	0.26000D 04
165	0.70000D 04	0.0
166	0.70000D 04	0.50000D 03
167	0.70000D 04	0.10000D 04
168	0.70000D 04	0.15000D 04
169	0.70000D 04	0.20000D 04
170	0.70000D 04	0.22000D 04
171	0.70000D 04	0.24000D 04
172	0.70000D 04	0.26000D 04
173	0.75000D 04	0.0
174	0.75000D 04	0.50000D 03
175	0.75000D 04	0.10000D 04
176	0.75000D 04	0.15000D 04
177	0.75000D 04	0.20000D 04
178	0.75000D 04	0.22000D 04
179	0.75000D 04	0.24000D 04
180	0.75000D 04	0.26000D 04
181	0.80000D 04	0.0
182	0.80000D 04	0.50000D 03
183	0.80000D 04	0.10000D 04
184	0.80000D 04	0.15000D 04
185	0.80000D 04	0.20000D 04
186	0.80000D 04	0.22000D 04
187	0.80000D 04	0.24000D 04
188	0.80000D 04	0.26000D 04
189	0.85000D 04	0.0
190	0.85000D 04	0.50000D 03
191	0.85000D 04	0.10000D 04
192	0.85000D 04	0.15000D 04
193	0.85000D 04	0.20000D 04
194	0.85000D 04	0.22000D 04
195	0.85000D 04	0.24000D 04
196	0.85000D 04	0.26000D 04
197	0.90000D 04	0.0
198	0.90000D 04	0.50000D 03
199	0.90000D 04	0.10000D 04
200	0.90000D 04	0.15000D 04
201	0.90000D 04	0.20000D 04
202	0.90000D 04	0.22000D 04
203	0.90000D 04	0.24000D 04
204	0.90000D 04	0.26000D 04
205	0.90000D 04	0.27500D 04

206	0.90000D 04	0.29000D 04
207	0.90000D 04	0.29500D 04
208	0.90000D 04	0.30000D 04
209	0.95000D 04	0.0
210	0.95000D 04	0.50000D 03
211	0.95000D 04	0.10700D 04
212	0.95000D 04	0.15000D 04
213	0.95000D 04	0.20000D 04
214	0.95000D 04	0.22000D 04
215	0.95000D 04	0.24000D 04
216	0.95000D 04	0.25000D 04
217	0.95000D 04	0.27500D 04
218	0.95000D 04	0.29000D 04
219	0.95000D 04	0.29500D 04
220	0.95000D 04	0.30000D 04
221	0.10000D 05	0.0
222	0.10000D 05	0.48000D 03
223	0.10000D 05	0.99000D 03
224	0.10000D 05	0.15800D 04
225	0.10000D 05	0.19900D 04
226	0.10000D 05	0.21900D 04
227	0.10000D 05	0.23900D 04
228	0.10000D 05	0.25600D 04
229	0.10000D 05	0.27300D 04
230	0.10000D 05	0.28900D 04
231	0.10000D 05	0.29400D 04
232	0.10000D 05	0.29900D 04
233	0.10500D 05	0.0
234	0.10500D 05	0.45000D 03
235	0.10500D 05	0.96000D 03
236	0.10500D 05	0.14600D 04
237	0.10500D 05	0.19200D 04
238	0.10500D 05	0.21300D 04
239	0.10500D 05	0.23200D 04
240	0.10500D 05	0.25200D 04
241	0.10500D 05	0.27000D 04
242	0.10500D 05	0.28500D 04
243	0.10500D 05	0.29000D 04
244	0.10500D 05	0.29500D 04
245	0.11000D 05	0.0
246	0.11000D 05	0.45000D 03
247	0.11000D 05	0.91000D 03
248	0.11000D 05	0.13800D 04
249	0.11000D 05	0.18100D 04
250	0.11000D 05	0.20200D 04
251	0.11000D 05	0.22000D 04
252	0.11000D 05	0.23900D 04
253	0.11000D 05	0.25700D 04
254	0.11000D 05	0.27500D 04
255	0.11000D 05	0.28000D 04
256	0.11000D 05	0.28500D 04
257	0.11500D 05	0.0
258	0.11500D 05	0.40000D 03
259	0.11500D 05	0.85000D 03
260	0.11500D 05	0.12500D 04
261	0.11500D 05	0.16600D 04
262	0.11500D 05	0.18600D 04
263	0.11500D 05	0.20600D 04
264	0.11500D 05	0.22500D 04
265	0.11500D 05	0.24400D 04
266	0.11500D 05	0.25900D 04
267	0.11500D 05	0.26800D 04
268	0.11500D 05	0.26900D 04
269	0.12000D 05	0.0
270	0.12000D 05	0.36000D 03
271	0.12000D 05	0.75000D 03
272	0.12000D 05	0.11000D 04
273	0.12000D 05	0.15000D 04
274	0.12000D 05	0.17000D 04

275	0.1200D 05	0.1860D 04
276	0.1200D 05	0.2020D 04
277	0.1200D 05	0.2200D 04
278	0.1200D 05	0.2370D 04
279	0.1200D 05	0.2420D 04
280	0.1200D 05	0.2470D 04
281	0.1250D 05	0.0
282	0.1250D 05	0.3000D 03
283	0.1250D 05	0.6500D 03
284	0.1250D 05	0.9500D 03
285	0.1250D 05	0.1130D 04
286	0.1250D 05	0.1490D 04
287	0.1250D 05	0.1680D 04
288	0.1250D 05	0.1760D 04
289	0.1250D 05	0.1830D 04
290	0.1250D 05	0.2000D 04
291	0.1250D 05	0.2050D 04
292	0.1250D 05	0.2100D 04
293	0.1300D 05	0.0
294	0.1300D 05	0.2700D 03
295	0.1300D 05	0.5700D 03
296	0.1300D 05	0.8500D 03
297	0.1300D 05	0.1140D 04
298	0.1300D 05	0.1210D 04
299	0.1300D 05	0.1300D 04
300	0.1300D 05	0.1400D 04
301	0.1300D 05	0.1510D 04
302	0.1300D 05	0.1620D 04
303	0.1300D 05	0.1670D 04
304	0.1300D 05	0.1720D 04
305	0.1325D 05	0.0
306	0.1325D 05	0.2500D 03
307	0.1325D 05	0.5300D 03
308	0.1325D 05	0.7700D 03
309	0.1325D 05	0.1030D 04
310	0.1325D 05	0.1120D 04
311	0.1325D 05	0.1200D 04
312	0.1325D 05	0.1300D 04
313	0.1325D 05	0.1370D 04
314	0.1325D 05	0.1450D 04
315	0.1325D 05	0.1500D 04
316	0.1325D 05	0.1550D 04
317	0.1350D 05	0.0
318	0.1350D 05	0.2200D 03
319	0.1350D 05	0.4600D 03
320	0.1350D 05	0.7000D 03
321	0.1350D 05	0.9200D 03
322	0.1350D 05	0.1010D 04
323	0.1350D 05	0.1100D 04
324	0.1350D 05	0.1180D 04
325	0.1350D 05	0.1250D 04
326	0.1350D 05	0.1300D 04
327	0.1350D 05	0.1350D 04
328	0.1350D 05	0.1400D 04
329	0.1375D 05	0.0
330	0.1375D 05	0.2600D 03
331	0.1375D 05	0.4400D 03
332	0.1375D 05	0.6500D 03
333	0.1375D 05	0.8300D 03
334	0.1375D 05	0.9100D 03
335	0.1375D 05	0.1000D 04
336	0.1375D 05	0.1080D 04
337	0.1375D 05	0.1140D 04
338	0.1375D 05	0.1200D 04
339	0.1375D 05	0.1250D 04
340	0.1375D 05	0.1300D 04
341	0.1400D 05	0.0
342	0.1400D 05	0.1900D 03
343	0.1400D 05	0.4000D 03

344	0.1400D 05	0.5900D 03
345	0.1400D 05	0.7500D 03
346	0.1400D 05	0.8300D 03
347	0.1400D 05	0.9000D 03
348	0.1400D 05	0.9800D 03
349	0.1400D 05	0.1050D 04
350	0.1400D 05	0.1120D 04
351	0.1400D 05	0.1170D 04
352	0.1400D 05	0.1220D 04
353	0.1425D 05	0.0
354	0.1425D 05	0.1700D 03
355	0.1425D 05	0.3500D 03
356	0.1425D 05	0.5400D 03
357	0.1425D 05	0.6700D 03
358	0.1425D 05	0.7500D 03
359	0.1425D 05	0.8200D 03
360	0.1425D 05	0.9000D 03
361	0.1425D 05	0.9600D 03
362	0.1425D 05	0.1050D 04
363	0.1425D 05	0.1100D 04
364	0.1425D 05	0.1150D 04
365	0.1450D 05	0.0
366	0.1450D 05	0.1500D 03
367	0.1450D 05	0.3200D 03
368	0.1450D 05	0.4700D 03
369	0.1450D 05	0.6100D 03
370	0.1450D 05	0.6900D 03
371	0.1450D 05	0.7600D 03
372	0.1450D 05	0.8300D 03
373	0.1450D 05	0.9000D 03
374	0.1450D 05	0.9800D 03
375	0.1450D 05	0.1030D 04
376	0.1450D 05	0.1080D 04
377	0.1475D 05	0.0
378	0.1475D 05	0.1400D 03
379	0.1475D 05	0.2700D 03
380	0.1475D 05	0.4300D 03
381	0.1475D 05	0.5600D 03
382	0.1475D 05	0.6300D 03
383	0.1475D 05	0.7000D 03
384	0.1475D 05	0.7600D 03
385	0.1475D 05	0.8400D 03
386	0.1475D 05	0.9100D 03
387	0.1475D 05	0.9600D 03
388	0.1475D 05	0.1010D 04
389	0.1500D 05	0.0
390	0.1500D 05	0.1200D 03
391	0.1500D 05	0.2500D 03
392	0.1500D 05	0.3900D 03
393	0.1500D 05	0.5200D 03
394	0.1500D 05	0.5900D 03
395	0.1500D 05	0.6500D 03
396	0.1500D 05	0.7200D 03
397	0.1500D 05	0.8000D 03
398	0.1500D 05	0.8600D 03
399	0.1500D 05	0.9100D 03
400	0.1500D 05	0.9600D 03
401	0.1525D 05	0.0
402	0.1525D 05	0.1100D 03
403	0.1525D 05	0.2300D 03
404	0.1525D 05	0.3700D 03
405	0.1525D 05	0.4800D 03
406	0.1525D 05	0.5500D 03
407	0.1525D 05	0.6100D 03
408	0.1525D 05	0.6800D 03
409	0.1525D 05	0.7500D 03
410	0.1525D 05	0.8200D 03
411	0.1525D 05	0.8700D 03
412	0.1525D 05	0.9200D 03

413	0.1550D 05	0.0
414	0.1550D 05	0.1000D 03
415	0.1550D 05	0.2100D 03
416	0.1550D 05	0.3300D 03
417	0.1550D 05	0.4400D 03
418	0.1550D 05	0.5000D 03
419	0.1550D 05	0.5600D 03
420	0.1550D 05	0.6400D 03
421	0.1550D 05	0.7100D 03
422	0.1550D 05	0.7900D 03
423	0.1550D 05	0.8400D 03
424	0.1550D 05	0.8900D 03
425	0.1575D 05	0.0
426	0.1575D 05	0.1000D 03
427	0.1575D 05	0.2000D 03
428	0.1575D 05	0.3000D 03
429	0.1575D 05	0.4000D 03
430	0.1575D 05	0.4700D 03
431	0.1575D 05	0.5400D 03
432	0.1575D 05	0.6100D 03
433	0.1575D 05	0.6900D 03
434	0.1575D 05	0.7500D 03
435	0.1575D 05	0.8000D 03
436	0.1575D 05	0.8500D 03
437	0.1600D 05	0.0
438	0.1600D 05	0.1000D 03
439	0.1600D 05	0.2000D 03
440	0.1600D 05	0.2900D 03
441	0.1600D 05	0.3900D 03
442	0.1600D 05	0.4570D 03
443	0.1600D 05	0.5100D 03
444	0.1600D 05	0.5900D 03
445	0.1600D 05	0.6600D 03
446	0.1600D 05	0.7300D 03
447	0.1600D 05	0.7800D 03
448	0.1600D 05	0.8300D 03
449	0.1625D 05	0.0
450	0.1625D 05	0.9000D 02
451	0.1625D 05	0.1900D 03
452	0.1625D 05	0.2800D 03
453	0.1625D 05	0.3600D 03
454	0.1625D 05	0.4400D 03
455	0.1625D 05	0.4900D 03
456	0.1625D 05	0.5600D 03
457	0.1625D 05	0.6300D 03
458	0.1625D 05	0.7000D 03
459	0.1625D 05	0.7500D 03
460	0.1625D 05	0.8000D 03
461	0.1650D 05	0.0
462	0.1650D 05	0.9000D 02
463	0.1650D 05	0.1800D 03
464	0.1650D 05	0.2700D 03
465	0.1650D 05	0.3500D 03
466	0.1650D 05	0.4100D 03
467	0.1650D 05	0.4800D 03
468	0.1650D 05	0.5400D 03
469	0.1650D 05	0.6000D 03
470	0.1650D 05	0.6600D 03
471	0.1650D 05	0.7100D 03
472	0.1650D 05	0.7600D 03
473	0.1660D 05	0.0
474	0.1660D 05	0.9000D 02
475	0.1660D 05	0.1800D 03
476	0.1660D 05	0.2700D 03
477	0.1660D 05	0.3500D 03
478	0.1660D 05	0.4000D 03
479	0.1660D 05	0.4600D 03
480	0.1660D 05	0.5200D 03
481	0.1660D 05	0.5900D 03

482	0.1660D 05	0.6500D 03
483	0.1660D 05	0.7000D 03
484	0.1660D 05	0.7500D 03
485	0.1670D 05	0.0
486	0.1670D 05	0.9000D 02
487	0.1670D 05	0.1800D 03
488	0.1670D 05	0.2600D 03
489	0.1670D 05	0.3400D 03
490	0.1670D 05	0.4000D 03
491	0.1670D 05	0.4600D 03
492	0.1670D 05	0.5100D 03
493	0.1670D 05	0.5700D 03
494	0.1670D 05	0.6400D 03
495	0.1670D 05	0.6900D 03
496	0.1670D 05	0.7400D 03
497	0.1680D 05	0.0
498	0.1680D 05	0.9000D 02
499	0.1680D 05	0.1800D 03
500	0.1680D 05	0.2600D 03
501	0.1680D 05	0.3400D 03
502	0.1680D 05	0.4000D 03
503	0.1680D 05	0.4500D 03
504	0.1680D 05	0.5000D 03
505	0.1680D 05	0.5600D 03
506	0.1680D 05	0.6200D 03
507	0.1680D 05	0.6700D 03
508	0.1680D 05	0.7200D 03
509	0.1690D 05	0.0
510	0.1690D 05	0.9000D 02
511	0.1690D 05	0.1800D 03
512	0.1690D 05	0.2600D 03
513	0.1690D 05	0.3400D 03
514	0.1690D 05	0.3900D 03
515	0.1690D 05	0.4500D 03
516	0.1690D 05	0.5000D 03
517	0.1690D 05	0.5500D 03
518	0.1690D 05	0.6100D 03
519	0.1690D 05	0.6600D 03
520	0.1690D 05	0.7100D 03
521	0.1700D 05	0.0
522	0.1700D 05	0.9000D 02
523	0.1700D 05	0.1800D 03
524	0.1700D 05	0.2600D 03
525	0.1700D 05	0.3400D 03
526	0.1700D 05	0.3900D 03
527	0.1700D 05	0.4500D 03
528	0.1700D 05	0.5000D 03
529	0.1700D 05	0.5500D 03
530	0.1700D 05	0.6000D 03
531	0.1700D 05	0.6500D 03
532	0.1700D 05	0.7000D 03
533	0.1710D 05	0.0
534	0.1710D 05	0.9000D 02
535	0.1710D 05	0.1800D 03
536	0.1710D 05	0.2600D 03
537	0.1710D 05	0.3400D 03
538	0.1710D 05	0.3900D 03
539	0.1710D 05	0.4500D 03
540	0.1710D 05	0.5000D 03
541	0.1710D 05	0.5500D 03
542	0.1710D 05	0.6000D 03
543	0.1710D 05	0.6500D 03
544	0.1710D 05	0.7000D 03
545	0.1725D 05	0.0
546	0.1725D 05	0.9000D 02
547	0.1725D 05	0.1800D 03
548	0.1725D 05	0.2600D 03
549	0.1725D 05	0.3400D 03
550	0.1725D 05	0.3900D 03

551	0.1725D 05	0.4500D 03
552	0.1725D 05	0.5000D 03
553	0.1720D 05	0.5500D 03
554	0.1720D 05	0.6000D 03
555	0.1720D 05	0.6500D 03
556	0.1720D 05	0.7000D 03
557	0.1740D 05	0.0
558	0.1740D 05	0.9000D 02
559	0.1740D 05	0.1800D 03
560	0.1740D 05	0.2600D 03
561	0.1740D 05	0.3400D 03
562	0.1740D 05	0.3900D 03
563	0.1740D 05	0.4500D 03
564	0.1740D 05	0.5000D 03
565	0.1735D 05	0.5500D 03
566	0.1730D 05	0.6000D 03
567	0.1730D 05	0.6500D 03
568	0.1730D 05	0.7000D 03
569	0.1760D 05	0.0
570	0.1760D 05	0.9000D 02
571	0.1760D 05	0.1800D 03
572	0.1760D 05	0.2600D 03
573	0.1760D 05	0.3400D 03
574	0.1760D 05	0.3900D 03
575	0.1760D 05	0.4500D 03
576	0.1755D 05	0.5000D 03
577	0.1750D 05	0.5500D 03
578	0.1745D 05	0.6000D 03
579	0.1740D 05	0.6500D 03
580	0.1740D 05	0.7000D 03
581	0.1780D 05	0.0
582	0.1780D 05	0.9000D 02
583	0.1780D 05	0.1800D 03
584	0.1780D 05	0.2600D 03
585	0.1780D 05	0.3400D 03
586	0.1780D 05	0.3900D 03
587	0.1780D 05	0.4500D 03
588	0.1765D 05	0.4900D 03
589	0.1800D 05	0.0
590	0.1800D 05	0.9000D 02
591	0.1800D 05	0.1800D 03
592	0.1800D 05	0.2600D 03
593	0.1800D 05	0.3400D 03
594	0.1800D 05	0.3900D 03
595	0.1800D 05	0.4500D 03

INPUT TABLE 6.. ELEMENT DATA

	GLOBAL INDICES OF ELEMENT NODES					
ELEMENT	1	2	3	4	MATERIAL	NODE DIFF
1	1	13	14	2	1	13
2	2	14	15	3	1	13
3	3	15	16	4	1	13
4	4	16	17	5	1	13
5	5	17	18	6	1	13
6	6	18	19	7	1	13
7	7	19	20	8	1	13
8	8	20	21	9	1	13
9	9	21	22	10	1	13
10	10	22	23	11	1	13
11	11	23	24	12	1	13
12	13	25	26	14	1	13
13	14	26	27	15	1	13
14	15	27	28	16	1	13
15	16	28	29	17	1	13
16	17	29	30	18	1	13
17	18	30	31	19	1	13
18	19	31	32	20	1	13
19	20	32	33	21	1	13
20	21	33	34	22	1	13
21	22	34	35	23	1	13
22	23	35	36	24	1	13
23	25	37	38	26	1	13
24	26	38	39	27	1	13
25	27	39	40	28	1	13
26	28	40	41	29	1	13
27	29	41	42	30	1	13
28	30	42	43	31	1	13
29	31	43	44	32	1	13
30	32	44	45	33	1	13
31	33	45	46	34	1	13
32	34	46	47	35	1	13
33	35	47	48	36	1	13
34	37	49	50	38	1	13
35	38	50	51	39	1	13
36	39	51	52	40	1	13
37	40	52	53	41	1	13
38	41	53	54	42	1	13
39	42	54	55	43	1	13
40	43	55	56	44	1	13
41	44	56	57	45	1	13
42	45	57	58	46	1	13
43	46	58	59	47	1	13
44	47	59	60	48	1	13
45	49	61	62	50	1	13
46	50	62	63	51	1	13
47	51	63	64	52	1	13
48	52	64	65	53	1	13
49	53	65	66	54	1	13
50	54	66	67	55	1	13
51	55	67	68	56	1	13
52	56	68	69	57	1	13
53	57	69	70	58	1	13
54	58	70	71	59	1	13
55	59	71	72	60	1	13
56	61	73	74	62	1	13
57	62	74	75	63	1	13
58	63	75	76	64	1	13
59	64	76	77	65	1	13
60	65	77	78	66	1	13
61	66	78	79	67	1	13
62	67	79	80	68	1	13
63	68	80	81	69	1	13
64	69	81	82	70	1	13
65	70	82	83	71	1	13
66	71	83	84	72	1	13

67	73	85	86	74	1	13
68	74	86	87	75	1	13
69	75	87	88	76	1	13
70	76	88	89	77	1	13
71	77	89	90	78	1	13
72	78	90	91	79	1	13
73	79	91	92	80	1	13
74	80	92	93	81	1	13
75	81	93	94	82	1	13
76	82	94	95	83	1	13
77	83	95	96	84	1	13
78	85	97	98	86	1	13
79	86	98	99	87	1	13
80	87	99	100	88	1	13
81	88	100	101	89	1	13
82	89	101	102	90	1	13
83	90	102	103	91	1	13
84	91	103	104	92	1	13
85	92	104	105	93	1	13
86	93	105	106	94	1	13
87	94	106	107	95	1	13
88	95	107	108	96	1	13
89	97	109	110	98	1	13
90	98	110	111	99	1	13
91	99	111	112	100	1	13
92	100	112	113	101	1	13
93	101	113	114	102	1	13
94	102	114	115	103	1	13
95	103	115	116	104	1	13
96	104	116	117	105	1	13
97	105	117	118	106	1	13
98	106	118	119	107	1	13
99	107	119	120	108	1	13
100	109	121	122	110	1	13
101	110	122	123	111	1	13
102	111	123	124	112	1	13
103	112	124	125	113	1	13
104	113	125	126	114	1	13
105	114	126	127	115	1	13
106	115	127	128	116	1	13
107	116	128	129	117	1	13
108	117	129	130	118	1	13
109	118	130	131	119	1	13
110	119	131	132	120	1	13
111	121	133	134	122	1	13
112	122	134	135	123	1	13
113	123	135	136	124	1	13
114	124	136	137	125	1	13
115	125	137	138	126	1	13
116	126	138	139	127	1	13
117	127	139	140	128	1	13
118	128	140	141	129	1	13
119	129	141	142	130	1	13
120	130	142	143	131	1	13
121	131	143	144	132	1	13
122	133	145	146	134	1	13
123	134	146	147	135	1	13
124	135	147	148	136	1	13
125	136	148	149	137	1	13
126	137	149	150	138	1	13
127	138	150	151	139	1	13
128	139	151	152	140	1	13
129	140	152	153	141	1	13
130	141	153	154	142	1	13
131	142	154	155	143	1	13
132	143	155	156	144	1	13
133	145	157	158	146	1	13
134	146	158	159	147	1	13
135	147	159	160	148	1	13

136	148	160	161	149	1	13
137	149	161	162	150	1	13
138	150	162	163	151	1	13
139	151	163	164	152	1	13
140	157	165	166	158	1	9
141	158	166	167	159	1	9
142	159	167	168	160	1	9
143	160	168	169	161	1	9
144	161	169	170	162	1	9
145	162	170	171	163	1	9
146	163	171	172	164	1	9
147	165	173	174	166	1	9
148	166	174	175	167	1	9
149	167	175	176	168	1	9
150	168	176	177	169	1	9
151	169	177	178	170	1	9
152	170	178	179	171	1	9
153	171	179	180	172	1	9
154	173	181	182	174	1	9
155	174	182	183	175	1	9
156	175	183	184	176	1	9
157	176	184	185	177	1	9
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159	178	186	187	179	1	9
160	179	187	188	180	1	9
161	181	189	190	182	1	9
162	182	190	191	183	1	9
163	183	191	192	184	1	9
164	184	192	193	185	1	9
165	185	193	194	186	1	9
166	186	194	195	187	1	9
167	187	195	196	188	1	9
168	189	197	198	190	1	9
169	190	198	199	191	1	9
170	191	199	200	192	1	9
171	192	200	201	193	1	9
172	193	201	202	194	1	9
173	194	202	203	195	1	9
174	195	203	204	196	1	9
175	197	209	210	198	1	13
176	198	210	211	199	1	13
177	199	211	212	200	1	13
178	200	212	213	201	1	13
179	201	213	214	202	1	13
180	202	214	215	203	1	13
181	203	215	216	204	1	13
182	204	216	217	205	1	13
183	205	217	218	206	1	13
184	206	218	219	207	1	13
185	207	219	220	208	1	13
186	209	221	222	210	1	13
187	210	222	223	211	1	13
188	211	223	224	212	1	13
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191	214	226	227	215	1	13
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200	224	236	237	225	1	13
201	225	237	238	226	1	13
202	226	238	239	227	1	13
203	227	239	240	228	1	13
204	228	240	241	229	1	13

205	229	241	242	230	1	13
206	230	242	243	231	1	13
207	231	243	244	232	1	13
208	233	245	246	234	1	13
209	234	246	247	235	1	13
210	235	247	248	236	1	13
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213	238	250	251	239	1	13
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216	241	253	254	242	1	13
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218	243	255	256	244	1	13
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220	246	258	259	247	1	13
221	247	259	260	248	1	13
222	248	260	261	249	1	13
223	249	261	262	250	1	13
224	250	262	263	251	1	13
225	251	263	264	252	1	13
226	252	264	265	253	1	13
227	253	265	266	254	1	13
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239	266	278	279	267	1	13
240	267	279	280	268	1	13
241	269	281	282	270	1	13
242	270	282	283	271	1	13
243	271	283	284	272	1	13
244	272	284	285	273	1	13
245	273	285	296	274	1	13
246	274	286	287	275	1	13
247	275	287	288	276	1	13
248	276	288	289	277	1	13
249	277	289	290	278	1	13
250	278	290	291	279	1	13
251	279	291	292	290	1	13
252	281	293	294	282	1	13
253	282	294	295	283	1	13
254	283	295	296	284	1	13
255	284	296	297	285	1	13
256	285	297	298	286	1	13
257	286	298	299	287	1	13
258	287	299	300	288	1	13
259	288	300	301	289	1	13
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268	298	310	311	299	1	13
269	299	311	312	300	1	13
270	300	312	313	301	1	13
271	301	313	314	302	1	13
272	302	314	315	303	1	13
273	303	315	316	304	1	13

274	305	317	318	306	1	13
275	306	318	319	307	1	13
276	307	319	320	308	1	13
277	308	320	321	309	1	13
278	309	321	322	310	1	13
279	310	322	323	311	1	13
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288	320	332	333	321	1	13
289	321	333	334	322	1	13
290	322	334	335	323	1	13
291	323	335	336	324	1	13
292	324	336	337	325	1	13
293	325	337	338	326	1	13
294	326	338	339	327	1	13
295	327	339	340	328	1	13
296	329	341	342	330	1	13
297	330	342	343	331	1	13
298	331	343	344	332	1	13
299	332	344	345	333	1	13
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301	334	346	347	335	1	13
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303	336	348	349	337	1	13
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305	338	350	351	339	1	13
306	339	351	352	340	1	13
307	341	353	354	342	1	13
308	342	354	355	343	1	13
309	343	355	356	344	1	13
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313	347	359	360	348	1	13
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324	359	371	372	360	1	13
325	360	372	373	361	1	13
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327	362	374	375	363	1	13
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331	367	379	380	368	1	13
332	368	380	381	369	1	13
333	369	381	382	370	1	13
334	370	382	383	371	1	13
335	371	383	384	372	1	13
336	372	384	385	373	1	13
337	373	385	386	374	1	13
338	374	386	387	375	1	13
339	375	387	388	376	1	13
340	377	389	390	378	1	13
341	378	390	391	379	1	13
342	379	391	392	380	1	13

343	380	392	393	381	1	13
344	381	393	394	382	1	13
345	382	394	395	383	1	13
346	383	395	396	384	1	13
347	384	396	397	385	1	13
348	385	397	398	386	1	13
349	386	398	399	387	1	13
350	387	399	400	388	1	13
351	389	401	402	390	1	13
352	390	402	403	391	1	13
353	391	403	404	392	1	13
354	392	404	405	393	1	13
355	393	405	406	394	1	13
356	394	406	407	395	1	13
357	395	407	408	396	1	13
358	396	408	409	397	1	13
359	397	409	410	398	1	13
360	398	410	411	399	1	13
361	399	411	412	400	1	13
362	401	413	414	402	1	13
363	402	414	415	403	1	13
364	403	415	416	404	1	13
365	404	416	417	405	1	13
366	405	417	418	406	1	13
367	406	418	419	407	1	13
368	407	419	420	408	1	13
369	408	420	421	409	1	13
370	409	421	422	410	1	13
371	410	422	423	411	1	13
372	411	423	424	412	1	13
373	413	425	426	414	1	13
374	414	426	427	415	1	13
375	415	427	428	416	1	13
376	416	428	429	417	1	13
377	417	429	430	418	1	13
378	418	430	431	419	1	13
379	419	431	432	420	1	13
380	420	432	433	421	1	13
381	421	433	434	422	1	13
382	422	434	435	423	1	13
383	423	435	436	424	1	13
384	425	437	438	426	1	13
385	426	438	439	427	1	13
386	427	439	440	428	1	13
387	428	440	441	429	1	13
388	429	441	442	430	1	13
389	430	442	443	431	1	13
390	431	443	444	432	1	13
391	432	444	445	433	1	13
392	433	445	446	434	1	13
393	434	446	447	435	1	13
394	435	447	448	436	1	13
395	437	449	450	438	1	13
396	438	450	451	439	1	13
397	439	451	452	440	1	13
398	440	452	453	441	1	13
399	441	453	454	442	1	13
400	442	454	455	443	1	13
401	443	455	456	444	1	13
402	444	456	457	445	1	13
403	445	457	458	446	1	13
404	446	458	459	447	1	13
405	447	459	460	448	1	13
406	449	461	462	450	1	13
407	450	462	463	451	1	13
408	451	463	464	452	1	13
409	452	464	465	453	1	13
410	453	465	466	454	1	13
411	454	466	467	455	1	13

412	455	467	468	456	1	13
413	456	468	469	457	1	13
414	457	469	470	458	1	13
415	458	470	471	459	1	13
416	459	471	472	460	1	13
417	461	473	474	462	1	13
418	462	474	475	463	1	13
419	463	475	476	464	1	13
420	464	476	477	465	1	13
421	465	477	478	466	1	13
422	466	478	479	467	1	13
423	467	479	480	468	1	13
424	468	480	481	469	1	13
425	469	481	482	470	1	13
426	470	482	483	471	1	13
427	471	483	484	472	1	13
428	473	485	486	474	1	13
429	474	486	487	475	1	13
430	475	487	488	476	1	13
431	476	488	489	477	1	13
432	477	489	490	478	1	13
433	478	490	491	479	1	13
434	479	491	492	480	1	13
435	480	492	493	481	1	13
436	481	493	494	482	1	13
437	482	494	495	483	1	13
438	483	495	496	484	1	13
439	485	497	498	486	1	13
440	486	498	499	487	1	13
441	487	499	500	488	1	13
442	488	500	501	489	1	13
443	489	501	502	490	1	13
444	490	502	503	491	1	13
445	491	503	504	492	1	13
446	492	504	505	493	1	13
447	493	505	506	494	1	13
448	494	506	507	495	1	13
449	495	507	508	496	1	13
450	497	509	510	498	1	13
451	498	510	511	499	1	13
452	499	511	512	500	1	13
453	500	512	513	501	1	13
454	501	513	514	502	1	13
455	502	514	515	503	1	13
456	503	515	516	504	1	13
457	504	516	517	505	1	13
458	505	517	518	506	1	13
459	506	518	519	507	1	13
460	507	519	520	508	1	13
461	509	521	522	510	1	13
462	510	522	523	511	1	13
463	511	523	524	512	1	13
464	512	524	525	513	1	13
465	513	525	526	514	1	13
466	514	526	527	515	1	13
467	515	527	528	516	1	13
468	516	528	529	517	1	13
469	517	529	530	518	1	13
470	518	530	531	519	1	13
471	519	531	532	520	1	13
472	521	533	534	522	1	13
473	522	534	535	523	1	13
474	523	535	536	524	1	13
475	524	536	537	525	1	13
476	525	537	538	526	1	13
477	526	538	539	527	1	13
478	527	539	540	528	1	13
479	528	540	541	529	1	13
480	529	541	542	530	1	13

481	530	582	583	531	1	13
482	531	583	584	532	1	13
483	533	585	586	534	1	13
484	534	586	587	535	1	13
485	535	587	588	536	1	13
486	536	588	589	537	1	13
487	537	589	550	538	1	13
488	538	550	551	539	1	13
489	539	551	552	540	1	13
490	540	552	553	541	1	13
491	541	553	554	542	1	13
492	542	554	555	543	1	13
493	543	555	556	544	1	13
494	545	557	558	546	1	13
495	546	558	559	547	1	13
496	547	559	560	548	1	13
497	548	560	561	549	1	13
498	549	561	562	550	1	13
499	550	562	563	551	1	13
500	551	563	564	552	1	13
501	552	564	565	553	1	13
502	553	565	566	554	1	13
503	554	566	567	555	1	13
504	555	567	568	556	1	13
505	557	569	570	558	1	13
506	558	570	571	559	1	13
507	559	571	572	560	1	13
508	560	572	573	561	1	13
509	561	573	574	562	1	13
510	562	574	575	563	1	13
511	563	575	576	564	1	13
512	564	576	577	565	1	13
513	565	577	578	566	1	13
514	566	578	579	567	1	13
515	567	579	580	568	1	13
516	569	581	582	570	1	13
517	570	582	583	571	1	13
518	571	583	584	572	1	13
519	572	584	585	573	1	13
520	573	585	586	574	1	13
521	574	586	587	575	1	13
522	575	587	588	576	1	13
523	581	589	590	582	1	9
524	582	590	591	583	1	9
525	583	591	592	584	1	9
526	584	592	593	585	1	9
527	585	593	594	586	1	9
528	586	594	595	587	1	9

INPUT TABLE 7.. STEADY-STATE B.C. PARAMETERS

NUMBER OF BOUNDARY CONDITIONS	7
NUMBER OF SURFACE TERMS	6
NUMBER OF RAINFALL PROFILES	0
NUMBER OF RAINFALL PARAMETERS	0
NUMBER OF RAINFALL-SEEPAGE ELEMENTS . .	29
NUMBER OF RAINFALL-SEEPAGE NODES. . . .	29

INPUT TABLE 12.. RAINFALL DISTRIBUTION AND PONDING

NODE	TYPE	DEPTH
244	0	0.0
256	0	0.0
268	0	0.0
280	0	0.0
292	0	0.0
304	0	0.0
316	0	0.0
328	0	0.0
340	0	0.0
352	0	0.0
364	0	0.0
376	0	0.0
388	0	0.0
400	0	0.0
412	0	0.0
424	0	0.0
436	0	0.0
448	0	0.0
460	0	0.0
472	0	0.0
484	0	0.0
496	0	0.0
508	0	0.0
520	0	0.0
532	0	0.0
544	0	0.0
556	0	0.0
568	0	0.0
580	0	0.0

INPUT TABLE 13.. RAINFALL-SEEPAGE SURFACE INFORMATION

ELEMENT	NODE 1	NODE 2
218	244	256
229	256	268
240	268	280
251	280	292
262	292	304
273	304	316
284	316	328
295	328	340
306	340	352
317	352	364
328	364	376
339	376	388
350	388	400
361	400	412
372	412	424
383	424	436
394	436	448
405	448	460
416	460	472
427	472	484
438	484	496
449	496	508
460	508	520
471	520	532
482	532	544
493	544	556
504	556	568
515	568	580
515	579	580

INPUT TABLE 8.. STEADY-STATE BOUNDARY CONDITIONS OF FORM H=HE

NODE	HE
579	0.0
578	0.5000D 02
577	0.1000D 03
576	0.1500D 03
588	0.1600D 03
587	0.2000D 03
595	0.2000D 03

INPUT TABLE 9.. STEADY-STATE SURFACE TERMS E=EI AT NODE NI, E=EJ AT NODE NJ

NI	NJ	EI	EJ
152	164	-4.0000D-04	-4.0000D-04
164	172	-4.0000D-04	-4.0000D-04
172	180	-4.0000D-04	-4.0000D-04
180	188	-4.0000D-04	-4.0000D-04
188	196	-4.0000D-04	-4.0000D-04
196	204	-4.0000D-04	-4.0000D-04

OUTPUT TABLE 1.. PRESSURE HEADS AT TIME = 0.0 ,(DELT = 3.0000D 02),(BAND WIDTH = 27)

INPUT INITIAL CONDITIONS

NODE I	PRESSURE HEAD OF NODES I,I+1,...,I+7							
1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
25	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
33	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
41	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
49	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
57	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
65	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
73	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
81	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
89	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
97	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
105	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
113	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
121	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
129	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
137	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
145	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
153	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
161	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
169	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
177	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
165	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
193	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
201	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
209	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
217	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
225	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
233	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
241	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
249	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
257	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
265	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
273	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
281	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
289	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
297	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

305	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
313	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
321	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
329	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
337	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
345	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
353	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
361	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
369	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
377	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
385	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
393	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
401	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
409	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
417	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
425	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
433	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
441	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
449	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
457	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
465	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
473	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
481	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
489	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
497	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
505	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
513	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
521	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
529	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
537	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
545	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
553	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
561	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
569	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5000D 02
577	1.0000D 02	5.0000D 01	0.0	0.0	0.0	0.0	0.0	0.0
585	0.0	0.0	2.0000D 02	1.6000D 02	0.0	0.0	0.0	0.0
593	0.0	0.0	2.0000D 02					

DIAGNOSTIC TABLE 1.. AT TIME = 0.0 , (DELT = 3.0000D 02)

TABLE OF ITERATIVE PARAMETERS

ITERATION	RESIDUAL	DEVIATION	NO. NON-CONV. NODES
1	0.2924D 04	0.0	559
2	0.4028D 02	0.6269D 01	556
3	0.2604D 01	0.2053D 02	348
4	0.8557D-01	0.1702D 00	246
5	0.2021D-02	C.4264D-02	0
6	0.2364D 04	0.0	566
7	0.1544D 03	0.3749D 02	563
8	0.7713D 02	0.3164D 02	396
9	0.6022D 01	0.8810D-01	274
10	0.2257D 00	0.1432D-01	235
11	0.2675D-01	0.4125D-03	2
12	0.2954D-02	0.2123D-03	0
13	0.2112D 04	0.0	569
14	0.5115D 03	0.1362D 02	568
15	0.3612D 03	0.6671D 02	351
16	0.1904D 03	0.3577D 01	329
17	0.5554D 02	C.3756D 00	287
18	0.9089D 01	0.4468D-01	250
19	0.5419D 00	0.3989D-02	30
20	0.6822D-01	0.5189D-03	4
21	0.1042D-01	0.6989D-04	1
22	0.1619D-02	0.1573D-04	0
23	0.2048D 04	0.0	570
24	0.5703D 03	0.4562D 02	569
25	0.4021D 03	0.4781D 02	395
26	0.2095D 03	0.3514D 02	340
27	0.4306D 02	0.2864D 00	296
28	0.9950D 01	0.5184D-01	270
29	0.6071D 00	C.3109D-02	89
30	0 6339D-01	0.2129D-02	231
31	0.3453D-01	0.2008D-03	6
32	0.1048D-01	0.1251D-03	1
33	0.9311D-03	C.3108D-04	0
34	0.2052D 04	0.0	571
35	0.5860D 03	0.8954D 02	567
36	0.4098D 03	0.3981D 02	422
37	0.2128D 03	C.8201D 01	339
38	0.3942D 02	0.1960D 02	299
39	0.8885D 01	0.4485D 01	275
40	0.1151D 01	0.3644D 00	265
41	0.2128D 00	0.4576D 00	250
42	0.5259D-01	0.9811D-02	14
43	0.6597D-02	0.3560D-01	0

TABLE OF SYSTEM-FLOW PARAMETERS

TYPE OF FLOW	RATE	INC. FLOW	TOTAL FLOW
CONSTANT-PRESSURE-NODE FLOW	0.2581D 00	0.0	0.0
CONSTANT-FLUX-NODE FLOW	-0.1014D 01	0.0	0.0
SEEPAGE	0.9408D 00	0.0	0.0
RAINFALL.	-0.3755D-01	0.0	0.0
NUMERICAL LOSSES.	0.1422D 00	0.0	0.0
NET FLOW.	0.2895D 00	0.0	0.0
INCREASE IN VOLUMETRIC WATER CONTENT. .	0.0	0.0	0.1002D 00

RAINFALL-SEEPAGE NODAL FLOWS

-0.1258D-03	-0.5539D-04	-0.1465D-03	0.4381D-04	0.1551D-03	0.8606D-03	0.6586D-02	0.3384D-02
-0.3723D-01	0.4256D-01	0.7027D-01	0.1088D 00	0.1539D 00	0.1326D 00	0.1010D 00	0.6356D-01
0.7910D-01	0.1877D-01	0.1807D-01	0.3820D-01	0.1086D-01	0.8667D-02	0.3364D-01	0.2553D-01
0.1076D-01	0.3479D-02	0.2396D-02	0.8991D-03	0.3492D-03			

OUTPUT TABLE 2.. PRESSURE HEADS AT TIME = 0.0 ,(DELT = 3.0000D 02),(BAND WIDTH = 27)

STEADY-STATE INITIAL CONDITIONS

NODE I	PRESSURE HEAD OF NODES I,I+1,...,I+7							
1	2.1993D 03	1.6993D 03	1.1993D 03	6.9931D 02	1.9931D 02	-6.8646D-01	-2.0069D 02	-4.0068D 02
9	-5.5068D 02	-7.0068D 02	-7.5068D 02	-8.0068D 02	2.1993D 03	1.6993D 03	1.1993D 03	6.9931D 02
17	1.5932D 02	-6.8320D-01	-2.0068D 02	-4.0068D 02	-5.5068D 02	-7.0068D 02	-7.5068D 02	-8.0068D 02
25	2.1993D 03	1.6993D 03	1.1993D 03	6.9931D 02	1.9933D 02	-6.7181D-01	-2.0067D 02	-4.0066D 02
33	-5.5066D 02	-7.0066D 02	-7.5066D 02	-8.0066D 02	2.1992D 03	1.6993D 03	1.1993D 03	6.9932D 02
41	1.9935D 02	-6.4679D-01	-2.0064D 02	-4.0063D 02	-5.5063D 02	-7.0062D 02	-7.5062D 02	-8.0062D 02
49	2.1992D 03	1.6992D 03	1.1993D 03	6.9934D 02	1.9939D 02	-5.9594D-01	-2.0059D 02	-4.0057D 02
57	-5.5055D 02	-7.0055D 02	-7.5055D 02	-8.0055D 02	2.1991D 03	1.6991D 03	1.1992D 03	6.9938D 02
65	1.9948D 02	-4.9455D-01	-2.0048D 02	-4.0044D 02	-5.5041D 02	-7.0040D 02	-7.5039D 02	-8.0039D 02
73	2.1989D 03	1.6990D 03	1.1992D 03	6.9946D 02	1.9967D 02	-2.9289D-01	-2.0026D 02	-4.0017D 02
81	-5.5012D 02	-7.0009D 02	-7.5009D 02	-8.0008D 02	2.1985D 03	1.6986D 03	1.1991D 03	6.9962D 02
89	2.0002D 02	1.0771D-01	-1.9982D 02	-3.9964D 02	-5.4952D 02	-6.9946D 02	-7.4946D 02	-7.9945D 02
97	2.1977D 03	1.6980D 03	1.1989D 03	6.9991D 02	2.0073D 02	9.0735D-01	-1.9896D 02	-3.9849D 02
105	-5.4831D 02	-6.9814D 02	-7.4811D 02	-7.9810D 02	2.1962D 03	1.6968D 03	1.1984D 03	7.0046D 02
113	2.0213D 02	2.5176D 00	-1.9713D 02	-3.9634D 02	-5.4542D 02	-6.9517D 02	-7.4514D 02	-7.9514D 02
121	2.1934D 03	1.6944D 03	1.1973D 03	7.0136D 02	2.0492D 02	5.7230D 00	-1.9355D 02	-3.8958D 02
129	-5.3952D 02	-6.8836D 02	-7.3814D 02	-7.8807D 02	2.1803D 03	1.6900D 03	1.1949D 03	7.0235D 02
137	2.1045D 02	1.2848D 01	-1.8512D 02	-3.8371D 02	-5.2058D 02	-6.6634D 02	-7.1588D 02	-7.6573D 02
145	2.1799D 03	1.6823D 03	1.1896D 03	7.0175D 02	2.1847D 02	2.6271D 01	-1.5969D 02	-2.9629D 02
153	-4.7435D 02	-6.3608D 02	-6.8756D 02	-7.3804D 02	2.1665D 03	1.6697D 03	1.1794D 03	6.9636D 02
161	2.2241D 02	3.6784D 01	-1.3254D 02	-1.8812D 02	2.1469D 03	1.6507D 03	1.1623D 03	6.8205D 02
169	2.1399D 02	3.0243D 01	-1.3811D 02	-2.0176D 02	2.1198D 03	1.6239D 03	1.1367D 03	6.5914D 02
177	1.9239D 02	8.9193D 00	-1.5895D 02	-2.0834D 02	2.0847D 03	1.5889D 03	1.1016D 03	6.2418D 02
185	1.5904D 02	-2.2842D 01	-1.8840D 02	-2.2081D 02	2.0415D 03	1.5454D 03	1.0571D 03	5.7751D 02
193	1.0993D 02	-6.8128D 01	-2.1944D 02	-2.3530D 02	1.9908D 03	1.4942D 03	1.0043D 03	5.2102D 02
201	4.2707D 01	-3.4208D 02	-2.9405D 02	-4.3682D 02	-6.4313D 02	-9.1745D 02	-8.7062D 02	-9.2168D 02
209	1.9334D 03	1.4362D 03	9.4459D 02	4.5835D 02	-2.6621D 01	-3.2250D 02	-4.0935D 02	-6.0760D 02
217	-7.4176D 02	-8.8815D 02	-9.3784D 02	-9.8771D 02	1.8704D 03	1.3925D 03	8.8920D 02	3.9055D 02
225	-7.4208D 01	-2.7050D 02	-4.6711D 02	-6.4100D 02	-8.1921D 02	-9.6650D 02	-1.0159D 03	-1.0654D 03
233	1.8027D 03	1.3443D 03	8.4949D 02	3.5741D 02	-9.3922D 01	-2.9817D 02	-4.8171D 02	-6.7626D 02
241	-8.5120D 02	-9.9808D 02	-1.0471D 03	-1.0962D 03	1.7311D 03	1.2825D 03	8.2669D 02	3.6268D 02
249	-6.0910D 01	-2.6404D 02	-4.3653D 02	-6.1893D 02	-7.9228D 02	-9.6583D 02	-1.0141D 03	-1.0624D 03
257	1.6558D 03	1.2570D 03	8.1119D 02	4.1719D 02	1.4675D 01	-1.7672D 02	-3.6966D 02	-5.5081D 02
265	-7.3161D 02	-8.7459D 02	-9.2237D 02	-9.7028D 02	1.5766D 03	1.2178D 03	8.3178D 02	4.8765D 02
273	9.7111D 01	-9.8253D 01	-2.5148D 02	-4.0125D 02	-5.6897D 02	-7.2700D 02	-7.7337D 02	-8.1967D 02
281	1.4928D 03	1.1938D 03	8.4764D 02	5.5298D 02	1.8194D 02	2.6746D 01	-1.1902D 02	-2.3637D 02
289	-3.4813D 02	-4.5609D 02	-5.0105D 02	-5.4605D 02	1.4030D 03	1.1341D 03	8.3781D 02	5.6376D 02
297	2.8216D 02	2.1430D 02	1.2688D 02	3.0984D 01	-7.3675D 01	-1.7769D 02	-2.2282D 02	-2.6810D 02

305	1.3555D 03	1.1064D 03	8.3000D 02	5.9532D 02	3.4370D 02	2.5724D 02	1.8066D 02	8.4931D 01
313	1.8045D 01	-5.7702D 01	-1.0466D 02	-1.5033D 02	1.3060D 03	1.0868D 03	8.4940D 02	6.1429D 02
321	4.0152D 02	3.1538D 02	2.2985D 02	1.5439D 02	8.6613D 01	4.1549D 01	-5.6446D 00	-5.3073D 01
329	1.2548D 03	1.0552D 03	8.1729D 02	6.1081D 02	4.3568D 02	3.5862D 02	2.7269D 02	1.9729D 02
337	1.4165D 02	8.7035D 01	4.2714D 01	0.0	1.2020D 03	1.0122D 03	8.0308D 02	6.1466D 02
345	4.5685D 02	3.7838D 02	3.0996D 02	2.3217D 02	1.6437D 02	9.6871D 01	4.8550D 01	0.0
353	1.1486D 03	9.7845D 02	7.9818D 02	6.0776D 02	4.7751D 02	3.9747D 02	3.2753D 02	2.4772D 02
361	1.8803D 02	9.8809D 01	4.9375D 01	0.0	1.0954D 03	9.4514D 02	7.7197D 02	6.2220D 02
369	4.7999D 02	3.9840D 02	3.2687D 02	2.5517D 02	1.8353D 02	1.0162D 02	5.0650D 01	0.0
377	1.0440D 03	9.0353D 02	7.7223D 02	6.0942D 02	4.7591D 02	4.0352D 02	3.3071D 02	2.6791D 02
385	1.8356D 02	1.0887D 02	5.4665D 01	0.0	9.9540D 02	8.7498D 02	7.4354D 02	6.0075D 02
393	4.6689D 02	3.9418D 02	3.3148D 02	2.5785D 02	1.7286D 02	1.0851D 02	5.4462D 01	0.0
401	9.5037D 02	8.4001D 02	7.1878D 02	5.7616D 02	4.6316D 02	3.9081D 02	3.2848D 02	2.5536D 02
409	1.8184D 02	1.0770D 02	5.4231D 01	0.0	9.0901D 02	8.0874D 02	6.9783D 02	5.7609D 02
417	4.5376D 02	8.0219D 02	3.4042D 02	2.5776D 02	1.8523D 02	1.0235D 02	5.0847D 01	0.0
425	8.7098D 02	7.7076D 02	6.7011D 02	5.6909D 02	4.6762D 02	3.9630D 02	3.2472D 02	2.5279D 02
433	1.7004D 02	1.0725D 02	5.4202D 01	0.0	8.3559D 02	7.3544D 02	6.3499D 02	5.4436D 02
441	4.4342D 02	3.8277D 02	3.2209D 02	2.4112D 02	1.7040D 02	9.9840D 01	4.9725D 01	0.0
449	8.0216D 02	7.1206D 02	6.1172D 02	5.2123D 02	4.4070D 02	3.6007D 02	3.0949D 02	2.3921D 02
457	1.6884D 02	9.8778D 01	4.9106D 01	0.0	7.7041D 02	6.8029D 02	5.8993D 02	4.9934D 02
465	4.1863D 02	3.5800D 02	2.8716D 02	2.2631D 02	1.6531D 02	1.0400D 02	5.2430D 01	0.0
473	7.5823D 02	6.6809D 02	5.7768D 02	4.8699D 02	4.0616D 02	3.5554D 02	2.9471D 02	2.3378D 02
481	1.6261D 02	1.0165D 02	5.0944D 01	0.0	7.4639D 02	6.5623D 02	5.6575D 02	4.8507D 02
489	4.0414D 02	3.4329D 02	2.8229D 02	2.3137D 02	1.7020D 02	9.8902D 01	4.8463D 01	0.0
497	7.3494D 02	6.4476D 02	5.5422D 02	4.7344D 02	3.9238D 02	3.3139D 02	2.8043D 02	2.2935D 02
505	1.6784D 02	1.0597D 02	5.3859D 01	0.0	7.2395D 02	6.3374D 02	5.4312D 02	4.6224D 02
513	3.8105D 02	3.3016D 02	2.6891D 02	2.1771D 02	1.6632D 02	1.0430D 02	5.2187D 01	0.0
521	7.1347D 02	6.2323D 02	5.3252D 02	4.5152D 02	3.7020D 02	3.1923D 02	2.5793D 02	2.0673D 02
529	1.5584D 02	1.0403D 02	5.2386D 01	0.0	7.0359D 02	6.1330D 02	5.2247D 02	4.4130D 02
537	3.5978D 02	3.0870D 02	2.4730D 02	1.9618D 02	1.4498D 02	9.3942D 01	4.3224D 01	-6.7965D 00
545	6.9013D 02	5.9976D 02	5.0864D 02	4.2709D 02	3.4500D 02	2.9349D 02	2.3159D 02	1.7981D 02
553	1.3807D 02	8.3110D 01	3.2262D 01	-1.7721D 01	6.7872D 02	5.8826D 02	4.9688D 02	4.1482D 02
561	3.3190D 02	2.7958D 02	2.1620D 02	1.6374D 02	1.1616D 02	7.0154D 01	2.0000D 01	-3.1707D 01
569	6.6738D 02	5.7689D 02	4.8534D 02	4.0304D 02	3.1970D 02	2.6698D 02	2.0287D 02	1.5000D 02
577	1.0000D 02	5.0000D 01	0.0	-4.3658D 01	6.6080D 02	5.7035D 02	4.7900D 02	3.9706D 02
585	3.1846D 02	2.6254D 02	2.0000D 02	1.6000D 02	6.5869D 02	5.6828D 02	4.7704D 02	3.9541D 02
593	3.1329D 02	2.6181D 02	2.0000D 02					

APPENDIX B

INPUT AND OUTPUT FOR SEEPAGE-PIT DISSOLVED-CONSTITUENT TRANSPORT

INPUT

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```
CP.      ... 1.  TITLE.  FORMAT (I5,9A8)*  ...

 1273  SEEPAGE-PIT DISSOLVED-CONSTITUENT TRANSPORT


CP.      ... 2.  BASIC INTEGER PARAMETERS.  FORMAT (16I5)  ...

  595  528    1    0  250    7    0   30    1    1    1


CP.      ... 3.  BASIC REAL PARAMETERS.  FORMAT (8F10.0)  ...

300.      .3        5256000.  630720000. 1.


CP.      ... 4.  PRINTER OUTPUT CONTROL.  FORMAT (80I1)  ...

511                 1                   1         2         1
1                   2                   1                   1         2
1                   1                   2                   1
1         2         1                   1                   2


CP.      ... 5.  MATERIAL PROPERTIES.  FORMAT (8F10.0)  ...

100.      1.75      2130.     4000.     0.        .3        0.        0.
0.


CP.      ... 8.  NODAL-POINT AND ELEMENT DEFINITIONS FROM
                 AUXILIARY STORAGE.  ...


CP.      ... 10.  INPUT FOR INITIAL CONDITIONS.  FORMAT (I5,5X,F10.0)   ...

    1     0.
  595     0.


CP.      ... 11.  DIRICHLET CONCENTRATION-TYPE BOUNDARY
                  CONDITIONS.  FORMAT (2I5,2F10.0)  ...

  152    0 1.
  164    C 1.
  208    8 1.


CP.      ... 13.  SEEPAGE SURFACE ELEMENTS.  FORMAT (16I5)   ...

  185  208  220    0
  515  568  580    1
  515  579  580    0
  514  578  579    0
  513  577  578    0
  512  576  577    0
  522  576  588    0
  522  587  588    0
  528  587  595    0


*  COMMENT CARDS ARE TO BE DELETED  FROM DATA SET.  THEY ARE INCLUDED  HERE AS A
   CROSS REFERENCE TO APPENDIX C.
```

OUTPUT

```
PROBLEM 1273..   SEEPAGE-PIT DISSOLVED-CONSTITUENT TRANSPORT

INPUT TABLE 1.. BASIC PARAMETERS
     NUMBER OF NODAL POINTS. . . . . . . . . .  595
     NUMBER OF ELEMENTS. . . . . . . . . . . .  528
     NUMBER OF DIFFERENT MATERIALS . . . . . .    1
     NUMBER OF CORRECTION MATERIALS. . . . . .    0
     NUMBER OF TIME INCREMENTS . . . . . . . .  250
     NUMBER OF BOUNDARY CONDITIONS . . . . . .    7
     NUMBER OF SURFACE TERMS . . . . . . . . .    0
     NUMBER OF SEEPAGE SURFACE TERMS . . . . .   38
     VELOCITY INPUT CONTROL. . . . . . . . . .    1
     AUXILIARY STORAGE CONTROL . . . . . . . .    1
     STEADY-STATE CONTROL. . . . . . . . . . .    1
     TIME INCREMENT. . . . . . . . . . . . .300.000000
     MULTIPLIER FOR INCREASING DELT. . . . .  0.300000
     MAXIMUM VALUE OF DELT . . . . . . . . .0.5256D 07
     MAXIMUM VALUE OF TIME . . . . . . . . .0.6307D 09
     TIME-INTEGRATION PARAMETER. . . . . . .  1.000000

     OUTPUT CONTROL
         51100000000000000000100000000000000000000010000000000200000000010000000000000000000001000000000000000000002
         000000000000000000001000000000000000000001000000000200000000010000000000000000000001000000000000000000020
         0000000000000000000100000000000000000000010000000002


INPUT TABLE 2.. MATERIAL PROPERTIES
MAT. NO.     RD          RHOB          AL           AT        LAMBDA       POR        ALP         AM         TAU
     1   0.1000D 03  0.1750D 01  0.2130D 04  0.4270D 03  0.0         0.3000D 00  0.0         0.0         0.0
```

INPUT TABLE 3.. NODAL POINT DATA

NODE	X	Z
1	0.0	0.0
2	0.0	0.5000D 03
3	0.0	0.1000D 04
4	0.0	0.1500D 04
5	0.0	0.2000D 04
6	0.0	0.2200D 04
7	0.0	0.2400D 04
8	0.0	0.2600D 04
9	0.0	0.2750D 04
10	0.0	0.2900D 04
11	0.0	0.2950D 04
12	0.0	0.3000D 04
13	0.5000D 03	0.0
14	0.5000D 03	0.5000D 03
15	0.5000D 03	0.1000D 04
16	0.5000D 03	0.1500D 04
17	0.5000D 03	0.2000D 04
18	0.5000D 03	0.2200D 04
19	0.5000D 03	0.2400D 04
20	0.5000D 03	0.2600D 04
21	0.5000D 03	0.2750D 04
22	0.5000D 03	0.2900D 04
23	0.5000D 03	0.2950D 04
24	0.5000D 03	0.3000D 04
25	0.1000D 04	0.0
26	0.1000D 04	0.5000D 03
27	0.1000D 04	0.1000D 04
28	0.1000D 04	0.1500D 04
29	0.1000D 04	0.2000D 04
30	0.1000D 04	0.2200D 04
31	0.1000D 04	0.2400D 04
32	0.1000D 04	0.2600D 04
33	0.1000D 04	0.2750D 04
34	0.1000D 04	0.2900D 04
35	0.1000D 04	0.2950D 04
36	0.1000D 04	0.3000D 04
37	0.1500D 04	0.0
38	0.1500D 04	0.5000D 03
39	0.1500D 04	0.1000D 04
40	0.1500D 04	0.1500D 04
41	0.1500D 04	0.2000D 04
42	0.1500D 04	0.2200D 04
43	0.1500D 04	0.2400D 04
44	0.1500D 04	0.2600D 04
45	0.1500D 04	0.2750D 04
46	0.1500D 04	0.2900D 04
47	0.1500D 04	0.2950D 04
48	0.1500D 04	0.3000D 04
49	0.2000D 04	0.0
50	0.2000D 04	0.5000D 03
51	0.2000D 04	0.1000D 04
52	0.2000D 04	0.1500D 04
53	0.2000D 04	0.2000D 04
54	0.2000D 04	0.2200D 04
55	0.2000D 04	0.2400D 04
56	0.2000D 04	0.2600D 04
57	0.2000D 04	0.2750D 04
58	0.2000D 04	0.2900D 04
59	0.2000D 04	0.2950D 04
60	0.2000D 04	0.3000D 04
61	0.2500D 04	0.0
62	0.2500D 04	0.5000D 03
63	0.2500D 04	0.1000D 04
64	0.2500D 04	0.1500D 04
65	0.2500D 04	0.2000D 04
66	0.2500D 04	0.2200D 04
67	0.2500D 04	0.2400D 04

68	0.2500D 04	0.2600D 04
69	0.2500D 04	0.2750D 04
70	0.2500D 04	0.2900D 04
71	0.2500D 04	0.2950D 04
72	0.2500D 04	0.3000D 04
73	0.3000D 04	0.0
74	0.3000D 04	0.5000D 03
75	0.3000D 04	0.1000D 04
76	0.3000D 04	0.1500D 04
77	0.3000D 04	0.2000D 04
78	0.3000D 04	0.2200D 04
79	0.3000D 04	0.2400D 04
80	0.3000D 04	0.2600D 04
81	0.3000D 04	0.2750D 04
82	0.3000D 04	0.2900D 04
83	0.3000D 04	0.2950D 04
84	0.3000D 04	0.3000D 04
85	0.3500D 04	0.0
86	0.3500D 04	0.5000D 03
87	0.3500D 04	0.1000D 04
88	0.3500D 04	0.1500D 04
89	0.3500D 04	0.2000D 04
90	0.3500D 04	0.2200D 04
91	0.3500D 04	0.2400D 04
92	0.3500D 04	0.2600D 04
93	0.3500D 04	0.2750D 04
94	0.3500D 04	0.2900D 04
95	0.3500D 04	0.2950D 04
96	0.3500D 04	0.3000D 04
97	0.4000D 04	0.0
98	0.4000D 04	0.5000D 03
99	0.4000D 04	0.1000D 04
100	0.4000D 04	0.1500D 04
101	0.4000D 04	0.2000D 04
102	0.4000D 04	0.2200D 04
103	0.4000D 04	0.2400D 04
104	0.4000D 04	0.2600D 04
105	0.4000D 04	0.2750D 04
106	0.4000D 04	0.2900D 04
107	0.4000D 04	0.2950D 04
108	0.4000D 04	0.3000D 04
109	0.4500D 04	0.0
110	0.4500D 04	0.5000D 03
111	0.4500D 04	0.1000D 04
112	0.4500D 04	0.1500D 04
113	0.4500D 04	0.2000D 04
114	0.4500D 04	0.2200D 04
115	0.4500D 04	0.2400D 04
116	0.4500D 04	0.2600D 04
117	0.4500D 04	0.2750D 04
118	0.4500D 04	0.2900D 04
119	0.4500D 04	0.2950D 04
120	0.4500D 04	0.3000D 04
121	0.5000D 04	0.0
122	0.5000D 04	0.5000D 03
123	0.5000D 04	0.1000D 04
124	0.5000D 04	0.1500D 04
125	0.5000D 04	0.2000D 04
126	0.5000D 04	0.2200D 04
127	0.5000D 04	0.2400D 04
128	0.5000D 04	0.2600D 04
129	0.5000D 04	0.2750D 04
130	0.5000D 04	0.2900D 04
131	0.5000D 04	0.2950D 04
132	0.5000D 04	0.3000D 04
133	0.5500D 04	0.0
134	0.5500D 04	0.5000D 03
135	0.5500D 04	0.1000D 04
136	0.5500D 04	0.1500D 04

137	0.5500D 04	0.2000D 04
138	0.5500D 04	0.2200D 04
139	0.5500D 04	0.2400D 04
140	0.5500D 04	0.2600D 04
141	0.5500D 04	0.2750D 04
142	0.5500D 04	0.2900D 04
143	0.5500D 04	0.2950D 04
144	0.5500D 04	0.3000D 04
145	0.6000D 04	0.0
146	0.6000D 04	0.5000D 03
147	0.6000D 04	0.1000D 04
148	0.6000D 04	0.1500D 04
149	0.6000D 04	0.2000D 04
150	0.6000D 04	0.2200D 04
151	0.6000D 04	0.2400D 04
152	0.6000D 04	0.2600D 04
153	0.6000D 04	0.2750D 04
154	0.6000D 04	0.2900D 04
155	0.6000D 04	0.2950D 04
156	0.6000D 04	0.3000D 04
157	0.6500D 04	0.0
158	0.6500D 04	0.5000D 03
159	0.6500D 04	0.1000D 04
160	0.6500D 04	0.1500D 04
161	0.6500D 04	0.2000D 04
162	0.6500D 04	0.2200D 04
163	0.6500D 04	0.2400D 04
164	0.6500D 04	0.2600D 04
165	0.7000D 04	0.0
166	0.7000D 04	0.5000D 03
167	0.7000D 04	0.1000D 04
168	0.7000D 04	0.1500D 04
169	0.7000D 04	0.2000D 04
170	0.7000D 04	0.2200D 04
171	0.7000D 04	0.2400D 04
172	0.7000D 04	0.2600D 04
173	0.7500D 04	0.0
174	0.7500D 04	0.5000D 03
175	0.7500D 04	0.1000D 04
176	0.7500D 04	0.1500D 04
177	0.7500D 04	0.2000D 04
178	0.7500D 04	0.2200D 04
179	0.7500D 04	0.2400D 04
180	0.7500D 04	0.2600D 04
181	0.8000D 04	0.0
182	0.8000D 04	0.5000D 03
183	0.8000D 04	0.1000D 04
184	0.8000D 04	0.1500D 04
185	0.8000D 04	0.2000D 04
186	0.8000D 04	0.2200D 04
187	0.8000D 04	0.2400D 04
188	0.8000D 04	0.2600D 04
189	[illegible] 04	0.0
190	[illegible] 04	0.5000D 03
191	[illegible] 04	0.1000D 04
192	[illegible] 04	0.1500D 04
193	0.8500D 04	0.2000D 04
194	0.8500D 04	0.2200D 04
195	0.8500D 04	0.2400D 04
196	0.8500D 04	0.2600D 04
197	0.9000D 04	0.0
198	0.9000D 04	0.5000D 03
199	0.9000D 04	0.1000D 04
200	0.9000D 04	0.1500D 04
201	0.9000D 04	0.2000D 04
202	0.9000D 04	0.2200D 04
203	0.9000D 04	0.2400D 04
204	0.9000D 04	0.2600D 04
205	0.9000D 04	0.2750D 04

206	0.9000D 04	0.2900D 04
207	0.9000D 04	0.2950D 04
208	0.9000D 04	0.3000D 04
209	0.9500D 04	0.0
210	0.9500D 04	0.5000D 03
211	0.9500D 04	0.1600D 04
212	0.9500D 04	0.1500D 04
213	0.9500D 04	0.2000D 04
214	0.9500D 04	0.2200D 04
215	0.9500D 04	0.2400D 04
216	0.9500D 04	0.2600D 04
217	0.9500D 04	0.2750D 04
218	0.9500D 04	0.2900D 04
219	0.9500D 04	0.2950D 04
220	0.9500D 04	0.3000D 04
221	0.1000D 05	0.0
222	0.1000D 05	0.4800D 03
223	0.1000D 05	0.9900D 03
224	0.1000D 05	0.1500D 04
225	0.1000D 05	0.1980D 04
226	0.1000D 05	0.2180D 04
227	0.1000D 05	0.2380D 04
228	0.1000D 05	0.2560D 04
229	0.1000D 05	0.2740D 04
230	0.1000D 05	0.2890D 04
231	0.1000D 05	0.2940D 04
232	0.1000D 05	0.2990D 04
233	0.1050D 05	0.0
234	0.1050D 05	0.4600D 03
235	0.1050D 05	0.9600D 03
236	0.1050D 05	0.1460D 04
237	0.1050D 05	0.1720D 04
238	0.1050D 05	0.2130D 04
239	0.1050D 05	0.2320D 04
240	0.1050D 05	0.2520D 04
241	0.1050D 05	0.2700D 04
242	0.1050D 05	0.2850D 04
243	0.1050D 05	0.2900D 04
244	0.1050D 05	0.2950D 04
245	0.1100D 05	0.0
246	0.1100D 05	0.4500D 03
247	0.1100D 05	0.9100D 03
248	0.1100D 05	0.1380D 04
249	0.1100D 05	0.1810D 04
250	0.1100D 05	0.2020D 04
251	0.1100D 05	0.2200D 04
252	0.1100D 05	0.2390D 04
253	0.1100D 05	0.2570D 04
254	0.1100D 05	0.2750D 04
255	0.1100D 05	0.2800D 04
256	0.1100D 05	0.2850D 04
257	0.1150D 05	0.0
258	0.1150D 05	0.4000D 03
259	0.1150D 05	0.8500D 03
260	0.1150D 05	0.1250D 04
261	0.1150D 05	0.1660D 04
262	0.1150D 05	0.1860D 04
263	0.1150D 05	0.2060D 04
264	0.1150D 05	0.2250D 04
265	0.1150D 05	0.2440D 04
266	0.1150D 05	0.2590D 04
267	0.1150D 05	0.2640D 04
268	0.1150D 05	0.2690D 04
269	0.1200D 05	0.0
270	0.1200D 05	0.3600D 03
271	0.1200D 05	0.7500D 03
272	0.1200D 05	0.1100D 04
273	0.1200D 05	0.1500D 04
274	0.1200D 05	0.1700D 04

275	0.1200D 05	0.1860D 04
276	0.1200D 05	0.2020D 04
277	0.1200D 05	0.2200D 04
278	0.1200D 05	0.2370D 04
279	0.1200D 05	0.2420D 04
280	0.1200D 05	0.2470D 04
281	0.1250D 05	0.0
282	0.1250D 05	0.3000D 03
283	0.1250D 05	0.6500D 03
284	0.1250D 05	0.9500D 03
285	0.1250D 05	0.1330D 04
286	0.1250D 05	0.1490D 04
287	0.1250D 05	0.1640D 04
288	0.1250D 05	0.1760D 04
289	0.1250D 05	0.1800D 04
290	0.1250D 05	0.2000D 04
291	0.1250D 05	0.2050D 04
292	0.1250D 05	0.2100D 04
293	0.1300D 05	0.0
294	0.1300D 05	0.2700D 03
295	0.1300D 05	0.5700D 03
296	0.1300D 05	0.8500D 03
297	0.1300D 05	0.1140D 04
298	0.1300D 05	0.1210D 04
299	0.1300D 05	0.1300D 04
300	0.1300D 05	0.1400D 04
301	0.1300D 05	0.1510D 04
302	0.1300D 05	0.1620D 04
303	0.1300D 05	0.1670D 04
304	0.1300D 05	0.1720D 04
305	0.1325D 05	0.0
306	0.1325D 05	0.2500D 03
307	0.1325D 05	0.5300D 03
308	0.1325D 05	0.7700D 03
309	0.1325D 05	0.1030D 04
310	0.1325D 05	0.1120D 04
311	0.1325D 05	0.1200D 04
312	0.1325D 05	0.1300D 04
313	0.1325D 05	0.1370D 04
314	0.1325D 05	0.1450D 04
315	0.1325D 05	0.1500D 04
316	0.1325D 05	0.1550D 04
317	0.1350D 05	0.0
318	0.1350D 05	0.2200D 03
319	0.1350D 05	0.4600D 03
320	0.1350D 05	0.7000D 03
321	0.1350D 05	0.9200D 03
322	0.1350D 05	0.1010D 04
323	0.1350D 05	0.1100D 04
324	0.1350D 05	0.1180D 04
325	0.1350D 05	0.1250D 04
326	0.1350D 05	0.1300D 04
327	0.1350D 05	0.1350D 04
328	0.1350D 05	0.1400D 04
329	0.1375D 05	0.0
330	0.1375D 05	0.2000D 03
331	0.1375D 05	0.4400D 03
332	0.1375D 05	0.6500D 03
333	0.1375D 05	0.8300D 03
334	0.1375D 05	0.9100D 03
335	0.1375D 05	0.1000D 04
336	0.1375D 05	0.1080D 04
337	0.1375D 05	0.1140D 04
338	0.1375D 05	0.1200D 04
339	0.1375D 05	0.1250D 04
340	0.1375D 05	0.1300D 04
341	0.1400D 05	0.0
342	0.1400D 05	0.1900D 03
343	0.1400D 05	0.4000D 03

344	0.1400D 05	0.5900D 03
345	0.1400D 05	0.7500D 03
346	0.1400D 05	0.8300D 03
347	0.1400D 05	0.9000D 03
348	0.1400D 05	0.9800D 03
349	0.1400D 05	0.1050D 04
350	0.1400D 05	0.1120D 04
351	0.1400D 05	0.1170D 04
352	0.1400D 05	0.1220D 04
353	0.1425D 05	0.0
354	0.1425D 05	0.1700D 03
355	0.1425D 05	0.3500D 03
356	0.1425D 05	0.5400D 03
357	0.1425D 05	0.6700D 03
358	0.1425D 05	0.7500D 03
359	0.1425D 05	0.8200D 03
360	0.1425D 05	0.9000D 03
361	0.1425D 05	0.9600D 03
362	0.1425D 05	0.1050D 04
363	0.1425D 05	0.1100D 04
364	0.1425D 05	0.1150D 04
365	0.1450D 05	0.0
366	0.1450D 05	0.1500D 03
367	0.1450D 05	0.3200D 03
368	0.1450D 05	0.4700D 03
369	0.1450D 05	0.6100D 03
370	0.1450D 05	0.6900D 03
371	0.1450D 05	0.7600D 03
372	0.1450D 05	0.8300D 03
373	0.1450D 05	0.9000D 03
374	0.1450D 05	0.9800D 03
375	0.1450D 05	0.1030D 04
376	0.1450D 05	0.1080D 04
377	0.1475D 05	0.0
378	0.1475D 05	0.1400D 03
379	0.1475D 05	0.2700D 03
380	0.1475D 05	0.4300D 03
381	0.1475D 05	0.5600D 03
382	0.1475D 05	0.6300D 03
383	0.1475D 05	0.7000D 03
384	0.1475D 05	0.7600D 03
385	0.1475D 05	0.8400D 03
386	0.1475D 05	[illegible] 03
387	0.1475D 05	0.9600D 03
388	0.1475D 05	0.1010D 04
389	0.1500D 05	0.0
390	0.1500D 05	0.1200D 03
391	0.1500D 05	0.2500D 03
392	0.1500D 05	0.3900D 03
393	0.1500D 05	0.5200D 03
394	0.1500D 05	0.5900D 03
395	0.1500D 05	0.6500D 03
396	0.1500D 05	0.7200D 03
397	0.1500D 05	0.8000D 03
398	0.1500D 05	0.8600D 03
399	0.1500D 05	0.9100D 03
400	0.1500D 05	0.9600D 03
401	0.1525D 05	0.0
402	0.1525D 05	0.1100D 03
403	0.1525D 05	0.2300D 03
404	0.1525D 05	0.3700D 03
405	0.1525D 05	0.4800D 03
406	0.1525D 05	0.5500D 03
407	0.1525D 05	0.6100D 03
408	0.1525D 05	0.6800D 03
409	0.1525D 05	0.7500D 03
410	0.1525D 05	0.8200D 03
411	0.1525D 05	0.8700D 03
412	0.1525D 05	0.9200D 03

413	0.15500D 05	0.0
414	0.15500D 05	0.10000 03
415	0.15500D 05	0.21000 03
416	0.15500D 05	0.31000 03
417	0.15500D 05	0.44000 03
418	0.15500D 05	0.50000 03
419	0.15500D 05	0.56000 03
420	0.15500D 05	0.64000 03
421	0.15500D 05	0.71000 03
422	0.15500D 05	0.79000 03
423	0.15500D 05	0.84000 03
424	0.15500D 05	0.89000 03
425	0.15750D 05	0.0
426	0.15750D 05	0.10000 03
427	0.15750D 05	0.20000 03
428	0.15750D 05	0.30000 03
429	0.15750D 05	0.40000 03
430	0.15750D 05	0.47000 03
431	0.15750D 05	0.54000 03
432	0.15750D 05	0.61000 03
433	0.15750D 05	0.69000 03
434	0.15750D 05	0.75000 03
435	0.15750D 05	0.80000 03
436	0.15750D 05	0.85000 03
437	0.16000D 05	0.0
438	0.16000D 05	0.10000 03
439	0.16000D 05	0.20000 03
440	0.16000D 05	0.29000 03
441	0.16000D 05	0.39000 03
442	0.16000D 05	0.45000 03
443	0.16000D 05	0.51000 03
444	0.16000D 05	0.59000 03
445	0.16000D 05	0.66000 03
446	0.16000D 05	0.73000 03
447	0.16000D 05	0.78000 03
448	0.16000D 05	0.83000 03
449	0.16250D 05	0.0
450	0.16250D 05	0.90000 02
451	0.16250D 05	0.19000 03
452	0.16250D 05	0.28000 03
453	0.16250D 05	0.36000 03
454	0.16250D 05	0.44000 03
455	0.16250D 05	0.49000 03
456	0.16250D 05	0.56000 03
457	0.16250D 05	0.61000 03
458	0.16250D 05	0.70000 03
459	0.16250D 05	0.75000 03
460	0.16250D 05	0.80000 03
461	0.16500D 05	0.0
462	0.16500D 05	0.90000 02
463	0.16500D 05	0.18000 03
464	0.16500D 05	0.27000 03
465	0.16500D 05	0.35000 03
466	0.16500D 05	0.41000 03
467	0.16500D 05	0.48000 03
468	0.16500D 05	0.54000 03
469	0.16500D 05	0.60000 03
470	0.16500D 05	0.66000 03
471	0.16500D 05	0.71000 03
472	0.16500D 05	0.76000 03
473	0.16600D 05	0.0
474	0.16600D 05	0.90000 02
475	0.16600D 05	0.18000 03
476	0.16600D 05	0.27000 03
477	0.16600D 05	0.35000 03
478	0.16600D 05	0.40000 03
479	0.16600D 05	0.46000 03
480	0.16600D 05	0.52000 03
481	0.16600D 05	0.59000 03

482	0.16400D 05	0.65000D 01
483	0.16400D 05	0.70000D 01
484	0.16400D 05	0.75000D 01
485	0.16700D 05	0.0
486	0.16700D 05	0.90000D 02
487	0.16700D 05	0.10000D 03
488	0.16700D 05	0.26000D 03
489	0.16700D 05	0.34000D 03
490	0.16700D 05	0.40000D 03
491	0.16700D 05	0.46000D 03
492	0.16700D 05	0.51000D 03
493	0.16700D 05	0.57000D 03
494	0.16700D 05	0.64000D 03
495	0.16700D 05	0.69000D 03
496	0.16700D 05	0.76000D 03
497	0.16800D 05	0.0
498	0.16800D 05	0.90000D 02
499	0.16800D 05	0.10000D 03
500	0.16800D 05	0.26000D 03
501	0.16800D 05	0.34000D 03
502	0.16800D 05	0.40000D 03
503	0.16800D 05	0.45000D 03
504	0.16800D 05	0.50000D 03
505	0.16800D 05	0.56000D 03
506	0.16800D 05	0.62000D 03
507	0.16800D 05	0.67000D 03
508	0.16800D 05	0.72000D 03
509	0.16900D 05	0.0
510	0.16900D 05	0.90000D 02
511	0.16900D 05	0.10000D 03
512	0.16900D 05	0.26000D 03
513	0.16900D 05	0.34000D 03
514	0.16900D 05	0.39000D 03
515	0.16900D 05	0.45000D 03
516	0.16900D 05	0.50000D 03
517	0.16900D 05	0.55000D 03
518	0.16900D 05	0.61000D 03
519	0.16900D 05	0.66000D 03
520	0.16900D 05	0.71000D 03
521	0.17000D 05	0.0
522	0.17000D 05	0.90000D 02
523	0.17000D 05	0.10000D 03
524	0.17000D 05	0.26000D 03
525	0.17000D 05	0.34000D 03
526	0.17000D 05	0.39000D 03
527	0.17000D 05	0.45000D 03
528	0.17000D 05	0.50000D 03
529	0.17000D 05	0.55000D 03
530	0.17000D 05	0.60000D 03
531	0.17000D 05	0.65000D 03
532	0.17000D 05	0.70000D 03
533	0.17100D 05	0.0
534	0.17100D 05	0.90000D 02
535	0.17100D 05	0.10000D 03
536	0.17100D 05	0.26000D 03
537	0.17100D 05	0.34000D 03
538	0.17100D 05	0.39000D 03
539	0.17100D 05	0.45000D 03
540	0.17100D 05	0.50000D 03
541	0.17100D 05	0.55000D 03
542	0.17100D 05	0.60000D 03
543	0.17100D 05	0.65000D 03
544	0.17100D 05	0.70000D 03
545	0.17250D 05	0.0
546	0.17250D 05	0.90000D 02
547	0.17250D 05	0.10000D 03
548	0.17250D 05	0.26000D 03
549	0.17250D 05	0.34000D 03
550	0.17250D 05	0.39000D 03

551	0.1725D 05	0.45000D 03
552	0.1725D 05	0.50000D 03
553	0.1720D 05	0.55000D 03
554	0.1720D 05	0.60000D 03
555	0.1720D 05	0.65000D 03
556	0.1720D 05	0.70000D 03
557	0.1740D 05	0.0
558	0.1740D 05	0.90000D 02
559	0.1740D 05	0.19000D 03
560	0.1740D 05	0.25000D 03
561	0.1740D 05	0.34000D 03
562	0.1740D 05	0.39000D 03
563	0.1740D 05	0.45000D 03
564	0.1740D 05	0.50000D 03
565	0.1735D 05	0.55000D 03
566	0.1730D 05	0.60000D 03
567	0.1736D 05	0.65000D 03
568	0.1730D 05	0.70000D 03
569	0.1760D 05	0.0
570	0.1760D 05	0.90000D 02
571	0.1740D 05	0.18000D 03
572	0.1740D 05	0.24000D 03
573	0.1750D 05	0.34000D 03
574	0.1750D 05	0.39000D 03
575	0.1760D 05	0.45000D 03
576	0.1755D 05	0.53000D 03
577	0.1750D 05	0.59000D 03
578	0.1745D 05	0.56000D 03
579	0.1740D 05	0.65000D 03
580	0.1740D 05	0.70000D 03
581	0.1790D 05	0.0
582	0.1790D 05	0.90000D 02
583	0.1780D 05	0.18000D 03
584	0.1780D 05	0.24000D 03
585	0.1780D 05	0.34000D 03
586	0.1780D 05	0.39000D 03
587	0.1780D 05	0.45000D 03
588	0.1765D 05	0.49000D 03
589	0.1800D 05	0.0
590	0.1800D 05	0.90000D 02
591	0.1800D 05	0.15000D 03
592	0.1890D 05	0.24000D 03
593	0.1800D 05	0.34000D 03
594	0.1850D 05	0.39000D 03
595	0.1800D 05	0.45000D 03

INPUT TABLE 4... ELEMENT DATA

ELEMENT	GLOBAL INDICES OF ELEMENT NODES 1	2	3	4	MATERIAL	NODE DIFF.
1	1	13	14	2	1	13
2	2	14	15	3	1	13
3	3	15	16	4	1	13
4	4	16	17	5	1	13
5	5	17	18	6	1	13
6	6	18	19	7	1	13
7	7	19	20	8	1	13
8	8	20	21	9	1	13
9	9	21	22	10	1	13
10	10	22	23	11	1	13
11	11	23	24	12	1	13
12	13	25	26	14	1	13
13	14	26	27	15	1	13
14	15	27	28	16	1	13
15	16	28	29	17	1	13
16	17	29	30	18	1	13
17	18	30	31	19	1	13
18	19	31	32	20	1	13
19	20	32	33	21	1	13
20	21	33	34	22	1	13
21	22	34	35	23	1	13
22	23	35	36	24	1	13
23	25	37	38	26	1	13
24	26	38	39	27	1	13
25	27	39	40	28	1	13
26	28	40	41	29	1	13
27	29	41	42	30	1	13
28	30	42	43	31	1	13
29	31	43	44	32	1	13
30	32	44	45	33	1	13
31	33	45	46	34	1	13
32	34	46	47	35	1	13
33	35	47	48	36	1	13
34	37	49	50	38	1	13
35	38	50	51	39	1	13
36	39	51	52	40	1	13
37	40	52	53	41	1	13
38	41	53	54	42	1	13
39	42	54	55	43	1	13
40	43	55	56	44	1	13
41	44	56	57	45	1	13
42	45	57	58	46	1	13
43	46	58	59	47	1	13
44	47	59	60	48	1	13
45	49	61	62	50	1	13
46	50	62	63	51	1	13
47	51	63	64	52	1	13
48	52	64	65	53	1	13
49	53	65	66	54	1	13
50	54	66	67	55	1	13
51	55	67	68	56	1	13
52	56	68	69	57	1	13
53	57	69	70	58	1	13
54	58	70	71	59	1	13
55	59	71	72	60	1	13
56	61	73	74	62	1	13
57	62	74	75	63	1	13
58	63	75	76	64	1	13
59	64	76	77	65	1	13
60	65	77	78	66	1	13
61	66	78	79	67	1	13
62	67	79	80	68	1	13
63	68	80	81	69	1	13
64	69	81	82	70	1	13
65	70	82	83	71	1	13
66	71	83	84	72	1	13

67	73	85	86	74	1	13
68	74	86	87	75	1	13
69	75	87	88	76	1	13
70	76	88	89	77	1	13
71	77	89	90	78	1	13
72	78	90	91	79	1	13
73	79	91	92	80	1	13
74	80	92	93	81	1	13
75	81	93	94	82	1	13
76	82	94	95	83	1	13
77	83	95	96	84	1	13
78	85	97	98	86	1	13
79	86	98	99	87	1	13
80	87	99	100	88	1	13
81	88	100	101	89	1	13
82	89	101	102	90	1	13
83	90	102	103	91	1	13
84	91	103	104	92	1	13
85	92	104	105	93	1	13
86	93	105	106	94	1	13
87	94	106	107	95	1	13
88	95	107	108	96	1	13
89	97	109	110	98	1	13
90	98	110	111	99	1	13
91	99	111	112	100	1	13
92	100	112	113	101	1	13
93	101	113	114	102	1	13
94	102	114	115	103	1	13
95	103	115	116	104	1	13
96	104	116	117	105	1	13
97	105	117	118	106	1	13
98	106	118	119	107	1	13
99	107	119	120	108	1	13
100	109	121	122	110	1	13
101	110	122	123	111	1	13
102	111	123	124	112	1	13
103	112	124	125	113	1	13
104	113	125	126	114	1	13
105	114	126	127	115	1	13
106	115	127	128	116	1	13
107	116	128	129	117	1	13
108	117	129	130	118	1	13
109	118	130	131	119	1	13
110	119	131	132	120	1	13
111	121	133	134	122	1	13
112	122	134	135	123	1	13
113	123	135	136	124	1	13
114	124	136	137	125	1	13
115	125	137	138	126	1	13
116	126	138	139	127	1	13
117	127	139	140	128	1	13
118	128	140	141	129	1	13
119	129	141	142	130	1	13
120	130	142	143	131	1	13
121	131	143	144	132	1	13
122	133	145	146	134	1	13
123	134	146	147	135	1	13
124	135	147	148	136	1	13
125	136	148	149	137	1	13
126	137	149	150	138	1	13
127	138	150	151	139	1	13
128	139	151	152	140	1	13
129	140	152	153	141	1	13
130	141	153	154	142	1	13
131	142	154	155	143	1	13
132	143	155	156	144	1	13
133	145	157	158	146	1	13
134	146	158	159	147	1	13
135	147	159	160	148	1	13

136	148	160	161	149	1	13
137	149	161	162	150	1	13
138	150	162	163	151	1	13
139	151	163	164	152	1	13
140	157	165	166	158	1	9
141	158	166	167	159	1	9
142	159	167	168	160	1	9
143	160	168	169	161	1	9
144	161	169	170	162	1	9
145	162	170	171	163	1	9
146	163	171	172	164	1	9
147	165	173	174	166	1	9
148	166	174	175	167	1	9
149	167	175	176	168	1	9
150	168	176	177	169	1	9
151	169	177	178	170	1	9
152	170	178	179	171	1	9
153	171	179	180	172	1	9
154	173	181	182	174	1	9
155	174	182	183	175	1	9
156	175	183	184	176	1	9
157	176	184	185	177	1	9
158	177	185	186	178	1	9
159	178	186	187	179	1	9
160	179	187	188	180	1	9
161	181	189	190	182	1	9
162	182	190	191	183	1	9
163	183	191	192	184	1	9
164	184	192	193	185	1	9
165	185	193	194	186	1	9
166	186	194	195	187	1	9
167	187	195	196	188	1	9
168	189	197	198	190	1	9
169	190	198	199	191	1	9
170	191	199	200	192	1	9
171	192	200	201	193	1	9
172	193	201	202	194	1	9
173	194	202	203	195	1	9
174	195	203	204	196	1	9
175	197	209	210	198	1	13
176	198	210	211	199	1	13
177	199	211	212	200	1	13
178	200	212	213	201	1	13
179	201	213	214	202	1	13
180	202	214	215	203	1	13
181	203	215	216	204	1	13
182	204	216	217	205	1	13
183	205	217	218	206	1	13
184	206	218	219	207	1	13
185	207	219	220	208	1	13
186	209	221	222	210	1	13
187	210	222	223	211	1	13
188	211	223	224	212	1	13
189	212	224	225	213	1	13
190	213	225	226	214	1	13
191	214	226	227	215	1	13
192	215	227	228	216	1	13
193	216	228	229	217	1	13
194	217	229	230	218	1	13
195	218	230	231	219	1	13
196	219	231	232	220	1	13
197	221	233	234	222	1	13
198	222	234	235	223	1	13
199	223	235	236	224	1	13
200	224	236	237	225	1	13
201	225	237	238	226	1	13
202	226	238	239	227	1	13
203	227	239	240	228	1	13
204	228	240	241	229	1	13

205	229	241	242	230	1	13
206	230	242	243	231	1	13
207	231	243	244	232	1	13
208	233	245	246	234	1	13
209	234	246	247	235	1	13
210	235	247	248	236	1	13
211	236	248	249	237	1	13
212	237	249	250	238	1	13
213	238	250	251	239	1	13
214	239	251	252	240	1	13
215	240	252	253	241	1	13
216	241	253	254	242	1	13
217	242	254	255	243	1	13
218	243	255	256	244	1	13
219	245	257	258	246	1	13
220	246	258	259	247	1	13
221	247	259	260	248	1	13
222	248	260	261	249	1	13
223	249	261	262	250	1	13
224	250	262	263	251	1	13
225	251	263	264	252	1	13
226	252	264	265	253	1	13
227	253	265	266	254	1	13
228	254	266	267	255	1	13
229	255	267	268	256	1	13
230	257	269	270	258	1	13
231	258	270	271	259	1	13
232	259	271	272	260	1	13
233	260	272	273	261	1	13
234	261	273	274	262	1	13
235	262	274	275	263	1	13
236	263	275	276	264	1	13
237	264	276	277	265	1	13
238	265	277	278	266	1	13
239	266	278	279	267	1	13
240	267	279	280	268	1	13
241	269	281	282	270	1	13
242	270	282	283	271	1	13
243	271	283	284	272	1	13
244	272	284	285	273	1	13
245	273	285	286	274	1	13
246	274	286	287	275	1	13
247	275	287	288	276	1	13
248	276	288	289	277	1	13
249	277	289	290	278	1	13
250	278	290	291	279	1	13
251	279	291	292	280	1	13
252	281	293	294	282	1	13
253	282	294	295	283	1	13
254	283	295	296	284	1	13
255	284	296	297	285	1	13
256	285	297	298	286	1	13
257	286	298	299	287	1	13
258	287	299	300	288	1	13
259	288	300	301	289	1	13
260	289	301	302	290	1	13
261	290	302	303	291	1	13
262	291	303	304	292	1	13
263	293	305	306	294	1	13
264	294	306	307	295	1	13
265	295	307	308	296	1	13
266	296	308	309	297	1	13
267	297	309	310	298	1	13
268	298	310	311	299	1	13
269	299	311	312	300	1	13
270	300	312	313	301	1	13
271	301	313	314	302	1	13
272	302	314	315	303	1	13
273	303	315	316	304	1	13

274	305	317	318	306	1	13
275	306	318	319	307	1	13
276	307	319	320	308	1	13
277	308	320	321	309	1	13
278	309	321	322	310	1	13
279	310	322	323	311	1	13
280	311	323	324	312	1	13
281	312	324	325	313	1	13
282	313	325	326	314	1	13
283	314	326	327	315	1	13
284	315	327	328	316	1	13
285	317	329	330	318	1	13
286	318	330	331	319	1	13
287	319	331	332	320	1	13
288	320	332	333	321	1	13
289	321	333	334	322	1	13
290	322	334	335	323	1	13
291	323	335	336	324	1	13
292	324	336	337	325	1	13
293	325	337	338	326	1	13
294	326	338	339	327	1	13
295	327	339	340	328	1	13
296	329	341	342	330	1	13
297	330	342	343	331	1	13
298	331	343	344	332	1	13
299	332	344	345	333	1	13
300	333	345	346	334	1	13
301	334	346	347	335	1	13
302	335	347	348	336	1	13
303	336	348	349	337	1	13
304	337	349	350	338	1	13
305	338	350	351	339	1	13
306	339	351	352	340	1	13
307	341	353	354	342	1	13
308	342	354	355	343	1	13
309	343	355	356	344	1	13
310	344	356	357	345	1	13
311	345	357	358	346	1	13
312	346	358	359	347	1	13
313	347	359	360	348	1	13
314	348	360	361	349	1	13
315	349	361	362	350	1	13
316	350	362	363	351	1	13
317	351	363	364	352	1	13
318	353	365	366	354	1	13
319	354	366	367	355	1	13
320	355	367	368	356	1	13
321	356	368	369	357	1	13
322	357	369	370	358	1	13
323	358	370	371	359	1	13
324	359	371	372	360	1	13
325	360	372	373	361	1	13
326	361	373	374	362	1	13
327	362	374	375	363	1	13
328	363	375	376	364	1	13
329	365	377	378	366	1	13
330	366	378	379	367	1	13
331	367	379	380	368	1	13
332	368	380	381	369	1	13
333	369	381	382	370	1	13
334	370	382	383	371	1	13
335	371	383	384	372	1	13
336	372	384	385	373	1	13
337	373	385	386	374	1	13
338	374	386	387	375	1	13
339	375	387	388	376	1	13
340	377	389	390	378	1	13
341	378	390	391	379	1	13
342	379	391	392	380	1	13

343	380	392	393	381	1	13
344	381	393	394	382	1	13
345	382	394	395	383	1	13
346	383	395	396	384	1	13
347	384	396	397	385	1	13
348	385	397	398	386	1	13
349	386	398	399	387	1	13
350	387	399	400	388	1	13
351	389	401	402	390	1	13
352	390	402	403	391	1	13
353	391	403	404	392	1	13
354	392	404	405	393	1	13
355	393	405	406	394	1	13
356	394	406	407	395	1	13
357	395	407	408	396	1	13
358	396	408	409	397	1	13
359	397	409	410	398	1	13
360	398	410	411	399	1	13
361	399	411	412	400	1	13
362	401	413	414	402	1	13
363	402	414	415	403	1	13
364	403	415	416	404	1	13
365	404	416	417	405	1	13
366	405	417	418	406	1	13
367	406	418	419	407	1	13
368	407	419	420	408	1	13
369	408	420	421	409	1	13
370	409	421	422	410	1	13
371	410	422	423	411	1	13
372	411	423	424	412	1	13
373	413	425	426	414	1	13
374	414	426	427	415	1	13
375	415	427	428	416	1	13
376	416	428	429	417	1	13
377	417	429	430	418	1	13
378	418	430	431	419	1	13
379	419	431	432	420	1	13
380	420	432	433	421	1	13
381	421	433	434	422	1	13
382	422	434	435	423	1	13
383	423	435	436	424	1	13
384	425	437	438	426	1	13
385	426	438	439	427	1	13
386	427	439	440	428	1	13
387	428	440	441	429	1	13
388	429	441	442	430	1	13
389	430	442	443	431	1	13
390	431	443	444	432	1	13
391	432	444	445	433	1	13
392	433	445	446	434	1	13
393	434	446	447	435	1	13
394	435	447	448	436	1	13
395	437	449	450	438	1	13
396	438	450	451	439	1	13
397	439	451	452	440	1	13
398	440	452	453	441	1	13
399	441	453	454	442	1	13
400	442	454	455	443	1	13
401	443	455	456	444	1	13
402	444	456	457	445	1	13
403	445	457	458	446	1	13
404	446	458	459	447	1	13
405	447	459	460	448	1	13
406	449	461	462	450	1	13
407	450	462	463	451	1	13
408	451	463	464	452	1	13
409	452	464	465	453	1	13
410	453	465	466	454	1	13
411	454	466	467	455	1	13

412	455	467	468	456	1	13
413	456	468	469	457	1	13
414	457	469	470	458	1	13
415	458	470	471	459	1	13
416	459	471	472	460	1	13
417	461	473	474	462	1	13
418	462	474	475	463	1	13
419	463	475	476	464	1	13
420	464	476	477	465	1	13
421	465	477	478	466	1	13
422	456	478	479	467	1	13
423	467	479	480	468	1	13
424	466	480	481	469	1	13
425	469	481	482	470	1	13
426	470	482	483	471	1	13
427	471	483	484	472	1	13
428	473	485	486	474	1	13
429	474	486	487	475	1	13
430	475	487	488	476	1	13
431	476	488	489	477	1	13
432	477	489	490	478	1	13
433	478	490	491	479	1	13
434	479	491	492	480	1	13
435	480	492	493	481	1	13
436	481	493	494	482	1	13
437	482	494	495	483	1	13
438	483	495	496	484	1	13
439	485	497	498	486	1	13
440	486	498	499	487	1	13
441	487	499	500	488	1	13
442	488	500	501	489	1	13
443	489	501	502	490	1	13
444	490	502	503	491	1	13
445	491	503	504	492	1	13
446	492	504	505	493	1	13
447	493	505	506	494	1	13
448	494	506	507	495	1	13
449	495	507	508	496	1	13
450	497	509	510	498	1	13
451	498	510	511	499	1	13
452	499	511	512	500	1	13
453	500	512	513	501	1	13
454	501	513	514	502	1	13
455	502	514	515	503	1	13
456	503	515	516	504	1	13
457	504	516	517	505	1	13
458	505	517	518	506	1	13
459	506	518	519	507	1	13
460	507	519	520	508	1	13
461	509	521	522	510	1	13
462	510	522	523	511	1	13
463	511	523	524	512	1	13
464	512	524	525	513	1	13
465	513	525	526	514	1	13
466	514	526	527	515	1	13
467	515	527	528	516	1	13
468	516	528	529	517	1	13
469	517	529	530	518	1	13
470	518	530	531	519	1	13
471	519	531	532	520	1	13
472	521	533	534	522	1	13
473	522	534	535	523	1	13
474	523	535	536	524	1	13
475	524	536	537	525	1	13
476	525	537	538	526	1	13
477	526	538	539	527	1	13
478	527	539	540	528	1	13
479	528	540	541	529	1	13
480	529	541	542	530	1	13

481	530	542	543	531	1	13
482	531	543	544	532	1	13
483	533	545	546	534	1	13
484	534	546	547	535	1	13
485	535	547	548	536	1	13
486	536	548	549	537	1	13
487	537	549	550	538	1	13
488	538	550	551	539	1	13
489	539	551	552	540	1	13
490	540	552	553	541	1	13
491	541	553	554	542	1	13
492	542	554	555	543	1	13
493	543	555	556	544	1	13
494	545	557	558	546	1	13
495	546	558	559	547	1	13
496	547	559	560	548	1	13
497	548	560	561	549	1	13
498	549	561	562	550	1	13
499	550	562	563	551	1	13
500	551	563	564	552	1	13
501	552	564	565	553	1	13
502	553	565	566	554	1	13
503	554	566	567	555	1	13
504	555	567	569	556	1	13
505	557	569	570	558	1	13
506	558	570	571	559	1	13
507	559	571	572	560	1	13
508	560	572	573	561	1	13
509	561	573	574	562	1	13
510	562	574	575	563	1	13
511	563	575	576	564	1	13
512	564	576	577	565	1	13
513	565	577	578	566	1	13
514	566	578	579	567	1	13
515	567	579	580	568	1	13
516	569	581	582	570	1	13
517	570	582	583	571	1	13
518	571	583	584	572	1	13
519	572	584	585	573	1	13
520	573	585	586	574	1	13
521	574	586	587	575	1	13
522	575	587	588	576	1	13
523	581	589	590	582	1	9
524	582	590	591	583	1	9
525	583	591	592	584	1	9
526	584	592	593	585	1	9
527	585	593	594	586	1	9
528	586	594	595	587	1	9

INPUT TABLE 5.. BOUNDARY CONDITIONS OF FORM 2=BB

NODE	BB
152	0.1000D 01
164	0.1000D 01
172	0.1000D 01
180	0.1000D 01
188	0.1000D 01
196	0.1000D 01
204	0.1000D 01

INPUT TABLE 7.. SEEPAGE SURFACE INFORMATION

ELEMENT	NODE 1	NODE 2
185	208	220
196	220	232
207	232	244
218	244	256
229	256	268
240	268	280
251	280	292
262	292	304
273	304	316
284	316	328
295	328	340
306	340	352
317	352	364
328	364	376
339	376	388
350	388	400
361	400	412
372	412	424
383	424	436
394	436	448
405	448	460
416	460	472
427	472	484
438	484	496
449	496	508
460	508	520
471	520	532
482	532	544
493	544	556
504	556	568
515	568	580
515	579	580
514	578	579
513	577	578
512	576	577
522	576	588
522	587	588
528	587	595

OUTPUT TABLE 1.. CONCENTRATIONS AT TIME = 0.0 ,(DELT = 3.0000D 02),(BAND WIDTH = 27)

NODE I	CONCENTRATION AT NODES I,I+1,...,I+7							
1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
25	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
33	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
41	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
49	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
57	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
65	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
73	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
81	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
89	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
97	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
105	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
113	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
121	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
129	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
137	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
145	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0000D 00
153	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
161	0.0	0.0	0.0	1.0000D 00	0.0	0.0	0.0	0.0
169	0.0	0.0	0.0	1.0000D 00	0.0	0.0	0.0	0.0
177	0.0	0.0	0.0	1.0000D 00	0.0	0.0	0.0	0.0
185	0.0	0.0	0.0	1.0000D 00	0.0	0.0	0.0	0.0
193	0.0	0.0	0.0	1.0000D 00	0.0	0.0	0.0	0.0
201	0.0	0.0	0.0	1.0000D 00	0.0	0.0	0.0	0.0
209	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
217	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
225	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
233	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
241	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
249	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
257	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
265	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
273	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
281	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
289	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
297	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

305	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
313	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
321	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
329	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
337	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
345	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
353	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
361	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
369	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
377	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
385	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
393	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
401	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
409	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
417	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
425	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
433	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
441	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
449	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
457	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
465	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
473	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
481	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
489	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
497	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
505	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
513	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
521	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
529	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
537	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
545	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
553	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
561	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
569	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
577	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
585	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
593	0.0	0.0	0.0					

OUTPUT TABLE 2.. MATERIAL FLUX AT TIME = 0.0 ,(DELT = 3.0000D 02),(BAND WIDTH = 27)

ELEMENT	FLUX-X AT NODES 1	2	3	4	FLUX-Z AT NODES 1	2	3	4
1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
19	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
21	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
22	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
23	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
25	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
27	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
28	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
29	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
30	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
31	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
32	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
33	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
34	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
35	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
36	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
37	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
38	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
39	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
40	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
41	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
42	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
43	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
44	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
45	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
47	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
48	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
49	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

50	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
51	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
52	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
53	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
54	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
55	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
56	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
57	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
58	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
59	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
60	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
61	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
62	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
63	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
64	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
65	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
66	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
67	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
68	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
69	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
70	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
71	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
72	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
73	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
74	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
76	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
77	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
78	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
79	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
80	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
81	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
82	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
83	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
84	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
85	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
86	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
87	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
88	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
89	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
90	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
91	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
92	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
93	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
94	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
95	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
96	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
97	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
98	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
99	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
101	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
102	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
103	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
104	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
105	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
106	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
107	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
108	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
109	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
110	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
111	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
112	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
113	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
114	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
115	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
116	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
117	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
118	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
119	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
120	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
121	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
122	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
123	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
124	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
125	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
126	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
127	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
128	0.0	-2.4560D-04	-8.4203D-04	-2.9795D-04	0.0	-1.9238D-03	-1.6206D-03	-9.6045D-06
129	-2.7994D-04	-9.1965D-04	-3.5853D-04	0.0	-1.0673D-04	1.2033D-03	9.5187D-04	0.0
130	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
131	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
132	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
133	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
134	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
135	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
136	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
137	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
138	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
139	-2.9288D-04	-3.5170D-04	-1.0311D-03	-7.8023D-04	-2.1038D-03	-5.8120D-03	-4.2604D-03	-1.4876D-03
140	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
141	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
142	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
143	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
144	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
145	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
146	7.2363D-05	6.9688D-05	1.4554D-04	1.5205D-04	-5.8201D-03	-5.2197D-03	-3.8850D-03	-4.3581D-03
147	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
148	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
149	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

150	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
151	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
152	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
153	2.6021D-04	2.2829D-04	6.0819D-05	6.1220D-05	-5.2148D-03	-5.0530D-03	-4.2653D-03	-3.8869D-03
154	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
155	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
156	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
157	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
158	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
159	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
160	1.2218D-04	2.8390D-04	1.8533D-04	1.8921D-04	-5.0488D-03	-4.7135D-03	-4.4233D-03	-4.2622D-03
161	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
162	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
163	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
164	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
165	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
166	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
167	2.9915D-04	2.8342D-04	5.8383D-05	5.8774D-05	-4.7127D-03	-5.1504D-03	-5.0732D-03	-4.4262D-03
168	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
169	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
170	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
171	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
172	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
173	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
174	6.7472D-04	5.6669D-04	9.2408D-04	1.6777D-03	-5.1206D-03	-1.3927D-03	-1.0641D-03	-4.8474D-03
175	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
176	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
177	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
178	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
179	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
180	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
181	7.8155D-04	9.0128D-05	6.4834D-04	1.3463D-03	-1.3183D-03	-3.4161D-06	-1.3896D-05	-1.3724D-03
182	1.5795D-03	5.1134D-04	0.0	7.0489D-04	2.1106D-03	-1.2405D-04	0.0	1.7709D-03
183	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
184	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
185	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
186	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
187	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
188	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
189	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
190	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
191	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
192	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
193	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
194	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
195	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
196	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
197	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
198	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
199	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

200	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
201	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
202	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
203	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
204	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
205	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
206	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
207	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
208	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
209	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
210	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
211	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
212	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
213	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
214	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
215	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
216	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
217	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
218	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
219	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
220	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
221	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
222	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
223	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
224	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
225	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
226	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
227	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
228	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
229	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
230	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
231	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
232	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
233	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
234	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
235	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
236	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
237	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
238	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
239	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
240	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
241	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
242	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
243	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
244	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
245	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
246	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
247	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
248	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
249	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

250	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
251	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
252	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
253	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
254	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
255	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
256	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
257	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
258	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
259	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
260	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
261	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
262	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
263	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
264	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
265	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
266	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
267	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
268	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
269	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
270	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
271	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
272	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
273	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
274	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
275	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
276	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
277	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
278	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
279	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
280	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
281	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
282	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
283	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
284	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
285	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
286	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
287	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
288	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
289	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
290	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
291	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
292	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
293	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
294	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
295	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
296	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
297	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
298	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
299	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

300	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
301	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
302	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
303	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
304	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
305	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
306	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
307	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
308	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
309	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
310	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
311	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
312	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
313	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
314	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
315	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
316	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
317	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
318	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
319	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
320	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
321	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
322	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
323	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
324	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
325	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
326	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
327	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
328	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
329	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
330	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
331	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
332	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
333	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
334	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
335	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
336	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
337	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
338	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
339	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
340	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
341	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
342	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
343	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
344	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
345	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
346	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
347	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
348	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
349	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

350	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
351	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
352	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
353	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
354	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
355	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
356	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
357	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
358	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
359	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
360	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
361	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
362	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
363	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
364	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
365	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
366	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
367	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
368	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
369	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
370	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
371	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
372	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
373	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
374	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
375	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
376	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
377	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
378	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
379	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
380	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
381	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
382	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
383	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
384	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
385	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
386	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
387	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
388	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
389	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
390	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
391	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
392	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
393	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
394	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
395	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
396	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
397	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
398	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
399	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

400	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
401	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
402	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
403	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
404	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
405	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
406	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
407	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
408	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
409	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
410	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
411	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
412	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
413	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
414	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
415	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
416	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
417	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
418	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
419	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
420	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
421	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
422	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
423	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
424	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
425	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
426	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
427	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
428	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
429	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
430	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
431	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
432	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
433	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
434	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
435	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
436	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
437	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
438	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
439	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
440	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
441	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
442	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
443	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
444	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
445	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
446	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
447	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
448	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
449	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

450	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
451	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
452	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
453	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
454	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
455	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
456	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
457	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
458	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
459	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
460	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
461	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
462	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
463	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
464	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
465	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
466	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
467	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
468	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
469	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
470	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
471	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
472	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
473	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
474	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
475	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
476	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
477	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
478	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
479	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
480	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
481	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
482	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
483	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
484	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
485	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
486	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
487	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
488	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
489	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
490	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
491	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
492	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
493	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
494	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
495	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
496	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
497	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
498	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
499	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

500	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
501	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
502	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
503	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
504	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
505	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
506	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
507	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
508	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
509	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
510	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
511	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
512	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
513	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
514	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
515	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
516	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
517	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
518	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
519	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
520	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
521	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
522	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
523	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
524	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
525	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
526	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
527	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
528	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

OUTPUT TABLE 3.. WATER CONTENTS AT TIME = 0.0 ,(DELT = 3.0000D 02),(BAND WIDTH = 27)

ELEMENT	NODES 1	2	3	4
1	3.0000D-01	3.0000D-01	2.9992D-01	2.9992D-01
2	2.9992D-01	2.9992D-01	2.9979D-01	2.9979D-01
3	2.9979D-01	2.9979D-01	2.9966D-01	2.9966D-01
4	2.9966D-01	2.9966D-01	2.9953D-01	2.9953D-01
5	2.9953D-01	2.9953D-01	2.9236D-01	2.9236D-01
6	2.9236D-01	2.9236D-01	4.2464D-02	4.2464D-02
7	4.2464D-02	4.2464D-02	3.1986D-02	3.1986D-02
8	3.1986D-02	3.1986D-02	2.8986D-02	2.8986D-02
9	2.8986D-02	2.8986D-02	2.5986D-02	2.5986D-02
10	2.5986D-02	2.5986D-02	2.4986D-02	2.4986D-02
11	2.4986D-02	2.4986D-02	2.4000D-02	2.4000D-02
12	3.0000D-01	3.0000D-01	2.9992D-01	2.9992D-01
13	2.9992D-01	2.9992D-01	2.9979D-01	2.9979D-01
14	2.9979D-01	2.9979D-01	2.9966D-01	2.9966D-01
15	2.9966D-01	2.9966D-01	2.9953D-01	2.9953D-01
16	2.9953D-01	2.9953D-01	2.9237D-01	2.9236D-01
17	2.9236D-01	2.9237D-01	4.2465D-02	4.2464D-02
18	4.2464D-02	4.2465D-02	3.1987D-02	3.1986D-02
19	3.1986D-02	3.1987D-02	2.8987D-02	2.8986D-02
20	2.8986D-02	2.8987D-02	2.5987D-02	2.5986D-02
21	2.5986D-02	2.5987D-02	2.4987D-02	2.4986D-02
22	2.4986D-02	2.4987D-02	2.4000D-02	2.4000D-02
23	3.0000D-01	3.0000D-01	2.9992D-01	2.9992D-01
24	2.9992D-01	2.9992D-01	2.9979D-01	2.9979D-01
25	2.9979D-01	2.9979D-01	2.9966D-01	2.9966D-01
26	2.9966D-01	2.9966D-01	2.9953D-01	2.9953D-01
27	2.9953D-01	2.9953D-01	2.9237D-01	2.9237D-01
28	2.9237D-01	2.9237D-01	4.2466D-02	4.2465D-02
29	4.2465D-02	4.2466D-02	3.1987D-02	3.1987D-02
30	3.1987D-02	3.1987D-02	2.8987D-02	2.8987D-02
31	2.8987D-02	2.8987D-02	2.5988D-02	2.5987D-02
32	2.5987D-02	2.5988D-02	2.4988D-02	2.4987D-02
33	2.4987D-02	2.4988D-02	2.4000D-02	2.4000D-02
34	3.0000D-01	3.0000D-01	2.9992D-01	2.9992D-01
35	2.9992D-01	2.9992D-01	2.9979D-01	2.9979D-01
36	2.9979D-01	2.9979D-01	2.9966D-01	2.9966D-01
37	2.9966D-01	2.9966D-01	2.9953D-01	2.9953D-01
38	2.9953D-01	2.9953D-01	2.9238D-01	2.9237D-01
39	2.9237D-01	2.9238D-01	4.2469D-02	4.2466D-02
40	4.2466D-02	4.2469D-02	3.1989D-02	3.1987D-02
41	3.1987D-02	3.1989D-02	2.8989D-02	2.8987D-02
42	2.8987D-02	2.9989D-02	2.5989D-02	2.5988D-02
43	2.5918D-02	2.5989D-02	2.4989D-02	2.4988D-02
44	2.4988D-02	2.4989D-02	2.4000D-02	2.4000D-02
45	3.0000D-01	3.0000D-01	2.9992D-01	2.9992D-01
46	2.9992D-01	2.9992D-01	2.9979D-01	2.9979D-01
47	2.9979D-01	2.9979D-01	2.9966D-01	2.9966D-01
48	2.9966D-01	2.9966D-01	2.9953D-01	2.9953D-01
49	2.9953D-01	2.9953D-01	2.9240D-01	2.9238D-01

50	2.9218D-01	2.9240D-01	4.2475D-02	4.2469D-02
51	4.2469D-02	4.2475D-02	3.1991D-02	3.1989D-02
52	3.1989D-02	3.1991D-02	2.8992D-02	2.8989D-02
53	2.8989D-02	2.8992D-02	2.5992D-02	2.5989D-02
54	2.5989D-02	2.5992D-02	2.4992D-02	2.4989D-02
55	2.4989D-02	2.4992D-02	2.4000D-02	2.4000D-02
56	3.0000D-01	3.0000D-01	2.9992D-01	2.9992D-01
57	2.9992D-01	2.9992D-01	2.9979D-01	2.9979D-01
58	2.9979D-01	2.9979D-01	2.9966D-01	2.9966D-01
59	2.9966D-01	2.9966D-01	2.9953D-01	2.9953D-01
60	2.9953D-01	2.9953D-01	2.9244D-01	2.9240D-01
61	2.9240D-01	2.9244D-01	4.2486D-02	4.2475D-02
62	4.2475D-02	4.2486D-02	3.1997D-02	3.1991D-02
63	3.1991D-02	3.1997D-02	2.8998D-02	2.8992D-02
64	2.8992D-02	2.8998D-02	2.5998D-02	2.5992D-02
65	2.5992D-02	2.5998D-02	2.4998D-02	2.4992D-02
66	2.4992D-02	2.4998D-02	2.4000D-02	2.4000D-02
67	3.0000D-01	3.0000D-01	2.9992D-01	2.9992D-01
68	2.9992D-01	2.9992D-01	2.9979D-01	2.9979D-01
69	2.9979D-01	2.9979D-01	2.9966D-01	2.9966D-01
70	2.9966D-01	2.9966D-01	2.9953D-01	2.9953D-01
71	2.9953D-01	2.9953D-01	2.9251D-01	2.9244D-01
72	2.9244D-01	2.9251D-01	4.2518D-02	4.2486D-02
73	4.2486D-02	4.2518D-02	3.2019D-02	3.1997D-02
74	3.1997D-02	3.2019D-02	2.9010D-02	2.8998D-02
75	2.8998D-02	2.9010D-02	2.6011D-02	2.5998D-02
76	2.5998D-02	2.6011D-02	2.5011D-02	2.4998D-02
77	2.4998D-02	2.5011D-02	2.4011D-02	2.4000D-02
78	3.0000D-01	3.0000D-01	2.9992D-01	2.9992D-01
79	2.9992D-01	2.9992D-01	2.9979D-01	2.9979D-01
80	2.9979D-01	2.9979D-01	2.9966D-01	2.9966D-01
81	2.9966D-01	2.9966D-01	2.9953D-01	2.9953D-01
82	2.9953D-01	2.9953D-01	2.9259D-01	2.9251D-01
83	2.9251D-01	2.9259D-01	4.2604D-02	4.2518D-02
84	4.2518D-02	4.2604D-02	3.2079D-02	3.2019D-02
85	3.2019D-02	3.2079D-02	2.9034D-02	2.9010D-02
86	2.9010D-02	2.9034D-02	2.6037D-02	2.6011D-02
87	2.6011D-02	2.6037D-02	2.5038D-02	2.5011D-02
88	2.5011D-02	2.5038D-02	2.4038D-02	2.4011D-02
89	3.0000D-01	3.0000D-01	2.9992D-01	2.9992D-01
90	2.9992D-01	2.9992D-01	2.9979D-01	2.9979D-01
91	2.9979D-01	2.9979D-01	2.9966D-01	2.9966D-01
92	2.9966D-01	2.9965D-01	2.9953D-01	2.9953D-01
93	2.9953D-01	2.9953D-01	2.9275D-01	2.9259D-01
94	2.9259D-01	2.92[illegible]5D-01	4.2787D-02	4.2604D-02
95	4.2604D-02	4.2787D-02	3.2191D-02	3.2079D-02
96	3.2079D-02	3.2191D-02	2.9092D-02	2.9034D-02
97	2.9034D-02	2.9092D-02	2.6097D-02	2.6037D-02
98	2.6037D-02	2.6097D-02	2.5097D-02	2.5038D-02
99	2.5038D-02	2.5097D-02	2.4097D-02	2.4038D-02

100	3.0000D-01	3.0000D-01	2.9992D-01	2.9992D-01
101	2.9992D-01	2.9992D-01	2.9979D-01	2.9979D-01
102	2.9979D-01	2.9979D-01	2.9966D-01	2.9966D-01
103	2.9966D-01	2.9966D-01	2.9953D-01	2.9953D-01
104	2.9953D-01	2.9953D-01	2.9307D-01	2.9275D-01
105	2.9275D-01	2.9307D-01	4.3145D-02	4.2787D-02
106	4.2787D-02	4.3145D-02	3.2547D-02	3.2191D-02
107	3.2191D-02	3.2547D-02	2.9210D-02	2.9092D-02
108	2.9092D-02	2.9210D-02	2.6233D-02	2.6097D-02
109	2.6097D-02	2.6233D-02	2.5237D-02	2.5097D-02
110	2.5097D-02	2.5237D-02	2.4239D-02	2.4097D-02
111	3.0000D-01	3.0000D-01	2.9992D-01	2.9992D-01
112	2.9992D-01	2.9992D-01	2.9979D-01	2.9979D-01
113	2.9979D-01	2.9979D-01	2.9966D-01	2.9966D-01
114	2.9966D-01	2.9966D-01	2.9953D-01	2.9953D-01
115	2.9953D-01	2.9953D-01	2.9378D-01	2.9307D-01
116	2.9307D-01	2.9378D-01	4.3988D-02	4.3145D-02
117	4.3145D-02	4.3988D-02	3.2855D-02	3.2547D-02
118	3.2547D-02	3.2855D-02	2.9588D-02	2.9210D-02
119	2.9210D-02	2.9588D-02	2.6673D-02	2.6233D-02
120	2.6233D-02	2.6673D-02	2.5682D-02	2.5237D-02
121	2.5237D-02	2.5682D-02	2.4685D-02	2.4239D-02
122	3.0000D-01	3.0000D-01	2.9992D-01	2.9992D-01
123	2.9992D-01	2.9992D-01	2.9979D-01	2.9979D-01
124	2.9979D-01	2.9979D-01	2.9966D-01	2.9966D-01
125	2.9966D-01	2.9966D-01	2.9953D-01	2.9953D-01
126	2.9953D-01	2.9953D-01	2.9513D-01	2.9378D-01
127	2.9378D-01	2.9513D-01	4.8063D-02	4.3988D-02
126	4.3988D-02	4.8063D-02	3.7445D-02	3.2855D-02
129	3.2855D-02	3.7445D-02	3.0513D-02	2.9588D-02
130	2.9588D-02	3.0513D-02	2.7278D-02	2.6673D-02
131	2.6673D-02	2.7278D-02	2.6249D-02	2.5682D-02
132	2.5682D-02	2.6249D-02	2.5239D-02	2.4685D-02
133	3.0000D-01	3.0000D-01	2.9991D-01	2.9992D-01
134	2.9992D-01	2.9991D-01	2.9978D-01	2.9979D-01
135	2.9979D-01	2.9978D-01	2.9966D-01	2.9966D-01
136	2.9966D-01	2.9966D-01	2.9953D-01	2.9953D-01
137	2.9953D-01	2.9953D-01	2.9618D-01	2.9513D-01
138	2.9513D-01	2.9618D-01	5.8730D-02	4.8063D-02
139	4.8063D-02	5.8730D-02	4.3888D-02	3.7445D-02
140	3.0000D-01	3.0000D-01	2.9991D-01	2.9991D-01
141	2.9991D-01	2.9991D-01	2.9978D-01	2.9978D-01
142	2.9978D-01	2.9978D-01	2.9965D-01	2.9966D-01
143	2.9966D-01	2.9965D-01	2.9953D-01	2.9953D-01
144	2.9953D-01	2.9953D-01	2.9552D-01	2.9618D-01
145	2.9618D-01	2.9552D-01	5.5944D-02	5.8730D-02
146	5.8730D-02	5.5944D-02	4.2607D-02	4.3888D-02
147	3.0000D-01	3.0000D-01	2.9990D-01	2.9991D-01
148	2.9991D-01	2.9990D-01	2.9977D-01	2.9978D-01
149	2.9978D-01	2.9977D-01	2.9965D-01	2.9965D-01

150	2.9965D-01	2.9965D-01	2.9952D-01	2.9953D-01
151	2.9953D-01	2.9952D-01	2.9339D-01	2.9952D-01
152	2.9952D-01	2.9339D-01	4.8210D-02	5.5948D-02
153	5.5948D-02	4.8210D-02	4.2062D-02	4.2407D-02
154	3.0000D-01	3.0000D-01	2.9989D-01	2.9990D-01
155	2.9990D-01	2.9989D-01	2.9976D-01	2.9977D-01
156	2.9977D-01	2.9976D-01	2.9964D-01	2.9965D-01
157	2.9965D-01	2.9964D-01	2.9952D-01	2.9952D-01
158	2.9952D-01	2.9952D-01	2.8586D-01	2.9119D-01
159	2.9119D-01	2.8586D-01	4.1660D-02	4.8210D-02
160	4.8210D-02	4.1660D-02	4.0987D-02	4.2062D-02
161	1.0000D-01	1.0000D-01	2.9988D-01	2.9989D-01
162	2.9989D-01	2.9988D-01	2.9975D-01	2.9976D-01
163	2.9976D-01	2.9975D-01	2.9963D-01	2.9964D-01
164	2.9964D-01	2.9963D-01	2.9950D-01	2.9952D-01
165	2.9952D-01	2.9950D-01	1.9199D-01	2.8586D-01
166	2.8586D-01	1.9199D-01	4.1479D-02	4.1660D-02
167	4.1660D-02	4.1479D-02	4.0447D-02	4.0987D-02
168	1.0000D-01	1.0000D-01	2.9987D-01	2.9988D-01
169	2.9988D-01	2.9987D-01	2.9974D-01	2.9975D-01
170	2.9975D-01	2.9974D-01	2.9961D-01	2.9963D-01
171	2.9963D-01	2.9961D-01	2.9677D-01	2.9950D-01
172	2.9950D-01	2.9677D-01	5.3962D-02	1.9199D-01
173	1.9199D-01	5.3962D-02	3.7562D-02	4.1479D-02
174	4.1479D-02	3.7562D-02	3.1264D-02	4.0447D-02
175	3.0000D-01	2.9998D-01	2.9985D-01	2.9987D-01
176	2.9987D-01	2.9985D-01	2.9972D-01	2.9974D-01
177	2.9974D-01	2.9972D-01	2.9959D-01	2.9961D-01
178	2.9961D-01	2.9959D-01	2.8370D-01	2.9677D-01
179	2.9677D-01	2.8170D-01	4.1319D-02	5.3962D-02
180	5.3962D-02	4.1319D-02	3.1813D-02	3.7562D-02
181	3.7562D-02	3.1813D-02	2.7848D-02	3.1264D-02
182	3.1264D-02	2.7848D-02	2.5165D-02	2.7137D-02
183	2.7137D-02	2.5165D-02	2.4000D-02	2.4000D-02
184	2.4000D-02	2.4000D-02	2.4000D-02	2.4000D-02
185	2.4000D-02	2.4000D-02	2.4000D-02	2.4000D-02
186	2.9990D-01	2.9997D-01	2.9984D-01	2.9985D-01
187	2.9985D-01	2.9984D-01	2.9971D-01	2.9972D-01
188	2.9972D-01	2.9971D-01	2.9958D-01	2.9959D-01
189	2.9959D-01	2.9958D-01	1.7253D-01	2.8170D-01
190	2.8170D-01	1.7253D-01	3.8799D-02	4.1319D-02
191	4.1319D-02	3.8799D-02	3.0658D-02	3.1813D-02
192	3.1813D-02	3.0658D-02	2.7100D-02	2.7848D-02
193	2.7848D-02	2.7100D-02	2.4000D-02	2.5165D-02
194	2.5165D-02	2.4000D-02	2.4000D-02	2.4000D-02
195	2.4000D-02	2.4000D-02	2.4000D-02	2.4000D-02
196	2.4000D-02	2.4000D-02	2.4000D-02	2.4000D-02
197	2.9997D-01	2.9995D-01	2.9983D-01	2.9984D-01
198	2.9984D-01	2.9983D-01	2.9970D-01	2.9971D-01
199	2.9971D-01	2.9970D-01	2.9957D-01	2.9958D-01

200	2.9958D-01	2.9957D-01	1.0945D-01	1.7253D-01
201	1.7253D-01	1.0945D-01	3.7346D-02	3.8799D-02
202	3.8799D-02	3.7346D-02	3.0366D-02	3.0658D-02
203	3.0658D-02	3.0366D-02	2.6475D-02	2.7180D-02
204	2.7180D-02	2.6475D-02	2.4000D-02	2.4000D-02
205	2.4000D-02	2.4000D-02	2.4000D-02	2.4000D-02
206	2.4000D-02	2.4000D-02	2.4000D-02	2.4000D-02
207	2.4000D-02	2.4000D-02	2.4000D-02	2.4000D-02
208	2.9995D-01	2.9993D-01	2.9981D-01	2.9983D-01
209	2.9983D-01	2.9981D-01	2.9969D-01	2.9970D-01
210	2.9970D-01	2.9969D-01	2.9957D-01	2.9957D-01
211	2.9957D-01	2.9957D-01	2.1509D-01	1.0945D-01
212	1.0945D-01	2.1509D-01	3.9138D-02	3.7346D-02
213	3.7346D-02	3.9138D-02	3.1269D-02	3.0366D-02
214	3.0366D-02	3.1269D-02	2.7621D-02	2.6475D-02
215	2.6475D-02	2.7621D-02	2.4154D-02	2.4000D-02
216	2.4000D-02	2.4154D-02	2.4000D-02	2.4000D-02
217	2.4000D-02	2.4000D-02	2.4000D-02	2.4000D-02
218	2.4000D-02	2.4000D-02	2.4000D-02	2.4000D-02
219	2.9993D-01	2.9991D-01	2.9980D-01	2.9981D-01
220	2.9981D-01	2.9980D-01	2.9969D-01	2.9969D-01
221	2.9969D-01	2.9969D-01	2.9958D-01	2.9957D-01
222	2.9957D-01	2.9958D-01	2.9417D-01	2.1509D-01
223	2.1509D-01	2.9417D-01	4.4828D-02	3.9138D-02
224	3.9138D-02	4.4828D-02	3.3593D-02	3.1269D-02
225	3.1269D-02	3.3593D-02	2.8984D-02	2.7621D-02
226	2.7621D-02	2.8984D-02	2.5368D-02	2.4154D-02
227	2.4154D-02	2.5368D-02	2.4000D-02	2.4000D-02
228	2.4000D-02	2.4000D-02	2.4000D-02	2.4000D-02
229	2.4000D-02	2.4000D-02	2.4000D-02	2.4000D-02
230	2.9991D-01	2.9989D-01	2.9979D-01	2.9980D-01
231	2.9980D-01	2.9979D-01	2.9969D-01	2.9969D-01
232	2.9969D-01	2.9965D-01	2.9960D-01	2.9958D-01
233	2.9958D-01	2.9960D-01	2.9938D-01	2.9417D-01
234	2.9417D-01	2.9938D-01	9.5591D-02	4.4828D-02
235	4.4828D-02	9.5591D-02	3.9798D-02	3.3593D-02
236	3.3593D-02	3.9798D-02	3.1975D-02	2.8984D-02
237	2.8984D-02	3.1975D-02	2.8621D-02	2.5368D-02
238	2.5368D-02	2.8621D-02	2.5460D-02	2.4000D-02
239	2.4000D-02	2.5460D-02	2.4533D-02	2.4000D-02
240	2.4000D-02	2.4533D-02	2.4000D-02	2.4000D-02
241	2.9989D-01	2.9987D-01	2.9979D-01	2.9979D-01
242	2.9979D-01	2.9979D-01	2.9970D-01	2.9969D-01
243	2.9969D-01	2.9970D-01	2.9962D-01	2.9960D-01
244	2.9960D-01	2.9962D-01	2.9952D-01	2.9938D-01
245	2.9938D-01	2.9952D-01	2.9517D-01	9.5591D-02
246	9.5591D-02	2.9517D-01	6.9074D-02	3.9798D-02
247	3.9798D-02	6.9074D-02	4.0591D-02	3.1975D-02
248	3.1975D-02	4.0591D-02	3.4723D-02	2.8621D-02
249	2.8621D-02	3.4723D-02	3.0878D-02	2.5460D-02

250	2.5460D-02	3.0878D-02	2.9979D-02	2.4533D-02
251	2.4533D-02	2.9979D-02	2.9079D-02	2.4000D-02
252	2.9983D-01	2.9984D-01	2.9977D-01	2.9979D-01
253	2.9979D-01	2.9977D-01	2.9969D-01	2.9970D-01
254	2.9970D-01	2.9969D-01	2.9962D-01	2.9962D-01
255	2.9962D-01	2.9962D-01	2.9955D-01	2.9952D-01
256	2.9952D-01	2.9955D-01	2.9953D-01	2.9517D-01
257	2.9517D-01	2.9953D-01	2.9951D-01	6.9074D-02
258	6.9074D-02	2.9951D-01	2.9560D-01	4.0591D-02
259	4.0591D-02	2.9560D-01	1.7424D-01	3.4723D-02
260	3.4723D-02	1.7424D-01	4.4791D-02	3.0878D-02
261	3.0878D-02	4.4791D-02	4.1302D-02	2.9979D-02
262	2.9979D-02	4.1302D-02	3.8925D-02	2.9079D-02
263	2.9984D-01	2.9983D-01	2.9976D-01	2.9977D-01
264	2.9977D-01	2.9976D-01	2.9969D-01	2.9969D-01
265	2.9969D-01	2.9969D-01	2.9963D-01	2.9962D-01
266	2.9962D-01	2.9963D-01	2.9956D-01	2.9955D-01
267	2.9955D-01	2.9956D-01	2.9954D-01	2.9953D-01
268	2.9953D-01	2.9954D-01	2.9952D-01	2.9951D-01
269	2.9951D-01	2.9952D-01	2.9890D-01	2.9560D-01
270	2.9560D-01	2.9890D-01	2.9430D-01	1.7424D-01
271	1.7424D-01	2.9430D-01	2.2535D-01	4.4791D-02
272	4.4791D-02	2.2535D-01	8.4873D-02	4.1302D-02
273	4.1302D-02	8.4873D-02	4.9934D-02	3.8925D-02
274	2.9983D-01	2.9982D-01	2.9976D-01	2.9976D-01
275	2.9976D-01	2.9976D-01	2.9970D-01	2.9969D-01
276	2.9969D-01	2.9970D-01	2.9964D-01	2.9963D-01
277	2.9963D-01	2.9964D-01	2.9958D-01	2.9956D-01
278	2.9956D-01	2.9958D-01	2.9956D-01	2.9954D-01
279	2.9954D-01	2.9956D-01	2.9953D-01	2.9952D-01
280	2.9952D-01	2.9953D-01	2.9951D-01	2.9890D-01
281	2.9890D-01	2.9951D-01	2.9904D-01	2.9430D-01
282	2.9430D-01	2.9904D-01	2.9665D-01	2.2535D-01
283	2.2535D-01	2.9665D-01	2.9137D-01	8.4873D-02
284	8.4873D-02	2.9137D-01	2.4017D-01	4.9934D-02
285	2.9982D-01	2.9980D-01	2.9975D-01	2.9976D-01
286	2.9976D-01	2.9975D-01	2.9969D-01	2.9970D-01
287	2.9970D-01	2.9964D-01	2.9963D-01	2.9964D-01
288	2.9964D-01	2.9963D-01	2.9959D-01	2.9958D-01
289	2.9958D-01	2.9959D-01	2.9957D-01	2.9956D-01
290	2.9956D-01	2.9957D-01	2.9955D-01	2.9953D-01
291	2.9953D-01	2.9955D-01	2.9953D-01	2.9951D-01
292	2.9951D-01	2.9953D-01	2.9951D-01	2.9904D-01
293	2.9904D-01	2.9951D-01	2.9898D-01	2.9665D-01
294	2.9665D-01	2.9898D-01	2.9677D-01	2.9137D-01
295	2.9137D-01	2.9677D-01	2.9250D-01	2.4017D-01
296	2.9980D-01	2.9979D-01	2.9974D-01	2.9975D-01
297	2.9975D-01	2.9974D-01	2.9969D-01	2.9969D-01
298	2.9969D-01	2.9969D-01	2.9964D-01	2.9963D-01
299	2.9963D-01	2.9964D-01	2.9959D-01	2.9954D-01

300	2.9959D-01	2.9959D-01	2.9957D-01	2.9957D-01
301	2.9957D-01	2.9957D-01	2.9956D-01	2.9955D-01
302	2.9955D-01	2.9956D-01	2.9953D-01	2.9953D-01
303	2.9953D-01	2.9953D-01	2.9952D-01	2.9951D-01
304	2.9951D-01	2.9952D-01	2.9937D-01	2.9898D-01
305	2.9898D-01	2.9937D-01	2.9736D-01	2.9677D-01
306	2.9677D-01	2.9716D-01	2.9250D-01	2.9250D-01
307	2.9979D-01	2.9978D-01	2.9973D-01	2.9974D-01
308	2.9974D-01	2.9973D-01	2.9968D-01	2.9969D-01
309	2.9969D-01	2.9968D-01	2.9963D-01	2.9964D-01
310	2.9964D-01	2.9963D-01	2.9960D-01	2.9959D-01
311	2.9959D-01	2.9960D-01	2.9958D-01	2.9957D-01
312	2.9957D-01	2.9958D-01	2.9956D-01	2.9956D-01
313	2.9956D-01	2.9956D-01	2.9954D-01	2.9953D-01
314	2.9953D-01	2.9954D-01	2.9952D-01	2.9952D-01
315	2.9952D-01	2.9952D-01	2.9945D-01	2.9937D-01
316	2.9937D-01	2.9945D-01	2.9744D-01	2.9736D-01
317	2.9736D-01	2.9744D-01	2.9250D-01	2.9250D-01
318	2.9978D-01	2.9976D-01	2.9972D-01	2.9973D-01
319	2.9973D-01	2.9972D-01	2.9968D-01	2.9968D-01
320	2.9968D-01	2.9968D-01	2.9964D-01	2.9963D-01
321	2.9963D-01	2.9964D-01	2.9960D-01	2.9960D-01
322	2.9960D-01	2.9960D-01	2.9958D-01	2.9958D-01
323	2.9958D-01	2.9958D-01	2.9956D-01	2.9956D-01
324	2.9956D-01	2.9956D-01	2.9954D-01	2.9954D-01
325	2.9954D-01	2.9954D-01	2.9952D-01	2.9952D-01
326	2.9952D-01	2.9952D-01	2.9950D-01	2.9945D-01
327	2.9945D-01	2.9950D-01	2.9753D-01	2.9744D-01
328	2.9744D-01	2.9753D-01	2.9250D-01	2.9250D-01
329	2.9976D-01	2.9975D-01	2.9971D-01	2.9972D-01
330	2.9972D-01	2.9971D-01	2.9968D-01	2.9968D-01
331	2.9968D-01	2.9968D-01	2.9963D-01	2.9964D-01
332	2.9964D-01	2.9963D-01	2.9960D-01	2.9960D-01
333	2.9960D-01	2.9960D-01	2.9958D-01	2.9958D-01
334	2.9958D-01	2.9958D-01	2.9956D-01	2.9956D-01
335	2.9956D-01	2.9956D-01	2.9954D-01	2.9954D-01
336	2.9954D-01	2.9954D-01	2.9952D-01	2.9952D-01
337	2.9952D-01	2.9952D-01	2.9950D-01	2.9950D-01
338	2.9950D-01	2.9950D-01	2.9769D-01	2.9753D-01
339	2.9753D-01	2.9769D-01	2.9250D-01	2.9250D-01
340	2.9975D-01	2.9974D-01	2.9970D-01	2.9971D-01
341	2.9971D-01	2.9970D-01	2.9967D-01	2.9968D-01
342	2.9968D-01	2.9967D-01	2.9963D-01	2.9963D-01
343	2.9963D-01	2.9963D-01	2.9960D-01	2.9960D-01
344	2.9960D-01	2.9960D-01	2.9958D-01	2.9958D-01
345	2.9958D-01	2.9958D-01	2.9956D-01	2.9956D-01
346	2.9956D-01	2.9956D-01	2.9954D-01	2.9954D-01
347	2.9954D-01	2.9954D-01	2.9952D-01	2.9952D-01
348	2.9952D-01	2.9952D-01	2.9950D-01	2.9950D-01
349	2.9950D-01	2.9950D-01	2.9768D-01	2.9769D-01

350	2.9769D-01	2.9768D-01	2.9250D-01	2.9250D-01
351	2.9974D-01	2.9972D-01	2.9969D-01	2.9970D-01
352	2.9970D-01	2.9969D-01	2.9966D-01	2.9967D-01
353	2.9967D-01	2.9966D-01	2.9963D-01	2.9963D-01
354	2.9963D-01	2.9963D-01	2.9960D-01	2.9960D-01
355	2.9960D-01	2.9960D-01	2.9958D-01	2.9958D-01
356	2.9958D-01	2.9958D-01	2.9956D-01	2.9956D-01
357	2.9956D-01	2.9956D-01	2.9954D-01	2.9954D-01
358	2.9954D-01	2.9954D-01	2.9952D-01	2.9952D-01
359	2.9952D-01	2.9952D-01	2.9950D-01	2.9950D-01
360	2.9950D-01	2.9950D-01	2.9767D-01	2.9768D-01
361	2.9768D-01	2.9767D-01	2.9250D-01	2.9250D-01
362	2.9972D-01	2.9971D-01	2.9969D-01	2.9969D-01
363	2.9969D-01	2.9969D-01	2.9966D-01	2.9966D-01
364	2.9966D-01	2.9966D-01	2.9963D-01	2.9963D-01
365	2.9963D-01	2.9963D-01	2.9960D-01	2.9960D-01
366	2.9960D-01	2.9960D-01	2.9958D-01	2.9958D-01
367	2.9958D-01	2.9958D-01	2.9956D-01	2.9956D-01
368	2.9956D-01	2.9956D-01	2.9954D-01	2.9954D-01
369	2.9954D-01	2.9954D-01	2.9952D-01	2.9952D-01
370	2.9952D-01	2.9952D-01	2.9950D-01	2.9950D-01
371	2.9950D-01	2.9950D-01	2.9753D-01	2.9767D-01
372	2.9767D-01	2.9753D-01	2.9250D-01	2.9250D-01
373	2.9971D-01	2.9970D-01	2.9968D-01	2.9969D-01
374	2.9969D-01	2.9968D-01	2.9965D-01	2.9966D-01
375	2.9966D-01	2.9965D-01	2.9962D-01	2.9963D-01
376	2.9963D-01	2.9962D-01	2.9960D-01	2.9960D-01
377	2.9960D-01	2.9960D-01	2.9958D-01	2.9958D-01
378	2.9958D-01	2.9958D-01	2.9956D-01	2.9956D-01
379	2.9956D-01	2.9956D-01	2.9954D-01	2.9954D-01
380	2.9954D-01	2.9954D-01	2.9952D-01	2.9952D-01
381	2.9952D-01	2.9952D-01	2.9950D-01	2.9950D-01
382	2.9950D-01	2.9950D-01	2.9767D-01	2.9753D-01
383	2.9753D-01	2.9767D-01	2.9250D-01	2.9250D-01
384	2.9970D-01	2.9969D-01	2.9967D-01	2.9968D-01
385	2.9968D-01	2.9967D-01	2.9964D-01	2.9965D-01
386	2.9965D-01	2.9964D-01	2.9962D-01	2.9962D-01
387	2.9962D-01	2.9962D-01	2.9959D-01	2.9960D-01
388	2.9960D-01	2.9959D-01	2.9957D-01	2.9958D-01
389	2.9958D-01	2.9957D-01	2.9956D-01	2.9956D-01
390	2.9956D-01	2.9956D-01	2.9954D-01	2.9954D-01
391	2.9954D-01	2.9954D-01	2.9952D-01	2.9952D-01
392	2.9952D-01	2.9952D-01	2.9949D-01	2.9950D-01
393	2.9950D-01	2.9949D-01	2.9747D-01	2.9767D-01
394	2.9767D-01	2.9747D-01	2.9250D-01	2.9250D-01
395	2.9969D-01	2.9968D-01	2.9966D-01	2.9967D-01
396	2.9967D-01	2.9966D-01	2.9963D-01	2.9964D-01
397	2.9964D-01	2.9963D-01	2.9961D-01	2.9962D-01
398	2.9962D-01	2.9961D-01	2.9959D-01	2.9959D-01
399	2.9959D-01	2.9959D-01	2.9957D-01	2.9957D-01

400	2.9957D-01	2.9957D-01	2.9956D-01	2.9956D-01
401	2.9956D-01	2.9956D-01	2.9954D-01	2.9954D-01
402	2.9954D-01	2.9954D-01	2.9952D-01	2.9952D-01
403	2.9952D-01	2.9952D-01	2.9945D-01	2.9949D-01
404	2.9949D-01	2.9945D-01	2.9741D-01	2.9747D-01
405	2.9747D-01	2.9741D-01	2.9250D-01	2.9250D-01
406	2.9968D-01	2.9968D-01	2.9965D-01	2.9966D-01
407	2.9966D-01	2.9965D-01	2.9963D-01	2.9963D-01
408	2.9963D-01	2.9963D-01	2.9961D-01	2.9961D-01
409	2.9961D-01	2.9961D-01	2.9958D-01	2.9959D-01
410	2.9959D-01	2.9958D-01	2.9957D-01	2.9957D-01
411	2.9957D-01	2.9957D-01	2.9955D-01	2.9956D-01
412	2.9956D-01	2.9955D-01	2.9953D-01	2.9954D-01
413	2.9954D-01	2.9953D-01	2.9952D-01	2.9952D-01
414	2.9952D-01	2.9952D-01	2.9950D-01	2.9945D-01
415	2.9945D-01	2.9950D-01	2.9760D-01	2.9741D-01
416	2.9741D-01	2.9760D-01	2.9250D-01	2.9250D-01
417	2.9968D-01	2.9967D-01	2.9965D-01	2.9965D-01
418	2.9965D-01	2.9965D-01	2.9963D-01	2.9963D-01
419	2.9963D-01	2.9963D-01	2.9960D-01	2.9961D-01
420	2.9961D-01	2.9960D-01	2.9958D-01	2.9958D-01
421	2.9958D-01	2.9958D-01	2.9957D-01	2.9957D-01
422	2.9957D-01	2.9957D-01	2.9955D-01	2.9955D-01
423	2.9955D-01	2.9955D-01	2.9954D-01	2.9953D-01
424	2.9953D-01	2.9954D-01	2.9952D-01	2.9952D-01
425	2.9952D-01	2.9952D-01	2.9950D-01	2.9950D-01
426	2.9950D-01	2.9950D-01	2.9754D-01	2.9760D-01
427	2.9760D-01	2.9754D-01	2.9250D-01	2.9250D-01
428	2.9967D-01	2.9967D-01	2.9965D-01	2.9965D-01
429	2.9965D-01	2.9965D-01	2.9962D-01	2.9963D-01
430	2.9963D-01	2.9962D-01	2.9960D-01	2.9960D-01
431	2.9960D-01	2.9960D-01	2.9958D-01	2.9958D-01
432	2.9958D-01	2.9958D-01	2.9956D-01	2.9957D-01
433	2.9957D-01	2.9956D-01	2.9955D-01	2.9955D-01
434	2.9955D-01	2.9955D-01	2.9953D-01	2.9954D-01
435	2.9954D-01	2.9953D-01	2.9952D-01	2.9952D-01
436	2.9952D-01	2.9952D-01	2.9946D-01	2.9950D-01
437	2.9950D-01	2.9946D-01	2.9735D-01	2.9754D-01
438	2.9754D-01	2.9735D-01	2.9250D-01	2.9250D-01
439	2.9967D-01	2.9967D-01	2.9964D-01	2.9965D-01
440	2.9965D-01	2.9964D-01	2.9962D-01	2.9962D-01
441	2.9962D-01	2.9962D-01	2.9960D-01	2.9960D-01
442	2.9960D-01	2.9960D-01	2.9958D-01	2.9958D-01
443	2.9958D-01	2.9958D-01	2.9956D-01	2.9956D-01
444	2.9956D-01	2.9956D-01	2.9955D-01	2.9955D-01
445	2.9955D-01	2.9955D-01	2.9953D-01	2.9953D-01
446	2.9953D-01	2.9953D-01	2.9952D-01	2.9952D-01
447	2.9952D-01	2.9952D-01	2.9950D-01	2.9946D-01
448	2.9946D-01	2.9950D-01	2.9765D-01	2.9735D-01
449	2.9735D-01	2.9765D-01	2.9250D-01	2.9250D-01

450	2.9967D-01	2.9956D-01	2.9964D-01	2.9964D-01
451	2.9964D-01	2.9964D-01	2.9962D-01	2.9962D-01
452	2.9962D-01	2.9962D-01	2.9960D-01	2.9960D-01
453	2.9960D-01	2.9960D-01	2.9957D-01	2.9958D-01
454	2.9958D-01	2.9957D-01	2.9956D-01	2.9956D-01
455	2.9956D-01	2.9956D-01	2.9954D-01	2.9955D-01
456	2.9955D-01	2.9954D-01	2.9953D-01	2.9953D-01
457	2.9953D-01	2.9953D-01	2.9952D-01	2.9952D-01
458	2.9952D-01	2.9952D-01	2.9950D-01	2.9950D-01
459	2.9950D-01	2.9950D-01	2.9759D-01	2.9765D-01
460	2.9765D-01	2.9759D-01	2.9250D-01	2.9250D-01
461	2.9966D-01	2.9966D-01	2.9964D-01	2.9964D-01
462	2.9964D-01	2.9964D-01	2.9961D-01	2.9962D-01
463	2.9962D-01	2.9961D-01	2.9959D-01	2.9960D-01
464	2.9960D-01	2.9959D-01	2.9957D-01	2.9957D-01
465	2.9957D-01	2.9957D-01	2.9956D-01	2.9956D-01
466	2.995[illegible]-01	2.9956D-01	2.9954D-01	2.9954D-01
467	2.[illegible]54D-01	2.9954D-01	2.9953D-01	2.9953D-01
468	2.9953D-01	2.9953D-01	2.9951D-01	2.9952D-01
469	2.9952D-01	2.9951D-01	2.9950D-01	2.9950D-01
470	2.9950D-01	2.9950D-01	2.9760D-01	2.9759D-01
471	2.9759D-01	2.9760D-01	2.9250D-01	2.9250D-01
472	2.9956D-01	2.9966D-01	2.9964D-01	2.9964D-01
473	2.9964D-01	2.9964D-01	2.9961D-01	2.9961D-01
474	2.9961D-01	2.9961D-01	2.9959D-01	2.9959D-01
475	2.9959D-01	2.9959D-01	2.9957D-01	2.9957D-01
476	2.9957D-01	2.9957D-01	2.9955D-01	2.9956D-01
477	2.9956D-01	2.9955D-01	2.9954D-01	2.9954D-01
478	2.9954D-01	2.9954D-01	2.9953D-01	2.9953D-01
479	2.9953D-01	2.9953D-01	2.9951D-01	2.9951D-01
480	2.9951D-01	2.9951D-01	2.9926D-01	2.9950D-01
481	2.9950D-01	2.9926D-01	2.9682D-01	2.9760D-01
482	2.9760D-01	2.9682D-01	2.9114D-01	2.9250D-01
483	2.9966D-01	2.9966D-01	2.9963D-01	2.9964D-01
484	2.9964D-01	2.9963D-01	2.9961D-01	2.9961D-01
485	2.9961D-01	2.9961D-01	2.9959D-01	2.9959D-01
486	2.9959D-01	2.9959D-01	2.9956D-01	2.9957D-01
487	2.9957D-01	2.9956D-01	2.9955D-01	2.9955D-01
488	2.9955D-01	2.9955D-01	2.9953D-01	2.9954D-01
489	2.9954D-01	2.9953D-01	2.9952D-01	2.9953D-01
490	2.9953D-01	2.9952D-01	2.9951D-01	2.9951D-01
491	2.9951D-01	2.9951D-01	2.9882D-01	2.9926D-01
492	2.9926D-01	2.9882D-01	2.9573D-01	2.9682D-01
493	2.9682D-01	2.9573D-01	2.8791D-01	2.9114D-01
494	2.9966D-01	2.9965D-01	2.9963D-01	2.9963D-01
495	2.9963D-01	2.9963D-01	2.9960D-01	2.9961D-01
496	2.9961D-01	2.9960D-01	2.9958D-01	2.9959D-01
497	2.9959D-01	2.9958D-01	2.9956D-01	2.9956D-01
498	2.9956D-01	2.9956D-01	2.9955D-01	2.9955D-01
499	2.9955D-01	2.9955D-01	2.9953D-01	2.9953D-01

500	2.9953D-01	2.9953D-01	2.9952D-01	2.9952D-01
501	2.9952D-01	2.9952D-01	2.9950D-01	2.9951D-01
502	2.9951D-01	2.9950D-01	2.9831D-01	2.9882D-01
503	2.9882D-01	2.9831D-01	2.9450D-01	2.9573D-01
504	2.9573D-01	2.9450D-01	2.7963D-01	2.8791D-01
505	2.9965D-01	2.9965D-01	2.9963D-01	2.9963D-01
506	2.9963D-01	2.9963D-01	2.9960D-01	2.9960D-01
507	2.9960D-01	2.9960D-01	2.9958D-01	2.9958D-01
508	2.9958D-01	2.9958D-01	2.9956D-01	2.9956D-01
509	2.9956D-01	2.9956D-01	2.9954D-01	2.9955D-01
510	2.9955D-01	2.9954D-01	2.9953D-01	2.9953D-01
511	2.9953D-01	2.9953D-01	2.9951D-01	2.9952D-01
512	2.9952D-01	2.9951D-01	2.9950D-01	2.9950D-01
513	2.9950D-01	2.9950D-01	2.9750D-01	2.9831D-01
514	2.9831D-01	2.9750D-01	2.9250D-01	2.9450D-01
515	2.9450D-01	2.9250D-01	2.6268D-01	2.7963D-01
516	2.9965D-01	2.9965D-01	2.9962D-01	2.9963D-01
517	2.9963D-01	2.9962D-01	2.9960D-01	2.9960D-01
518	2.9960D-01	2.9960D-01	2.9958D-01	2.9958D-01
519	2.9958D-01	2.9958D-01	2.9956D-01	2.9956D-01
520	2.9956D-01	2.9956D-01	2.9954D-01	2.9954D-01
521	2.9954D-01	2.9954D-01	2.9953D-01	2.9953D-01
522	2.9953D-01	2.9953D-01	2.9952D-01	2.9951D-01
523	2.9965D-01	2.9965D-01	2.9962D-01	2.9962D-01
524	2.9962D-01	2.9962D-01	2.9960D-01	2.9960D-01
525	2.9960D-01	2.9960D-01	2.9958D-01	2.9958D-01
526	2.9958D-01	2.9958D-01	2.9956D-01	2.9956D-01
527	2.9956D-01	2.9956D-01	2.9954D-01	2.9954D-01
528	2.9954D-01	2.9954D-01	2.9953D-01	2.9953D-01

OUTPUT TABLE 4.. DARCY VELOCITIES AT TIME = 0.0 ,(DELT = 1.0000D 02),(BAND WIDTH = 27)

ELEMENT	VEL-X AT NODES 1	2	3	4	VEL-Z AT NODES 1	2	3	4
1	2.9409D-08	2.9409D-08	2.3272D-08	2.3272D-08	-2.5318D-08	-3.1455D-08	-3.1455D-08	-2.5318D-08
2	2.3272D-08	2.3272D-08	7.4167D-09	7.4167D-09	-6.5383D-08	-8.1238D-08	-8.1238D-08	-6.5383D-08
3	7.4167D-09	7.4167D-09	-1.1544D-08	-1.1544D-08	-7.8146D-08	-9.7107D-08	-9.7107D-08	-7.8146D-08
4	-1.1544D-08	-1.1544D-08	-2.5692D-08	-2.5692D-08	-5.8267D-08	-7.2415D-08	-7.2415D-08	-5.8267D-08
5	-2.5692D-08	-2.5692D-08	-2.7585D-08	-2.7585D-08	-2.9625D-08	-3.6820D-08	-3.5550D-08	-2.8604D-08
6	-2.7535D-08	-2.7585D-08	-3.4390D-09	-3.4390D-09	-2.1125D-08	-2.6204D-08	-3.0487D-09	-2.4503D-09
7	-3.4390D-09	-3.4390D-09	-3.2850D-09	-3.2850D-09	-6.8513D-09	-8.5152D-09	-6.8150D-09	-5.4833D-09
8	-3.2850D-09	-3.2850D-09	-3.3821D-09	-3.3821D-09	-4.1176D-09	-5.1318D-09	-4.8156D-09	-3.8800D-09
9	-3.3821D-09	-3.3821D-09	-3.3246D-09	-3.3246D-09	-2.2079D-09	-2.7391D-09	-2.5714D-09	-2.0727D-09
10	-3.3246D-09	-3.3246D-09	-3.2743D-09	-3.2743D-09	-9.1134D-10	-1.1381D-09	-1.1134D-09	-8.9348D-10
11	-3.2743D-09	-3.2743D-09	-3.2098D-09	-3.2098D-09	-3.0188D-10	-3.7637D-10	-3.6812D-10	-2.9527D-10
12	1.0248D-07	1.0248D-07	8.1102D-08	8.1102D-08	-3.1455D-08	-5.2834D-08	-5.2834D-08	-3.1455D-08
13	8.1102D-08	8.1102D-08	2.5864D-08	2.5864D-08	-8.1238D-08	-1.3648D-07	-1.3648D-07	-8.1238D-08
14	2.5864D-08	2.5864D-08	-4.0216D-08	-4.0216D-08	-9.7107D-08	-1.6319D-07	-1.6319D-07	-9.7107D-08
15	-4.0216D-08	-4.0216D-08	-8.9543D-08	-8.9543D-08	-7.2415D-08	-1.2174D-07	-1.2174D-07	-7.2415D-08
16	-8.9543D-08	-8.9543D-08	-9.6160D-08	-9.6160D-08	-3.6820D-08	-6.1943D-08	-5.9812D-08	-3.5550D-08
17	-9.6160D-08	-9.6160D-08	-1.1984D-08	-1.1984D-08	-2.6284D-08	-4.4179D-08	-5.1245D-09	-3.0487D-09
18	-1.1984D-08	-1.1984D-08	-1.1465D-08	-1.1465D-08	-8.5152D-09	-1.4369D-08	-1.1500D-08	-6.8150D-09
19	-1.1465D-08	-1.1465D-08	-1.1787D-08	-1.1787D-08	-5.1318D-09	-8.6117D-09	-8.1147D-09	-4.8356D-09
20	-1.1787D-08	-1.1787D-08	-1.1602D-08	-1.1602D-08	-2.7391D-09	-4.6439D-09	-4.3595D-09	-2.5714D-09
21	-1.1602D-08	-1.1602D-08	-1.1426D-08	-1.1426D-08	-1.1381D-09	-1.9149D-09	-1.8733D-09	-1.1134D-09
22	-1.1426D-08	-1.1426D-08	-1.1200D-08	-1.1200D-08	-3.7637D-10	-6.3261D-10	-6.1873D-10	-3.6812D-10
23	2.2518D-07	2.2518D-07	1.7825D-07	1.7825D-07	-5.2834D-08	-9.9764D-08	-9.9764D-08	-5.2834D-08
24	1.7825D-07	1.7825D-07	5.6939D-08	5.6939D-08	-1.3648D-07	-2.5779D-07	-2.5779D-07	-1.3648D-07
25	5.6939D-08	5.6939D-08	-8.8308D-08	-8.8308D-08	-1.6319D-07	-3.0843D-07	-3.0843D-07	-1.6319D-07
26	-8.8308D-08	-8.8308D-08	-1.9686D-07	-1.9686D-07	-1.2174D-07	-2.3023D-07	-2.3029D-07	-1.2174D-07
27	-1.9686D-07	-1.9686D-07	-2.1142D-07	-2.1142D-07	-6.1948D-08	-1.1723D-07	-1.1319D-07	-5.9812D-08
28	-2.1142D-07	-2.1142D-07	-2.6374D-08	-2.6374D-08	-4.4179D-08	-8.4050D-08	-9.7504D-09	-5.1245D-09
29	-2.6374D-08	-2.6374D-08	-2.5214D-08	-2.5214D-08	-1.4369D-08	-2.7197D-08	-2.1766D-08	-1.1500D-08
30	-2.5214D-08	-2.5214D-08	-2.5999D-08	-2.5998D-08	-8.6117D-09	-1.6534D-08	-1.5580D-08	-8.1147D-09
31	-2.5998D-08	-2.5999D-08	-2.5554D-08	-2.5553D-08	-4.6439D-09	-8.7168D-09	-8.1830D-09	-4.3595D-09
32	-2.5553D-08	-2.5554D-08	-2.5167D-08	-2.5167D-08	-1.9149D-09	-3.6440D-09	-3.5654D-09	-1.8733D-09
33	-2.5167D-08	-2.5167D-08	-2.4671D-08	-2.4671D-08	-6.3261D-10	-1.2067D-09	-1.1802D-09	-6.1873D-10
34	4.5675D-07	4.5675D-07	3.6176D-07	3.6176D-07	-9.9764D-08	-1.9476D-07	-1.9476D-07	-9.9764D-08
35	3.6176D-07	3.6176D-07	1.1594D-07	1.1594D-07	-2.5779D-07	-5.0361D-07	-5.0361D-07	-2.5779D-07
36	1.1594D-07	1.1594D-07	-1.7888D-07	-1.7888D-07	-3.0843D-07	-6.0326D-07	-6.0326D-07	-3.0843D-07
37	-1.7888D-07	-1.7888D-07	-3.9971D-07	-3.9971D-07	-2.3029D-07	-4.5112D-07	-4.5112D-07	-2.3029D-07
38	-3.9971D-07	-3.9971D-07	-4.2960D-07	-4.2960D-07	-1.1723D-07	-2.3030D-07	-2.2236D-07	-1.1319D-07
39	-4.2960D-07	-4.2960D-07	-5.3557D-08	-5.3554D-08	-8.4058D-08	-1.6428D-07	-1.9057D-08	-9.7504D-09
40	-5.3554D-08	-5.3557D-08	-5.1484D-08	-5.1483D-08	-2.7197D-08	-5.4134D-08	-4.3321D-08	-2.1766D-08
41	-5.1483D-08	-5.1484D-08	-5.2875D-08	-5.2874D-08	-1.6534D-08	-3.1963D-08	-3.0119D-08	-1.5580D-08
42	-5.2874D-08	-5.2875D-08	-5.2173D-08	-5.2172D-08	-8.7168D-09	-1.7722D-08	-1.6636D-08	-8.1830D-09
43	-5.2172D-08	-5.2173D-08	-5.1392D-08	-5.1390D-08	-3.6446D-09	-7.2508D-09	-7.0931D-09	-3.5654D-09
44	-5.1390D-08	-5.1392D-08	-5.0378D-08	-5.0376D-08	-1.2067D-09	-2.3908D-09	-2.3382D-09	-1.1802D-09
45	9.0840D-07	9.0840D-07	7.2022D-07	7.2022D-07	-1.9476D-07	-3.8294D-07	-3.8294D-07	-1.9476D-07
46	7.2022D-07	7.2022D-07	2.3236D-07	2.3236D-07	-5.0361D-07	-9.9146D-07	-9.9146D-07	-5.0361D-07
47	2.3236D-07	2.3236D-07	-3.5482D-07	-3.5482D-07	-6.0326D-07	-1.1904D-06	-1.1904D-06	-6.0326D-07
48	-3.5482D-07	-3.5482D-07	-7.9661D-07	-7.9661D-07	-4.5112D-07	-8.9291D-07	-8.9291D-07	-4.5112D-07
49	-7.9661D-07	-7.9661D-07	-8.5656D-07	-8.5656D-07	-2.3010D-07	-4.5667D-07	-4.4092D-07	-2.2236D-07

50	-8.5656D-07	-8.5656D-07	-1.0721D-07	-1.0719D-07	-1.6428D-07	-3.3302D-07	-3.8615D-08	-1.9057D-08
51	-1.0719D-07	-1.0721D-07	-1.0268D-07	-1.0268D-07	-5.4134D-08	-1.0691D-07	-8.5555D-08	-4.1323D-08
52	-1.0268D-07	-1.0268D-07	-1.0682D-07	-1.0682D-07	-3.1963D-08	-6.7571D-08	-6.3673D-08	-3.0119D-08
53	-1.0682D-07	-1.0682D-07	-1.0480D-07	-1.0479D-07	-1.7722D-08	-3.3756D-08	-3.1689D-08	-1.6636D-08
54	-1.0479D-07	-1.0480D-07	-1.0321D-07	-1.0320D-07	-7.2508D-09	-1.4267D-08	-1.3957D-08	-7.0931D-09
55	-1.0320D-07	-1.0321D-07	-1.0116D-07	-1.0116D-07	-2.1908D-09	-4.7390D-09	-4.6345D-09	-2.3382D-09
56	1.7947D-06	1.7947D-06	1.4259D-06	1.4259D-06	-3.8294D-07	-7.5175D-07	-7.5175D-07	-3.8294D-07
57	1.4259D-06	1.4259D-06	4.6593D-07	4.6593D-07	-9.9146D-07	-1.9514D-06	-1.9514D-06	-9.9146D-07
58	4.6593D-07	4.6593D-07	-6.9714D-07	-6.9714D-07	-1.1904D-06	-2.3535D-06	-2.3535D-06	-1.1904D-06
59	-6.9714D-07	-6.9714D-07	-1.5804D-06	-1.5804D-06	-8.9291D-07	-1.7762D-06	-1.7762D-06	-8.9291D-07
60	-1.5804D-06	-1.5804D-06	-1.7036D-06	-1.7036D-06	-4.5667D-07	-9.1676D-07	-8.8515D-07	-4.4092D-07
61	-1.7036D-06	-1.7036D-06	-2.1260D-07	-2.1256D-07	-3.3302D-07	-6.5427D-07	-7.5922D-08	-3.8635D-08
62	-2.1256D-07	-2.1260D-07	-2.0869D-07	-2.0866D-07	-1.0691D-07	-2.2744D-07	-1.8199D-07	-8.5555D-08
63	-2.0866D-07	-2.0869D-07	-2.1287D-07	-2.1284D-07	-6.7571D-08	-1.2495D-07	-1.1774D-07	-6.3673D-08
64	-2.1284D-07	-2.1287D-07	-2.1224D-07	-2.1221D-07	-3.3756D-08	-7.7783D-08	-7.3021D-08	-3.1689D-08
65	-2.1221D-07	-2.1224D-07	-2.0933D-07	-2.0930D-07	-1.4267D-08	-3.1756D-08	-3.1065D-08	-1.3957D-08
66	-2.0930D-07	-2.0933D-07	-2.0525D-07	-2.0525D-07	-4.7390D-09	-1.0433D-08	-1.0202D-08	-4.6345D-09
67	3.5281D-06	3.5281D-06	2.8144D-06	2.8144D-06	-7.5175D-07	-1.4654D-06	-1.4654D-06	-7.5175D-07
68	2.8144D-06	2.8144D-06	9.4305D-07	9.4305D-07	-1.9514D-06	-3.8228D-06	-3.8228D-06	-1.9514D-06
69	9.4305D-07	9.4305D-07	-1.3566D-06	-1.3566D-06	-2.3535D-06	-4.6531D-06	-4.6531D-06	-2.3535D-06
70	-1.3566D-06	-1.3566D-06	-3.1300D-06	-3.1300D-06	-1.7762D-06	-3.5497D-06	-3.5497D-06	-1.7762D-06
71	-3.1300D-06	-3.1300D-06	-3.3845D-06	-3.3844D-06	-9.1676D-07	-1.8549D-06	-1.7910D-06	-8.8515D-07
72	-3.3844D-06	-3.3845D-06	-4.2923D-07	-4.2889D-07	-6.5427D-07	-1.4334D-06	-1.6646D-07	-7.5922D-08
73	-4.2889D-07	-4.2923D-07	-4.1178D-07	-4.1157D-07	-2.2744D-07	-4.4149D-07	-3.5315D-07	-1.8199D-07
74	-4.1157D-07	-4.1178D-07	-4.4543D-07	-4.4532D-07	-1.2495D-07	-3.2848D-07	-3.0945D-07	-1.1774D-07
75	-4.4532D-07	-4.4543D-07	-4.3370D-07	-4.3358D-07	-7.7783D-08	-1.3291D-07	-1.2477D-07	-7.3021D-08
76	-4.3358D-07	-4.3370D-07	-4.2658D-07	-4.2646D-07	-3.1756D-08	-5.5375D-08	-5.4172D-08	-3.1065D-08
77	-4.2646D-07	-4.2658D-07	-4.1789D-07	-4.1779D-07	-1.0433D-08	-1.8489D-08	-1.8079D-08	-1.0202D-08
78	6.8822D-06	6.8822D-06	5.5336D-06	5.5336D-06	-1.4654D-06	-2.8140D-06	-2.8140D-06	-1.4654D-06
79	5.5336D-06	5.5336D-06	1.9419D-06	1.9419D-06	-3.8228D-06	-7.4145D-06	-7.4145D-06	-3.8228D-06
80	1.9419D-06	1.9419D-06	-2.5838D-06	-2.5838D-06	-4.6531D-06	-9.1788D-06	-9.1788D-06	-4.6531D-06
81	-2.5838D-06	-2.5838D-06	-6.2121D-06	-6.2121D-06	-3.5497D-06	-7.1780D-06	-7.1780D-06	-3.5497D-06
82	-6.2121D-06	-6.2121D-06	-6.7578D-06	-6.7558D-06	-1.8549D-06	-3.8167D-06	-3.6863D-06	-1.7910D-06
83	-6.7558D-06	-6.7578D-06	-8.4848D-07	-8.4624D-07	-1.4334D-06	-2.7622D-06	-3.2153D-07	-1.6646D-07
84	-8.4624D-07	-8.4848D-07	-9.0923D-07	-9.0792D-07	-4.4149D-07	-1.1665D-06	-9.3197D-07	-3.5315D-07
85	-9.0792D-07	-9.0923D-07	-8.9109D-07	-8.9065D-07	-3.2848D-07	-4.5414D-07	-4.2743D-07	-3.0945D-07
86	-8.9065D-07	-8.9109D-07	-9.2038D-07	-9.1985D-07	-1.3291D-07	[illegible].3028D-07	-4.0398D-07	-1.2477D-07
87	-9.1985D-07	-9.2038D-07	-9.1329D-07	-9.1275D-07	-5.5375D-08	-1.8722D-07	-1.8316D-07	-5.4172D-08
88	-9.1275D-07	-9.1329D-07	-8.9724D-07	-8.9669D-07	-1.8489D-08	-6.1725D-08	-6.0355D-08	-1.8079D-08
89	1.3221D-05	1.3221D-05	1.0806D-05	1.0806D-05	-2.8140D-06	-5.2294D-06	-5.2294D-06	-2.8140D-06
90	1.0806D-05	1.0806D-05	4.1318D-06	4.1318D-06	-7.4145D-06	-1.4089D-05	-1.4089D-05	-7.4145D-06
91	4.1318D-06	4.1318D-06	-4.7531D-06	-4.7531D-06	-9.1788D-06	-1.8064D-05	-1.8064D-05	-9.1788D-06
92	-4.7531D-06	-4.7531D-06	-1.2235D-05	-1.2235D-05	-7.1780D-06	-1.4660D-05	-1.4660D-05	-7.1780D-06
93	-1.2235D-05	-1.2235D-05	-1.3616D-05	-1.3608D-05	-3.8167D-06	-8.4522D-06	-8.1681D-06	-3.6863D-06
94	-1.3608D-05	-1.3616D-05	-1.8127D-06	-1.8025D-06	-2.7622D-06	-7.4596D-06	-8.7271D-07	-3.2153D-07
95	-1.8025D-06	-1.8127D-06	-1.6789D-06	-1.6744D-06	-1.1665D-06	-1.9102D-06	-1.5216D-06	-9.3197D-07
96	-1.6744D-06	-1.6789D-06	-2.1435D-06	-2.1410D-06	-4.5414D-07	-2.4619D-06	-2.3136D-06	-4.2743D-07
97	-2.1410D-06	-2.1435D-06	-2.0632D-06	-2.0606D-06	-4.3028D-07	-6.1005D-07	-5.7283D-07	-4.0398D-07
98	-2.0606D-06	-2.0632D-06	-2.0194D-06	-2.0167D-06	-1.8722D-07	-1.9625D-07	-1.9199D-07	-1.8316D-07
99	-2.0167D-06	-2.0194D-06	-1.9748D-06	-1.9721D-06	-6.1725D-08	-6.4078D-08	-5.2658D-08	-6.0355D-08

100	2.4683D-05	2.4683D-05	2.0763D-05	2.0763D-05	-5.2294D-06	-9.1494D-06	-9.1494D-06	-5.2294D-06
101	2.0763D-05	2.0763D-05	9.2907D-06	9.2907D-06	-1.4089D-05	-2.5561D-05	-2.5561D-05	-1.4089D-05
102	9.2907D-06	9.2907D-06	-7.9445D-06	-7.9445D-06	-1.8064D-05	-3.5299D-05	-3.5299D-05	-1.8064D-05
103	-7.9445D-06	-7.9445D-06	-2.4413D-05	-2.4413D-05	-1.4660D-05	-3.1129D-05	-3.1129D-05	-1.4660D-05
104	-2.4413D-05	-2.4413D-05	-2.7136D-05	-2.7105D-05	-8.4522D-06	-1.7538D-05	-1.6968D-05	-8.1681D-06
105	-2.7105D-05	-2.7136D-05	-3.5810D-06	-3.5423D-06	-7.4596D-06	-1.5410D-05	-1.8205D-06	-8.7271D-07
106	-3.5423D-06	-3.5810D-06	-5.3870D-06	-5.3420D-06	-1.9102D-06	-9.9264D-06	-7.8880D-06	-1.5216D-06
107	-5.3420D-06	-5.3870D-06	-4.3793D-06	-4.3688D-06	-2.4619D-06	-1.5241D-07	-1.4238D-07	-2.3136D-06
108	-4.3688D-06	-4.3793D-06	-4.7503D-06	-4.7363D-06	-6.1005D-07	-2.8677D-06	-2.6942D-06	-5.7283D-07
109	-4.7363D-06	-4.7503D-06	-4.7777D-06	-4.7629D-06	-1.9625D-07	-1.5218D-06	-1.4890D-06	-1.9199D-07
110	-4.7629D-06	-4.7777D-06	-4.7162D-06	-4.7011D-06	-6.4078D-08	-5.1418D-07	-5.0283D-07	-6.2658D-08
111	4.4062D-05	4.4062D-05	3.8522D-05	3.8522D-05	-9.1494D-06	-1.4689D-05	-1.4689D-05	-9.1494D-06
112	3.8522D-05	3.8522D-05	2.1389D-05	2.1389D-05	-2.5561D-05	-4.2694D-05	-4.2694D-05	-2.5561D-05
113	2.1389D-05	2.1389D-05	-8.5893D-06	-8.5893D-06	-3.5299D-05	-6.5277D-05	-6.5277D-05	-3.5299D-05
114	-8.5893D-06	-8.5893D-06	-4.8377D-05	-4.8377D-05	-3.1129D-05	-7.0917D-05	-7.0917D-05	-3.1129D-05
115	-4.8377D-05	-4.8377D-05	-6.0474D-05	-6.0320D-05	-1.7538D-05	-5.2464D-05	-5.0888D-05	-1.6968D-05
116	-6.0320D-05	-6.0474D-05	-8.6413D-06	-8.4270D-06	-1.5410D-05	-4.3054D-05	-5.2023D-06	-1.8205D-06
117	-8.4270D-06	-8.6413D-06	-4.6958D-06	-4.6621D-06	-9.9264D-06	-3.6156D-06	-2.8222D-06	-7.8880D-06
118	-4.6621D-06	-4.6958D-06	-1.4172D-05	-1.4063D-05	-1.5241D-07	-3.5045D-05	-3.2753D-05	-1.4238D-07
119	-1.4063D-05	-1.4172D-05	-1.5507D-05	-1.5361D-05	-2.8677D-06	-1.0571D-05	-9.9492D-06	-2.6942D-06
120	-1.5361D-05	-1.5507D-05	-1.5344D-05	-1.5194D-05	-1.5218D-06	-3.2293D-06	-3.1607D-06	-1.4890D-06
121	-1.5194D-05	-1.5344D-05	-1.5058D-05	-1.4907D-05	-5.1418D-07	-1.0216D-06	-9.9929D-07	-5.0283D-07
122	7.4171D-05	7.4171D-05	6.7534D-05	6.7534D-05	-1.4689D-05	-2.1326D-05	-2.1326D-05	-1.4689D-05
123	6.7534D-05	6.7534D-05	4.6286D-05	4.6286D-05	-4.2694D-05	-6.3943D-05	-6.3943D-05	-4.2694D-05
124	4.6286D-05	4.6286D-05	5.2520D-06	5.2520D-06	-6.5277D-05	-1.0631D-04	-1.0631D-04	-6.5277D-05
125	5.2520D-06	5.2520D-06	-7.0197D-05	-7.0197D-05	-7.0917D-05	-1.4637D-04	-1.4637D-04	-7.0917D-05
126	-7.0197D-05	-7.0197D-05	-1.1446D-04	-1.1392D-04	-5.2464D-05	-1.7059D-04	-1.6625D-04	-5.0888D-05
127	-1.1392D-04	-1.1446D-04	-2.9212D-05	-2.6085D-05	-4.3054D-05	-2.9938D-04	-4.0319D-05	-5.2023D-06
128	-2.6085D-05	-2.9212D-05	-7.7470D-05	-6.9976D-05	-3.6156D-06	-1.8201D-04	-1.4045D-04	-2.8222D-06
129	-6.9976D-05	-7.7470D-05	-3.5225D-05	-3.4580D-05	-3.5045D-05	8.2893D-05	7.1282D-05	-3.2753D-05
130	-3.4580D-05	-3.5225D-05	-2.1585D-05	-2.1309D-05	-1.0571D-05	2.9775D-05	2.7869D-05	-9.9492D-06
131	-2.1309D-05	-2.1585D-05	-1.9763D-05	-1.9521D-05	-3.2293D-06	1.0554D-05	1.0324D-05	-3.1607D-06
132	-1.9521D-05	-1.9763D-05	-1.8896D-05	-1.8665D-05	-1.0216D-06	3.4158D-06	3.3413D-06	-9.9929D-07
133	1.1681D-04	1.1681D-04	1.1019D-04	1.1019D-04	-2.1326D-05	-2.7942D-05	-2.7942D-05	-2.1326D-05
134	1.1019D-04	1.1019D-04	8.8839D-05	8.8839D-05	-6.3943D-05	-8.5296D-05	-8.5296D-05	-6.3943D-05
135	8.8839D-05	8.8839D-05	4.7144D-05	4.7144D-05	-1.0631D-04	-1.4801D-04	-1.4801D-04	-1.0631D-04
136	4.7144D-05	4.7144D-05	-3.4479D-05	-3.4479D-05	-1.4637D-04	-2.2799D-04	-2.2799D-04	-1.4637D-04
137	-3.4479D-05	-3.4479D-05	-8.9984D-05	-8.9650D-05	-1.7059D-04	-3.1436D-04	-3.0751D-04	-1.6625D-04
138	-8.9650D-05	-8.9984D-05	-3.7054D-05	-3.1177D-05	-2.9938D-04	-6.5643D-04	-1.0469D-04	-4.0319D-05
139	-3.1177D-05	-3.7054D-05	-1.1265D-04	-9.7610D-05	-1.8201D-04	-4.9963D-04	-3.7427D-04	-1.4045D-04
140	1.7181D-04	1.7181D-04	1.6652D-04	1.6652D-04	-2.7942D-05	-3.3235D-05	-3.3235D-05	-2.7942D-05
141	1.6652D-04	1.6652D-04	1.4957D-04	1.4957D-04	-8.5296D-05	-1.0224D-04	-1.0224D-04	-8.5296D-05
142	1.4957D-04	1.4957D-04	1.1821D-04	1.1821D-04	-1.4801D-04	-1.7937D-04	-1.7937D-04	-1.4801D-04
143	1.1821D-04	1.1821D-04	7.3671D-05	7.3671D-05	-2.2799D-04	-2.7253D-04	-2.7253D-04	-2.2799D-04
144	7.3671D-05	7.3671D-05	5.5858D-05	5.5987D-05	-3.1436D-04	-3.5545D-04	-3.4690D-04	-3.0751D-04
145	5.5987D-05	5.5858D-05	7.3249D-06	7.6060D-06	-6.5643D-04	-6.7560D-04	-1.0400D-04	-1.0468D-04
146	7.6060D-06	7.3249D-06	1.5111D-05	1.5993D-05	-4.9963D-04	-4.4808D-04	-3.3367D-04	-3.7427D-04
147	2.3670D-04	2.3670D-04	2.3378D-04	2.3378D-04	-3.3235D-05	-3.6154D-05	-3.6154D-05	-3.3235D-05
148	2.3378D-04	2.3378D-04	2.2444D-04	2.2444D-04	-1.0224D-04	-1.1158D-04	-1.1158D-04	-1.0224D-04
149	2.2444D-04	2.2444D-04	2.0746D-04	2.0746D-04	-1.7937D-04	-1.9635D-04	-1.9635D-04	-1.7937D-04

150	2.0746D-04	2.0746D-04	1.8903D-04	1.8903D-04	-2.7253D-04	-2.9096D-04	-2.9096D-04	-2.7253D-04
151	1.8903D-04	1.8903D-04	1.8072D-04	1.8209D-04	-3.5545D-04	-3.6158D-04	-3.5023D-04	-3.4690D-04
152	1.8209D-04	1.8072D-04	2.4025D-05	2.7393D-05	-6.7560D-04	-6.8077D-04	-9.2605D-05	-1.0400D-04
153	2.7393D-05	2.4025D-05	6.3928D-06	6.4351D-06	-4.4808D-04	-4.3410D-04	-3.6615D-04	-3.3367D-04
154	3.0710D-04	3.0710D-04	3.0704D-04	3.0704D-04	-3.6154D-05	-3.6206D-05	-3.6206D-05	-3.6154D-05
155	3.0704D-04	3.0704D-04	3.0706D-04	3.0706D-04	-1.1158D-04	-1.1156D-04	-1.1156D-04	-1.1158D-04
156	3.0706D-04	3.0706D-04	3.0588D-04	3.0588D-04	-1.9635D-04	-1.9753D-04	-1.9753D-04	-1.9635D-04
157	3.0588D-04	3.0589D-04	2.9183D-04	2.9183D-04	-2.9096D-04	-3.0501D-04	-3.0501D-04	-2.9096D-04
158	2.9183D-04	2.9183D-04	2.6437D-04	2.6918D-04	-3.6158D-04	-3.9638D-04	-3.7705D-04	-3.5023D-04
159	2.6918D-04	2.6437D-04	2.9910D-05	3.3953D-05	-6.8077D-04	-7.1667D-04	-8.7446D-05	-9.2605D-05
160	3.3953D-05	2.9910D-05	1.9501D-05	1.9912D-05	-4.3410D-04	-4.0519D-04	-3.7396D-04	-3.6615D-04
161	3.7777D-04	3.7777D-04	3.8032D-04	3.8032D-04	-3.6206D-05	-3.3654D-05	-3.3654D-05	-3.6206D-05
162	3.8032D-04	3.8032D-04	3.8918D-04	3.8918D-04	-1.1156D-04	-1.0271D-04	-1.0271D-04	-1.1156D-04
163	3.8916D-04	3.8918D-04	4.0836D-04	4.0836D-04	-1.9753D-04	-1.7834D-04	-1.7834D-04	-1.9753D-04
164	4.0836D-04	4.0836D-04	4.2967D-04	4.2967D-04	-3.0501D-04	-2.8370D-04	-2.8370D-04	-3.0501D-04
165	4.2967D-04	4.2967D-04	2.4867D-04	3.7693D-04	-3.9638D-04	-4.7994D-04	-3.0119D-04	-3.7705D-04
166	3.7693D-04	2.4867D-04	2.9847D-05	3.1525D-05	-7.1667D-04	-6.6835D-04	-1.1703D-04	-8.7446D-05
167	3.1525D-05	2.9847D-05	6.1364D-06	6.1777D-06	-4.0519D-04	-4.4265D-04	-4.3549D-04	-3.7996D-04
168	4.4395D-04	4.4395D-04	4.4820D-04	4.4820D-04	-3.3654D-05	-2.9411D-05	-2.9411D-05	-3.3654D-05
169	4.4020D-04	4.4820D-04	4.6229D-04	4.6229D-04	-1.0271D-04	-8.8616D-05	-8.8616D-05	-1.0271D-04
170	4.6229D-04	4.6229D-04	4.9430D-04	4.9430D-04	-1.7834D-04	-1.4633D-04	-1.4633D-04	-1.7834D-04
171	4.9430D-04	4.9430D-04	5.7659D-04	5.8821D-04	-2.8370D-04	-1.8979D-04	-1.8604D-04	-2.8370D-04
172	5.8821D-04	5.7659D-04	9.4551D-05	4.0605D-04	-4.7994D-04	-3.2630D-04	-4.8643D-05	-3.0119D-04
173	4.0605D-04	9.4551D-05	6.6279D-05	7.1738D-05	-6.6835D-04	-1.5352D-04	-1.0666D-04	-1.1703D-04
174	7.1738D-05	6.6279D-05	1.5585D-04	1.9064D-04	-4.4265D-04	-1.2710D-04	-1.1065D-04	-4.3549D-04
175	5.0242D-04	5.0242D-04	5.0719D-04	5.0719D-04	-2.9411D-05	-2.4643D-05	-2.4643D-05	-2.9411D-05
176	5.0719D-04	5.0719D-04	5.2243D-04	5.2243D-04	-8.8616D-05	-7.3377D-05	-7.3377D-05	-8.8616D-05
177	5.2243D-04	5.2243D-04	5.4830D-04	5.4830D-04	-1.4633D-04	-1.2046D-04	-1.2046D-04	-1.4633D-04
178	5.4830D-04	5.4830D-04	5.7253D-04	5.9464D-04	-1.8979D-04	-1.3147D-04	-1.2408D-04	-1.8604D-04
179	5.9464D-04	5.7253D-04	7.7092D-05	1.0284D-04	-3.2630D-04	-8.5035D-05	-9.8700D-06	-4.9643D-05
180	1.0284D-04	7.7092D-05	9.0128D-05	1.0243D-04	-1.5352D-04	-3.1509D-05	-2.5695D-05	-1.0666D-04
181	1.0243D-04	9.0128D-05	1.2328D-04	1.3208D-04	-1.2710D-04	-3.4161D-06	-3.1547D-06	-1.1065D-04
182	1.3208D-04	1.2328D-04	6.7200D-05	7.0135D-05	1.4517D-04	-3.8124D-05	-3.5986D-05	1.3349D-04
183	7.0135D-05	6.7200D-05	4.6930D-05	4.6930D-05	5.7627D-05	-8.2093D-06	-7.9976D-06	5.3792D-05
184	4.6930D-05	4.6930D-05	4.4621D-05	4.4621D-05	2.1080D-05	-2.0082D-06	-2.0082D-06	2.1080D-05
185	4.4621D-05	4.4621D-05	4.3830D-05	4.3830D-05	7.0460D-06	-8.6389D-07	-8.6389D-07	7.0460D-06
186	5.5119D-04	5.5119D-04	5.5680D-04	5.5657D-04	-2.4643D-05	-1.9035D-05	-1.9035D-05	-2.4643D-05
187	5.5463D-04	5.5526D-04	5.7100D-04	5.7069D-04	-7.3377D-05	-5.7631D-05	-5.7631D-05	-7.3377D-05
188	5.6975D-04	5.7023D-04	5.9329D-04	5.9329D-04	-1.2046D-04	-9.7374D-05	-9.7374D-05	-1.2046D-04
189	5.9329D-04	5.9329D-04	3.2834D-04	5.5320D-04	-1.3147D-04	-1.3892D-04	-7.7861D-05	-1.2408D-04
190	5.5476D-04	3.2963D-04	6.1637D-05	6.4781D-05	-8.5035D-05	-4.5510D-05	-8.4587D-06	-9.8700D-06
191	6.3915D-05	6.1667D-05	5.9165D-05	5.9751D-05	-3.1509D-05	-7.7203D-06	-6.4731D-06	-2.5695D-05
192	6.0642D-05	5.8905D-05	5.1278D-05	5.2731D-05	-3.4151D-06	-1.2959D-05	-1.2069D-05	-3.1547D-06
193	4.9933D-05	5.1959D-05	5.7981D-05	5.8864D-05	-3.8124D-05	-3.5514D-06	-3.3120D-06	-3.5986D-05
194	5.9420D-05	5.7927D-05	5.8530D-05	5.8490D-05	-8.2093D-06	-5.9901D-06	-5.9901D-06	-7.9976D-06
195	5.8609D-05	5.8565D-05	5.8346D-05	5.8390D-05	-2.0082D-06	-4.2007D-06	-4.2007D-06	-2.0082D-06
196	5.8413D-05	5.8373D-05	5.8176D-05	5.8215D-05	-8.6389D-07	-2.8385D-06	-2.8385D-06	-8.6389D-07
197	5.9208D-04	5.9208D-04	5.9579D-04	5.9563D-04	-1.9035D-05	-1.5176D-05	-1.5176D-05	-1.9035D-05
198	5.9409D-04	5.9459D-04	6.0724D-04	6.0650D-04	-5.7631D-05	-4.5224D-05	-4.5224D-05	-5.7631D-05
199	6.0411D-04	6.0579D-04	6.3440D-04	6.3216D-04	-9.7374D-05	-6.9327D-05	-6.9327D-05	-9.7374D-05

200	6.2883D-04	6.3335D-04	2.3579D-04	3.8157D-04	-1.3892D-04	-8.2418D-05	-2.8263D-05	-7.7861D-05
201	3.8545D-04	2.3426D-04	6.7483D-05	6.9955D-05	-4.55.0D-05	-4.1061D-05	-1.2102D-05	-8.4587D-06
202	7.0029D-05	6.7189D-05	5.5133D-05	5.6236D-05	-7.7203D-06	-1.5043D-05	-1.2925D-05	-6.4731D-06
203	5.5458D-05	5.5443D-05	5.2003D-05	5.2602D-05	-1.2959D-05	-1.0345D-05	-9.5461D-06	-1.2069D-05
204	5.3283D-05	5.1977D-05	4.7038D-05	4.7521D-05	-3.5514D-06	-9.8692D-06	-9.3417D-06	-3.3120D-06
205	4.7306D-05	4.7233D-05	4.6959D-05	4.7032D-05	-5.9901D-06	-6.9031D-06	-6.9031D-06	-5.9901D-06
206	4.7176D-05	4.7005D-05	4.6792D-05	4.6962D-05	-4.2007D-06	-6.3315D-06	-6.3315D-06	-4.2007D-06
207	4.7071D-05	4.6820D-05	4.6507D-05	4.6758D-05	-2.8385D-06	-5.9762D-06	-5.9762D-06	-2.8385D-06
208	6.2701D-04	6.2701D-04	6.2794D-04	6.2792D-04	-1.5176D-05	-1.4155D-05	-1.4155D-05	-1.5176D-05
209	6.2732D-04	6.2743D-04	6.3299D-04	6.3244D-04	-4.5224D-05	-3.9666D-05	-3.9666D-05	-4.5224D-05
210	6.3003D-04	6.3138D-04	6.4497D-04	6.4280D-04	-6.9327D-05	-5.5738D-05	-5.5738D-05	-6.9327D-05
211	6.4070D-04	6.4346D-04	6.6626D-04	2.2479D-04	-8.2418D-05	-6.5201D-05	-4.6111D-05	-2.8263D-05
212	2.2198D-04	4.5414D-04	6.6330D-05	6.4430D-05	-4.1061D-05	-1.0118D-04	-1.5007D-05	-1.2102D-05
213	6.3783D-05	6.5419D-05	5.3999D-05	5.3749D-05	-1.5043D-05	-1.9147D-05	-1.6136D-05	-1.2925D-05
214	5.4369D-05	5.4158D-05	4.8469D-05	4.3467D-05	-1.0345D-05	-1.5471D-05	-1.4370D-05	-9.5461D-06
215	4.8383D-05	4.8754D-05	4.4149D-05	4.4754D-05	-9.8692D-06	-1.3275D-05	-1.2309D-05	-9.3437D-06
216	4.5389D-05	4.4246D-05	4.2593D-05	4.3592D-05	-6.9031D-06	-1.1937D-05	-1.1896D-05	-6.9031D-06
217	4.3706D-05	4.2685D-05	4.2175D-05	4.3196D-05	-6.3315D-06	-1.1435D-05	-1.1435D-05	-6.3315D-06
218	4.3267D-05	4.2188D-05	4.1649D-05	4.2727D-05	-5.9762D-06	-1.1369D-05	-1.1369D-05	-5.9762D-06
219	6.5851D-04	6.5851D-04	6.5940D-04	6.5930D-04	-1.4155D-05	-1.3172D-05	-1.3172D-05	-1.4155D-05
220	6.5675D-04	6.5666D-04	6.5579D-04	6.5590D-04	-3.9666D-05	-4.0509D-05	-4.0609D-05	-3.9666D-05
221	6.5397D-04	6.5279D-04	6.4353D-04	6.4609D-04	-5.5738D-05	-6.5591D-05	-6.5591D-05	-5.5738D-05
222	6.4353D-04	6.3426D-04	5.8592D-04	4.3427D-04	-6.5201D-05	-1.0125D-04	-9.8341D-05	-4.6111D-05
223	4.1775D-04	5.7336D-04	7.0829D-05	6.1906D-05	-1.0118D-04	-1.4022D-04	-1.7338D-05	-1.5007D-05
224	6.0581D-05	7.0440D-05	5.5520D-05	5.2046D-05	-1.9147D-05	-1.8553D-05	-1.4376D-05	-1.6136D-05
225	5.2232D-05	5.4233D-05	4.8294D-05	4.7615D-05	-1.5471D-05	-1.8972D-05	-1.7219D-05	-1.4370D-05
226	4.7921D-05	4.8108D-05	4.3147D-05	4.2984D-05	-1.3275D-05	-1.7884D-05	-1.6563D-05	-1.2309D-05
227	4.3081D-05	4.3286D-05	4.0667D-05	4.1835D-05	-1.1937D-05	-1.6029D-05	-1.5546D-05	-1.1896D-05
228	4.1992D-05	4.0945D-05	4.0621D-05	4.1658D-05	-1.1435D-05	-1.4677D-05	-1.4677D-05	-1.1435D-05
229	4.1679D-05	4.0862D-05	4.0606D-05	4.1424D-05	-1.1369D-05	-1.3924D-05	-1.3924D-05	-1.1369D-05
230	6.9325D-04	6.9325D-04	6.9190D-04	6.9204D-04	-1.3172D-05	-1.4853D-05	-1.4853D-05	-1.3172D-05
231	6.8984D-04	6.8952D-04	6.8592D-04	6.8672D-04	-4.0609D-05	-4.4609D-05	-4.4609D-05	-4.0609D-05
232	6.8172D-04	6.8017D-04	6.7394D-04	6.7628D-04	-6.5591D-05	-7.3375D-05	-7.3375D-05	-6.5591D-05
233	6.6558D-04	6.6490D-04	6.6239D-04	3.4470D-04	-1.0125D-04	-1.0351D-04	-1.0340D-04	-9.8341D-05
234	6.3130D-04	6.6306D-04	2.0096D-04	8.0123D-05	-1.4022D-04	-1.0131D-04	-2.9929D-05	-1.7338D-05
235	7.9734D-05	1.9304D-04	6.8219D-05	6.0865D-05	-1.8553D-05	-5.4683D-05	-1.9695D-05	-1.4376D-05
236	5.9026D-05	6.4205D-05	5.1545D-05	5.1523D-05	-1.8972D-05	-2.9729D-05	-2.5062D-05	-1.7219D-05
237	5.1217D-05	5.0766D-05	4.4725D-05	4.4992D-05	-1.7884D-05	-2.6755D-05	-2.5028D-05	-1.6563D-05
238	4.5248D-05	4.4352D-05	3.9049D-05	4.1230D-05	-1.6029D-05	-2.5805D-05	-2.4127D-05	-1.5546D-05
239	4.1612D-05	3.8707D-05	3.6963D-05	4.0669D-05	-1.4677D-05	-2.4904D-05	-2.4396D-05	-1.4677D-05
240	4.1001D-05	3.6757D-05	3.5252D-05	3.9936D-05	-1.3924D-05	-2.4867D-05	-2.4569D-05	-1.3924D-05
241	7.3346D-04	7.3346D-04	7.3327D-04	7.3330D-04	-1.4853D-05	-1.5122D-05	-1.5122D-05	-1.4853D-05
242	7.2973D-04	7.2931D-04	7.2659D-04	7.2729D-04	-4.4609D-05	-4.8101D-05	-4.8101D-05	-4.4609D-05
243	7.2153D-04	7.2064D-04	7.1753D-04	7.1886D-04	-7.3375D-05	-7.7821D-05	-7.7821D-05	-7.3375D-05
244	7.0983D-04	7.0891D-04	7.1014D-04	7.0934D-04	-1.0351D-04	-1.0322D-04	-1.0322D-04	-1.0340D-04
245	7.1005D-04	7.0056D-04	6.7118D-04	2.0694D-04	-1.0131D-04	-1.3139D-04	-1.2807D-04	-2.9929D-05
246	1.9654D-04	6.7447D-04	1.3565D-04	7.2764D-05	-5.4683D-05	-1.2023D-04	-2.3507D-05	-1.9695D-05
247	6.8350D-05	1.3788D-04	6.4451D-05	6.1553D-05	-2.9729D-05	-1.8439D-05	-1.0449D-05	-2.5062D-05
248	6.0673D-05	7.3012D-05	6.4479D-05	5.6719D-05	-2.6755D-05	-3.2447D-05	-2.8684D-05	-2.5028D-05
249	5.6222D-05	5.6023D-05	4.7569D-05	5.0103D-05	-2.5805D-05	-4.1895D-05	-3.8496D-05	-2.4127D-05

250	4.9527D-05	4.7395D-05	4.5491D-05	4.7567D-05	-2.4904D-05	-1.8731D-05	-3.6046D-05	-2.4346D-05
251	4.7219D-05	4.5763D-05	4.4002D-05	4.5796D-05	-2.4867D-05	-3.7652D-05	-3.6974D-05	-2.4569D-05
252	7.6541D-04	7.6541D-04	7.8396D-04	7.8410D-04	-1.5122D-05	-1.7549D-05	-1.7549D-05	-1.5122D-05
253	7.8212D-04	7.8174D-04	7.7728D-04	7.7830D-04	-4.8101D-05	-5.4472D-05	-5.4472D-05	-4.8101D-05
254	7.7354D-04	7.7113D-04	7.6207D-04	7.6509D-04	-7.7821D-05	-9.2919D-05	-9.2919D-05	-7.7821D-05
255	7.6001D-04	7.5529D-04	7.3735D-04	7.4612D-04	-1.0322D-04	-1.2682D-04	-1.2682D-04	-1.0322D-04
256	7.3562D-04	7.3474D-04	7.3400D-04	7.1672D-04	-1.3139D-04	-1.3369D-04	-1.3369D-04	-1.2807D-04
257	7.2111D-04	7.3867D-04	7.3806D-04	1.4092D-04	-1.2023D-04	-1.2537D-04	-1.2537D-04	-2.3507D-05
258	1.4437D-04	7.0127D-04	6.6521D-04	8.0020D-05	-1.8439D-05	-1.7946D-04	-1.7519D-04	-1.0449D-05
259	6.4181D-05	6.4206D-04	3.8446D-04	5.8587D-05	-3.2447D-05	-2.0734D-04	-1.2029D-04	-2.8664D-05
260	4.8811D-05	3.6363D-04	8.2118D-05	4.8261D-05	-4.1895D-05	-1.4849D-04	-3.1444D-05	-3.8496D-05
261	4.8082D-05	7.1975D-05	6.6447D-05	4.7820D-05	-3.8731D-05	-4.4791D-05	-4.0886D-05	-3.8046D-05
262	4.8120D-05	6.3129D-05	6.0452D-05	4.7454D-05	-3.7652D-05	-4.5251D-05	-4.3155D-05	-3.6974D-05
263	8.3181D-04	8.3181D-04	8.3237D-04	8.3233D-04	-1.7549D-05	-1.7030D-05	-1.7030D-05	-1.7549D-05
264	8.2937D-04	8.2928D-04	8.2787D-04	8.2606D-04	-5.4472D-05	-5.5642D-05	-5.5642D-05	-5.4472D-05
265	8.2191D-04	8.2125D-04	8.1660D-04	8.1793D-04	-9.2919D-05	-9.7068D-05	-9.7068D-05	-9.2919D-05
266	8.0708D-04	8.0254D-04	7.8609D-04	7.9233D-04	-1.2682D-04	-1.4100D-04	-1.4100D-04	-1.2682D-04
267	7.8931D-04	7.7233D-04	7.6152D-04	7.7541D-04	-1.3369D-04	-1.7229D-04	-1.7229D-04	-1.3369D-04
268	7.7841D-04	7.5638D-04	7.3435D-04	7.5883D-04	-1.2537D-04	-1.8656D-04	-1.8656D-04	-1.2537D-04
269	7.3719D-04	7.3414D-04	7.2730D-04	7.1667D-04	-1.7946D-04	-1.8708D-04	-1.8611D-04	-1.7519D-04
270	7.0381D-04	7.2431D-04	7.1513D-04	4.1114D-04	-2.0734D-04	-1.9358D-04	-1.8909D-04	-1.2029D-04
271	3.9537D-04	6.9444D-04	5.4033D-04	8.4886D-05	-1.4844D-04	-2.2603D-04	-1.7273D-04	-3.1444D-05
272	7.5811D-05	5.2343D-04	1.8519D-04	7.1551D-05	-4.4791D-05	-1.9758D-04	-6.7838D-05	-4.0886D-05
273	6.6583D-05	1.6561D-04	9.0388D-05	6.6120D-05	-4.5251D-05	-9.6624D-05	-5.2185D-05	-4.3155D-05
274	8.6486D-04	8.6486D-04	8.6697D-04	8.6672D-04	-1.7030D-05	-1.4913D-05	-1.4913D-05	-1.7030D-05
275	8.6209D-04	8.6306D-04	8.7218D-04	8.6990D-04	-5.5642D-05	-4.7505D-05	-4.7505D-05	-5.5642D-05
276	8.5830D-04	8.6049D-04	8.6801D-04	8.6582D-04	-9.7068D-05	-8.9236D-05	-8.9236D-05	-9.7068D-05
277	8.5352D-04	8.5277D-04	8.4998D-04	8.5116D-04	-1.4100D-04	-1.4368D-04	-1.4368D-04	-1.4100D-04
278	8.3739D-04	8.3064D-04	8.2512D-04	8.3187D-04	-1.7229D-04	-1.8763D-04	-1.8763D-04	-1.7229D-04
279	8.2559D-04	8.1189D-04	8.0193D-04	8.1438D-04	-1.8656D-04	-2.1768D-04	-2.1768D-04	-1.8656D-04
280	8.1818D-04	7.8970D-04	7.6523D-04	7.9047D-04	-1.8708D-04	-2.4826D-04	-2.4826D-04	-1.8611D-04
281	7.8688D-04	7.5784D-04	7.3560D-04	7.4985D-04	-1.9358D-04	-2.6365D-04	-2.6262D-04	-1.8909D-04
282	7.3212D-04	7.3883D-04	7.1917D-04	5.5587D-04	-2.2603D-04	-2.5590D-04	-2.5173D-04	-1.7273D-04
283	5.4096D-04	7.2583D-04	7.1917D-04	1.8678D-04	-1.9758D-04	-2.4064D-04	-2.3712D-04	-6.7838D-05
284	1.6951D-04	7.3107D-04	6.2539D-04	9.5788D-05	-9.6624D-05	-2.1728D-04	-1.7861D-04	-5.2185D-05
285	8.9732D-04	8.9732D-04	9.0123D-04	9.0087D-04	-1.4913D-05	-1.0473D-05	-1.0473D-05	-1.4913D-05
286	8.9827D-04	8.9908D-04	9.0888D-04	9.0807D-04	-4.7505D-05	-3.7294D-05	-3.7294D-05	-4.7505D-05
287	9.0473D-04	9.0600D-04	9.2128D-04	9.1809D-04	-8.9236D-05	-7.3327D-05	-7.3327D-05	-8.9236D-05
288	9.0720D-04	9.1228D-04	9.3460D-04	9.2547D-04	-1.4368D-04	-1.1831D-04	-1.1831D-04	-1.4368D-04
289	9.0965D-04	9.1931D-04	9.2898D-04	9.1824D-04	-1.8763D-04	-1.6078D-04	-1.6078D-04	-1.8763D-04
290	9.0622D-04	9.1414D-04	9.2126D-04	9.1335D-04	-2.1768D-04	-1.9788D-04	-1.9788D-04	-2.1768D-04
291	9.0111D-04	8.9979D-04	8.9873D-04	9.0005D-04	-2.4826D-04	-2.5158D-04	-2.5158D-04	-2.4826D-04
292	8.9390D-04	8.7213D-04	8.5689D-04	8.7738D-04	-2.6365D-04	-3.1807D-04	-3.1807D-04	-2.6262D-04
293	8.8033D-04	8.2408D-04	7.9338D-04	8.3407D-04	-2.5590D-04	-3.9263D-04	-3.9088D-04	-2.5173D-04
294	8.3851D-04	7.5183D-04	6.9100D-04	7.7771D-04	-2.4064D-04	-4.9475D-04	-4.8716D-04	-2.3712D-04
295	7.8564D-04	6.3590D-04	5.4670D-04	5.8035D-04	-2.1728D-04	-6.2490D-04	-6.1551D-04	-1.7861D-04
296	9.2316D-04	9.2316D-04	9.2728D-04	9.2707D-04	-1.0473D-05	-5.3316D-06	-5.3316D-06	-1.0473D-05
297	9.2600D-04	9.2679D-04	9.4585D-04	9.4267D-04	-3.7294D-05	-1.7443D-05	-1.7443D-05	-3.7294D-05
298	9.3691D-04	9.4282D-04	9.7386D-04	9.6499D-04	-7.3327D-05	-3.6377D-05	-3.6377D-05	-7.3327D-05
299	9.5419D-04	9.6824D-04	1.0104D-03	9.9164D-04	-1.1831D-04	-5.9797D-05	-5.9797D-05	-1.1831D-04

300	9.7905D-04	1.0027D-03	1.0273D-03	1.0027D-03	-1.6078D-04	-8.3895D-05	-8.3895D-05	-1.6078D-04
301	9.9078D-04	1.0225D-03	1.0582D-03	1.0185D-03	-1.9788D-04	-9.8743D-05	-9.8743D-05	-1.9788D-04
302	9.9707D-04	1.0495D-03	1.0914D-03	1.0390D-03	-2.5158D-04	-1.2056D-04	-1.2056D-04	-2.5158D-04
303	1.0124D-03	1.0846D-01	1.1279D-03	1.0629D-03	-3.1807D-04	-1.3765D-04	-1.3765D-04	-3.1807D-04
304	1.0361D-03	1.1211D-03	1.1765D-03	1.0973D-03	-3.9263D-04	-1.5639D-04	-1.5622D-04	-3.9088D-04
305	1.0680D-03	1.1796D-03	1.2287D-03	1.1163D-03	-4.9475D-04	-1.4676D-04	-1.4431D-04	-4.8716D-04
306	1.0723D-03	1.2350D-03	1.3125D-03	1.1548D-03	-6.2490D-04	-1.2461D-04	-1.2249D-04	-6.1551D-04
307	9.3551D-04	9.3551D-04	9.4155D-04	9.4092D-04	-5.3116D-06	2.6217D-06	2.6217D-06	-5.3116D-06
308	9.3995D-04	9.4188D-04	9.6215D-04	9.5712D-04	-1.7443D-05	6.6837D-06	6.6837D-06	-1.7443D-05
309	9.5353D-04	9.6273D-04	9.9767D-04	9.8847D-04	-3.6377D-05	9.5947D-06	9.5947D-06	-3.6377D-05
310	9.8379D-04	9.9744D-04	1.0411D-03	1.0193D-03	-5.9797D-05	8.4717D-06	8.4717D-06	-5.9797D-05
311	1.0116D-03	1.0392D-03	1.0667D-03	1.0392D-03	-8.3895D-05	2.2879D-06	2.2879D-06	-8.3895D-05
312	1.0384D-03	1.0648D-03	1.0913D-03	1.0610D-03	-9.8743D-05	-3.9000D-06	-3.9000D-06	-9.8743D-05
313	1.0540D-03	1.0892D-03	1.1244D-03	1.0892D-03	-1.2056D-04	-1.0547D-05	-1.0547D-05	-1.2056D-04
314	1.0837D-03	1.1207D-03	1.1531D-03	1.1115D-03	-1.3765D-04	-2.2071D-05	-2.2071D-05	-1.3765D-04
315	1.1047D-03	1.1473D-03	1.1799D-03	1.1461D-03	-1.5639D-04	-3.8089D-05	-3.8074D-05	-1.5622D-04
316	1.1487D-03	1.1767D-03	1.1758D-03	1.1487D-03	-1.4676D-04	-4.9508D-05	-4.8664D-05	-1.4431D-04
317	1.1542D-03	1.1744D-03	1.1680D-03	1.1485D-03	-1.2461D-04	-5.3745D-05	-5.2811D-05	-1.2249D-04
318	9.2939D-04	9.2939D-04	9.3368D-04	9.3317D-04	2.6217D-06	8.9277D-06	8.9277D-06	2.6217D-06
319	9.3350D-04	9.3537D-04	9.5225D-04	9.4944D-04	6.6837D-06	3.0128D-05	3.0128D-05	6.6837D-06
320	9.4979D-04	9.5482D-04	9.8667D-04	9.7493D-04	9.5947D-06	5.1505D-05	5.1505D-05	9.5947D-06
321	9.7462D-04	9.9160D-04	1.0231D-03	1.0086D-03	8.4717D-06	6.9130D-05	6.9130D-05	8.4717D-06
322	1.0071D-03	1.0274D-03	1.0545D-03	1.0342D-03	2.2879D-06	8.7004D-05	8.7004D-05	2.2879D-06
323	1.0327D-03	1.0566D-03	1.0845D-03	1.0606D-03	-3.9000D-06	9.5650D-05	9.5650D-05	-3.9000D-06
324	1.0590D-03	1.0871D-03	1.1245D-03	1.0918D-03	-1.0547D-05	1.0643D-04	1.0643D-04	-1.0547D-05
325	1.0885D-03	1.1233D-03	1.1531D-03	1.1233D-03	-2.2071D-05	1.0203D-04	1.0203D-04	-2.2071D-05
326	1.1194D-03	1.1537D-03	1.2051D-03	1.1646D-03	-3.8089D-05	1.0463D-04	1.0463D-04	-3.8074D-05
327	1.1614D-03	1.1996D-03	1.2056D-03	1.1681D-03	-4.9508D-05	8.4994D-05	8.3548D-05	-4.8664D-05
328	1.1666D-03	1.1979D-03	1.1981D-03	1.1680D-03	-5.3745D-05	5.5932D-05	5.4938D-05	-5.2811D-05
329	9.0001D-04	9.0001D-04	9.0375D-04	9.0350D-04	8.9277D-06	1.5171D-05	1.5171D-05	8.9277D-06
330	9.0435D-04	9.0490D-04	9.1[illegible]16D-04	9.1143D-04	3.0128D-05	4.3746D-05	4.3746D-05	3.0128D-05
331	9.1571D-04	9.2080D-04	9.3607D-04	9.3200D-04	5.1505D-05	7.6954D-05	7.6954D-05	5.1505D-05
332	9.3482D-04	9.4263D-04	9.6999D-04	9.6022D-04	6.9130D-05	1.1798D-04	1.1798D-04	6.9130D-05
333	9.6379D-04	9.7623D-04	9.9612D-04	9.8120D-04	8.7004D-05	1.4918D-04	1.4918D-04	8.7004D-05
334	9.8328D-04	1.0025D-03	1.0249D-03	1.0057D-03	9.5650D-05	1.7569D-04	1.7569D-04	9.5650D-05
335	1.0083D-03	1.0318D-03	1.0592D-03	1.0318D-03	1.0643D-04	2.0430D-04	2.0430D-04	1.0643D-04
336	1.0305D-03	1.0686D-03	1.1066D-03	1.0740D-03	1.0203D-04	2.3791D-04	2.3791D-04	1.0203D-04
337	1.0746D-01	1.1194D-03	1.1803D-03	1.1275D-03	1.0463D-04	2.9326D-04	2.9326D-04	1.0463D-04
338	1.1220D-03	1.1963D-03	1.2299D-03	1.1550D-03	8.4994D-05	3.5044D-04	1.4499D-04	8.3548D-05
339	1.1473D-03	1.2507D-03	1.2978D-03	1.1981D-03	5.5912D-05	4.1902D-04	4.1097D-04	5.8918D-05
340	8.5078D-04	8.5078D-04	8.5082D-04	8.5081D-04	1.5171D-05	1.5241D-05	1.5241D-05	1.5171D-05
341	8.5310D-04	8.5349D-04	8.5602D-04	8.5563D-04	4.3746D-05	4.8617D-05	4.8617D-05	4.3746D-05
342	8.5829D-04	8.5910D-04	8.6557D-04	8.6396D-04	7.6954D-05	8.7071D-05	8.7071D-05	7.6954D-05
343	8.7052D-04	8.7245D-04	8.7872D-04	8.7679D-04	1.1798D-04	1.3004D-04	1.3004D-04	1.1798D-04
344	8.8178D-04	8.8496D-04	8.9052D-04	8.8734D-04	1.4918D-04	1.6903D-04	1.6903D-04	1.4918D-04
345	8.9158D-04	8.9495D-04	9.0086D-04	8.9664D-04	1.7569D-04	1.9677D-04	1.9677D-04	1.7569D-04
346	9.0236D-04	9.0700D-04	9.1256D-04	9.0885D-04	2.0430D-04	2.2747D-04	2.2747D-04	2.0430D-04
347	9.1423D-04	9.1977D-04	9.3084D-04	9.2530D-04	2.3791D-04	2.7253D-04	2.7251D-04	2.3791D-04
348	9.3416D-04	9.3798D-04	9.4467D-04	9.3989D-04	2.9326D-04	3.1714D-04	3.1714D-04	2.9326D-04
349	9.5133D-04	9.5214D-04	9.3798D-04	9.[illegible]732D-04	3.5044D-04	3.5447D-04	3.4890D-04	3.4499D-04

350	9.5212D-04	9.4505D-04	9.2021D-04	9.2702D-04	4.1902D-04	3.8426D-04	3.7693D-04	4.1097D-04
351	7.8796D-04	7.8[illegible]6D-04	7.8760D-04	7.8763D-04	1.5241D-05	1.4492D-05	1.4492D-05	1.5241D-05
352	7.8896D-04	7.8881D-04	7.8691D-04	7.8720D-04	4.8617D-05	4.4952D-05	4.4952D-05	4.8617D-05
353	7.9048D-04	7.8986D-04	7.8692D-04	7.8734D-04	8.7071D-05	8.1831D-05	8.1831D-05	8.7071D-05
354	7.9078D-04	7.8993D-04	7.8439D-04	7.8609D-04	1.3004D-04	1.1938D-04	1.1938D-04	1.3004D-04
355	7.9233D-04	7.8877D-04	7.8255D-04	7.8610D-04	1.6903D-04	1.4679D-04	1.4679D-04	1.6903D-04
356	7.9054D-04	7.8626D-04	7.7983D-04	7.8411D-04	1.9677D-04	1.6999D-04	1.6999D-04	1.9677D-04
357	7.8903D-04	7.8377D-04	7.7458D-04	7.7980D-04	2.2747D-04	1.9464D-04	1.9464D-04	2.2747D-04
358	7.8705D-04	7.7864D-04	7.6183D-04	7.7233D-04	2.7253D-04	2.1999D-04	2.1999D-04	2.7253D-04
359	7.8126D-04	7.6956D-04	7.5552D-04	7.6488D-04	3.1714D-04	2.5865D-04	2.5865D-04	3.1714D-04
360	7.7095D-04	7.6276D-04	7.4078D-04	7.4880D-04	3.5447D-04	3.0392D-04	2.9912D-04	3.4890D-04
361	7.5446D-04	7.5122D-04	7.3306D-04	7.3617D-04	3.8426D-04	3.6440D-04	3.5747D-04	3.7693D-04
362	7.2396D-04	7.2396D-04	7.2265D-04	7.2277D-04	1.4492D-05	1.1516D-05	1.1516D-05	1.4492D-05
363	7.2399D-04	7.2364D-04	7.1944D-04	7.2014D-04	4.4952D-05	3.6201D-05	3.6201D-05	4.4952D-05
364	7.2309D-04	7.2162D-04	7.1136D-04	7.1429D-04	8.1831D-05	6.3501D-05	6.3501D-05	8.1831D-05
365	7.2030D-04	7.1601D-04	7.0420D-04	7.0849D-04	1.1938D-04	9.2545D-05	9.2545D-05	1.1938D-04
366	7.1288D-04	7.0772D-04	6.9870D-04	7.0514D-04	1.4679D-04	1.1457D-04	1.1457D-04	1.4679D-04
367	7.0978D-04	7.0163D-04	6.9184D-04	7.0000D-04	1.6999D-04	1.2921D-04	1.2921D-04	1.6999D-04
368	7.0493D-04	6.9506D-04	6.8125D-04	6.8914D-04	1.9464D-04	1.4530D-04	1.4530D-04	1.9464D-04
369	6.9320D-04	6.8333D-04	6.6607D-04	6.7593D-04	2.1999D-04	1.5834D-04	1.5834D-04	2.1999D-04
370	6.8212D-04	6.6592D-04	6.3757D-04	6.4972D-04	2.5865D-04	1.5741D-04	1.5741D-04	2.5865D-04
371	6.5515D-04	6.3448D-04	5.8986D-04	6.1091D-04	3.0392D-04	1.3166D-04	1.2943D-04	2.9912D-04
372	6.1874D-04	5.8307D-04	5.1548D-04	5.4979D-04	3.6440D-04	7.2821D-05	7.1522D-05	3.5747D-04
373	6.6548D-04	6.6549D-04	6.6461D-04	6.6461D-04	1.1516D-05	9.3520D-06	9.3520D-06	1.1516D-05
374	6.6461D-04	6.6461D-04	6.6086D-04	6.6120D-04	3.6201D-05	2.7671D-05	2.7671D-05	3.6201D-05
375	6.6229D-04	6.6158D-04	6.5296D-04	6.5511D-04	6.3501D-05	4.5546D-05	4.5546D-05	6.3501D-05
376	6.5860D-04	6.5522D-04	6.4283D-04	6.4733D-04	9.2545D-05	6.4381D-05	6.4381D-05	9.2545D-05
377	6.5096D-04	6.4566D-04	6.3788D-04	6.4177D-04	1.1457D-04	8.2127D-05	8.2127D-05	1.1457D-04
378	6.4353D-04	6.3943D-04	6.3272D-04	6.3512D-04	1.2921D-04	9.9183D-05	9.9183D-05	1.2921D-04
379	6.3641D-04	6.3442D-04	6.2644D-04	6.2943D-04	1.4530D-04	1.2039D-04	1.2039D-04	1.4530D-04
380	6.3100D-04	6.3004D-04	6.2780D-04	6.2844D-04	1.5834D-04	1.5034D-04	1.5034D-04	1.5834D-04
381	6.2836D-04	6.3209D-04	6.4699D-04	6.3954D-04	1.5741D-04	2.0398D-04	2.0398D-04	1.5741D-04
382	6.3542D-04	6.5695D-04	6.7307D-04	6.5111D-04	1.3166D-04	2.6625D-04	2.6204D-04	1.2943D-04
383	6.4205D-04	6.8905D-04	7.3266D-04	6.8730D-04	7.2821D-05	3.6190D-04	3.5502D-04	7.1522D-05
384	6.1923D-04	6.1923D-04	6.1815D-04	6.1815D-04	9.3520D-06	6.6620D-06	6.6620D-06	9.3520D-06
385	6.1815D-04	6.1815D-04	6.1494D-04	6.1494D-04	2.7671D-05	1.9643D-05	1.9643D-05	2.7671D-05
386	6.1494D-04	6.1494D-04	6.0904D-04	6.0963D-04	4.5546D-05	3.0791D-05	3.0791D-05	4.5546D-05
387	6.1038D-04	6.0945D-04	6.0009D-04	6.0103D-04	6.4381D-05	4.0992D-05	4.0992D-05	6.4381D-05
388	6.0174D-04	6.0035D-04	5.9067D-04	5.9344D-04	8.2127D-05	4.7558D-05	4.7558D-05	8.2127D-05
389	5.9480D-04	5.9085D-04	5.7702D-04	5.8295D-04	9.9183D-05	4.9775D-05	4.9775D-05	9.9183D-05
390	5.8549D-04	5.7736D-04	5.5838D-04	5.6380D-04	1.2039D-04	5.2618D-05	5.2618D-05	1.2039D-04
391	5.6620D-04	5.5781D-04	5.2423D-04	5.3682D-04	1.5034D-04	4.5418D-05	4.5418D-05	1.5034D-04
392	5.4326D-04	5.2296D-04	4.8235D-04	4.9591D-04	2.0398D-04	3.4872D-05	3.4870D-05	2.0398D-04
393	5.0089D-04	4.8037D-04	4.2171D-04	4.4255D-04	2.6625D-04	1.0034D-05	9.8654D-06	2.6204D-04
394	4.5053D-04	4.1903D-04	3.3607D-04	3.6633D-04	3.6190D-04	-2.3624D-05	-2.3212D-05	3.5502D-04
395	5.8513D-04	5.8513D-04	5.8434D-04	5.8442D-04	6.6620D-06	4.6967D-06	4.6967D-06	6.6620D-06
396	5.8494D-04	5.8475D-04	5.8280D-04	5.8299D-04	1.9643D-05	1.4763D-05	1.4761D-05	1.9643D-05
397	5.8344D-04	5.8316D-04	5.8066D-04	5.8094D-04	3.0791D-05	2.3856D-05	2.3856D-05	3.0791D-05
398	5.8135D-04	5.8084D-04	5.7623D-04	5.7763D-04	4.0992D-05	2.9368D-05	2.9368D-05	4.0992D-05
399	5.7842D-04	5.7681D-04	5.7159D-04	5.7412D-04	4.7558D-05	3.4143D-05	3.4143D-05	4.7558D-05

400	5.7421D-04	5.7354D-04	5.6949D-04	5.7084D-04	4.9775D-05	1.2921D-05	1.2921D-05	4.9775D-05
401	5.7107D-04	5.6929D-04	5.6219D-04	5.6485D-04	5.2618D-05	1.0410D-05	1.0410D-05	5.2618D-05
402	5.6399D-04	5.6132D-04	5.5508D-04	5.5775D-04	4.5418D-05	2.3164D-05	2.3164D-05	4.5418D-05
403	5.5689D-04	5.5275D-04	5.4381D-04	5.4774D-04	1.4872D-05	3.7499D-06	3.7483D-06	1.4870D-05
404	5.4477D-04	5.3992D-04	5.2305D-04	5.2774D-04	1.0019D-05	-2.8691D-05	-2.8199D-05	9.8654D-06
405	5.2372D-04	5.1721D-04	4.9783D-04	5.0411D-04	-2.3624D-05	-7.6887D-05	-7.5562D-05	-2.3212D-05
406	5.5554D-04	5.5554D-04	5.5600D-04	5.5600D-04	4.6967D-06	5.9854D-06	5.8654D-06	4.6367D-06
407	5.5600D-04	5.5600D-04	5.5712D-04	5.5701D-04	1.4761D-05	1.7560D-05	1.7560D-05	1.4761D-05
408	5.5737D-04	5.5756D-04	5.5924D-04	5.5905D-04	2.3856D-05	2.8521D-05	2.8521D-05	2.3856D-05
409	5.5927D-04	5.5964D-04	5.6260D-04	5.6223D-04	2.9368D-05	1.8611D-05	1.8611D-05	2.9368D-05
410	5.6242D-04	5.6292D-04	5.6687D-04	5.6539D-04	1.4143D-05	4.6501D-05	4.6501D-05	1.4143D-05
411	5.6524D-04	5.6758D-04	5.7149D-04	5.7073D-04	1.2921D-05	5.2436D-05	5.2436D-05	1.2921D-05
412	5.7061D-04	5.7187D-04	5.8069D-04	5.7817D-04	1.0410D-05	6.1928D-05	6.1928D-05	1.0410D-05
413	5.7759D-04	5.8155D-04	5.9539D-04	5.8946D-04	2.3164D-05	7.2618D-05	7.2618D-05	2.3164D-05
414	5.8713D-04	5.9818D-04	6.2397D-04	6.0898D-04	1.7499D-06	9.5862D-05	9.5862D-05	1.7483D-06
415	6.0379D-04	6.3059D-04	6.5289D-04	6.2605D-04	-2.8691D-05	1.1723D-04	1.1498D-04	-2.8194D-05
416	5.1826D-04	6.6475D-04	7.0870D-04	6.6377D-04	-7.6887D-05	2.0912D-04	2.0526D-04	-7.5562D-05
417	5.3311D-04	5.3311D-04	5.1178D-04	5.1178D-04	5.9854D-06	6.7347D-06	6.7147D-06	5.9654D-06
418	5.3378D-04	5.3378D-04	5.1599D-04	5.1599D-04	1.7560D-05	2.0013D-05	2.0013D-05	1.7560D-05
419	5.3599D-04	5.3599D-04	5.4026D-04	5.4026D-04	2.8521D-05	3.3270D-05	3.3270D-05	2.8521D-05
420	5.4026D-04	5.4026D-04	5.4572D-04	5.4572D-04	1.8613D-05	4.5433D-05	4.5433D-05	1.8613D-05
421	5.4572D-04	5.4572D-04	5.5024D-04	5.4949D-04	4.6501D-05	5.4037D-05	5.4037D-05	4.6501D-05
422	5.5008D-04	5.5091D-04	5.5690D-04	5.5520D-04	5.2436D-05	6.0962D-05	6.0362D-05	5.2436D-05
423	5.5710D-04	5.5823D-04	5.6167D-04	5.6053D-04	6.1928D-05	6.7650D-05	6.7650D-05	6.1928D-05
424	5.6267D-04	5.6272D-04	5.6289D-04	5.6286D-04	7.2618D-05	7.2892D-05	7.2892D-05	7.2618D-05
425	5.6518D-04	5.6260D-04	5.4710D-04	5.4966D-04	9.5862D-05	7.0025D-05	7.0025D-05	9.5862D-05
426	5.5382D-04	5.4630D-04	5.0013D-04	5.0778D-04	1.1723D-04	6.2087D-05	6.1036D-05	1.1498D-04
427	5.1519D-04	5.0214D-04	4.3018D-04	4.4294D-04	2.0912D-04	8.1164D-05	7.3714D-05	2.0528D-04
428	5.1798D-04	5.1798D-04	5.1887D-04	5.1887D-04	6.7347D-06	7.7227D-06	7.7227D-06	6.7347D-06
429	5.1987D-04	5.1887D-04	5.2172D-04	5.2172D-04	2.0013D-05	2.3174D-05	2.3174D-05	2.0013D-05
430	5.2172D-04	5.2172D-04	5.2554D-04	5.2512D-04	3.3270D-05	3.7520D-05	3.7520D-05	3.3270D-05
431	5.2633D-04	5.2686D-04	5.3109D-04	5.3056D-04	4.5433D-05	5.0717D-05	5.0717D-05	4.5433D-05
432	5.3142D-04	5.3223D-04	5.3628D-04	5.3628D-04	5.4037D-05	6.2141D-05	6.2141D-05	5.4037D-05
433	5.3628D-04	5.3628D-04	5.4315D-04	5.4315D-04	6.0962D-05	7.2409D-05	7.2409D-05	6.0962D-05
434	5.4315D-04	5.4315D-04	5.5099D-04	5.4968D-04	6.7650D-05	8.0717D-05	8.0717D-05	6.7650D-05
435	5.5021D-04	5.5148D-04	5.6037D-04	5.5783D-04	7.2892D-05	8.5591D-05	8.5591D-05	7.2892D-05
436	5.5725D-04	5.5942D-04	5.6572D-04	5.6885D-04	7.0025D-05	8.0874D-05	8.0843D-05	7.0025D-05
437	5.6405D-04	5.6148D-04	5.4009D-04	5.4288D-04	6.2087D-05	3.8414D-05	3.7745D-05	6.1036D-05
438	5.4490D-04	5.2319D-04	4.0943D-04	4.3038D-04	8.1164D-05	-1.3209D-04	-1.2984D-04	7.9714D-05
439	5.0075D-04	5.0075D-04	5.0174D-04	5.0174D-04	7.7227D-06	8.8222D-06	8.8222D-06	7.7227D-06
440	5.0174D-04	5.0174D-04	5.0459D-04	5.0459D-04	2.3174D-05	2.6350D-05	2.6350D-05	2.3174D-05
441	5.0459D-04	5.0459D-04	5.0873D-04	5.0873D-04	3.7520D-05	4.2688D-05	4.2688D-05	3.7520D-05
442	5.0873D-04	5.0873D-04	5.1452D-04	5.1452D-04	5.0717D-05	5.7955D-05	5.7955D-05	5.0717D-05
443	5.1452D-04	5.1452D-04	5.2055D-04	5.2055D-04	6.2141D-05	7.2195D-05	7.2195D-05	6.2141D-05
444	5.2055D-04	5.2055D-04	5.2720D-04	5.2609D-04	7.2409D-05	8.3489D-05	8.3489D-05	7.2409D-05
445	5.2692D-04	5.2828D-04	5.3510D-04	5.3174D-04	8.0717D-05	9.4144D-05	9.4144D-05	8.0717D-05
446	5.3422D-04	5.3671D-04	5.5160D-04	5.4912D-04	8.5591D-05	1.1042D-04	1.1042D-04	8.5591D-05
447	5.4865D-04	5.5421D-04	5.9314D-04	5.8110D-04	8.0874D-05	1.3649D-04	1.3649D-04	8.0843D-05
448	5.7331D-04	6.0292D-04	6.6565D-04	6.3552D-04	3.8414D-05	1.8541D-04	1.8246D-04	3.7745D-05
449	6.0155D-04	6.9546D-04	9.0987D-04	8.1886D-04	-1.3209D-04	3.3149D-04	3.2524D-04	-1.2984D-04

450	4.8105D-04	4.8105D-04	4.8216D-04	4.8216D-04	8.8222D-06	1.0063D-05	1.0063D-05	8.8222D-06
451	4.8216D-04	4.8216D-04	4.8541D-04	4.8541D-04	2.6350D-05	2.9957D-05	2.9957D-05	2.6350D-05
452	4.8541D-04	4.8541D-04	4.8983D-04	4.8983D-04	4.2688D-05	4.8216D-05	4.8216D-05	4.2688D-05
453	4.8983D-04	4.8983D-04	4.9547D-04	4.9547D-04	5.7955D-05	6.5004D-05	6.5004D-05	5.7955D-05
454	4.9547D-04	4.9547D-04	4.9923D-04	4.9860D-04	7.2195D-05	7.8462D-05	7.8462D-05	7.2195D-05
455	4.9973D-04	5.0044D-04	5.0399D-04	5.0399D-04	8.3489D-05	9.0580D-05	9.0580D-05	8.3489D-05
456	5.0399D-04	5.0399D-04	5.0943D-04	5.0943D-04	9.4344D-05	1.0522D-04	1.0522D-04	9.4344D-05
457	5.0943D-04	5.0943D-04	5.1634D-04	5.1519D-04	1.1042D-04	1.2195D-04	1.2195D-04	1.1042D-04
458	5.1780D-04	5.1887D-04	5.2533D-04	5.2425D-04	1.3649D-04	1.4724D-04	1.4724D-04	1.3649D-04
459	5.2914D-04	5.2907D-04	5.1998D-04	5.2016D-04	1.8541D-04	1.8466D-04	1.8162D-04	1.8246D-04
460	5.3526D-04	5.2064D-04	4.4089D-04	4.5494D-04	3.3149D-04	1.8823D-04	1.8479D-04	3.2524D-04
461	4.5847D-04	4.5847D-04	4.5987D-04	4.5987D-04	1.0063D-05	1.1625D-05	1.1625D-05	1.0063D-05
462	4.5987D-04	4.5987D-04	4.6390D-04	4.6390D-04	2.9957D-05	3.4432D-05	3.4432D-05	2.9957D-05
463	4.6390D-04	4.6390D-04	4.6916D-04	4.6916D-04	4.8216D-05	5.4783D-05	5.4783D-05	4.8216D-05
464	4.6916D-04	4.6916D-04	4.7490D-04	4.7490D-04	6.5004D-05	7.2186D-05	7.2186D-05	6.5004D-05
465	4.7490D-04	4.7490D-04	4.7813D-04	4.7813D-04	7.8462D-05	8.4919D-05	8.4919D-05	7.8462D-05
466	4.7813D-04	4.7813D-04	4.8043D-04	4.8043D-04	9.0580D-05	9.4412D-05	9.4412D-05	9.0580D-05
467	4.8043D-04	4.8043D-04	4.8032D-04	4.8032D-04	1.0522D-04	1.0501D-04	1.0501D-04	1.0522D-04
468	4.8032D-04	4.8032D-04	4.7572D-04	4.7572D-04	1.2195D-04	1.1275D-04	1.1275D-04	1.2195D-04
469	4.7572D-04	4.7572D-04	4.6145D-04	4.6382D-04	1.4724D-04	1.2346D-04	1.2346D-04	1.4724D-04
470	4.6757D-04	4.6351D-04	4.3595D-04	4.3991D-04	1.8466D-04	1.4410D-04	1.4173D-04	1.8162D-04
471	4.4057D-04	4.4231D-04	4.4257D-04	4.4089D-04	1.8823D-04	2.0532D-04	2.0155D-04	1.8479D-04
472	4.3229D-04	4.3229D-04	4.3416D-04	4.3416D-04	1.1625D-05	1.3707D-05	1.3707D-05	1.1625D-05
473	4.3416D-04	4.3416D-04	4.3966D-04	4.3966D-04	3.4432D-05	4.0536D-05	4.0536D-05	3.4432D-05
474	4.3966D-04	4.3966D-04	4.4710D-04	4.4710D-04	5.4783D-05	6.4093D-05	6.4093D-05	5.4783D-05
475	4.4710D-04	4.4710D-04	4.5574D-04	4.5574D-04	7.2186D-05	8.2981D-05	8.2981D-05	7.2186D-05
476	4.5574D-04	4.5574D-04	4.6067D-04	4.6067D-04	8.4919D-05	9.4782D-05	9.4782D-05	8.4919D-05
477	4.6067D-04	4.6067D-04	4.6514D-04	4.6514D-04	9.4412D-05	1.0186D-04	1.0186D-04	9.4412D-05
478	4.6514D-04	4.6514D-04	4.6175D-04	4.6175D-04	1.0501D-04	9.8233D-05	9.8233D-05	1.0501D-04
479	4.6175D-04	4.6175D-04	4.5758D-04	4.5758D-04	1.1275D-04	1.0440D-04	1.0440D-04	1.1275D-04
480	4.5758D-04	4.5758D-04	4.4056D-04	4.4148D-04	1.2346D-04	9.1260D-05	9.1069D-05	1.2346D-04
481	4.4148D-04	4.4056D-04	3.9297D-04	3.9424D-04	1.4410D-04	6.2645D-05	6.1548D-05	1.4173D-04
482	3.9424D-04	3.9297D-04	2.8709D-04	2.8709D-04	2.0532D-04	1.7634D-06	1.7366D-06	2.0155D-04
483	3.9247D-04	3.9247D-04	3.9496D-04	3.9496D-04	1.3707D-05	1.7861D-05	1.7861D-05	1.3707D-05
484	3.9496D-04	3.9496D-04	4.0267D-04	4.0267D-04	4.0536D-05	5.3388D-05	5.3388D-05	4.0536D-05
485	4.0267D-04	4.0267D-04	4.1440D-04	4.1440D-04	6.4093D-05	8.6088D-05	8.6088D-05	6.4093D-05
486	4.1440D-04	4.1440D-04	4.3104D-04	4.3104D-04	8.2981D-05	1.1418D-04	1.1418D-04	8.2981D-05
487	4.3104D-04	4.3104D-04	4.4355D-04	4.4355D-04	9.4782D-05	1.3231D-04	1.3231D-04	9.4782D-05
488	4.4355D-04	4.4355D-04	4.5821D-04	4.5821D-04	1.0186D-04	1.3850D-04	1.3850D-04	1.0186D-04
489	4.5821D-04	4.5821D-04	4.7725D-04	4.7725D-04	9.8233D-05	1.5537D-04	1.5537D-04	9.8233D-05
490	4.7725D-04	4.7725D-04	4.7737D-04	4.7737D-04	1.0440D-04	1.0463D-04	1.0474D-04	1.0440D-04
491	4.7737D-04	4.7737D-04	4.7111D-04	4.7288D-04	9.1260D-05	8.4270D-05	8.3779D-05	9.1069D-05
492	4.7288D-04	4.7111D-04	4.6755D-04	4.6936D-04	6.2645D-05	7.2063D-05	7.0793D-05	6.1548D-05
493	4.6936D-04	4.6755D-04	4.5803D-04	4.6147D-04	1.7634D-06	2.4450D-07	2.3991D-07	1.7366D-06
494	3.3286D-04	3.3286D-04	3.3541D-04	3.3541D-04	1.7861D-05	2.2116D-05	2.2116D-05	1.7861D-05
495	3.3541D-04	3.3541D-04	3.4372D-04	3.4372D-04	5.3388D-05	6.7241D-05	6.7241D-05	5.3388D-05
496	3.4372D-04	3.4372D-04	3.5778D-04	3.5778D-04	8.6088D-05	1.1244D-04	1.1244D-04	8.6088D-05
497	3.5778D-04	3.5778D-04	3.8199D-04	3.8199D-04	1.1418D-04	1.5958D-04	1.5958D-04	1.1418D-04
498	3.8199D-04	3.8199D-04	4.0560D-04	4.0560D-04	1.3231D-04	2.0315D-04	2.0315D-04	1.3231D-04
499	4.0560D-04	4.0560D-04	4.4901D-04	4.4901D-04	1.3850D-04	2.4702D-04	2.4702D-04	1.3850D-04

500	4.4901D-04	4.4901D-04	4.6877D-04	4.6877D-04	1.5537D-04	2.1466D-04	2.1466D-04	1.5537D-04
501	4.6877D-04	4.6877D-04	5.2245D-04	5.2245D-04	2.6143D-05	2.5718D-04	1.1046D-04	1.4982D-04
502	5.2245D-04	5.2245D-04	5.5099D-04	5.6353D-04	8.4270D-05	1.7302D-04	2.1516D-04	8.3779D-05
503	5.6353D-04	5.6099D-04	5.2248D-04	5.2475D-04	7.2063D-05	1.3292D-05	1.3060D-05	7.0793D-05
504	5.2475D-04	5.2248D-04	5.6891D-04	5.8638D-04	2.4450D-07	1.4530D-04	1.3891D-04	2.3591D-07
505	2.4805D-04	2.4805D-04	2.4907D-04	2.4907D-04	2.2116D-05	2.4378D-05	2.4378D-05	2.2116D-05
506	2.4907D-04	2.4907D-04	2.5233D-04	2.5233D-04	6.7241D-05	7.4499D-05	7.4499D-05	6.7241D-05
507	2.5233D-04	2.5231D-04	2.5776D-04	2.5776D-04	1.1244D-04	1.2600D-04	1.2600D-04	1.1244D-04
508	2.5776D-04	2.5776D-04	2.6695D-04	2.6695D-04	1.5958D-04	1.8256D-04	1.8256D-04	1.5956D-04
509	2.6695D-04	2.6695D-04	2.7577D-04	2.7577D-04	2.0315D-04	2.3847D-04	2.3847D-04	2.0315D-04
510	2.7577D-04	2.7577D-04	2.9142D-04	2.9142D-04	2.4702D-04	2.9915D-04	2.9915D-04	2.4702D-04
511	2.9142D-04	2.9142D-04	4.0082D-04	4.0082D-04	2.1466D-04	5.4286D-04	6.5226D-04	2.1466D-04
512	4.0082D-04	4.0082D-04	4.7135D-04	4.7135D-04	1.8923D-04	4.0082D-04	4.7135D-04	2.5376D-04
513	4.7135D-04	4.7135D-04	5.7769D-04	5.8177D-04	1.2191D-04	4.7135D-04	5.7769D-04	2.3594D-04
514	5.8177D-04	5.7769D-04	8.4485D-04	8.5088D-04	1.3292D-05	5.7769D-04	8.4485D-04	1.3060D-05
515	8.5088D-04	8.4485D-04	4.5556D-04	4.8612D-04	1.4530D-04	-5.3581D-04	-4.8354D-04	1.3693D-04
516	1.4391D-04	1.4391D-04	1.4280D-04	1.4280D-04	2.4378D-05	2.1922D-05	2.1922D-05	2.4378D-05
517	1.4280D-04	1.4280D-04	1.3878D-04	1.3878D-04	7.4499D-05	6.5556D-05	6.5556D-05	7.4499D-05
518	1.3878D-04	1.3878D-04	1.3078D-04	1.3078D-04	1.2600D-04	1.0602D-04	1.0602D-04	1.2600D-04
519	1.3078D-04	1.3078D-04	1.1463D-04	1.1463D-04	1.8256D-04	1.4216D-04	1.4216D-04	1.8256D-04
520	1.1463D-04	1.1463D-04	9.7114D-05	9.7114D-05	2.3847D-04	1.6842D-04	1.6842D-04	2.3847D-04
521	9.7114D-05	9.7114D-05	6.2861D-05	6.2861D-05	2.9915D-04	1.8498D-04	1.8498D-04	2.9915D-04
522	6.2861D-05	6.2861D-05	9.7144D-19	2.7938D-05	3.1430D-04	2.3573D-04	3.8858D-18	2.7938D-04
523	4.6062D-05	4.6062D-05	4.5165D-05	4.5165D-05	2.1922D-05	1.9929D-05	1.9929D-05	2.1922D-05
524	4.5165D-05	4.5165D-05	4.2026D-05	4.2026D-05	6.5556D-05	5.8581D-05	5.8581D-05	6.5556D-05
525	4.2026D-05	4.2026D-05	3.6211D-05	3.6211D-05	1.0602D-04	9.1477D-05	9.1477D-05	1.0602D-04
526	3.6211D-05	3.6211D-05	2.5715D-05	2.5715D-05	1.4216D-04	1.1592D-04	1.1592D-04	1.4216D-04
527	2.5715D-05	2.5715D-05	1.5790D-05	1.5790D-05	1.6842D-04	1.2872D-04	1.2872D-04	1.6842D-04
528	1.5790D-05	1.5790D-05	0.0	0.0	1.8498D-04	1.3234D-04	1.3234D-04	1.8498D-04

OUTPUT TABLE 5.. PRESSURE HEADS AT TIME = 0.0 ,(DELT = 3.0000D 02),(BAND WIDTH = 27)

NODE I	PRESSURE HEAD OF NODES I,I+1,....,I+7							
1	2.1993D 03	1.6993D 03	1.1993D 03	6.9931D 02	1.9931D 02	-6.8646D-01	-2.0069D 02	-4.0068D 02
9	-5.5068D 02	-7.0068D 02	-7.5068D 02	-8.0068D 02	2.1993D 03	1.6991D 03	1.1993D 03	6.9931D 02
17	1.9932D 02	-6.8320D-01	-2.0068D 02	-4.0068D 02	-5.5068D 02	-7.0068D 02	-7.5068D 02	-8.0068D 02
25	2.1993D 03	1.6993D 03	1.1993D 03	6.9931D 02	1.9933D 02	-6.7181D-01	-2.0067D 02	-4.0066D 02
33	-5.5066D 02	-7.0066D 02	-7.5066D 02	-8.0066D 02	2.1992D 03	1.6993D 03	1.1993D 03	6.9932D 02
41	1.9935D 02	-6.4679D-01	-2.0064D 02	-4.0063D 02	-5.5063D 02	-7.0062D 02	-7.5062D 02	-8.0062D 02
49	2.1992D 03	1.6992D 03	1.1993D 03	6.9934D 02	1.9939D 02	-5.9594D-01	-2.0059D 02	-4.0057D 02
57	-5.5055D 02	-7.0055D 02	-7.5055D 02	-8.0055D 02	2.1991D 03	1.6991D 03	1.1992D 03	6.9938D 02
65	1.9948D 02	-4.9455D-01	-2.0048D 02	-4.0044D 02	-5.5041D 02	-7.0040D 02	-7.5039D 02	-8.0039D 02
73	2.1989D 03	1.6990D 03	1.1992D 03	6.9946D 02	1.9967D 02	-2.9289D-01	-2.0026D 02	-4.0017D 02
81	-5.5012D 02	-7.0009D 02	-7.5009D 02	-8.0008D 02	2.1985D 03	1.6986D 03	1.1991D 03	6.9962D 02
89	2.0002D 02	1.0771D-01	-1.9982D 02	-3.9964D 02	-5.4952D 02	-6.9946D 02	-7.4946D 02	-7.9945D 02
97	2.1977D 03	1.6980D 03	1.1989D 03	6.9991D 02	2.0073D 02	9.0735D-01	-1.9896D 02	-3.9849D 02
105	-5.4831D 02	-6.9814D 02	-7.4811D 02	-7.9810D 02	2.1962D 03	1.6968D 03	1.1984D 03	7.0046D 02
113	2.0213D 02	2.5176D 00	-1.9713D 02	-3.9636D 02	-5.4542D 02	-6.9517D 02	-7.4514D 02	-7.9514D 02
121	2.1934D 03	1.6944D 03	1.1973D 03	7.0136D 02	2.0492D 02	5.7230D 00	-1.9355D 02	-3.8958D 02
129	-5.3952D 02	-6.8836D 02	-7.3814D 02	-7.8807D 02	2.1883D 03	1.6900D 03	1.1949D 03	7.0235D 02
137	2.1045D 02	1.2848D 01	-1.8512D 02	-3.8371D 02	-5.2058D 02	-6.6634D 02	-7.1588D 02	-7.6573D 02
145	2.1799D 03	1.6823D 03	1.1896D 03	7.0175D 02	2.1847D 02	2.6271D 01	-1.5969D 02	-2.9629D 02
153	-4.7435D 02	-6.3608D 02	-6.8756D 02	-7.3804D 02	2.1665D 03	1.6697D 03	1.1794D 03	6.9636D 02
161	2.2241D 02	3.6784D 01	-1.3254D 02	-1.8612D 02	2.1469D 03	1.6507D 03	1.1623D 03	6.8285D 02
169	2.1399D 02	3.0243D 01	-1.3811D 02	-2.0176D 02	2.1198D 03	1.6239D 03	1.1367D 03	6.5914D 02
177	1.9239D 02	8.9193D 00	-1.5895D 02	-2.0834D 02	2.0847D 03	1.5889D 03	1.1016D 03	6.2418D 02
185	1.5904D 02	-2.2842D 01	-1.8840D 02	-2.2881D 02	2.0415D 03	1.5454D 03	1.0571D 03	5.7751D 02
193	1.0993D 02	-6.8128D 01	-2.1944D 02	-2.1530D 02	1.9908D 03	1.4942D 03	1.0043D 03	5.2102D 02
201	4.2707D 01	-1.4208D 02	-2.9405D 02	-4.3682D 02	-6.4311D 02	-8.1745D 02	-8.7062D 02	-9.2168D 02
209	1.9334D 03	1.4362D 03	9.4459D 02	4.5835D 02	-2.6621D 01	-2.2750D 02	-4.3935D 02	-6.0760D 02
217	-7.4176D 02	-8.8815D 02	-9.3784D 02	-9.3771D 02	1.8704D 03	1.3925D 03	8.8920D 02	3.9055D 02
225	-7.4208D 01	-2.7050D 02	-4.6711D 02	-6.4100D 02	-8.1921D 02	-9.6650D 02	-1.0154D 03	-1.0654D 03
233	1.8027D 03	1.3443D 03	8.4949D 02	3.5741D 02	-9.3922D 01	-2.9417D 02	-4.4171D 02	-6.7626D 02
241	-8.5120D 02	-9.9808D 02	-1.0471D 03	-1.0962D 03	1.7311D 03	1.2825D 03	8.2669D 02	3.6268D 02
249	-6.0910D 01	-2.6404D 02	-4.3653D 02	-6.1893D 02	-7.9228D 02	-9.6581D 02	-1.0141D 03	-1.0624D 03
257	1.6558D 03	1.2570D 03	8.1119D 02	4.1719D 02	1.6675D 01	-1.7672D 02	-3.6966D 02	-5.5061D 02
265	-7.3161D 02	-8.7459D 02	-9.2237D 02	-9.7028D 02	1.5766D 03	1.2178D 03	8.3178D 02	4.8765D 02
273	9.7111D 01	-9.8253D 01	-2.5148D 02	-4.0125D 02	-5.6897D 02	-7.2700D 02	-7.7337D 02	-8.1967D 02
281	1.4928D 03	1.1936D 03	8.4764D 02	5.5298D 02	1.8194D 02	2.6746D 01	-1.1902D 02	-2.3637D 02
289	-3.4813D 02	-4.5609D 02	-5.0105D 02	-5.4605D 02	1.4030D 03	1.1341D 03	8.3781D 02	5.6376D 02
297	2.8216D 02	2.1430D 02	1.2688D 02	3.0984D 01	-7.3675D 01	-1.7709D 02	-2.2282D 02	-2.6810D 02

305	1.3555D 03	1.1064D 03	8.3000D 02	5.9532D 02	3.4170D 02	2.5724D 02	1.8066D 02	8.4931D 01
313	1.8045D 01	-5.7702D 01	-1.0466D 02	-1.5033D 02	1.3060D 03	1.0868D 03	8.4940D 02	6.1429D 02
321	4.0152D 02	3.1538D 02	2.2985D 02	1.5439D 02	8.8611D 01	4.1549D 01	-5.6446D 00	-5.3073D 01
329	1.2548D 03	1.0552D 03	8.1729D 02	6.1081D 02	4.3568D 02	3.5862D 02	2.7269D 02	1.9729D 02
337	1.4165D 02	8.7035D 01	4.2714D 01	0.0	1.2020D 03	1.0122D 03	8.0308D 02	6.1466D 02
345	4.5685D 02	3.7836D 02	3.0996D 02	2.3217D 02	1.6437D 02	9.6871D 01	4.8550D 01	0.0
353	1.1486D 03	9.7845D 02	7.9818D 02	6.0776D 02	4.7751D 02	3.9747D 02	3.2753D 02	2.4772D 02
361	1.8803D 02	9.8809D 01	4.9375D 01	0.0	1.0954D 03	9.4514D 02	7.7397D 02	6.2220D 02
369	4.7999D 02	3.9840D 02	3.2687D 02	2.5517D 02	1.8353D 02	1.0162D 02	5.0650D 01	0.0
377	1.0440D 03	9.0353D 02	7.7223D 02	6.0942D 02	4.7591D 02	4.0352D 02	3.3071D 02	2.6791D 02
385	1.8356D 02	1.0887D 02	5.4865D 01	0.0	9.9540D 02	8.7498D 02	7.4354D 02	6.0075D 02
393	4.6689D 02	3.9418D 02	3.3148D 02	2.5785D 02	1.7286D 02	1.0851D 02	5.4462D 01	0.0
401	9.5037D 02	8.4001D 02	7.1878D 02	5.7616D 02	4.6316D 02	3.9081D 02	3.2848D 02	2.5536D 02
409	1.8188D 02	1.0770D 02	5.4231D 01	0.0	9.0901D 02	8.0874D 02	6.9783D 02	5.7609D 02
417	4.6376D 02	4.0219D 02	3.4042D 02	2.5776D 02	1.8523D 02	1.0235D 02	5.0847D 01	0.0
425	8.7098D 02	7.7076D 02	6.7013D 02	5.6909D 02	4.6762D 02	3.9630D 02	3.2472D 02	2.5279D 02
433	1.7004D 02	1.0725D 02	5.4202D 01	0.0	8.3559D 02	7.3544D 02	6.3499D 02	5.4436D 02
441	4.4382D 02	3.8277D 02	3.2209D 02	2.4112D 02	1.7040D 02	9.9840D 01	4.9725D 01	0.0
449	8.[illegible]216D 02	7.1206D 02	6.1172D 02	5.2123D 02	4.4070D 02	3.6007D 02	3.0969D 02	2.3921D 02
457	1.6884D 02	9.8778D 01	4.9106D 01	0.0	7.7041D 02	6.8029D 02	5.8993D 02	4.9934D 02
465	4.1863D 02	3.5800D 02	2.8716D 02	2.2631D 02	1.6531D 02	1.0400D 02	5.2430D 01	0.0
473	7.5823D 02	6.6809D 02	5.7768D 02	4.8699D 02	4.0616D 02	3.5554D 02	2.9471D 02	2.3178D 02
481	1.6261D 02	1.01[illegible]5D 02	5.0944D 01	0.0	7.4639D 02	6.5623D 02	5.6575D 02	4.8507D 02
489	4.0414D 02	3.4329D 02	2.8229D 02	2.3117D 02	1.7020D 02	9.8902D 01	4.8463D 01	0.0
497	7.3494D 02	6.4476D 02	5.5422D 02	4.7344D 02	3.9238D 02	3.3139D 02	2.4043D 02	2.2935D 02
505	1.6784D 02	1.0597D 02	5.1850D 01	0.0	7.2395D 02	6.3374D 02	5.4312D 02	4.6224D 02
513	3.8105D 02	3.3016D 02	2.6891D 02	2.1771D 02	1.6632D 02	1.0430D 02	5.2187D 01	0.0
521	7.1347D 02	6.2323D 02	5.3252D 02	4.5152D 02	3.7030D 02	3.1923D 02	2.5793D 02	2.0673D 02
529	1.5584D 02	1.0403D 02	5.2386D 01	0.0	7.0359D 02	6.1330D 02	5.2247D 02	4.4130D 02
537	3.5978D 02	3.0870D 02	2.4730D 02	1.9618D 02	1.4498D 02	9.3942D 01	4.3224D 01	-6.7565D 00
545	6.9013D 02	5.9976D 02	5.0866D 02	4.2709D 02	3.4500D 02	2.9349D 02	2.3159D 02	1.7981D 02
553	1.3407D 02	8.3110D 01	3.2282D 01	-1.7721D 01	6.7872D 02	5.8826D 02	4.9688D 02	4.1482D 02
561	3.3190D 02	2.7958D 02	2.1620D 02	1.6374D 02	1.1616D 02	7.0154D 01	2.0000D 01	-3.1707D 01
569	6.6738D 02	5.7688D 02	4.8534D 02	4.0304D 02	3.1970D 02	2.6698D 02	2.0287D 02	1.5000D 02
577	1.0000D 02	5.0000D 01	0.0	-4.3658D 01	6.6080D 02	5.7035D 02	4.7900D 02	3.9706D 02
585	3.1446D 02	2.6254D 02	2.0000D 02	1.6000D 02	6.5869D 02	5.6828D 02	4.7708D 02	3.9541D 02
593	3.1329D 02	2.6181D 02	2.0000D 02					

OUTPUT TABLE 6.. TOTAL HEADS AT TIME = 0.0 ,(DELT = 1.0000D 02),(BAND WIDTH = 27)

NODE I	TOTAL HEAD OF NODES I,I+1,....,I+7							
1	2.1993D 03	2.1993D 03	2.1993D 03	2.1993D 03	2.1993D 03	2.1993D 03	2.1993D 03	2.1993D 03
9	2.1993D 03	2.1993D 03	2.1993D 03	2.1993D 03	2.1993D 03	2.1993D 03	2.1993D 03	2.1993D 03
17	2.1993D 03	2.1993D 03	2.1993D 03	2.1993D 03	2.1993D 03	2.1993D 03	2.1993D 03	2.1993D 03
25	2.1993D 03	2.1993D 03	2.1993D 03	2.1993D 03	2.1993D 03	2.1993D 03	2.1993D 03	2.1993D 03
33	2.1993D 03	2.1993D 03	2.1993D 03	2.1993D 03	2.1992D 03	2.1993D 03	2.1993D 03	2.1993D 03
41	2.1993D 03	2.1994D 03	2.1994D 03	2.1994D 03	2.1994D 03	2.1994D 03	2.1994D 03	2.1994D 03
49	2.1992D 03	2.1992D 03	2.1993D 03	2.1993D 03	2.1994D 03	2.1994D 03	2.1994D 03	2.1994D 03
57	2.1994D 03	2.1995D 03	2.1995D 03	2.1995D 03	2.1991D 03	2.1991D 03	2.1992D 03	2.1994D 03
65	2.1995D 03	2.1995D 03	2.1995D 03	2.1996D 03	2.1996D 03	2.1996D 03	2.1996D 03	2.1996D 03
73	2.1989D 03	2.1990D 03	2.1992D 03	2.1995D 03	2.1997D 03	2.1997D 03	2.1997D 03	2.1996D 03
81	2.1999D 03	2.1999D 03	2.1999D 03	2.1999D 03	2.1985D 03	2.1986D 03	2.1991D 03	2.1996D 03
89	2.2000D 03	2.2001D 03	2.2002D 03	2.2004D 03	2.2005D 03	2.2005D 03	2.2005D 03	2.2005D 03
97	2.1977D 03	2.1980D 03	2.1989D 03	2.1999D 03	2.2007D 03	2.2009D 03	2.2010D 03	2.2015D 03
105	2.2017D 03	2.2013D 03	2.2019D 03	2.2019D 03	2.1962D 03	2.1968D 03	2.1984D 03	2.2005D 03
113	[illegible]	2.2025D 03	2.2029D 03	2.2031D 03	2.2046D 03	2.2048D 03	2.2049D 03	2.2049D 03
121	[illegible]	2.1944D 03	2.1973D 03	2.2014D 03	2.2049D 03	2.2057D 03	2.2065D 03	2.2104D 03
129	2.2105D 03	2.2116D 03	2.2119D 03	2.2119D 03	2.1883D 03	2.1900D 03	2.1949D 03	2.2023D 03
137	2.2105D 03	2.2128D 03	2.2149D 03	2.2163D 03	2.2294D 03	2.2337D 03	2.2341D 03	2.2343D 03
145	2.1799D 03	2.1823D 03	2.1896D 03	2.2017D 03	2.2185D 03	2.2263D 03	2.2403D 03	2.3037D 03
153	2.2756D 03	2.2639D 03	2.2624D 03	2.2720D 03	2.1665D 03	2.1697D 03	2.1794D 03	2.1964D 03
161	2.2224D 03	2.2369D 03	2.2675D 03	2.4113D 03	2.1469D 03	2.1507D 03	2.1623D 03	2.1828D 03
169	2.2140D 03	2.2302D 03	2.2619D 03	2.3982D 03	2.1198D 03	2.1239D 03	2.1367D 03	2.1591D 03
177	2.1924D 03	2.2089D 03	2.2410D 03	2.1917D 03	2.0847D 03	2.0889D 03	2.1036D 03	2.1242D 03
185	2.1590D 03	2.1772D 03	2.2116D 03	2.3712D 03	2.0415D 03	2.0454D 03	2.0571D 03	2.0775D 03
193	2.1099D 03	2.1319D 03	2.1806D 03	2.3647D 03	1.9708D 03	1.9942D 03	2.0041D 03	2.0210D 03
201	2.0427D 03	2.0579D 03	2.1060D 03	2.1612D 03	2.1069D 03	2.0826D 03	2.0794D 03	2.0783D 03
209	1.9334D 03	1.9362D 03	1.9446D 03	1.9584D 03	1.9734D 03	1.9775D 03	1.9906D 03	1.9924D 03
217	2.0082D 03	2.0119D 03	2.0122D 03	2.0123D 03	1.8704D 03	1.8725D 03	1.8794D 03	1.8905D 03
225	1.9058D 03	1.9095D 03	1.9129D 03	1.9190D 03	1.9208D 03	1.9235D 03	1.9241D 03	1.9246D 03
233	1.8027D 03	1.8043D 03	1.8095D 03	1.8174D 03	1.8261D 03	1.8318D 03	1.8381D 03	1.8437D 03
241	1.8488D 03	1.8513D 03	1.8529D 03	1.8538D 03	1.7311D 03	1.7325D 03	1.7367D 03	1.7427D 03
249	1.7491D 03	1.7560D 03	1.7635D 03	1.7711D 03	1.7777D 03	1.7842D 03	1.7859D 03	1.7876D 03
257	1.6558D 03	1.6570D 03	1.6612D 03	1.6672D 03	1.6767D 03	1.6833D 03	1.6903D 03	1.6952D 03
265	1.7084D 03	1.7154D 03	1.7176D 03	1.7197D 03	1.5766D 03	1.5778D 03	1.5818D 03	1.5876D 03
273	1.5971D 03	1.6017D 03	1.6085D 03	1.6188D 03	1.6310D 03	1.6430D 03	1.6466D 03	1.6503D 03
281	1.4928D 03	1.4938D 03	1.4976D 03	1.5030D 03	1.5119D 03	1.5167D 03	1.5210D 03	1.5236D 03
289	1.5319D 03	1.5439D 03	1.5490D 03	1.5539D 03	1.4030D 03	1.4041D 03	1.4078D 03	1.4138D 03
297	1.4222D 03	1.4243D 03	1.4269D 03	1.4310D 03	1.4363D 03	1.4429D 03	1.4472D 03	1.4519D 03

305	1.3555D 03	1.3564D 03	1.3600D 03	1.3653D 03	1.3737D 03	1.3772D 03	1.3807D 03	1.3849D 03
313	1.3880D 03	1.3923D 03	1.3953D 03	1.3997D 03	1.3060D 03	1.3068D 03	1.3094D 03	1.3143D 03
321	1.3215D 03	1.3258D 03	1.3299D 03	1.3384D 03	1.3346D 03	1.3415D 03	1.3444D 03	1.3469D 03
329	1.2548D 03	1.2552D 03	1.2573D 03	1.2608D 03	1.2657D 03	1.2686D 03	1.2727D 03	1.2773D 03
337	1.2816D 03	1.2870D 03	1.2927D 03	1.3000D 03	1.2020D 03	1.2022D 03	1.2031D 03	1.2047D 03
345	1.2068D 03	1.2084D 03	1.2100D 03	1.2122D 03	1.2144D 03	1.2169D 03	1.2186D 03	1.2200D 03
353	1.1486D 03	1.1485D 03	1.1482D 03	1.1478D 03	1.1475D 03	1.1475D 03	1.1475D 03	1.1477D 03
361	1.1490D 03	1.1488D 03	1.1494D 03	1.1500D 03	1.0954D 03	1.0951D 03	1.0940D 03	1.0922D 03
369	1.0900D 03	1.0884D 03	1.0869D 03	1.0852D 03	1.0835D 03	1.0816D 03	1.0807D 03	1.0800D 03
377	1.0440D 03	1.0435D 03	1.0422D 03	1.0394D 03	1.0359D 03	1.0335D 03	1.0307D 03	1.0279D 03
385	1.0236D 03	1.0189D 03	1.0149D 03	1.0100D 03	9.9540D 02	9.9498D 02	9.9154D 02	9.9075D 02
393	9.8689D 02	9.8418D 02	9.8148D 02	9.7785D 02	9.7286D 02	9.6851D 02	9.6446D 02	9.6000D 02
401	9.5037D 02	9.5001D 02	9.4878D 02	9.4616D 02	9.4316D 02	9.4081D 02	9.3848D 02	9.3536D 02
409	9.3184D 02	9.2770D 02	9.2423D 02	9.2000D 02	9.0901D 02	9.0874D 02	9.0781D 02	9.0609D 02
417	9.0376D 02	9.0219D 02	9.0042D 02	8.9776D 02	8.9521D 02	8.9235D 02	8.9085D 02	8.9030D 02
425	9.7098D 02	8.7076D 02	8.7013D 02	8.6909D 02	8.6762D 02	8.6630D 02	8.6474D 02	8.6279D 02
433	8.6004D 02	8.5725D 02	8.5420D 02	8.5000D 02	8.3559D 02	8.3544D 02	8.3499D 02	8.3436D 02
441	8.3382D 02	8.3277D 02	8.3209D 02	8.3112D 02	8.3040D 02	8.2984D 02	8.2973D 02	8.3030D 02
449	8.0216D 02	8.0206D 02	8.0172D 02	8.0123D 02	8.0070D 02	8.0007D 02	7.9969D 02	7.9921D 02
457	7.9884D 02	7.9878D 02	7.9911D 02	8.0000D 02	7.7041D 02	7.7029D 02	7.6993D 02	7.6934D 02
465	7.6863D 02	7.6800D 02	7.6716D 02	7.6631D 02	7.6531D 02	7.6400D 02	7.6243D 02	7.6000D 02
473	7.5823D 02	7.5809D 02	7.5768D 02	7.5699D 02	7.5616D 02	7.5554D 02	7.5471D 02	7.5378D 02
481	7.5261D 02	7.5165D 02	7.5094D 02	7.5000D 02	7.4619D 02	7.4621D 02	7.4575D 02	7.4507D 02
489	7.4414D 02	7.4329D 02	7.4229D 02	7.4117D 02	7.4020D 02	7.3890D 02	7.3846D 02	7.4000D 02
497	7.3494D 02	7.3476D 02	7.3422D 02	7.3344D 02	7.3238D 02	7.3139D 02	7.3043D 02	7.2935D 02
505	7.2784D 02	7.2597D 02	7.2385D 02	7.2000D 02	7.2195D 02	7.2174D 02	7.2312D 02	7.2224D 02
513	7.2105D 02	7.2016D 02	7.1891D 02	7.1771D 02	7.1632D 02	7.1430D 02	7.1219D 02	7.1000D 02
521	7.1347D 02	7.1323D 02	7.1252D 02	7.1152D 02	7.1020D 02	7.0921D 02	7.0793D 02	7.0671D 02
529	7.0584D 02	7.0403D 02	7.0219D 02	7.0000D 02	7.0354D 02	7.0310D 02	7.0247D 02	7.0130D 02
537	6.9978D 02	6.9870D 02	6.9730D 02	6.9618D 02	6.9498D 02	6.9394D 02	6.9122D 02	6.9320D 02
545	6.9013D 02	6.8976D 02	6.8866D 02	6.8709D 02	6.8500D 02	6.8349D 02	6.8159D 02	6.7981D 02
553	6.8407D 02	6.8311D 02	6.8228D 02	6.8229D 02	6.7672D 02	6.7826D 02	6.7688D 02	6.7482D 02
561	6.7190D 02	6.6958D 02	6.6620D 02	6.6374D 02	6.6616D 02	6.7015D 02	6.7000D 02	6.6829D 02
569	6.6738D 02	6.6688D 02	6.6534D 02	6.6304D 02	6.5970D 02	6.5699D 02	6.5287D 02	6.5500D 02
577	6.5000D 02	6.5000D 02	6.5000D 02	6.5634D 02	6.6080D 02	6.6035D 02	6.5900D 02	6.5706D 02
585	6.5446D 02	6.5258D 02	6.5000D 02	6.5000D 02	6.5869D 02	6.5829D 02	6.5708D 02	6.5541D 02
593	6.5329D 02	6.5161D 02	6.5000D 02					

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SYSTEM-FLOW TABLE   1.. AT TIME =  3.0000D 02 ,(DELT =  3.0000D 02)
     TYPE OF FLOW                                    RATE          INC. FLOW        TOTAL FLOW
     CONSTANT-CONCENTRATION NODE FLOW. . . . -0.1170D 02       -0.3512D 04      -0.3512D 04
     CONSTANT-FLUX-NODE FLOW . . . . . . . .  0.0               0.0              0.0
     SEEPAGE FLUX-NODE FLOW. . . . . . . . .  0.4395D-05        0.6593D-03       0.6593D-03
     NUMERICAL LOSSES. . . . . . . . . . . . -0.1163D 00       -0.3497D 02      -0.3497D 02
     NET FLOW. . . . . . . . . . . . . . . . -0.1182D 02       -0.3547D 04      -0.3547D 04
     INCREASE IN MATERIAL CONTENT (LIQUID) .  0.7973D-02        0.2392  01       0.2392D 01
     INCREASE IN MATERIAL CONTENT (SOLID). .  0.4651D 01        0.1395D 04       0.1395D 04
     RADIOACTIVE LOSSES (LIQUID AND SOLID) .  0.0               0.0              0.0
****************************************************************************************************
SYSTEM-FLOW TABLE   2.. AT TIME =  6.9000D 02 ,(DELT =  3.9000D 02)
     TYPE OF FLOW                                    RATE          INC. FLOW        TOTAL FLOW
     CONSTANT-CONCENTRATION NODE FLOW. . . . -0.1170D 02       -0.4564D 04      -0.8076D 04
     CONSTANT-FLUX-NODE FLOW . . . . . . . .  0.0               0.0              0.0
     SEEPAGE FLUX-NODE FLOW. . . . . . . . .  0.1008D-04        0.2822D-02       0.3481D-02
     NUMERICAL LOSSES. . . . . . . . . . . . -0.1166D 00       -0.4547D 02      -0.8044D 02
     NET FLOW. . . . . . . . . . . . . . . . -0.1182D 02       -0.4609D 04      -0.8156D 04
     INCREASE IN MATERIAL CONTENT (LIQUID) .  0.7978D-02        0.3111D 01       0.5503D 01
     INCREASE IN MATERIAL CONTENT (SOLID). .  0.4654D 01        0.1815D 04       0.3210D 04
     RADIOACTIVE LOSSES (LIQUID AND SOLID) .  0.0               0.0              0.0
****************************************************************************************************
SYSTEM-FLOW TABLE   3.. AT TIME =  1.8905D 05 ,(DELT =  4.3858D 04)
     TYPE OF FLOW                                    RATE          INC. FLOW        TOTAL FLOW
     CONSTANT-CONCENTRATION NODE FLOW. . . . -0.1037D 02       -0.4605D 06      -0.2079D 07
     CONSTANT-FLUX-NODE FLOW . . . . . . . .  0.0               0.0              0.0
     SEEPAGE FLUX-NODE FLOW. . . . . . . . .  0.3047D-03        0.1755D 02       0.8396D 02
     NUMERICAL LOSSES. . . . . . . . . . . . -0.1239D 00       -0.5401D 04      -0.2276D 05
     NET FLOW. . . . . . . . . . . . . . . . -0.1049D 02       -0.4659D 06      -0.2102D 07
     INCREASE IN MATERIAL CONTENT (LIQUID) .  0.9878D-02        0.4312D 03       0.1723D 04
     INCREASE IN MATERIAL CONTENT (SOLID). .  0.5762D 01        0.2527D 06       0.1005D 07
     RADIOACTIVE LOSSES (LIQUID AND SOLID) .  0.0               0.0              0.0
****************************************************************************************************
SYSTEM-FLOW TABLE   4.. AT TIME =  3.1893D 07 ,(DELT =  5.2560D 06)
     TYPE OF FLOW                                    RATE          INC. FLOW        TOTAL FLOW
     CONSTANT-CONCENTRATION NODE FLOW. . . . -0.3301D 01       -0.1743D 08      -0.1414D 09
     CONSTANT-FLUX-NODE FLOW . . . . . . . .  0.0               0.0              0.0
     SEEPAGE FLUX-NODE FLOW. . . . . . . . .  0.2943D-02        0.1683D 05       0.1521D 06
     NUMERICAL LOSSES. . . . . . . . . . . . -0.9320D-01       -0.5010D 06      -0.3707D 07
     NET FLOW. . . . . . . . . . . . . . . . -0.3391D 01       -0.1832D 08      -0.1450D 09
     INCREASE IN MATERIAL CONTENT (LIQUID) .  0.6663D-02        0.3502D 05       0.2672D 06
     INCREASE IN MATERIAL CONTENT (SOLID). .  0.3887D 01        0.2043D 08       0.1559D 09
     RADIOACTIVE LOSSES (LIQUID AND SOLID) .  0.0               0.0              0.0
****************************************************************************************************
SYSTEM-FLOW TABLE   5.. AT TIME =  8.4443D 07 ,(DELT =  5.2560D 06)
     TYPE OF FLOW                                    RATE          INC. FLOW        TOTAL FLOW
     CONSTANT-CONCENTRATION NODE FLOW. . . . -0.2422D 01       -0.1286D 08      -0.2871D 09
     CONSTANT-FLUX-NODE FLOW . . . . . . . .  0.0               0.0              0.0
     SEEPAGE FLUX-NODE FLOW. . . . . . . . .  0.1266D-02        0.6816D 04       0.2484D 06
     NUMERICAL LOSSES. . . . . . . . . . . . -0.7671D-01       -0.4067D 06      -0.8060D 07
     NET FLOW. . . . . . . . . . . . . . . . -0.2498D 01       -0.1326D 08      -0.2949D 09
     INCREASE IN MATERIAL CONTENT (LIQUID) .  0.4894D-02        0.2572D 05       0.5565D 06
     INCREASE IN MATERIAL CONTENT (SOLID). .  0.2855D 01        0.1501D 08       0.3246D 09
     RADIOACTIVE LOSSES (LIQUID AND SOLID) .  0.0               0.0              0.0
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OUTPUT TABLE 7.. CONCENTRATIONS AT TIME = 8.4443D 07 , (DELT = 5.2560D 06), (BAND WIDTH = 27)

NODE I	CONCENTRATION AT NODES I,I+1,...,I+7							
1	-1.0123D-10	4.4896D-11	-4.0259D-10	3.3492D-09	-3.4222D-10	9.4214D-08	-1.4816D-07	1.8753D-07
9	1.8281D-07	1.2948D-07	1.5967D-07	1.7046D-07	2.0167D-10	-8.8143D-11	7.9914D-10	-8.6778D-09
17	6.2922D-10	-1.8828D-07	2.9629D-07	-3.7565D-07	-3.6513D-07	-2.5919D-07	-3.1947D-07	-3.4094D-07
25	-6.9895D-10	2.9417D-10	-2.7425D-09	2.3194D-08	-1.8029D-09	6.5807D-07	-1.0381D-06	1.3208D-06
33	1.2747D-06	9.0975D-07	1.1188D-06	1.1945D-06	2.5411D-09	-9.7942D-10	9.7575D-09	-8.4744D-08
41	3.6436D-09	-2.4371D-06	3.8627D-06	-4.9470D-06	-4.7177D-06	-3.3960D-06	-4.1616D-06	-4.4485D-06
49	-9.0728D-09	2.8180D-09	-3.3244D-08	3.0580D-07	8.6750D-09	9.0391D-06	-1.4460D-05	1.8755D-05
57	1.7489D-05	1.2788D-05	1.5582D-05	1.6685D-05	3.0884D-08	-4.4384D-09	1.0118D-07	-1.0655D-06
65	-1.9582D-07	-3.3324D-05	5.4308D-05	-7.2139D-05	-6.4501D-05	-4.8552D-05	-5.8635D-05	-6.2899D-05
73	-9.3968D-08	-2.6562D-08	-2.1619D-07	3.4323D-06	1.9190D-06	1.2116D-04	-2.0440D-04	2.8452D-04
81	2.3509D-04	1.8717D-04	2.2294D-04	2.3906D-04	2.0366D-07	3.9186D-07	-2.7523D-07	-9.0200D-06
89	-1.5629D-05	-4.2478D-04	7.7046D-04	-1.1588D-03	-8.4479D-04	-7.3727D-04	-8.6578D-04	-9.2468D-04
97	1.4662D-07	-3.1984D-06	7.2485D-06	1.0198D-05	1.1031D-04	1.3526D-03	-2.7504D-03	4.9285D-03
105	2.8962D-03	3.0377D-03	3.5089D-03	3.7059D-03	-4.8833D-06	1.9359D-05	-5.0674D-05	6.6698D-05
113	-5.6248D-04	-2.9647D-03	9.8177D-03	-2.0115D-02	-1.0789D-02	-1.3072D-02	-1.5005D-02	-1.5785D-02
121	3.6994D-05	-9.6484D-05	2.2810D-04	-4.5987D-04	-1.5762D-03	-2.2044D-03	-1.0594D-02	7.7712D-02
129	2.8759D-02	5.4707D-02	6.4300D-02	6.7956D-02	-6.6503D-04	1.2596D-03	-3.4593D-03	1.4201D-02
137	1.4521D-01	2.3909D-01	3.4429D-01	3.4911D-01	4.7474D-01	4.6139D-01	4.4993D-01	4.4573D-01
145	-3.2347D-04	1.4082D-03	-1.0677D-02	8.7654D-02	4.0743D-01	5.8316D-01	7.8811D-01	1.0000D 00
153	8.9693D-01	8.1934D-01	8.0049D-01	7.9151D-01	1.8413D-03	-2.9974D-03	-1.0465D-03	1.7193D-01
161	5.3784D-01	7.0336D-01	8.6231D-01	1.0000D 00	2.5573D-03	-5.9916D-03	1.5588D-02	2.1703D-01
169	5.7319D-01	7.2444D-01	8.6859D-01	1.0000D 00	1.9193D-03	-6.1179D-03	2.6629D-02	2.3613D-01
177	5.9105D-01	7.4194D-01	8.7945D-01	1.0000D 00	1.1554D-03	-5.3276D-03	3.1980D-02	2.4731D-01
185	6.0851D-01	7.5309D-01	8.8497D-01	1.0000D 00	5.3933D-04	-4.3651D-03	3.3610D-02	2.4179D-01
193	6.0284D-01	7.4766D-01	8.8539D-01	1.0000D 00	4.3079D-05	-3.1727D-03	3.1443D-02	2.0562D-01
201	5.0692D-01	6.6341D-01	8.2810D-01	1.0000D 00	9.4820D-01	9.0283D-01	8.8654D-01	8.6950D-01
209	-2.9347D-04	-1.8687D-03	2.5577D-02	1.4960D-01	3.4478D-01	4.4704D-01	6.0587D-01	6.4653D-01
217	6.9382D-01	6.8682D-01	6.8285D-01	6.8192D-01	-3.1190D-04	-1.0190D-03	1.7080D-02	9.2217D-02
225	1.9540D-01	2.4292D-01	3.3635D-01	4.0167D-01	4.1942D-01	4.3607D-01	4.3945D-01	4.4168D-01
233	-2.6845D-04	-3.4793D-04	9.2088D-03	4.4302D-02	9.0880D-02	1.1879D-01	1.5506D-01	2.0006D-01
241	2.2146D-01	2.3030D-01	2.3262D-01	2.3474D-01	-1.9103D-04	4.2916D-05	3.9033D-03	1.6387D-02
249	3.3372D-02	4.3738D-02	6.2295D-02	7.9957D-02	9.2672D-02	1.0152D-01	1.0328D-01	1.0515D-01
257	-6.5068D-05	3.3556D-05	1.3509D-03	4.7047D-03	1.0344D-02	1.3038D-02	1.9395D-02	2.5130D-02
265	3.0876D-02	3.4542D-02	3.6129D-02	3.7870D-02	-2.0347D-05	3.0489D-05	3.4073D-04	1.1188D-03
273	2.7897D-03	3.6030D-03	4.4401D-03	5.9867D-03	7.6612D-03	8.9013D-03	9.0983D-03	9.2160D-03
281	-1.9880D-06	9.7783D-06	7.8292D-05	2.3322D-04	6.2951D-04	8.1073D-04	9.7044D-04	1.0513D-03
289	1.2873D-03	1.6344D-03	1.8605D-03	2.1235D-03	5.2985D-07	4.1349D-06	1.9534D-05	5.3917D-05
297	.7561D-05	1.0982D-04	1.5200D-04	2.0447D-04	2.5197D-04	3.0371D-04	3.0328D-04	3.0453D-04

305	6.6948D-07	2.4308D-06	1.0071D-05	2.3497D-05	4.4415D-05	5.4649D-05	6.5677D-05	8.5145D-05
313	9.9998D-05	1.1771D-04	1.3145D-04	1.4055D-04	6.8267D-07	1.3711D-06	4.4677D-06	1.0785D-05
321	1.9910D-05	2.4760D-05	3.0517D-05	3.6031D-05	4.1550D-05	4.5529D-05	5.0722D-05	5.9537D-05
329	4.3341D-07	7.9502D-07	2.4605D-06	5.3544D-06	9.2527D-06	1.1537D-05	1.4491D-05	1.7285D-05
337	1.9213D-05	2.0859D-05	2.0789D-05	1.7682D-05	2.8908D-07	4.8423D-07	1.2167D-06	2.5299D-06
345	4.3261D-06	5.4834D-06	6.6726D-06	8.2503D-06	9.6128D-06	1.0744D-05	1.1594D-05	1.3111D-05
353	1.8596D-07	2.6722D-07	5.5765D-07	1.1885D-06	1.8913D-06	2.4852D-06	3.1018D-06	3.9115D-06
361	4.6173D-06	5.7631D-06	6.4173D-06	7.0821D-06	1.1041D-07	1.4191D-07	2.6409D-07	4.8152D-07
369	8.3451D-07	1.1138D-06	1.4276D-06	1.8126D-06	2.2810D-06	2.9142D-06	3.3768D-06	3.8934D-06
377	6.0696D-08	7.3052D-08	1.0921D-07	2.0321D-07	3.3631D-07	4.4095D-07	5.7704D-07	7.2869D-07
385	1.0023D-06	1.3071D-06	1.5749D-06	1.8819D-06	3.0732D-08	3.4485D-08	4.8031D-08	7.7840D-08
393	1.2664D-07	1.630 D-07	2.0426D-07	2.7069D-07	3.6806D-07	4.6861D-07	5.7747D-07	7.106[illegible]D-07
401	1.4332D-08	1.5534D-08	1.9906D-08	2.9782D-08	4.2354D-08	5.3717D-08	6.5[illegible]11D-08	8.2848[illegible]-08
409	1.0800D-07	1.4505D-07	1.7869D-07	2.2423D-07	6.1431D-09	6.4872D-09	7.6473D-09	1.0046D-08
417	1.3474D-08	1.5836D-08	1.9419D-08	2.5360D-08	3.2066D-08	4.2931D-08	5.1553D-08	6.2199D-08
425	2.4536D-09	2.5519D-09	2.8538D-09	3.3762D-09	4.2790D-09	5.1864D-09	6.1336D-09	7.5513D-09
433	1.0115D-08	1.3071D-08	1.7029D-08	2.1888D 08	9.1854D-10	9.4828D-10	1.0395D-09	1.1923D-09
441	1.4289D-09	1.6019D-09	1.8618D-09	2.2411D-09	2.5665D-09	3.0296D-09	3.1515D-09	3.4305D-09
449	3.2138D-10	3.3065D-10	3.6013D-10	4.0030D-10	4.5015D-10	5.4343D-10	5.8910D-10	6.9704D-10
457	8.3763D-10	9.7409D-10	1.0941D-09	1.0979D-09	1.0957D-10	1.1160D-10	1.1908D-10	1.3371D-10
465	1.5037D-10	1.6852D-10	2.0149D-10	2.2620D-10	2.6365D-10	3.2576D-10	4.0018D-10	5.3790D-10
473	7.0778D-11	7.2225D-11	7.7183D-11	8.6214D-11	9.7410D-11	1.0701D-10	1.2301D-10	1.4272D-10
481	1.7061D-10	2.0307D-10	2.3405D-10	2.8620D-10	4.5286D-11	4.6268D-11	4.9353D-11	5.4216D-11
489	6.1498D-11	6.8982D-11	7.8884D-11	8.9557D-11	1.0693D-10	1.3482D-10	1.5972D-10	1.6203D-10
497	2.8643D-11	2.9264D-11	3.1215D-11	3.4251D-11	3.8871D-11	4.3501D-11	4.8568D-11	5.5447D-11
505	6.6807D-11	8.4505D-11	1.0633D-10	1.3124D-10	1.7856D-11	1.8245D-11	1.9459D-11	2 1347D-11
513	2.4125D-11	2.6494D-11	3.0201D-11	3.4120D-11	3.9574D-11	4.9306D-11	6.1114D-11	7.7768D-11
521	1.0933D-11	1.1174D-11	1.1929D-11	1.3093D-11	1.4820D-11	1.6248D-11	1.8392D-11	2.0661D-11
529	2.3436D-11	2.7098D-11	3.2873D-11	4.4000D-11	6.5354D-12	6.6856D-12	7.1583D-12	7.8944D-12
537	8.9925D-12	9.8921D-12	1.1251D-11	1.2483D-11	1.4146D-11	1.6054D-11	1.8077D-11	1.9057D-11
545	2.8252D-12	2.8972D-12	3 1340D-12	3.5270D-12	4.1495D-12	4.6809D-12	5.5042D-12	6.4972D-12
553	9.1521D-12	1.0244D-11	1.1442D-11	1.1748D-11	1.0886D-12	1.1193D-12	1.2299D-12	1.4380D-12
561	1.8148D-12	2.1609D-12	2.7092D-12	3.3730D-12	5.2919D-12	7.5694D-12	7.9494D-12	8.4695D-12
569	2.0005D-13	2.0344D-13	2.2008D-13	2.6466D-13	3.7509D-13	4.9060D-13	7.0031D-13	1.3699D-12
577	2.6947D-12	4.5725D-12	6.8532D-12	6.5233D-12	6.0861D-15	4.2887D-15	-3.3991D-15	-1.8237D-14
585	-4.6544D-14	-7.7646D-14	-1.4835D-13	5.1244D-13	-3.0752D-15	-1.4718D 15	7.6270D-16	4.1024D-15
593	1.1149D-14	2.1680D-14	5.5407D-14					

SYSTEM-FLOW TABLE 6.. AT TIME = 1.3700D 08 ,(DELT = 5.2560D 06)

TYPE OF FLOW	RATE	INC. FLOW	TOTAL FLOW
CONSTANT-CONCENTRATION NODE FLOW. . . .	-0.2088D 01	-0.1104D 08	-0.4046D 09
CONSTANT-FLUX-NODE FLOW	0.0	0.0	0.0
SEEPAGE FLUX-NODE FLOW.	0.1118D-02	0.5809D 04	0.3074D 06
NUMERICAL LOSSES.	-0.4918D-01	-0.2684D 06	-0.1149D 08
NET FLOW.	-0.2136D 01	-0.1130D 08	-0.4158D 09
INCREASE IN MATERIAL CONTENT (LIQUID) .	0.4232D-02	0.2224D 05	0.7926D 06
INCREASE IN MATERIAL CONTENT (SOLID). .	0.2469D 01	0.1297D 08	0.4624D 09
RADIOACTIVE LOSSES (LIQUID AND SOLID) .	0.0	0.0	0.0

SYSTEM-FLOW TABLE 7.. AT TIME = 2.4212D 08 ,(DELT = 5.2560D 06)

TYPE OF FLOW	RATE	INC. FLOW	TOTAL FLOW
CONSTANT-CONCENTRATION NODE FLOW. . . .	-0.1774D 01	-0.9354D 07	-0.6053D 09
CONSTANT-FLUX-NODE FLOW	0.0	0.0	0.0
SEEPAGE FLUX NODE FLOW.	0.4654D-02	0.2354D 05	0.5525D 06
NUMERICAL LOSSES.	0.3776D-01	0.1877D 06	-0.1203D 08
NET FLOW.	-0.1732D 01	-0.9143D 07	-0.6169D 09
INCREASE IN MATERIAL CONTENT (LIQUID) .	0.3607D-02	0.1896D 05	0.1199D 07
INCREASE IN MATERIAL CONTENT (SOLID). .	0.2104D 01	0.1106D 08	0.6992D 09
RADIOACTIVE LOSSES (LIQUID AND SOLID) .	0.0	0.0	0.0

SYSTEM-FLOW TABLE 8.. AT TIME = 3.4724D 08 ,(DELT = 5.2560D 06)

TYPE OF FLOW	RATE	INC. FLOW	TOTAL FLOW
CONSTANT-CONCENTRATION NODE FLOW. . . .	-0.1616D 01	-0.8508D 07	-0.7820D 09
CONSTANT-FLUX-NODE FLOW	0.0	0.0	0.0
SEEPAGE FLUX-NODE FLOW.	0.1636D-01	0.8385D 05	0.1577D 07
NUMERICAL LOSSES.	0.1029D 00	0.5341D 06	-0.4420D 07
NET FLOW.	-0.1496D 01	-0.7890D 07	-0.7856D 09
INCREASE IN MATERIAL CONTENT (LIQUID) .	0.3273D-02	0.1720D 05	0.1578D 07
INCREASE IN MATERIAL CONTENT (SOLID). .	0.1909D 01	0.1004D 08	0.9089D 09
RADIOACTIVE LOSSES (LIQUID AND SOLID) .	0.0	0.0	0.0

OUTPUT TABLE 8.. CONCENTRATIONS AT TIME = 3.4724D 08 ,(DELT = 5.2560D 06),(BAND WIDTH = 27)

NODE I	CONCENTRATION AT NODES I,I+1,...,I+7							
1	2.6260D-10	-8.0772D-09	9.4928D-09	7.5263D-09	-1.5658D-07	-4.9753D-08	-2.1524D-07	1.6973D-08
9	-1.8922D-07	-1.9264D-07	-1.4902D-07	-1.3693D-07	-5.4196D-10	1.6176D-08	-1.9029D-08	-1.4945D-08
17	3.1288D-07	9.9630D-08	4.3149D-07	-3.4558D-08	3.8108D-07	3.8515D-07	2.9830D-07	2.7421D-07
25	2.0565D-09	-5.6827D-08	6.7020D-08	5.1261D-08	-1.0933D-06	-3.4711D-07	-1.5224D-06	1.2603D-07
33	-1.3578D-06	-1.3569D-06	-1.0590D-06	-9.7387D-07	-8.8697D-09	2.1279D-07	-2.5324D-07	-1.8190D-07
41	4.0471D-06	1.2777D-06	5.7375D-06	-4.0253D-07	5.2172D-06	5.1384D-06	4.0640D-06	3.7372D-06
49	4.2299D-08	-8.0680D-07	9.6505D-07	6.1668D-07	-1.4995D-05	-4.6793D-06	-2.2005D-05	1.8502D-06
57	-2.0766D-05	-1.9983D-05	-1.6154D-05	-1.4908D-05	-2.2571D-07	3.1048D-06	-3.7684D-06	-1.8655D-06
65	5.5109D-05	1.6955D-05	8.6290D-05	-6.4797D-06	8.6906D-05	8.1275D-05	6.7749D-05	6.3128D-05
73	1.3376D-06	-1.2244D-05	1.5130D-05	4.1419D-06	-1.4811D-04	-6.0942D-05	-3.4935D-04	1.6234D-05
81	-1.9857D-04	-3.5570D-04	-3.1024D-04	-2.9404D-04	-8.5256D-06	4.9975D-05	-6.1844D-05	-1.9881D-06
89	6.7223D-04	2.3562D-04	1.4710D-03	1.5525D-04	2.0006D-03	1.8070D-03	1.6426D-03	1.5840D-03
97	5.6122D-05	-2.1053D-04	2.4009D-04	4.3017D-05	-1.8722D-03	-9.8227D-04	-6.3890D-03	-2.7118D-03
105	-1.2681D-02	-1.0760D-02	-1.0249D-02	-1.0079D-02	-3.7858D-04	9.0316D-04	-7.5672D-04	-2.6291D-03
113	9.7784D-04	6.1657D-03	3.4647D-02	4.7171D-02	7.9679D-02	8.1358D-02	8.0789D-02	8.0722D-02
121	2.5330D-03	-3.0379D-03	1.7184D-03	6.7076D-02	1.6439D-01	1.9095D-01	2.1915D-01	3.2064D-01
129	3.4485D-01	3.7207D-01	3.7727D-01	3.7906D-01	1.8125D-03	-1.1958D-02	6.6827D-02	2.5651D-01
137	4.5942D-01	5.2374D-01	5.9077D-01	6.2013D-01	6.8917D-01	6.8887D-01	6.8573D-01	6.8460D-01
145	-8.3284D-03	7.9519D-03	1.8365D-01	4.4456D-01	6.9181D-01	7.8528D-01	8.8957D-01	1.0000D 00
153	9.5137D-01	9.2125D-01	9.1584D-01	9.1367D-01	-1.1542D-02	5.3058D-02	2.8874D-01	5.6248D-01
161	7.9331D-01	8.7260D-01	9.4176D-01	1.0000D 00	8.8131D-04	1.0042D-01	3.5768D-01	6.2068D-01
169	8.2632D-01	8.9159D-01	9.4868D-01	1.0000D 00	2.3043D-02	1.3656D-01	3.9386D-01	6.4504D-01
177	8.3884D-01	9.0110D-01	9.5398D-01	1.0000D 00	4.6031D-02	1.5831D-01	4.0501D-01	6.4508D-01
185	8.3937D-01	8.9935D-01	9.5296D-01	1.0000D 00	6.4080D-02	1.6674D-01	3.9527D-01	6.3043D-01
193	9.2466D-01	8.8871D-01	9.5008D-01	1.0000D 00	7.4934D-02	1.6411D-01	3.6770D-01	5.8307D-01
201	7.6303D-01	8.3642D-01	9.1544D-01	1.0000D 00	9.7555D-01	9.5036D-01	9.3825D-01	9.2216D-01
209	7.8664D-02	1.5294D-01	3.2710D-01	5.1177D-01	6.5559D-01	7.0992D-01	7.9466D-01	8.2352D-01
217	8.4980D-01	8.5052D-01	8.4900D-01	8.4889D-01	7.7214D-02	1.3210D-01	2.7555D-01	4.2769D-01
225	5.3405D-01	5.7074D-01	6.3929D-01	6.8742D-01	7.0776D-01	7.2287D-01	7.2612D-01	7.2832D-01
233	7.1004D-02	1.1031D-01	2.1819D-01	3.3245D-01	4.1034D-01	4.4643D-01	5.0076D-01	5.4537D-01
241	5.7814D-01	5.8910D-01	5.9228D-01	5.9469D-01	6.1911D-02	9.0533D-02	1.6136D-01	2.4293D-01
249	2.9823D-01	3.2469D-01	3.6958D-01	4.0896D-01	4.3851D-01	4.5905D-01	4.6104D-01	4.6615D-01
257	5.2601D-02	6.9082D-02	1.1794D-01	1.6810D-01	2.0998D-01	2.2654D-01	2.6073D-01	2.9364D-01
265	3.2064D-01	3.3775D-01	3.4258D-01	3.4707D-01	4.3021D-02	5.2733D-02	8.0909D-02	1.1267D-01
273	1.4404D-01	1.5498D-01	1.6955D-01	1.9396D-01	2.1617D-01	2.3176D-01	2.3597D-01	2.3977D-01
281	3.4457D-02	3.9252D-02	5.5274D-02	7.3903D-02	9.5908D-02	1.0283D-01	1.0917D-01	1.1417D-01
289	1.2657D-01	1.4111D-01	1.4546D-01	1.4952D-01	2.6986D-02	2.9852D-02	3.8799D-02	5.0173D-02
297	6.1466D-02	6.4046D-02	6.7079D-02	6.9956D-02	7.3982D-02	7.9282D-02	8.2118D-02	8.4460D-02

305	2.3781D-02	2.5891D-02	3.2595D-02	4.0489D-02	4.9097D-02	5.1803D-02	5.4018D-02	5.6472D-02
313	5.8041D-02	5.9918D-02	6.1182D-02	6.2014D-02	2.0890D-02	2.2104D-02	2.6734D-02	3.3100D-02
321	3.9330D-02	4.1706D-02	4.3805D-02	4.5317D-02	4.6460D-02	4.7161D-02	4.7988D-02	4.9471D-02
329	1.8240D-02	1.9238D-02	2.2884D-02	2.7591D-02	3.2015D-02	3.3029D-02	3.5901D-02	3.7342D-02
337	3.8097D-02	3.8531D-02	3.8361D-02	3.7314D-02	1.5788D-02	1.6584D-02	1.9185D-02	2.2710D-02
345	2.6171D-02	2.7919D-02	2.9409D-02	3.0965D-02	3.2136D-02	3.3036D-02	3.3662D-02	3.4457D-02
353	1.3534D-02	1.4081D-02	1.5794D-02	1.8669D-02	2.1101D-02	2.2710D-02	2.4126D-02	2.5707D-02
361	2.6836D-02	2.8377D-02	2.9173D-02	2.9947D-02	1.1435D-02	1.1783D-02	1.3021D-02	1.4804D-02
369	1.6970D-02	1.8392D-02	1.9715D-02	2.1088D-02	2.2448D-02	2.3991D-02	2.4908D-02	2.5790D-02
377	9.4781D-03	9.7224D-03	1.0387D-02	1.1775D-02	1.3163D-02	1.4390D-02	1.5525D-02	1.6566D-02
385	1.8101D-02	1.9488D-02	2.0491D-02	2.1475D-02	7.6881D-03	7.8218D-03	8.2701D-03	9.1257D-03
393	1.0267D-02	1.1020D-02	1.1756D-02	1.2723D-02	1.3940D-02	1.4939D-02	1.5813D-02	1.6701D-02
401	6.0832D-03	6.1629D-03	6.4357D-03	7.0038D-03	7.6533D-03	8.1542D-03	8.6010D-03	9.3247D-03
409	1.0078D-02	1.0948D-02	1.1625D-02	1.2364D-02	4.6919D-03	4.7373D-03	4.8914D-03	5.1904D-03
417	5.5976D-03	5.8596D-03	6.1915D-03	6.7088D-03	7.2421D-03	7.9308D-03	8.3770D-03	8.8413D-03
425	3.5334D-03	3.5632D-03	3.6535D-03	3.8048D-03	4.0283D-03	4.2287D-03	4.4515D-03	4.7566D-03
433	5.1951D-03	5.6439D-03	6.0997D-03	6.5766D-03	2.6040D-03	2.6245D-03	2.6668D-03	2.7813D-03
441	2.9247D-03	3.0313D-03	3.1562D-03	3.3473D-03	3.5138D-03	3.6999D-03	3.8163D-03	3.9673D-03
449	1.8794D-03	1.8928D-03	1.9378D-03	2.0045D-03	2.0889D-03	2.1956D-03	2.2697D-03	2.3953D-03
457	2.5398D-03	2.6921D-03	2.7881D-03	2.8049D-03	1.3315D-03	1.3415D-03	1.3724D-03	1.4260D-03
465	1.4910D-03	1.5545D-03	1.6431D-03	1.7305D-03	1.8122D-03	1.9533D-03	2.0808D-03	2.2475D-03
473	1.1529D-03	1.1625D-03	1.1917D-03	1.2407D-03	1.3010D-03	1.3482D-03	1.4160D-03	1.4455D-03
481	1.6024D-03	1.7002D-03	1.7734D-03	1.8790D-03	9.9425D-04	1.0035D-03	1.0306D-03	1.0703D-03
489	1.1243D-03	1.1749D-03	1.2365D-03	1.2978D-03	1.3855D-03	1.5042D-03	[illegible]	1.5876D-03
497	8.5358D-04	8.6247D-04	8.8860D-04	9.2544D-04	9.7481D-04	1.0203D-03	1.0650D-03	1.1183D-03
505	1.1974D-03	1.3006D-03	1.4052D-03	1.5055D-03	7.2896D-04	7.3778D-04	7.6330D-04	7.9632D-04
513	8.4353D-04	8.7707D-04	9.2290D-04	9.6668D-04	1.0188D-03	1.0980D-03	1.1827D-03	1.2787D-03
521	6.1861D-04	6.2765D-04	6.5337D-04	6.8764D-04	7.3037D-04	7.6080D-04	8.0044D-04	[illegible]
529	8.7472D-04	9.1730D-04	9.7319D-04	1.0679D-03	5.2079D-04	5.3033D-04	5.5710D-04	5.9197D-04
537	6.3407D-04	6.6296D-04	7.0058D-04	7.3124D-04	7.6348D-04	7.9416D-04	8.2076D-04	8.2892D-04
545	3.9380D-04	4.0434D-04	4.3354D-04	4.7097D-04	5.1536D-04	5.4546D-04	5.8247D-04	6.1860D-04
553	6.8636D-04	7.1150D-04	7.3174D-04	7.3525D-04	2.8642D-04	2.9749D-04	3.2702D-04	3.6699D-04
561	4.1383D-04	4.4592D-04	4.8678D-04	5.1989D-04	5.9312D-04	6.6487D-04	6.7574D-04	6.8235D-04
569	1.6838D-04	1.7815D-04	2.0323D-04	2.3513D-04	2.7441D-04	3.0096D-04	3.3319D-04	4.0163D-04
577	4.8364D-04	5.6516D-04	6.4904D-04	6.4719D-04	7.7068D-05	8.6669D-05	9.6831D-05	1.0597D-04
585	1.1617D-04	1.2257D-04	1.2836D-04	2.9166D-04	2.1404D-06	1.7654D-05	2.5252D-05	3.0100D-05
593	3.2841D-05	3.3229D-05	3.1981D-05					

SYSTEM-FLOW TABLE 9.. AT TIME = 4.5236D 08 ,(DELT = 5.2560D 06)

TYPE OF FLOW	RATE	INC. FLOW	TOTAL FLOW
CONSTANT-CONCENTRATION NODE FLOW. . . .	-0.1517D 01	-0.7983D 07	-0.9471D 09
CONSTANT-FLUX-NODE FLOW	0.0	0.0	0.0
SEEPAGE FLUX-NODE FLOW.	0.3720D-01	0.1922D 06	0.4314D 07
NUMERICAL LOSSES.	0.1400D 00	0.7321D 06	0.8543D 07
NET FLOW.	-0.1340D 01	-0.7059D 07	-0.9342D 09
INCREASE IN MATERIAL CONTENT (LIQUID) .	0.3041D-02	0.1598D 05	0.1889D 07
INCREASE IN MATERIAL CONTENT (SOLID) . .	0.1774D 01	0.9322D 07	0.1102D 10
RADIOACTIVE LOSSES (LIQUID AND SOLID) .	0.0	0.0	0.0

SYSTEM-FLOW TABLE 10.. AT TIME = 5.5748D 08 ,(DELT = 5.2560D 06)

TYPE OF FLOW	RATE	INC. FLOW	TOTAL FLOW
CONSTANT-CONCENTRATION NODE FLOW. . . .	-0.1448D 01	-0.7618D 07	-0.1103D 10
CONSTANT-FLUX-NODE FLOW	0.0	0.0	0.0
SEEPAGE FLUX-NODE FLOW.	0.6632D-01	0.3443D 06	0.9688D 07
NUMERICAL LOSSES.	0.1594D 00	0.8362D 06	0.2439D 08
NET FLOW.	-0.1222D 01	-0.6438D 07	-0.1069D 10
INCREASE IN MATERIAL CONTENT (LIQUID) .	0.2852D-02	0.1499D 05	0.2198D 07
INCREASE IN MATERIAL CONTENT (SOLID) . .	0.1663D 01	0.8743D 07	0.1282D 10
RADIOACTIVE LOSSES (LIQUID AND SOLID) .	0.0	0.0	0.0

SYSTEM-FLOW TABLE 11.. AT TIME = 6.1004D 08 ,(DELT = 5.2560D 06)

TYPE OF FLOW	RATE	INC. FLOW	TOTAL FLOW
CONSTANT-CONCENTRATION NODE FLOW. . . .	-0.1420D 01	-0.7473D 07	-0.1178D 10
CONSTANT-FLUX-NODE FLOW	0.0	0.0	0.0
SEEPAGE FLUX-NODE FLOW.	0.8354D-01	0.4343D 06	0.1362D 08
NUMERICAL LOSSES.	0.1651D 00	0.8667D 06	0.3293D 08
NET FLOW.	-0.1172D 01	-0.6172D 07	-0.1132D 10
INCREASE IN MATERIAL CONTENT (LIQUID) .	0.2766D-02	0.1454D 05	0.2345D 07
INCREASE IN MATERIAL CONTENT (SOLID) . .	0.1613D 01	0.8479D 07	0.1368D 10
RADIOACTIVE LOSSES (LIQUID AND SOLID) .	0.0	0.0	0.0

OUTPUT TABLE 9.. CONCENTRATIONS AT TIME = 6.1004D 08 ,(DELT = 5.2560D 06),(BAND WIDTH = 27)

NODE I	CONCENTRATION AT NODES I,I+1,....,I+7							
1	-1.1864D-08	3.8827D-08	3.8092D-09	-6.5800D-08	-1.3680D-07	4.0270D-08	-8.1593D-08	6.1193D-07
9	6.7229D-07	7.2903D-07	7.8164D-07	7.9574D-07	2.3749D-08	-7.7616D-08	-7.8456D-09	1.3225D-07
17	2.7434D-07	-8.0387D-08	1.6332D-07	-1.2326D-06	-1.3425D-06	-1.4600D-06	-1.5644D-06	-1.5919D-06
25	-8.3492D-08	2.7141D-07	2.9378D-08	-4.6903D-07	-9.6756D-07	2.7851D-07	-5.8121D-07	4.3611D-06
33	4.6897D-06	5.1378D-06	5.4924D-06	5.5919D-06	3.1331D-07	-1.0067D-06	-1.2295D-07	1.7890D-06
41	3.6564D-06	-9.9594D-07	2.2164D-06	-1.6520D-05	-1.7405D-05	-1.9238D-05	-2.0558D-05	-2.0948D-05
49	-1.1938D-06	3.7472D-06	5.5868D-07	-7.0253D-06	-1.4131D-05	3.3818D-06	-8.6395D-06	6.3889D-05
57	6.4952D-05	7.3400D-05	7.7972D-05	7.9488D-05	4.6440D-06	-1.3924D-05	-2.7449D-06	2.8646D-05
65	5.6407D-05	-9.6885D-06	3.4351D-05	-2.5362D-04	-2.6277D-04	-2.8381D-04	-3.0042D-04	-3.0627D-04
73	-1.8762D-05	5.1530D-05	1.5235D-05	-1.2733D-04	-2.3808D-04	8.9279D-06	-1.3126D-04	1.0380D-03
81	9.0813D-04	1.1202D-03	1.1855D-03	1.2084D-03	8.1064D-05	-1.8924D-04	-8.5457D-05	6.1907D-04
89	1.1112D-03	2.3747D-04	5.2680D-04	-4.2406D-03	-3.2877D-03	-4.4624D-03	-4.7302D-03	-4.8270D-03
97	-3.8582D-04	6.7656D-04	4.7812D-04	-3.3154D-03	-6.2575D-03	-3.6039D-03	-2.7507D-03	1.3409D-02
105	7.3595D-03	1.3904D-02	1.5259D-02	1.5743D-02	1.8630D-03	-1.8939D-03	-3.2821D-03	1.9031D-02
113	5.5987D-02	7.0153D-02	1.0652D-01	1.4502D-01	1.8452D-01	1.9357D-01	1.9435D-01	1.9463D-01
121	2.3258D-04	-1.0779D-02	4.9720D-02	1.7812D-01	2.9465D-01	3.1955D-01	1.4366D-01	4.2869D-01
129	4.5954D-01	4.8361D-01	4.8788D-01	4.8931D-01	-9.5778D-03	2.2755D-02	1.9717D-01	4.1145D-01
137	5.7978D-01	6.2515D-01	6.7379D-01	6.9914D-01	7.5147D-01	7.5038D-01	7.4794D-01	7.4707D-01
145	1.2337D-03	1.0467D-01	3.5570D-01	5.9516D-01	7.7928D-01	8.4467D-01	9.1936D-01	1.0000D 00
153	9.6269D-01	9.3970D-01	9.3572D-01	9.3417D-01	4.4912D-02	1.9555D-01	4.7051D-01	6.9868D-01
161	8.6292D-01	9.1616D-01	9.6229D-01	1.0000D 00	1.0579D-01	2.6865D-01	5.3763D-01	7.4557D-01
169	8.8711D-01	9.2978D-01	9.6670D-01	1.0000D 00	1.6481D-01	3.1775D-01	5.6967D-01	7.6264D-01
177	8.9457D-01	9.3535D-01	9.6984D-01	1.0000D 00	2.1133D-01	3.4541D-01	5.7741D-01	7.6278D-01
185	8.9243D-01	9.3219D-01	9.6826D-01	1.0000D 00	2.4214D-01	3.5577D-01	5.6622D-01	7.4569D-01
193	8.8055D-01	9.2427D-01	9.6658D-01	1.0000D 00	2.5793D-01	3.5245D-01	5.3926D-01	7.0718D-01
201	8.3533D-01	8.8584D-01	9.4082D-01	1.0000D 00	9.8175D-01	9.6074D-01	9.4435D-01	9.3134D-01
209	2.6103D-01	3.3844D-01	5.0033D-01	6.4935D-01	7.5510D-01	7.9275D-01	8.5220D-01	8.7251D-01
217	8.9202D-01	8.9218D-01	8.9079D-01	8.9070D-01	2.5483D-01	3.1260D-01	4.5013D-01	5.7312D-01
225	6.6160D-01	6.8872D-01	7.3874D-01	7.7430D-01	7.8898D-01	8.0103D-01	8.0182D-01	8.0587D-01
233	2.4086D-01	2.8332D-01	3.9174D-01	4.9539D-01	5.6021D-01	5.8434D-01	6.3176D-01	6.4660D-01
241	6.8919D-01	7.0168D-01	7.0329D-01	7.0610D-01	2.2165D-01	2.5387D-01	3.3176D-01	4.1040D-01
249	4.6123D-01	4.8456D-01	5.2297D-01	5.5610D-01	5.8111D-01	5.9868D-01	6.0213D-01	6.0494D-01
257	2.0069D-01	2.3046D-01	2.7681D-01	3.3146D-01	3.7431D-01	3.9095D-01	4.2297D-01	4.5356D-01
265	4.7875D-01	4.9487D-01	4.9927D-01	5.0338D-01	1.7848D-01	1.9102D-01	2.2651D-01	2.6475D-01
273	3.0062D-01	3.1243D-01	3.2829D-01	3.5471D-01	3.7759D-01	3.9318D-01	1.9774D-01	4.0184D-01
281	1.5697D-01	1.6374D-01	1.8594D-01	2.1091D-01	2.3899D-01	2.4745D-01	2.5536D-01	2.6019D-01
289	2.7638D-01	2.9521D-01	2.9993D-01	3.0451D-01	1.3658D-01	1.4106D-01	1.5484D-01	1.7190D-01
297	1.8828D-01	1.9191D-01	1.9583D-01	1.9916D-01	2.0455D-01	2.1195D-01	2.1617D-01	2.1977D-01

305	1.2706D-01	1.3056D-01	1.4155D-01	1.5420D-01	1.6750D-01	1.7151D-01	1.7468D-01	1.7797D-01
313	1.8000D-01	1.8232D-01	1.8372D-01	1.8378D-01	1.1796D-01	1.2049D-01	1.2830D-01	1.3929D-01
321	1.4969D-01	1.5352D-01	1.5679D-01	1.5901D 01	1.6054D-01	1.6148D-01	1.6262D-01	1.6507D-01
329	1.0916D-01	1.1110D-01	1.1809D-01	1.2695D-01	1.3505D-01	1.3841D-01	1.4186D-01	1.4424D-01
337	1.4532D-01	1.4578D-01	1.4515D-01	1.4278D-01	1.0057D-01	1.0226D-01	1.0779D-01	1.1513D-01
345	1.2222D-01	1.2569D-01	1.2863D-01	1.3158D-01	1.3177D-01	1.3534D-01	1.3649D-01	1.3801D-01
353	9.2156D-02	9.3470D-02	9.7537D-02	1.0429D-01	1.0993D-01	1.1156D-01	1.1671D-01	1.2018D-01
361	1.2260D-01	1.2581D-01	1.2745D-01	1.2905D-01	8.3820D-02	8.4753D-02	8.8100D-02	9.2672D-02
369	9.8538D-02	1.0223D-01	1.0560D-01	1.090[illegible]D-01	1.1235D-01	1.1604D-01	1.1813D-01	1.2006D-01
377	7.5479D-02	7.6237D-02	7.8285D-02	8.2508D-02	8.7109D-02	9.0361D-02	9.3690D-02	9.5750D-02
385	1.0098D-01	1.0480D-01	1.0747D-01	1.1005D-01	6.7210D-02	6.7680D-02	6.9260D-02	7.2257D-02
393	7.6215D-02	7.8817D-02	8.1326D-02	8.4536D-02	8.8512D-02	9.1724D-02	9.4437D-02	9.7111D-02
401	5.9074D-02	5.9198D-02	6.0500D-02	6.2801D-02	6.5426D-02	6.7469D-02	6.9458D-02	7.2077D-02
409	7.4969D-02	7.8194D-02	8.0691D-02	8.3378D-02	5.1250D-02	5.1464D-02	5.2194D-02	5.3601D-02
417	5.5470D-02	5.6751D-02	5.8284D-02	6.0672D-02	6.3112D-02	6.6197D-02	6.8106D-02	6.9920D-02
425	4.3923D-02	4.4094D-02	4.4608D-02	4.5456D-02	4.6680D-02	4.7766D-02	4.9036D-02	5.0622D-02
433	5.2931D-02	5.5311D-02	5.7676D-02	6.0156D-02	3.7247D-02	3.7192D-02	3.7828D-02	3.8465D-02
441	3.9838D-02	4.0135D-02	4.0929D-02	4.2130D-02	4.3172D-02	4.4292D-02	4.4976D-02	4.5834D-02
449	3.1294D-02	3.1409D-02	3.1800D-02	3.2374D-02	3.3067D-02	3.3929D-02	3.4516D-02	3.5471D-02
457	3.6539D-02	3.7642D-02	3.8296D-02	3.8346D-02	2.6079D-02	2.6197D-02	2.6549D-02	2.7119D-02
465	2.7793D-02	2.8423D-02	2.9255D-02	3.0073D-02	3.0980D-02	3.2011D-02	3.3062D-02	3.4406D-02
473	2.4185D-02	2.4309D-02	2.4673D-02	2.5255D-02	2.5916D-02	2.6443D-02	2.7141D-02	2.7931D-02
481	2.8961D-02	2.9857D-02	3.0480D-02	1.1794D-02	2.2192D-02	2.2525D-02	2.2907D-02	2.3428D-02
489	2.4094D-02	2.4685D-02	2.5170D-02	2.6025D-02	2.6925D-02	2.8091D-02	2.8845D-02	2.8692D-02
497	2.0694D-02	2.0838D-02	2.1246D-02	2.1785D-02	2.2454D-02	2.3031D-02	2.3572D-02	2.4181D-02
505	2.5048D-02	2.6131D-02	2.7184D-02	2.8181D-02	1.9082D-02	1.9241D-02	1.9688D-02	2.0255D-02
513	2.0930D-02	2.1198D-02	2.2000D-02	2.2844D-02	2.3156D-02	2.4042D-02	2.4967D-02	2.5963D-02
521	1.7545D-02	1.7729D-02	1.8227D-02	1.8840D-02	1.9539D-02	2.0002D-02	2.0571D-02	2.1061D-02
529	2.1553D-02	2.2065D-02	2.2702D-02	2.3791D-02	1.6070D-02	1.628[illegible]D-02	1.6856D-02	1.7537D-02
537	1.8384D-02	1.8756D-02	1.9343D-02	1.9804D-02	2.0257D-02	2.0[illegible]D-02	2.0978D-02	2.1009D-02
545	1.3937D-02	1.4211D-02	1.4918D-02	1.5735D-02	1.6606D-02	1.7147D-02	1.7754D-02	1.0312D-02
553	1.9326D-02	1.9690D-02	1.9947D-02	1.9951D-02	1.1845D-02	1.3178D-02	1.3012D-02	1.3962D-02
561	1.4975D-02	1.5509D-02	1.6365D-02	1.6858D-02	1.8005D-02	1.9150D-02	1.9311D-02	1.9372D-02
569	9.0611D-03	9.4363D-03	1.0278D-02	1.1214D-02	1.2241D-02	1.2885D-02	1.3608D-02	1.4982D-02
577	1.6245D-02	1.7547D-02	1.9007D-02	1.8977D-02	6.2089D-03	6.734[illegible]D-03	7.2580D-03	7.6842D-03
585	8.1206D-03	8.3924D-03	8.6806D-03	1.2672D-02	3.8870D-03	3.798[illegible]D-03	4.2718D-03	4.5790D-03
593	4.7648D-03	4.8054D-03	4.7411D-03					

APPENDIX C

LISTING OF DISSOLVED-CONSTITUENT TRANSPORT CODE

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C  FUNCTION OF PROGRAM--TO SIMULATE TRANSIENT TWO-DIMENSIONAL
C  DISPERSIVE-ADVECTIVE MATERIAL FLOW IN A POROUS MEDIA SUBJECT TO
C  ADSORPTION AND RADIOACTIVE DECAY.  THE GALERKIN METHOD WITH
C  FINITE ELEMENTS IS USED.
C
C
C  FUNCTION OF MAIN ROUTINE--TO CONTROL THE INTEGRATION OF THE
C  MATERIAL-FLOW EQUATION, WHICH CONSISTS OF ASSEMBLY, APPLICATION
C  OF BOUNDARY CONDITIONS, AND MATRIX SOLUTION OF THE RESULTING
C  SET OF EQUATIONS.
C
C
C  DIMENSIONING FORMAT--
C
C  COMMON/GEOM/X(MAXNP),Z(MAXNP),BP(MAXNP),DCOSXB(MAXEL),DCOSZ(MAXEL),
C  [illegible](MAXEL),[illegible](MAXEL),DLB(MAXEL),DL(MAXEL),SPN(MAXNP),
C  [illegible](MAXNP),[illegible](MAXNP),[illegible](MAXEL),[illegible](MAXEL),IE(MAXEL,5),
C  ISB(MAXEL,4),[illegible](MAXEL,4)
C
C  COMMON/MTL/PROP(MAXMAT,NPROP)
C
C  DIMENSION C(MAXNP,MAXBW),R(MAXNP),RP(MAXNP),
C  DP(MAXNP),W(MAXNP),VT(MAXNP),DFLX(MAXNP),DFLXP(MAXNP),
C  [illegible](MAXEL,4),VX(MAXEL,4),VZ(MAXEL,4),FX(MAXEL,4),FZ(MAXEL,4),
C  [illegible](MAXNTI),PMAT(3,NPROP),PMATZ(10),FLOW(10),[illegible](10),TITLE(9)
C
C  COMMON/GEOM/ APPEARS IN THE FOLLOWING ROUTINES--MAIN,DATAIN,FLUX,
C  ASEMBL,STORE,BC,STEP,SFLOW
C
C  COMMON/MTL/ APPEARS IN THE FOLLOWING ROUTINES--MAIN,DATAIN,FLUX,
C  ASEMBL,SFLOW
C
      IMPLICIT REAL*8 (A-H,O-Z)
      REAL*8 PMAT
      COMMON/GEOM/X(595),Z(595),BP(595),DCOSXB(520),DCOSX(520),
     > DCOSZB(520),DCOSZ(520),DLB(520),DL(520),DELT,[illegible],DELMAX,TMAX,
     > NPN(595),NPSP(595),NPTSP(595),NBP(520),NTSP(520),IE(520,5),
     > ISB(520,4),IS(520,4),NNP,NEL,NMAT,IBAND,NBC,NST,NTST,NTI,NBEL,
     > NSTB,NTSTB
      COMMON/MTL/PROP(3,9)
      DIMENSION C(595,27),R(595),RP(595),DP(595),W(595),VP(595),DR(595),
     >  VT(595),DFLX(595),DFLXP(595),TE(520,4),TEP(520,4),DTE(520,4),
     > TEN(520,4),VX(520,4),VZ(520,4),VXP(520,4),VZP(520,4),VXN(520,4),
     > VZN(520,4),FX(520,4),FZ(520,4),NTP(1000),PMAT(3,9),PMATZ(10),
     > FLOW(10),[illegible](10),TITLE(9)
      DATA MAXEL,MAXNP,MAXMAT,MAXBW,MAXNTI,NPROP /520,595,3,27,1000,9/
      DATA PMAT/8H      ,8H  KD,8H      ,8H      ,8HDECAY,8H     ,8H      ,
     > 8H  AL,8H      ,8H      ,8H  AT,8H      ,8H  1,8HDENS,8HTA      ,8H      ,
     > 8HDROP ,8H      ,8H      ,8HHALF ,8H      ,8H      ,8H  DM,8H      ,8H      ,
     > 8H  POR,8H      /
C
C  INPUT PROBLEM IDENTIFICATION AND DESCRIPTION
C
   10 READ 10000,NPROB,(TITLE(I),I=1,9)
      IF (NPROB.LE.0) GO TO 260
      PRINT 10100,NPROB,(TITLE(I),I=1,9)
C
C  READ AND PRINT INPUT DATA
C
      NONT=0
      NTIG=0
      CALL DATAIN(RP,DP,MXEL,MAXNP,MAXMAT,ISTOP,NTI,PMAT,NPROP,KSTB,W,
     > NPOC,NPD,MAXNTI,MAXDIF,KSS)
      IF (ISTOP.GT.0) GO TO 200
C
C  COMPUTE BAND-WIDTH VARIABLES
C
      IHALFP=MAXDIF
      IBAND=2*IHALFP+1
      INBP=IHALFP+1
      IF (IBAND.GT.MAXBW) GO TO 230
C
C  PREPARE INITIAL VARIABLES
C
```

```
      ITER=0.
C
C     READ INITIAL VELOCITIES, PRESSURES, AND WATER CONTENTS, IF NECESSARY
C
      DO 20 N=1,NEL
         NTYP=IE(N,5)
         POR=PROP(NTYP,6)
         DO 20 IQ=1,4
            TH(N,IQ)=POR
            VX(N,IQ)=0.
   20       VZ(N,IQ)=0.
      DO 30 NP=1,NNP
         H(NP)=0.
   30    HT(NP)=0.
      IF (NVI.EQ.0) GO TO 70
      IF (NVI.GE.1) GO TO 60
      READ 10200,(H(NP),NP=1,NNP)
      DO 40 N=1,NEL
         READ 10200,(TH(N,IQ),IQ=1,4)
   40    CONTINUE
      DO 50 N=1,NEL
         READ 10200,(VX(N,JQ),JQ=1,4),(VZ(N,JQ),JQ=1,4)
   50    CONTINUE
      GO TO 70
   60 READ(1) TIME,(H(NP),NP=1,NNP),(HT(NP),NP=1,NNP),((TH(N,IQ), N=1,
     > NEL),IQ=1,4),((VX(N,IQ),N=1,NEL),IQ=1,4),((VZ(N,IQ), N=1,NEL),IQ=
     > 1,4)
C
C     CALCULATE MATERIAL FLUX FX(N,IQ) AND FZ(N,IQ)
C
   70 CALL FLUX(FX,FZ,VX,VZ,NP,IE,MAXEL,MAXNP)
C
C     DETERMINE BOUNDARY FLOWS
C
      DO 80 I=1,8
   80    TFLOW(I)=0.
      DO 90 NP=1,NNP
   90    RFLX(NP)=0.
      CALL BFLOW(FX,FZ,NP,RFLX,RFLXP,FRATE,FLOW,TFLOW,IE,MAXEL,MAXNP,
     > VX,VZ)
      DO 100 I=1,8
         FLOW(I)=0.
  100    TFLOW(I)=0.
      FRATE(6)=0.
      FRATE(7)=0.
      FRATE(8)=0.
C
C     PRINT INITIAL VARIABLES
C
      CALL PRINTT(NNP,IBAND,MAXNP,MAXEL,DELT,NP,FX,FZ,VX,VZ,TIME,NEL,
     > KPRO,KOUT,KDIS,FRATE,FLOW,TFLOW,H,HT,TH)
      IF (KSTR.EQ.1) CALL STORE(NUNCB,MAXNP,MAXEL,NP,TIME,TITLE,FX,FZ,
     > H,HT,TH,VX,VZ)
C
C     PERFORM TRANSIENT-STATE CALCULATION
C
      TIME=DELT
      W1=W
      W2=1.-W
      DO 220 ITM=1,NTI
C
C     READ TIME-DEPENDENT VELOCITIES, AS REQUIRED
C
         DO 110 NP=1,NNP
  110       HP(NP)=H(NP)
         DO 130 M=1,NEL
            DO 120 IQ=1,4
               THP(M,IQ)=TH(M,IQ)
               VXP(M,IQ)=VX(M,IQ)
  120          VZP(M,IQ)=VZ(M,IQ)
  130       CONTINUE
         IF (NVI.NE.(-2)) GO TO 160
         READ 10200,(H(NP),NP=1,NNP)
         DO 140 M=1,NEL
            READ 10200,(TH(M,IQ),IQ=1,4)
```

```
 140        CONTINUE
        DO 150 N=1,NEL
           READ 10200,(VX(N,JQ),JQ=1,4),(VZ(N,JQ),JQ=1,4)
 150       CONTINUE
 160    IF (NVT.NE.2) GO TO 170
        READ(1) TIMEM,(H(NP),NP=1,NNP),(HT(NP),NP=1,NNP),((TH(N,IQ), N=
   >     1,NEL),IQ=1,4),((VX(N,IQ),N=1,NEL),IQ=1,4),((VZ(N,IQ), N=1,
   >     NEL),IQ=1,4)
C
C  ASSEMBLE COEFFICIENT MATRICES A, B, AND C, AND CONSTRUCT
C  LOAD VECTOR F
C
 170    DO 180 NP=1,NNP
 180       DH(NP)=(H(NP)-HP(NP))/DELT
        DO 200 N=1,NEL
           DO 190 IQ=1,4
              DTH(N,IQ)=(TH(N,IQ)-THP(N,IQ))/DELT
              THW(N,IQ)=W1*TH(N,IQ)+W2*THP(N,IQ)
              VXW(N,IQ)=W1*VX(N,IQ)+W2*VXP(N,IQ)
 190          VZW(N,IQ)=W1*VZ(N,IQ)+W2*VZP(N,IQ)
 200       CONTINUE
        CALL ASEMBL(C,F,HP,VXW,VZW,THW,DH,DTH,W,MAXNP,MAXBW,MAXEL,KSS)
C
C  APPLY BOUNDARY CONDITIONS
C
        CALL BC(C,F,HP,DP,VXW,VZW,W,MAXNP,MAXEL,MAXBW,KSS)
C
C  TRIANGULARIZE C MATRIX
C
        CALL SOLVE(1,C,F,NNP,IHALFB,MAXNP,MAXBW)
C
C  BACK SUBSTITUTE
C
        CALL SOLVE(2,C,F,NNP,IHALFB,MAXNP,MAXBW)
C
C  CALCULATE MATERIAL FLUX FX(N,IQ) AND FZ(N,IQ)
C
        CALL FLUX(FX,FZ,VX,VZ,F,TH,MAXEL,MAXNP)
C
C  DETERMINE BOUNDARY FLOWS
C
        CALL SFLOW(FX,FZ,F,SPLX,SPLXD,FRATE,FLOW,TFLOW,TH,MAXEL,MAXNP,
   >     VX,VZ)
C
C  PRINT VARIABLES AT CURRENT TIME STEP
C
        CALL PRINT(NNP,IBAND,MAXNP,MAXEL,DELT,F,FX,FZ,VX,VZ,TIME,NEL,
   >     NPROFIL,FORT,NDIG,FRATE,FLOW,TFLOW,H,HT,TH)
        IF (KSTR.EQ.1) CALL STORE(NPROB,MAXNP,MAXEL,3,TIME,TITLE,FX,FZ,
   >     H,HT,TH,VX,VZ)
C
C  PREPARE FOR NEXT TIME STEP
C
        IF (KSS.EQ.0) GO TO 10
        IF (TIME.GT.TMAX) GO TO 10
        DELT=DELT*(1.+CHNG)
        DELT=AMIN1(DELT,DELMAX)
        TIME=TIME+DELT
        DO 220 NP=1,NNP
 220       HP(NP)=H(NP)
 220    CONTINUE
        GO TO 10
 230 PRINT 10630, IBAND, MAXBW
 240 STOP
10000 FORMAT(I5,9A8)
10130 FORMAT(/9H1PROBLEM,I5,3H.- ,9A8/)
10200 FORMAT(8F10.0)
10330 FORMAT(/////35H ERROR IN VELOCITY INPUT AT ELEMENT, I5///)
10630 FORMAT(/////12H BANDWIDTH =,I6,25H EXCEEDS MAX. ALLOWABLE =,I4///)
        END
```

```
      SUBROUTINE DATAIN(NP,DP,MAXEL,MAXNP,MAXMAT,ISTOP,KVI,PMAT,NNPPM,
     > KSTR,W,KSPP,KPP,MAXNTI,MAXDIF,KSS)
C
C
C     FUNCTION OF SUBROUTINE--TO READ, PRINT, AND CHECK VARIABLES
C     PERTAINING TO SIMULATION TIME, GEOMETRY OF THE SYSTEM, BOUNDARY-
C     INITIAL CONDITIONS, AND PROPERTIES OF BOTH THE MATERIAL BEING
C     TRANSPORTED AND THE POROUS MEDIA.
C
C
      IMPLICIT REAL*8 (A-H,O-Z)
      REAL*8 PMAT(3,9)
      COMMON/MESH/X(595),Z(595),BB(595),DCOSXB(520),DCOSX(520),
     > DCOSTB(520),DCOSZ(520),CLB(520),DL(520),DELT,CHNG,DELMAX,TMAX,
     > NPN(595),NPST(595),NPTST(595),NBE(520),NTSE(520),IE(524,5),
     > ISB(524,8),IS(524,8),NNP,NEL,NMAT,IBAND,NBC,NST,NTST,NTI,NBEL,
     > NSTB,NTSTB
      COMMON/MTL/PROP(2,9)
      DIMENSION DP(MAXNP),NP(MAXNP),TITLE(9),KPP(MAXNTI)
      ISTOP=0
      READ 10000,NNP,NEL,NMAT,NCN,NTI,NBC,NST,NTST,KVI,KSPP,KSS
      IF (KSS.NE.0) KSS=1
      IF (KSTR.NE.0) KSTR=1
      READ 11000, DELT,CHNG,DELMAX,TMAX,W
      IF (DELMAX.LE.0.D0) DELMAX=1.E50
      IF (TMAX.LE.0.D0) TMAX=1.E50
      PRINT 10000,NNP,NEL,NMAT,NCN,NTI,NBC,NST,NTST,KVI,KSTR,KSS,DELT,
     > CHNG,DELMAX,TMAX,W
      READ 11100,KSPP,(KPP(ITM),ITM=1,NTI)
      PRINT 10100
      PRINT 11200,KSPP,(KPP(ITM),ITM=1,NTI)
C
C     CHECK TO BE SURE INPUT DATA DOES NOT EXCEED STORAGE CAPACITY
C
      IF (NNP.GE.0.AND.NNP.LE.MAXNP) GO TO 10
      ISTOP=ISTOP+1
      PRINT 12300, MAXNP
   10 IF (NEL.GE.0.AND.NEL.LE.MAXEL) GO TO 20
      ISTOP=ISTOP+1
      PRINT 12400, MAXEL
   20 IF (NMAT.GE.0.AND.NMAT.LE.MAXMAT) GO TO 30
      ISTOP=ISTOP+1
      PRINT 12500, MAXMAT
   30 IF (NCN.GE.0.AND.NCN.LE.MAXEL) GO TO 40
      ISTOP=ISTOP+1
      PRINT 12500,MAXEL
   40 IF (NTI.GE.0.AND.NTI.LE.MAXNTI) GO TO 50
      ISTOP=ISTOP+1
      PRINT 12600, MAXNTI
   50 IF (NBC.GE.0.AND.NBC.LE.MAXNP) GO TO 60
      ISTOP=ISTOP+1
      PRINT 12900,MAXNP
   60 IF (NST.GE.0.AND.NST.LE.MAXNP) GO TO 70
      ISTOP=ISTOP+1
      PRINT 13000,MAXNP
   70 IF (NTST.GE.0.AND.NTST.LE.MAXNP) GO TO 80
      ISTOP=ISTOP+1
      PRINT 13100,MAXNP
   80 IF (IABS(KVI).LT.2) GO TO 90
      ISTOP=ISTOP+1
      PRINT 12700
   90 IF (ISTOP.EQ.0) GO TO 100
      PRINT 13200, ISTOP
      STOP
C
C     READ AND PRINT MATERIAL PROPERTIES
C
  100 IF (NNPPM.LE.0) GO TO 120
      PRINT 10200, ((PMAT(I,J),I=1,3),J=1,NNPPM)
      DO 110 I=1,NMAT
         READ 11900,(PROP(I,J),J=1,NNPPM)
  110    PRINT 11300,I,(PROP(I,J),J=1,NNPPM)
  120 IF (KVI.LE.0) GO TO 160
C
C     READ NODAL-POINT AND ELEMENT DATA FROM AUXILIARY STORAGE AND PRINT.
```

```
C   IF NECESSARY
C
      REWIND 1
      READ(1) (TITLE(I),I=1,9),NPROBM,NNP,NEL,NTIM
      READ(1) (X(NP),NP=1,NNP),(Z(NP),NP=1,NNP),((IE(N,IQ),N=1,NEL), IQ=
     > 1,5)
      PRINT 10300
      DO 130 NP=1,NNP
  130    PRINT 11500,NP,X(NP),Z(NP)
      PRINT 10400
      MAXDIF=0
      DO 150 N=1,NEL
         IE(N,5)=1
         MND=0
         DO 140 IQ=1,3
            IQ1 = IQ + 1
            DO 140 JQ=IQ1,4
               ND = IABS(IE(N,IQ)-IE(N,JQ))
               MND = MAX0(ND,MND)
  140          MAXDIF = MAX0(ND,MAXDIF)
         PRINT 11600, N,(IE(N,I),I=1,5),MND
  150    CONTINUE
      GO TO 370
C
C   READ NODAL-POINT DATA FROM CARDS AND PRINT, IF REQUIRED
C
  160 PRINT 10300
      NI=1
  170 READ 11400, NJ,X(NJ),Z(NJ)
      IF (NJ-NI) 180,210,190
  180 PRINT 11300, NJ
      PRINT 11500, NJ,X(NJ),Z(NJ)
      ISTOP=ISTOP+1
      GO TO 170
  190 DF=NJ+1-NI
      DX=(X(NJ)-X(NI-1))/DF
      DZ=(Z(NJ)-Z(NI-1))/DF
  200 CONTINUE
      X(NI)=X(NI-1)+DX
      Z(NI)=Z(NI-1)+DZ
  210 PRINT 11500,NI,X(NI),Z(NI)
      NI=NI+1
      IF (NJ-NI) 220,210,200
  220 IF (NI.LE.NNP) GO TO 170
C
C   READ ELEMENT DATA FROM CARDS AND PRINT, IF REQUESTED
C
C   ALSO COMPUTE MAXIMUM NODAL DIFFERENCE FOR EACH ELEMENT
C
      PRINT 10400
      MAXDIF=0
      NJ = 0
  230 READ 10900, NI,(IE(NI,I),I=1,5),NODL,NLAY
      MND = 0
      DO 240 IQ=1,3
         IQ1 = IQ + 1
         DO 240 JQ=IQ1,4
            ND = IABS(IE(NI,IQ)-IE(NI,JQ))
            MND = MAX0(ND,MND)
  240       MAXDIF = MAX0(ND,MAXDIF)
  250 NJ = NJ + 1
      IF (NI-NJ) 260,290,270
  260 PRINT 13400, NI
      PRINT 11600, NI, (IE(NI,I),I=1,5),MND
      ISTOP = ISTOP + 1
  270 DO 280 IQ=1,4
  280    IE(NJ,IQ) = IE(NJ-1,IQ) + 1
      IE(NJ,5) = IE(NJ-1,5)
  290 PRINT 11600, NJ, (IE(NJ,I),I=1,5),MND
      IF (NJ.LT.NI) GO TO 250
      IF (NJ.EQ.NEL) GO TO 330
      IF (NODL.LE.0) GO TO 230
      DO 320 I=1,NLAY
         LL=2
         DO 320 J=1,NODL
```

```
            IF (NJ.EQ.NI) GO TO 310
            DO 300 KQ=1,4
  300          IE(NJ,KQ) = IE(NJ-1,KQ) + LL
            IE(NJ,5) = IE(NJ-1,5)
            PRINT 11600, NJ,(IE(NJ,K),K=1,5),NND
  310       LL = 1
  320       NJ = NJ + 1
        NJ = NJ - 1
        IF (NJ.LT.NEL) GO TO 230
  330 CONTINUE
C
C  MODIFY MATERIAL TYPES FOR SELECTED ELEMENTS, IF NECESSARY
C
      IF (NCH.LT.0) GO TO 370
      PRINT 10500
      L=0
  340 READ 10900, NI,MTYP,NK,NINC
      IE(NI,5) = MTYP
      PRINT 11700, NI,IE(NI,5)
      L = L + 1
      IF (NK.LE.NI) GO TO 360
      IF (NINC.LE.0) NINC = 1
      NI = NI + NINC
      DO 350 NJ=NI,NK,NINC
         IE(NJ,5) = MTYP
         PRINT 11700, NJ,IE(NJ,5)
  350    L = L + 1
  360 IF (L.LT.NCH) GO TO 340
C
C  CHECK MATERIAL TYPES FOR EACH ELEMENT
C
  370 DO 380 N=1,NEL
         MTYP=IE(N,5)
         IF (MTYP.GT.0.AND.MTYP.LE.NMAT) GO TO 380
         PRINT 14100,N
         ISTOP=ISTOP+1
  380    CONTINUE
      IF (ISTOP.EQ.0) GO TO 390
      PRINT 13600,ISTOP
C
C  READ INITIAL CONDITIONS
C
  390 NI=0
      NJ=0
  400 IF (NJ.EQ.NNP) GO TO 440
      READ 11800,NJ,RP(NJ)
  410 NI=NI+1
      IF (NI.GT.1) GO TO 420
      IF (NJ.EQ.1) GO TO 420
      PRINT 13500,NJ
      ISTOP=ISTOP+1
      GO TO 420
  420 IF (NJ.EQ.NI) GO TO 400
      IF (NJ.GT.NI) GO TO 430
      PRINT 13500,NJ
      ISTOP=ISTOP+1
      GO TO 420
  430 RP(NI)=RP(NI-1)
      GO TO 410
C
C  IDENTIFY BOUNDARY ELEMENTS AND COMPUTE DIRECTION COSINES OF
C  BOUNDARY SIDES
C
  440 CALL SURF
      DO 450 NP=1,NNP
  450    DP(NP)=0.
      IF (NBC.EQ.0) GO TO 550
C
C  READ CONSTANT-CONCENTRATION DIRICHLET CONDITIONS BB(NPP) TO BE
C  APPLIED AT NODES NPN(NPP)
C
      NPP=0
  460 IF (NPP.EQ.NBC) GO TO 520
      IF (NPP.LT.NBC) GO TO 470
      PRINT 12900,NB
```

```
      ISTOP=ISTOP+1
      GO TO 520
  470 READ 11900,NI,NPINC,BBI
      IF (NPINC.GT.0) GO TO 490
  480 NPP=NPP+1
      NPN(NPP)=NI
      BB(NPP)=BBI
      GO TO 460
  490 IF (NPP.GT.0) GO TO 500
      ISTOP=ISTOP+1
      PRINT 13900
  500 NJ=NPN(NPP)+NPIN
      BBJ=BB(NPP)
      NK=NI-1
      DO 510 NP=NJ,NK,NPIN
         NPP=NPP+1
         NPN(NPP)=NP
  510    BB(NPP)=BBJ
      GO TO 480
  520 PRINT 10600
      DO 530 NPP=1,NB
  530    PRINT 12000,NPN(NPP),BB(NPP)
C
C  APPLY DIRICHLET BOUNDARY SPECIFICATIONS TO THE INITIAL CONDITIONS
C
      DO 540 NPP=1,NB
         NP=NPN(NPP)
  540    FP(NP)=BB(NPP)
  550 IF (NST.LE.0) GO TO 650
C
C  READ SURFACE-TERM FLUXES EI AND EJ TO BE APPLIED AT BOUNDARY
C  NODES NI AND NJ, RESPECTIVELY
C
      NPP=0
      NP=0
      PRINT 10700
  560 IF (NP.EQ.NST) GO TO 610
      READ 12100,NI,NJ,KINC,EI,EJ
      IF (KINC.GT.0) GO TO 580
  570 NP=NP+1
      DX=X(NI)-X(NJ)
      DZ=Z(NI)-Z(NJ)
      EL=DSQRT(DX*DX+DZ*DZ)
      DP(NI)=DP(NI)+EI*EL/3.0+EJ*EL/6.0
      DP(NJ)=DP(NJ)+EI*EL/6.0+EJ*EL/3.0
      NPP=NPP+1
      NPST(NPP)=NI
      NPP=NPP+1
      NPST(NPP)=NJ
      EK=EJ
      PRINT 12200,NI,NJ,EI,EJ
      GO TO 560
  580 IF (NP.GT.0) GO TO 590
      ISTOP=ISTOP+1
      PRINT 14000
  590 NPINC=IABS(NJ-NI)
      NPMIN=MAX0(NPST(NPP),NPST(NPP-1))
      NPMAX=MIN0(NI,NJ)-1
      DO 600 NK=NPMIN,NPMAX,NPIN
         NL=NK+NPIN
         PRINT 12200,NK,NL,EK,EK
         NP=NP+1
         DX=X(NK)-X(NL)
         DZ=Z(NK)-Z(NL)
         EL=DSQRT(DX*DX+DZ*DZ)
         DP(NK)=DP(NK)+EK*EL/2.0
         DP(NL)=DP(NL)+EK*EL/2.0
         NPP=NPP+1
         NPST(NPP)=NK
         NPP=NPP+1
         NPST(NPP)=NL
  600    CONTINUE
      GO TO 570
  610 NPPMAX=NPP
      NSTN=0
```

```
      DO 640 NPPI=1,NPPMAX
         IF (NSTN.EQ.0) GO TO 630
         DO 620 NPPJ=1,NSTN
            IF (NPST(NPPI).EQ.NPST(NPPJ)) GO TO 640
  620       CONTINUE
  630    NSTN=NSTN+1
         NPST(NSTN)=NPST(NPPI)
  640    CONTINUE
  650 IF (NTST.LE.0) GO TO 820
C
C  READ NUMBERS OF ELEMENTS AND SIDES TO WHICH SEEPAGE
C  CONDITIONS OF THE FORM, FLUX = (DARCY FLUX)*CONCENTRATION,
C  ARE TO BE APPLIED
C
      NPI=0
  660 IF (NPI.EQ.NTST) GO TO 710
      READ 10900,NI,IS1,IS2,NIN
      IF (NINC.GT.0) GO TO 680
  670 NPI=NPI+1
      NTSE(NPI)=NI
      IS(NPI,1)=IS1
      IS(NPI,2)=IS2
      GO TO 660
  680 IF (NPI.GT.0) GO TO 690
      ISTOP=ISTOP+1
      PRINT 13700
  690 NPINC=IS(NPI,2)-IS(NPI,1)
      NINC=IABS(NPINC)-1
      NJ=NTSE(NPI)+NIN
      NK=NI-1
      DO 700 N=NJ,NK,NIN
         NPJ=NPI
         NPI=NPI+1
         NTSE(NPI)=N
         IS(NPI,1)=IS(NPJ,2)
  700    IS(NPI,2)=IS(NPI,1)+NPIN
      GO TO 670
  710 PRINT 10800
      DO 720 NP=1,NTST
         N=NTSE(NP)
  720    PRINT 11600,N,IS(NP,1),IS(NP,2)
      NTSTN=0
      DO 770 NP=1,NTST
         NI=IS(NP,1)
         IF (NTSTN.EQ.0) GO TO 740
         DO 730 NPP=1,NTSTN
            IF (NPTST(NPP).EQ.NI) GO TO 750
  730       CONTINUE
  740    NTSTN=NTSTN+1
         NPTST(NTSTN)=NI
  750    NJ=IS(NP,2)
         DO 760 NPP=1,NTSTN
            IF (NPTST(NPP).EQ.NJ) GO TO 770
  760       CONTINUE
         NTSTN=NTSTN+1
         NPTST(NTSTN)=NJ
  770    CONTINUE
C
C  DETERMINE DIRECTION COSINES DCOSX(NP) AND DCOSZ(NP) FOR THE
C  SEEPAGE SIDES
C
       DO 810 NPI=1,NTST
          NI=NTSE(NPI)
          DO 800 NPJ=1,NBEL
             NJ=NBE(NPJ)
             IF (NJ.NE.NI) GO TO 800
             IF (ISB(NPJ,1).EQ.IS(NPI,1).AND.ISB(NPJ,2).EQ.IS(NPI,2)) GO
     >        TO 780
             IF (ISB(NPJ,1).EQ.IS(NPI,2).AND.ISB(NPJ,2).EQ.IS(NPI,1)) GO
     >        TO 780
             GO TO 800
  780        DO 790 J=1,2
  790           IS(NPI,J)=ISB(NPJ,J)
             DL(NPI)=DLB(NPJ)
             DCOSX(NPI)=DCOSXB(NPJ)
```

```
          DCOSZ(NPI) =DCOSZ(NPJ)
          GO TO 810
 800      CONTINUE
        ISTOP=ISTOP+1
        PRINT 13800,NI
 810    CONTINUE
 820 IF (ISTOP.EQ.0) GO TO 830
     PRINT 13600, ISTOP
 830 RETURN
13000 FORMAT(35H0INPUT TABLE 1.. BASIC PARAMETERS   // 5X,
     > 40H NUMBER OF NODAL POINTS. . . . . . . . . .,I5/ 5X,
     > 40H NUMBER OF ELEMENTS. . . . . . . . . . .,I5/ 5X,
     > 40H NUMBER OF DIFFERENT MATERIALS . . . . .,I5/ 5X,
     > 40H NUMBER OF CORRECTION MATERIALS. . . . .,I5/ 5X,
     > 40H NUMBER OF TIME INCREMENTS . . . . . . .,I5/ 5X,
     > 40H NUMBER OF BOUNDARY CONDITIONS . . . . .,I5/ 5X,
     > 40H NUMBER OF SURFACE TERMS . . . . . . . .,I5/ 5X,
     > 40H NUMBER OF SEEPAGE SURFACE TERMS . . . .,I5/ 5X,
     > 40H VELOCITY INPUT CONTROL. . . . . . . . .,I5/ 5X,
     > 40H AUXILIARY STORAGE CONTROL . . . . . . .,I5/ 5X,
     > 40H STEADY-STATE CONTROL. . . . . . . . . .,I5/ 5X,
     > 40H TIME INCREMENT. . . . . . . . . . . . .,F10.6/ 5X,
     > 40H MULTIPLIER FOR INCREASING DELT. . . . .,F10.6/ 5X,
     > 40H MAXIMUM VALUE OF DELT . . . . . . . . .,D10.4/ 5X,
     > 40H MAXIMUM VALUE OF TIME . . . . . . . . .,D10.4/ 5X,
     > 40H TIME-INTEGRATION PARAMETER. . . . . . .,F10.6)
13100 FORMAT(//5X,14HOUTPUT CONTROL)
13200 FORMAT(36H1INPUT TABLE 2.. MATERIAL PROPERTIES// 9H MAT. NO., 9(
     > 3X4))
13300 FORMAT(34H1INPUT TABLE 3.. NODAL POINT DATA // 7X,4HNODE, 8X,1HX,
     > 14X,1HZ)
10400 FORMAT(34H1INPUT TABLE 4.. ELEMENT DATA     // 11X,
     > 31HGLOBAL INDICES OF ELEMENT NODES/7X,7HELEMENT, 3X,1H1,7X,1H2,
     > 7X,1H3,7X,1H4,6X,8HMATERIAL,6X, 10HNODE DIFF. )
10500 FORMAT(//52H CORRECTIONS TO MATERIAL TYPES FOR SELECTED ELEMENTS/)
10600 FORMAT(44H1INPUT TABLE 5.. BOUNDARY CONDITIONS OF FORM, 5H R=BB//
     > 6H  NODE,7X,2HBB/)
13700 FORMAT(32H1INPUT TABLE 6.. SURFACE TERMS , 20H E=EI AT NODE NI, E=
     >  13HEJ AT NODE NJ//3X,2HNI,3X,2HNJ,6X,2HEI,13X,2HEJ/)
13800 FORMAT(44H1INPUT TABLE 7.. SEEPAGE-SURFACE INFORMATION//5X
     > 14HELEMENT NODE 1,2X,6HNODE 2)
10900 FORMAT(16I5)
11000 FORMAT(8F10.0)
11100 FORMAT(80I1)
11200 FORMAT(10X,10I1)
11300 FORMAT(I8,9D12.4)
11400 FORMAT(I5,2F10.3)
11500 FORMAT(I10,2D15.4)
11600 FORMAT(I10,4I8,I10,I15)
11700 FORMAT(I10,32X,I10)
11800 FORMAT(I5,5X,F10.0)
11900 FORMAT(2I5,F10.0)
12000 FORMAT(I5,D15.4)
12100 FORMAT(3I5,5X,2F10.0)
12200 FORMAT(2I5,2(1PD15.4))
12300 FORMAT(////33H TOO MANY NODAL POINTS, MAXIMUM =, I5///)
12400 FORMAT(////30H TOO MANY ELEMENTS, MAXIMUM = ,I5///)
12500 FORMAT(////41H TOO MANY CORRECTION MATERIALS, MAXIMUM =,I5///)
12600 FORMAT(////36H TOO MANY TIME INCREMENTS, MAXIMUM =,I5///)
12700 FORMAT(////29H CHECK VELOCITY INPUT CONTROL///)
12800 FORMAT(////30H TOO MANY MATERIALS, MAXIMUM =,I5///)
12900 FORMAT(////36H CHECK BOUNDARY CONDITIONS, MAXIMUM=,I5///)
13000 FORMAT(////30H CHECK SURFACE TERMS, MAXIMUM=,I5///)
13100 FORMAT(////31H CHECK TRANSIENT S.T., MAXIMUM=,I5///)
13200 FORMAT(////28H EXECUTION HALTED BECAUSE OF,I5,13H FATAL ERRORS///)
13300 FORMAT(////30H ERROR IN NODAL-POINT CARD NO.,I5///)
13400 FORMAT(////26H ERROR IN ELEMENT CARD NO.,I5///)
13500 FORMAT(////36H ERROR IN INITIAL-CONDITION CARD NO.,I5///)
13600 FORMAT(////45H ASSEMBLY AND SOLUTION WILL NOT BE PERFORMED,,I5,
     > 19H  FATAL CARD ERRORS///)
13700 FORMAT(////38H ERROR IN FIRST TRANSIENT-SURFACE CARD///)
13800 FORMAT(////44H ERROR IN TRANSIENT-SURFACE CARD FOR ELEMENT,I5///)
13900 FORMAT(////49H ERROR IN FIRST R=BB TYPE BOUNDARY-CONDITION CARD //
     >  /)
14000 FORMAT(////33H ERROR IN FIRST SURFACE-TERM CARD///)
```

```
10000 FORMAT(////' ERROR IN MATERIAL TYPE CODE FOR ELEMENT ',I5///)
      END



      SUBROUTINE FLUX(FX,FZ,VX,VZ,R,TH,MAXEL,MAXNP)
C
C
C  FUNCTION OF SUBROUTINE--TO DETERMINE MATERIAL FLUX FX(M,KQ) AND
C  FZ(M,KQ).
C
C
      IMPLICIT REAL*8 (A-H,O-Z)
      COMMON/GEOM/X(595),Z(595),BB(595),DCOSXB(528),DCOSX(528),
     > DCOSZB(528),DCOSZ(528),DLB(528),DL(528),DELT,CHNS,DELMAX,TMAX,
     > NPB(595),NPST(595),NPTST(595),NBE(528),NTSE(528),IE(528,5),
     > ISB(528,4),ISE(528,4),NNP,NEL,NMAT,IBAND,NBC,NST,NTST,NPI,NBEL,
     > NSTB,NTSTB
      COMMON/MTL/PROP(2,9)
      DIMENSION DNX(4,4),DNZ(4,4),XQ(4),ZQ(4),VX(MAXEL,4),VZ(MAXEL,4),
     > FX(MAXEL,4),FZ(MAXEL,4),R(MAXNP),TH(MAXEL,4)
      ISTOP=0
      DO 50 M=1,NEL
C
C  FOR EACH ELEMENT M PREPARE VARIABLES XQ(IQ) AND ZQ(IQ) FOR QSD,
C  WHICH DETERMINES DERIVATIVES DNX(IQ,KQ) AND DNZ(IQ,KQ) OF EACH OF
C  THE FOUR BASIS FUNCTIONS N(IQ) AT EACH NODAL POINT KQ
C
         DO 10 IQ=1,4
            NP=IE(M,IQ)
            XQ(IQ)=X(NP)
   10       ZQ(IQ)=Z(NP)
         CALL QSD(DNX,DNZ,AREA,XQ,ZQ)
         IF (AREA.GT.0.0) GO TO 20
         ISTOP=ISTOP+1
         PRINT 10000,M
C
C  FOR EACH NODAL POINT KQ SUM OVER CONTRIBUTIONS FROM EACH BASIS-
C  INTERPOLATION FUNCTION N(IQ) TO OBTAIN DERIVATIVES DRX AND DRZ
C  OF THE CONCENTRATION R(NP)
C
   20    DO 40 KQ=1,4
            DRX=0.
            DRZ=0.
            DO 30 IQ=1,4
               NP=IE(M,IQ)
               DRX=DRX+DNX(IQ,KQ)*R(NP)
   30          DRZ=DRZ+DNZ(IQ,KQ)*R(NP)
C
C  FORM THE DISPERSIVE FLUXES IN FX(M,KQ) AND FZ(M,KQ)
C
            MTYP=IE(M,5)
            AL=PROP(MTYP,3)
            AT=PROP(MTYP,4)
            AM=PROP(MTYP,8)
            TAU=PROP(MTYP,9)
            DD=AM*TAU
            VXK=VX(M,KQ)
            VZK=VZ(M,KQ)
            VK=DSQRT(VXK*VXK+VZK*VZK)
            VKI=1./VK
            DXX=(AL*VXK*VXK+AT*VZK*VZK)*VKI+DD
            DZZ=(AL*VZK*VZK+AT*VXK*VXK)*VKI+DD
            DXZ=(AL-AT)*VXK*VZK*VKI
            FX(M,KQ)=-(DXX*DRX+DXZ*DRZ)
            FZ(M,KQ)=-(DZZ*DRZ+DXZ*DRX)
C
C  ADD THE ADVECTIVE FLUXES TO FX(M,KQ) AND FZ(M,KQ) AND ASSUME
C  NEGLIGIBLE FLUX AT THE BOUNDARY DUE TO COMPRESSIBILITY OF THE
C  MEDIUM
C
            FX(M,KQ)=FX(M,KQ)+VXK*R(NP)
            FZ(M,KQ)=FZ(M,KQ)+VZK*R(NP)
```

```
   40       CONTINUE
   50    CONTINUE
      IF (ISTOP.GT.0) STOP
      RETURN
10000 FORMAT(////5X,17H AREA OF ELEMENT ,I5,14H  IS NEGATIVE  ///)
      END
```

```
      SUBROUTINE Q4D(DNX,DNZ,AREA,XQ,ZQ)
C
C
C  FUNCTION OF SUBROUTINE--TO COMPUTE X AND Z DERIVATIVES DNX(IQ,KQ)
C  AND DNZ(IQ,KQ) OF EACH BASIS FUNCTION N(IQ) AT EACH NODE KQ OF THE
C  ELEMENT.  RESULTS ARE IN THE GLOBAL COORDINATE SYSTEM.
C
C
      IMPLICIT REAL*8 (A-H,O-Z)
      DIMENSION S(4),T(4),DNX(4,4),DNZ(4,4),XQ(4),ZQ(4)
      DATA S / -1.0D+00, 1.0D+00, 1.0D+00,-1.0D+00 /, T / -1.0D+00,-
     > 1.0D+00, 1.0D+00, 1.0D+00 /
C
C  EVALUATE QUANTITIES FOR USE IN THE JACOBIAN DJ/8, BELOW, NECESSARY
C  FOR TRANSFORMATION FROM GLOBAL TO LOCAL COORDINATES
C
      X12 = XQ(1)  - XQ(2)
      X13 = XQ(1)  - XQ(3)
      X23 = XQ(2)  - XQ(3)
      X14 = XQ(1)  - XQ(4)
      X24 = XQ(2)  - XQ(4)
      X34 = XQ(3)  - XQ(4)
      Z13 = ZQ(1)  - ZQ(3)
      Z24 = ZQ(2)  - ZQ(4)
      Z34 = ZQ(3)  - ZQ(4)
      Z12 = ZQ(1)  - ZQ(2)
      Z23 = ZQ(2)  - ZQ(3)
      Z14 = ZQ(1)  - ZQ(4)
      AREA = X13*Z24 - X24*Z13
C
C  LOOP OVER EACH NODE
C
      DO 10 KQ=1,4
C
C  LOCAL COORDINATES OF ANY GIVEN NODE ARE (SS,TT)
C
         SS = S(KQ)
         TT = T(KQ)
C
C  EVALUATE 'JACOBIAN'
C
         DJ = AREA + SS*(X34*Z12-X12*Z34) + TT*(X23*Z14-X14*Z23)
C
C  DETERMINE THE DERIVATIVES OF EACH BASIS FUNCTION AT NODE KQ
C
         DNZ(1,KQ)=(-X24+X34*SS+X23*TT)/DJ
         DNZ(2,KQ)=(+X13-X34*SS-X14*TT)/DJ
         DNZ(3,KQ)=(+X24-X12*SS+X14*TT)/DJ
         DNZ(4,KQ)=(-X13+X12*SS-X23*TT)/DJ
         DNX(1,KQ)=(+Z24-Z34*SS-Z23*TT)/DJ
         DNX(2,KQ)=(-Z13+Z34*SS+Z14*TT)/DJ
         DNX(3,KQ)=(-Z24+Z12*SS-Z14*TT)/DJ
         DNX(4,KQ)=(+Z13-Z12*SS+Z23*TT)/DJ
   10    CONTINUE
      RETURN
      END
```

```
      SUBROUTINE BC(C,R,RP,DP,VXW,VZW,W,MAXNP,MAXEL,MAXBW,KSS)
C
C  FUNCTION OF SUBROUTINE--TO APPLY CONSTANT-CONCENTRATION DIRICHLET
```

```
C  CONDITIONS AND BOTH CONSTANT AND TRANSIENT NEUMANN SURFACE
C  BOUNDARY CONDITIONS.
C
C
      IMPLICIT REAL*8 (A-H,O-Z)
      REAL*8 KP
      COMMON/GEOM/X(595),Z(595),BB(595),DCOSXB(528),DCOSX(528),
     > DCOSZB(528),DCOSZ(528),DLB(528),DL(528),DELT,CHNG,DELMAX,TMAX,
     > NPB(595),NPST(595),NPTSP(595),NBE(528),NTSE(528),IE(528,5),
     > ISP(528,4),IS(528,4),NNP,NEL,NMAT,IBAND,NBC,NST,NTST,NTI,NSEL,
     > NSTB,NTSTB
      DIMENSION C(MAXNP,MAXBW),R(MAXNP),DP(MAXNP),VXE(MAXEL,4),
     > VZE(MAXEL,4),KQ(2),VXQ(4),VZQ(4),DELXQ(2,2),XQ(4),ZQ(4),
     > KP(MAXNP)
      IHALFB=(IBAND-1)/2
      IHBP=IHALFB+1
      IF (NBC.EQ.0) GO TO 100
C
C  APPLY CONSTANT-CONCENTRATION DIRICHLET BOUNDARY CONDITIONS
C
      DO 90 NPP=1,NB
C
C  MODIFY ROW NPB(NPP) OF MATRIX C(NP,IB)
C
         NI=NPB(NPP)
         DO 10 IB=1,IBAND
   10       C(NI,IB)=0.0
         C(NI,IHBP)=1.0
         R(NI)=BB(NPP)
C
C  MODIFY LOAD VECTOR R(NP) FOR NON-ZERO BB(NPP)
C
         IF (BB(NPP).EQ.0.0) GO TO 50
         DO 20 IB=1,IHALFB
            NJ=NI-IB
            IF (NJ.LT.1) GO TO 30
            JP=IHBP+IB
   20       R(NJ)=R(NJ)-BB(NPP)*C(NJ,JB)
   30    DO 40 IB=1,IHALFB
            NJ=NI+IB
            IF (NJ.GT.NNP) GO TO 50
            JB=IHBP-IB
   40       R(NJ)=R(NJ)-BB(NPP)*C(NJ,JB)
C
C  ZERO COLUMN NPB(NPP) OF MATRIX C(NP,IB)
C
   50    DO 60 IB=1,IHALFB
            NJ=NI-IB
            IF (NJ.LT.1) GO TO 70
            JB=IHBP+IB
   60       C(NJ,JB)=0.0
   70    DO 80 IB=1,IHALFB
            NJ=NI+IB
            IF (NJ.GT.NNP) GO TO 90
            JB=IHBP-IB
   80       C(NJ,JB)=0.0
   90    CONTINUE
  100 IF (NTST.LE.0) GO TO 140
C
C  ENTER SURFACE TERMS IN MATRIX C(NP,IB)
C
      W1=W
      W2=1.-W
      IF (KSS.NE.0) GO TO 110
      W1=1.
      W2=0.
  110 DO 130 NP=1,NTST
         N=NTSE(NP)
         NI=IS(NP,1)
         NJ=IS(NP,2)
         KQ(1)=IS(NP,3)
         KQ(2)=IS(NP,4)
         DO 120 IQ=1,4
            NP=IE(N,IQ)
            XQ(IQ)=X(NP)
```

```
            ZQ(IQ)=Z(NP)
            VXQ(IQ)=VXW(M,IQ)
            VZQ(IQ)=VZW(M,IQ)
120         CONTINUE
         CALL Q4SF(DFLXQ,FQ,DL(NP),DCOSX(NP),DCOSZ(NP),XQ,ZQ,VXQ, VZQ,
     >    APPA)
         IB=INBP
         JB=INBP+(NJ-NI)
         C(NI,IB)=C(NI,IB)+W1*DFLXQ(1,1)
         C(NI,JB)=C(NI,JB)+W1*DFLXQ(1,2)
         R(NI)=R(NI)-W2*(DFLXQ(1,1)*RP(NI)+DFLXQ(1,2)*RP(NJ))
         JB=INBP
         IB=INBP+(NI-NJ)
         C(NJ,JB)=C(NJ,JB)+W1*DFLXQ(2,2)
         C(NJ,IB)=C(NJ,IB)+W1*DFLXQ(2,1)
         R(NJ)=R(NJ)-W2*(DFLXQ(2,1)*RP(NI)+DFLXQ(2,2)*RP(NJ))
130      CONTINUE
140 IF (NST.LE.0) GO TO 160
C
C  MODIFY LOAD VECTOR FOR SURFACE TERMS OF THE FORM DR/DN=C
C
      DO 150 NP=1,NNP
150      R(NP)=R(NP)+DR(NP)
160 RETURN
      END
```

```
      SUBROUTINE ASMBL(C,R,RP,VXW,VZW,THW,DH,DTH,W,MAXNP,MAXBW,MAXEL,
     > KSS)
C
C
C  FUNCTION OF SUBROUTINE--TO ASSEMBLE THE GLOBAL COEFFICIENT MATRIX
C  C(NP,IB) AND LOAD VECTOR R(NP) FROM THE ELEMENT MATRICES QA(IQ,JQ)
C  AND QB(IQ,JQ).
C
C
      IMPLICIT REAL*8 (A-H,O-Z)
      REAL*8 KD,LAMBDA
      COMMON/GEOM/X(595),Z(595),RR(595),DCOSXB(528),DCOSX(528),
     > DCOSZB(528),DCOSZ(528),DLB(528),DL(528),DELT,CHNG,DELMAX,TMAX,
     > NPC(595),NPST(595),NPTSP(595),NBE(528),NTSE(528),IE(528,5),
     > ISB(528,4),IS(528,4),NNP,NEL,NMAT,IBAND,NBC,NST,NTST,NTI,NBEL,
     > NSTN,NTSTN
      COMMON/MTL/PROP(2,9)
      DIMENSION C(MAXNP,MAXBW),R(MAXNP),RP(MAXNP),QA(4,4),QB(4,4),
     > VXQ(4),VZQ(4),XQ(4),ZQ(4),VXW(MAXEL,4),VZW(MAXEL,4),THW(MAXEL,4),
     >  DH(MAXNP),DTH(MAXEL,4),DHQ(4),DTHQ(4),THQ(4)
      IHALFB=(IBAND-1)/2
      INBP=IHALFB+1
      DELTI=1./DELT
      W1=W
      W2=1.-W
      IF (KSS.NE.0) GO TO 10
      DELTI=0.
      W1=1.
      W2=0.
C
C  INITIALIZE MATRICES C(NP,IB) AND R(NP)
C
   10 DO 20 NP=1,NNP
         R(NP)=0.
         DO 20 IB=1,IBAND
   20       C(NP,IB)=0.0
C
C  COMPUTE MATRICES QA(IQ,JQ) AND QB(IQ,JQ) FOR EACH ELEMENT M
C
      DO 50 M=1,NEL
         MTYP=IE(M,5)
         KD=PROP(MTYP,1)
         RHOB=PROP(MTYP,2)
         AL=PROP(MTYP,3)
         AT=PROP(MTYP,4)
```

```
      LAMBDA=PROP(MTYP,5)
      POR=PROP(MTYP,6)
      ALP=PROP(MTYP,7)
      AM=PROP(MTYP,8)
      TAU=PROP(MTYP,9)
      DO 30 IQ=1,4
         NP=IE(M,IQ)
         DHQ(IQ)=DH(NP)
         THQ(IQ)=THN(M,IQ)
         DTHQ(IQ)=DTH(M,IQ)
         VXQ(IQ)=VXN(M,IQ)
         VZQ(IQ)=VZN(M,IQ)
         XQ(IQ)=X(NP)
 30      ZQ(IQ)=Z(NP)
100   CALL Q4(VXQ,VZQ,QA,QB,AREA,XQ,ZQ,KD,RHOB,AL,AT,LAMBDA,POR,THQ,
     >  DTHQ,DHQ,ALP,AM,TAU)
C
C ASSEMBLE QA(IQ,JQ) AND QB(IQ,JQ) INTO THE GLOBAL MATRIX
C C(NP,IP) = W1*B + A/DELT AND FORM THE LOAD VECTOR
C F(NP) = (A/DELT - W2*B)*RP.  MATRIX C IS ASYMMETRIC DUE TO
C THE ADVECTION TERM.
C
      DO 50 IQ=1,4
         NI=IE(M,IQ)
         DO 40 JQ=1,4
            NJ=IE(M,JQ)
            QA(IQ,JQ)=QA(IQ,JQ)*DELTI
            F(NI)=F(NI)+(QA(IQ,JQ)-W2*QB(IQ,JQ))*FP(NJ)
            IB=NJ-NI+INBP
            C(NI,IB)=C(NI,IB)+QA(IQ,JQ)+W1*QB(IQ,JQ)
 40         CONTINUE
 50   CONTINUE
      RETURN
      END
```

```
      SUBROUTINE Q4(VXQ,VZQ,QA,QB,AREA,XQ,ZQ,KD,RHOB,AL,AT,LAMBDA, POR,
     > THQ,DTHQ,DHQ,ALP,AM,TAU)
C
C
C FUNCTION OF SUBROUTINE--TO EVALUATE THE MATRIX QUADRATURES QA(IQ,JQ)
C AND QB(IQ,JQ) OVER THE AREA OF ONE ELEMENT.
C
C
      IMPLICIT REAL*8 (A-H,O-Z)
      REAL*8 W(4),RW,KD,LAMBDA
      DIMENSION QA(4,4),QB(4,4),VXQ(4),VZQ(4),S(4),T(4),U(4),V(4),XQ(4),
     >  ZQ(4),THQ(4),DTHQ(4),DHQ(4)
      DATA P / 0.577350269189626 /, S / -1.0D+00, 1.0D+00, 1.0D+00,-
     > 1.0D+00 /, T / -1.0D+00,-1.0D+00, 1.0D+00, 1.0D+00 /
      RD=1.+KD*RHOB/POR
      DD=AM*TAU
C
C INITIALIZE MATRICES QA(IQ,JQ) AND QB(IQ,JQ)
C
      DO 10 IQ=1,4
         DO 10 JQ=1,4
            QA(IQ,JQ)=0.0
 10         QB(IQ,JQ)=0.0
C
C EVALUATE QUANTITIES FOR USE IN JACOBIAN DJAC, BELOW, NECESSARY
C FOR TRANSFORMATION FROM GLOBAL TO LOCAL COORDINATES
C
      X12 = XQ(1) - XQ(2)
      X13 = XQ(1) - XQ(3)
      X23 = XQ(2) - XQ(3)
      X14 = XQ(1) - XQ(4)
      X24 = XQ(2) - XQ(4)
      X34 = XQ(3) - XQ(4)
      Z13 = ZQ(1) - ZQ(3)
      Z24 = ZQ(2) - ZQ(4)
      Z34 = ZQ(3) - ZQ(4)
```

```
      Z12 = ZQ(1)  - ZQ(2)
      Z23 = ZQ(2)  - ZQ(3)
      Z14 = ZQ(1)  - ZQ(4)
      AREA = X13*Z24 - X24*Z13
      DO 40 KG=1,4
C
C  DETERMINE THE LOCAL COORDINATES (SS,TT) AND EVALUATE THE JACOBIAN AT
C  EACH GAUSS-INTEGRATION POINT KG
C
         SS = P*S(KG)
         TT = P*T(KG)
         DJ = AREA + SS*(X34*Z12-X12*Z34)  + TT*(X23*Z14-X14*Z23)
         DJAC = DJ/8.0
         DJI=1./DJ
         SN = 1.0 - SS
         SP = 1.0 + SS
         TN = 1.0 - TT
         TP = 1.0 + TT
C
C  CALCULATE VALUES OF THE BASIS FUNCTIONS W(IQ) AND THEIR DERIVATIVES
C  V(IQ) AND U(IQ) W.R.T. X AND Z, RESPECTIVELY, AT GAUSS POINT KG
C
         U(1)=(-X24+X34*SS+X23*TT)*DJI
         U(2)=(+X13-X34*SS-X14*TT)*DJI
         U(3)=(+X24-X12*SS+X14*TT)*DJI
         U(4)=(-X13+X12*SS-X23*TT)*DJI
         V(1)=(+Z24-Z34*SS-Z23*TT)*DJI
         V(2)=(-Z13+Z34*SS+Z14*TT)*DJI
         V(3)=(-Z24+Z12*SS-Z14*TT)*DJI
         V(4)=(+Z13-Z12*SS+Z23*TT)*DJI
         W(1)=0.25*SN*TN
         W(2)=0.25*SP*TN
         W(3)=0.25*SP*TP
         W(4)=0.25*SN*TP
C
C  INTERPOLATE WITH THE BASIS-INTERPOLATION FUNCTIONS W(IQ) TO OBTAIN
C  THE ADVECTIVE VELOCITY AT EACH GAUSS INTEGRATION POINT
C
         DHK=0.
         THK=0.
         DTHK=0.
         VXK=0.
         VZK=0.
         DO 20 IQ=1,4
            DHK=DHK+W(IQ)*DHQ(IQ)
            THK=THK+W(IQ)*THQ(IQ)
            DTHK=DTHK+W(IQ)*DTHQ(IQ)
            VXK=VXK+W(IQ)*VXQ(IQ)
   20       VZK=VZK+W(IQ)*VZQ(IQ)
         VK=DSQRT(VXK*VXK+VZK*VZK)
         VKI=1./VK
C
C  ACCUMULATE THE SUMS TO EVALUATE THE MATRIX INTEGRALS QA(IQ,JQ)
C  AND QB(IQ,JQ)
C
         A=DJAC*RD*THK
         DXX=DJAC*((AL*VXK*VXK+AT*VZK*VZK)*VKI+DD)
         DZZ=DJAC*((AL*VZK*VZK+AT*VXK*VXK)*VKI+DD)
         DXZ=DJAC*(AL-AT)*VXK*VZK*VKI
         C=DJAC*RD*(DTHK+THK*ALP*DHK+LAMBDA*THK)
         VXK=VXK*DJA
         VZK=VZK*DJA
         DO 30 IQ=1,4
            DO 30 JQ=1,4
               WW=W(IQ)*W(JQ)
               UU=U(IQ)*U(JQ)
               VV=V(IQ)*V(JQ)
               VW=V(IQ)*W(JQ)
               UW=U(IQ)*W(JQ)
               UV=U(IQ)*V(JQ)
               VU=V(IQ)*U(JQ)
               QA(IQ,JQ)=QA(IQ,JQ)+A*WW
   30          QB(IQ,JQ)=QB(IQ,JQ)+DXX*VV+DXZ*(VU+UV)+DZZ*UU+C*WW -(VXK*
     >          VW+VZK*UW)
   40    CONTINUE
```

```
      RETURN
      END



      SUBROUTINE PRINTT(NNP,IBAND,MAXNP,MAXEL,DELT,R,FX,FZ,VX,VZ, TIME,
     > NEL,KPR,KOUT,KDIG,FRATE,FLOW,TFLOW,H,HT,TH)
C
C
C     FUNCTION OF SUBROUTINE--TO OUTPUT FLOWS, CONCENTRATIONS, MATERIAL
C     FLUXES, WATER CONTENTS, DARCY VELOCITIES, PRESSURE HEADS, AND
C     TOTAL HEADS AS SPECIFIED BY THE PARAMETER KPR.
C
C
      IMPLICIT REAL*8 (A-H,O-Z)
      DIMENSION R(MAXNP),FX(MAXEL,4),FZ(MAXEL,4),VX(MAXEL,4), VZ(MAXEL,
     > 4),FRATE(10),FLOW(10),TFLOW(10),H(MAXNP), HT(MAXNP),TH(MAXEL,4)
      IF (KPR.EQ.0) RETURN
      IF (KOUT.EQ.0) GO TO 10
C
C     PRINT DIAGNOSTIC FLOW INFORMATION
C
      KDIG=KDIG+1
      PRINT 10600,KDIG,TIME,DELT
      PRINT 10500,(FRATE(I),FLOW(I),TFLOW(I),I=1,8)
   10 IF (KPR.EQ.1) RETURN
C
C     PRINT CONCENTRATIONS
C
      KOUT=KOUT+1
      PRINT 10000,KOUT,TIME,DELT,IBAND
      DO 20 NI=1,NNP,8
         NJMN=NI
         NJMX=MIN0(NI+7,NNP)
   20    PRINT 10100,NI,(R(NJ),NJ=NJMN,NJMX)
      IF (KPR.EQ.2) RETURN
C
C     PRINT MATERIAL FLUX
C
      KOUT=KOUT+1
      PRINT 10200,KOUT,TIME,DELT,IBAND
      DO 30 M=1,NEL
   30    PRINT 10100,M,(FX(M,IQ),IQ=1,4),(FZ(M,IQ),IQ=1,4)
      IF (KPR.EQ.3) RETURN
C
C     PRINT WATER CONTENTS
C
      KOUT=KOUT+1
      PRINT 10300,KOUT,TIME,DELT,IBAND
      DO 40 M=1,NEL
   40    PRINT 10100,M,(TH(M,IQ),IQ=1,4)
C
C     PRINT DARCY VELOCITIES
C
      KOUT=KOUT+1
      PRINT 10400,KOUT,TIME,DELT,IBAND
      DO 50 M=1,NEL
   50    PRINT 10100,M,(VX(M,IQ),IQ=1,4),(VZ(M,IQ),IQ=1,4)
      IF (KPR.EQ.4) RETURN
C
C     PRINT PRESSURE HEADS
C
      KOUT=KOUT+1
      PRINT 10700,KOUT,TIME,DELT,IBAND
      DO 60 NI=1,NNP,8
         NJMN=NI
         NJMX=MIN0(NI+7,NNP)
   60    PRINT 10100,NI,(H(NJ),NJ=NJMN,NJMX)
C
C     PRINT TOTAL HEADS
C
      KOUT=KOUT+1
      PRINT 10800,KOUT,TIME,DELT,IBAND
```

```
      DO 70 NI=1,NNP,8
         NJMN=NI
         NJMX=MIN0(NI+7,NNP)
   70    PRINT 10100,NI,(HT(NJ),NJ=NJMN,NJMX)
      RETURN
10000 FORMAT(13H1OUTPUT TABLE,I4,27H.. CONCENTRATIONS AT TIME =,
     > 1PD12.4,9H ,(DELT =,1PD12.4,15H),(BAND WIDTH =,I4,1H)//
     > 7H NODE I,5X,36HCONCENTRATION AT NODES I,I+1,...,I+7/)
10100 FORMAT(I7,8(1PD15.8))
10200 FORMAT(13H1OUTPUT TABLE,I4,26H.. MATERIAL FLUX AT TIME =, 1PD12.4,
     >  9H ,(DELT =,1PD12.4,15H),(BAND WIDTH =,I4,1H)// 31X,
     > 15HFLUX-X AT NODES,45X,15HFLUX-Z AT NODES/17X,1H1,14X,1H2,14X
     > 1H3,14X,1H4,14X,1H1,14X,1H2,14X,1H3,14X,1H4,/3X,7HELEMENT,2X.
     > 55H*******************************************************,5X,
     > 55H*******************************************************)
10300 FORMAT(13H1OUTPUT TABLE,I4,27H.. WATER CONTENTS AT TIME =,
     > 1PD12.4,9H ,(DELT =,1PD12.4,15H),(BAND WIDTH =,I4,1H)// 37X,
     > 5HNODES/17X,1H1,14X,1H2,14X,1H3,14X,1H4/3X,7HELEMENT,2X,
     > 55H*******************************************************)
10400 FORMAT(13H1OUTPUT TABLE,I4,29H.. DARCY VELOCITIES AT TIME =,
     > 1PD12.4,9H ,(DELT =,1PD12.4,15H),(BAND WIDTH =,I4,1H)// 32X,
     > 14HVEL-X AT NODES,46X,14HVEL-Z AT NODES/17X,1H1,14X,1H2,14X, 1H3,
     >  14X,1H4,14X,1H1,14X,1H2,14X,1H3,14X,1H4,/3X,7HELEMENT,2X,
     > 55H*******************************************************,5X,
     > 55H*******************************************************)
10500 FORMAT(//5X,13H TYPE OF FLOW,35X,4HRATE,8X,9HINC. FLOW,7X,
     > 10HTOTAL FLOW/5X,40H CONSTANT-CONCENTRATION NODE FLOW. . . .,3(
     > E12.4,5X)/5X,40H CONSTANT-FLUX-NODE FLOW . . . . . . . . .,3(E12.4,
     >  5X)/5X,40H SEEPAGE FLUX-NODE FLOW. . . . . . . . . .,3(E12.4,5X)/
     > 5X,40H NUMERICAL LOSSES. . . . . . . . . . . . .,3(E12.4,5X)/5X,
     > 40H NET FLOW. . . . . . . . . . . . . . . . .,3(E12.4,5X)/5X,
     > 40H INCREASE IN MATERIAL CONTENT (LIQUID) .,3(E12.4,5X)/5X,
     > 40H INCREASE IN MATERIAL CONTENT (SOLID). .,3(E12.4,5X)/5X,
     > 40H RADIOACTIVE LOSSES (LIQUID AND SOLID) .,3(E12.4,5X))
10600 FORMAT(///53H *****************************************************
     > 62H**************************************************************
     > 5H*****///18H SYSTEM-FLOW TABLE,I4,12H.. AT TIME =,1PD12.4,
     > 9H ,(DELT =,1PD12.4,1H))
10700 FORMAT(13H1OUTPUT TABLE,I4,27H.. PRESSURE HEADS AT TIME =,
     > 1PD12.4,9H ,(DELT =,1PD12.4,15H),(BAND WIDTH =,I4,1H)//
     > 7H NODE I,5X,36HPRESSURE HEAD OF NODES I,I+1,...,I+7/)
10800 FORMAT(13H1OUTPUT TABLE,I4,24H.. TOTAL HEADS AT TIME =, 1PD12.4,
     > 9H ,(DELT =,1PD12.4,15H),(BAND WIDTH =,I4,1H)// 7H NODE I,5X,
     > 33HTOTAL HEAD OF NODES I,I+1,...,I+7/)
      END
```

```
      SUBROUTINE STORE(NPROB,MAXNP,MAXEL,R,TIME,TITLE,FX,FZ,H,HT,TH,VX,
     > VZ)
C
C
C     FUNCTION OF SUBROUTINE--TO STORE PERTINENT QUANTITIES ON AUXILIARY
C     DEVICE FOR FUTURE USE, E.G. FOR PLOTTING.  WHAT DEVICE IS TO BE
C     USED MUST BE SPECIFIED BY APPROPRIATE JOB-CONTROL CARDS.
C
C
      IMPLICIT REAL*8 (A-H,O-Z)
      COMMON/GEOM/X(595),Z(595),BB(595),DCOSXB(528),DCOSX(528),
     > DCOSZB(528),DCOSZ(528),DLB(528),DL(528),DELT,CHNG,DELMAX,TMAX,
     > NFN(595),NPST(595),NPTST(595),NBE(528),NTSE(528),IE(528,5),
     > ISS(528,4),IS(528,4),NNP,NEL,NMAT,IBAND,NBC,NST,NTST,NTI,NBEL,
     > NSTN,NTSTN
      DIMENSION R(MAXNP),TITLE(9),FX(MAXEL,4),FZ(MAXEL,4),H(MAXNP),
     > HT(MAXNP),TH(MAXEL,4),VX(MAXEL,4),VZ(MAXEL,4)
      DATA NPPROB/-1/
      IF (NPPROB.EQ.(-1)) REWIND 2
      IF (NPPROB.EQ.NPROB) GO TO 10
      WRITE(2) (TITLE(I),I=1,9),NPROB,NNP,NEL,NTI
      WRITE(2) (X(NP),NP=1,NNP),(Z(NP),NP=1,NNP),((IE(M,IQ),M=1,NEL),
     > IQ=1,4)
      NPPROB=NPROB
   10 WRITE(2) TIME,(R(NP),NP=1,NNP),((FX(M,IQ),M=1,NEL),IQ=1,4),
```

```
     > ((FT(N,IQ),N=1,NEL),IQ=1,4),(H(NP),NP=1,NNP),(HT(NP),NP=1,NNP),
     > ((TH(N,IQ),N=1,NEL),IQ=1,4),((TZ(N,IQ),N=1,NEL),IQ=1,4), ((VZ(N,
     > IQ),N=1,NEL),IQ=1,4)
       RETURN
       END
```

```
      SUBROUTINE SURF
C
C
C  FUNCTION OF SUBROUTINE--TO IDENTIFY BOUNDING SIDES THRU THE ARRAY
C  ISB(NP,4), CALCULATE THEIR LENGTHS DLB(NP), AND TO DETERMINE THE
C  DIRECTION COSINES DCOSX(NP) AND DCOSZ(NP) OF THE OUTWARDLY DIRECTED
C  UNIT NORMAL VECTOR FOR EACH BOUNDARY ELEMENT NBE(NP).
C
C
      IMPLICIT REAL*8 (A-H,O-Z)
      COMMON/GEOM/X(595),Z(595),BB(595),DCOSXB(528),DCOSX(528),
     > DCOSZB(528),DCOSZ(528),DLB(528),DL(528),DELT,CHNG,DELMAX,TMAX,
     > NPN(595),NPST(595),NPTST(595),NBE(528),NTSE(528),IE(528,5),
     > ISB(528,4),IS(528,4),NNP,NEL,NMAT,IBAND,NBC,NST,NTST,NTI,NBEL,
     > NSTN,NTSTN
C
C  FIND SURFACE SIDES BY LOCATING NON-DUPLICATED SIDES
C
      NBEL=0
      DO 40 NI=1,NEL
         DO 30 IQ=1,4
            IQ1=IQ+1
            IF (IQ.EQ.4) IQ1=1
            DO 20 NJ=1,NEL
               IF (NJ.EQ.NI) GO TO 20
               DO 10 JQ=1,4
                  JQ1=JQ+1
                  IF (JQ.EQ.4) JQ1=1
                  IF (IE(NI,IQ).EQ.IE(NJ,JQ).AND.IE(NI,IQ1).EQ.IE(NJ,
     >             JQ1)) GO TO 30
                  IF (IE(NI,IQ).EQ.IE(NJ,JQ1).AND.IE(NI,IQ1).EQ.IE(NJ,
     >             JQ)) GO TO 30
 10               CONTINUE
 20            CONTINUE
            NBEL=NBEL+1
            NBE(NBEL)=NI
            ISB(NBEL,1)=IE(NI,IQ)
            ISB(NBEL,2)=IE(NI,IQ1)
            ISB(NBEL,3)=IQ
            ISB(NBEL,4)=IQ1
 30         CONTINUE
 40      CONTINUE
C
C  CALCULATE SIDE LENGTHS AND DIRECTION COSINES
C
      DO 70 NP=1,NBEL
         N=NBE(NP)
         NI=ISB(NP,1)
         NJ=ISB(NP,2)
         DX=X(NI)-X(NJ)
         DZ=Z(NI)-Z(NJ)
         DLB(NP)=DSQRT(DX*DX+DZ*DZ)
         DCOSXB(NP)=DABS(DZ)/DLB(NP)
         DCOSZB(NP)=DABS(DX)/DLB(NP)
         DO 50 KQ=1,4
            NK=IE(N,KQ)
            IF (KQ.NE.ISB(NP,3).AND.KQ.NE.ISB(NP,4)) GO TO 60
 50         CONTINUE
 60      ANO=1.
         ANI=1.
         IF (DX.NE.0.D0) ANO=DZ/DX
         IF (DZ.NE.0.D0) ANI=DX/DZ
         X0=X(NI)+ANI*(Z(NK)-Z(NI))
         Z0=Z(NI)+ANO*(X(NK)-X(NI))
         IF (Z(NK).GT.Z0) DCOSZB(NP)=-DCOSZB(NP)
```

```
      IF (X(NK).GT.X0) DCOSXB(NP)=-DCOSXB(NP)
   70    CONTINUE
      RETURN
      END



      SUBROUTINE SFLOW(FX,FZ,R,BFLX,BFLXP,FRATE,FLOW,TFLOW,TH, MAXEL,
     > MAXNP,VX,VZ)
C
C
C FUNCTION OF SUBROUTINE--TO COMPUTE BOUNDARY FLUXES, FLOW RATES,
C INCREMENTAL FLOWS OCCURRING DURING TIME DELT, TOTAL FLOWS SINCE
C TIME ZERO, AND THE CHANGE IN MOISTURE CONTENT FOR THE ENTIRE
C SYSTEM DURING TIME DELT.
C
C
      IMPLICIT REAL*8 (A-H,O-Z)
      REAL*8 KD,LAMBDA
      COMMON/GEOM/X(595),Z(595),BB(595),DCOSXB(528),DCOSX(528),
     > DCOSZB(528),DCOSZ(528),DLB(528),DL(528),DELT,CHNG,DELMAX,TMAX,
     > NPB([illegible]),NPST(595),NPTST(595),NBE(528),NTSE(528),IE(528,5),
     > ISB(5[illegible],4),IS(528,4),NNP,NEL,NNET,IBAND,NBC,NST,NTST,NTI,NBEL,
     > NSTN,NTSIN
      COMMON/MTL/PROP(2,9)
      DIMENSION FX(MAXEL,4),FZ(MAXEL,4),BFLX(MAXNP),BFLXP(MAXNP), XQ(4),
     >  ZQ(4),RQ(4),FRATE(10),FLOW(10),TFLOW(10),R(MAXNP),TH(MAXEL,4),
     > VXQ(4),VZQ(4),VX(MAXEL,4),VZ(MAXEL,4),KQ(2),DFLXQ(2)
      DATA QP,QD,QL/0.D0,0.D0,0.D0/
C
C CALCULATE NODAL FLOW RATES
C
      DO 10 NP=1,NNP
         BFLXP(NP)=BFLX(NP)
   10    BFLX(NP)=0.
      DO 30 MP=1,NBEL
         M=NBE(MP)
         NI=ISB(MP,1)
         NJ=ISB(MP,2)
         KQ(1)=ISB(MP,3)
         KQ(2)=ISB(MP,4)
         MTYP=IE(M,5)
         AL=PROP(MTYP,3)
         AT=PROP(MTYP,4)
         AM=PROP(MTYP,8)
         TAU=PROP(MTYP,9)
         DO 20 IQ=1,4
            NP=IE(M,IQ)
            XQ(IQ)=X(NP)
            ZQ(IQ)=Z(NP)
            RQ(IQ)=R(NP)
            VXQ(IQ)=VX(M,IQ)
            VZQ(IQ)=VZ(M,IQ)
   20       CONTINUE
         CALL Q4S(DFLXQ,KQ,DLB(MP),DCOSXB(MP),DCOSZB(MP),RQ,XQ,ZQ,VXQ,
     >     VZQ,AL,AT,AREA,AM,TAU)
         BFLX(NI)=BFLX(NI)+DFLXQ(1)
         BFLX(NJ)=BFLX(NJ)+DFLXQ(2)
   30    CONTINUE
C
C DETERMINE FLOWS AND FLOW RATES THRU THE VARIOUS
C TYPES OF BOUNDARY NODES, STARTING WITH THE
C NET FLOWS THROUGH ALL BOUNDARY NODES
C
      S=0.
      SP=0.
      DO 40 NP=1,NNP
         S=S+BFLX(NP)
   40    SP=SP+BFLXP(NP)
      FRATE(5)=S
      FLOW(5)=.5*(S+SP)*DELT
C
C CONSTANT DIRICHLET BOUNDARY NODES
```

```
C
      FRATE(1)=0.
      FLOW(1)=0.
      IF (NBC.LE.0) GO TO 60
      S=0.
      SP=0.
      DO 50 NPP=1,NB
         NP=NPB(NPP)
         S=S+BFLX(NP)
   50    SP=SP+BFLXP(NP)
      FRATE(1)=S
      FLOW(1)=.5*(S+SP)*DELT
C
C  CONSTANT NEUMANN BOUNDARY NODES
C
   60 FRATE(2)=0.
      FLOW(2)=0.
      IF (NST.LE.0) GO TO 80
      S=0.
      SP=0.
      DO 70 NPP=1,NSTN
         NP=NPST(NPP)
         S=S+BFLX(NP)
   70    SP=SP+BFLXP(NP)
      FRATE(2)=S
      FLOW(2)=.5*(S+SP)*DELT
C
C  TRANSIENT SEEPAGE BOUNDARY NODES
C
   80 FRATE(3)=0.
      FLOW(3)=0.
      IF (NTST.LE.0) GO TO 100
      S=0.
      SP=0.
      DO 90 NPP=1,NTSTN
         NP=NPTST(NPP)
         S=S+BFLX(NP)
   90    SP=SP+BFLXP(NP)
      FRATE(3)=S
      FLOW(3)=.5*(S+SP)*DELT
C
C  NUMERICAL FLOW THROUGH UNSPECIFIED BOUNDARY NODES
C
  100 S=0.
      SP=0.
      DO 110 I=1,3
         S=S+FRATE(I)
  110    SP=SP+FLOW(I)
      FRATE(4)=FRATE(5)-S
      FLOW(4)=FLOW(5)-SP
C
C  CALCULATE THE INCREASES IN THE INTEGRATED MATERIAL CONTENTS FOR THE
C  FLUID AND THE SOLID PHASES AND DETERMINE LOSSES DUE TO RADIOACTIVE
C  DECAY
C
      QRP=QR
      QDP=QD
      QLP=QL
      QR=0.
      QD=0.
      QL=0.
      DO 130 M=1,NEL
         MTYP=IE(M,5)
         KD=PROP(MTYP,1)
         RHOB=PROP(MTYP,2)
         LAMBDA=PROP(MTYP,5)
         POR=PROP(MTYP,6)
         DO 120 IQ=1,4
            NP=IE(M,IQ)
            XQ(IQ)=X(NP)
            ZQ(IQ)=Z(NP)
  120       RQ(IQ)=R(NP)*TH(M,IQ)
         CALL Q4R(RQ,QRM,AREA,XQ,ZQ)
         QR=QR+QRM
         QDM=RHOB*KD*QRM/POR
```

```
      QD=QD+QDM
      QLM=QBM+QDM
      QL=QL+LAMBDA*QLM
130   CONTINUE
   FLOW(6)=QM-QBF
   FRATE(6)=FLOW(6)/DELT
   FLOW(7)=QD-QDP
   FRATE(7)=FLOW(7)/DELT
   FRATE(8)=.5*(QL+QLP)
   FLOW(8)=DELT*FRATE(8)
   DO 140 I=1,8
140   TFLOW(I)=TFLOW(I)+FLOW(I)
   RETURN
   END
```

```
      SUBROUTINE Q4S(DFLXQ,KQ,DL,DCOSXQ,DCOSZQ,BQ,XQ,ZQ,VXQ,VZQ,AL,AT,
     > AREA,AM,TAU)
C
C
C  FUNCTION OF SUBROUTINE--TO EVALUATE THE NORMAL-FLUX INTEGRAL
C  ALONG THE BOUNDARY LINE EXTENDING FROM NODE LQ TO NODE MQ.
C
C
      IMPLICIT REAL*8 (A-H,O-Z)
      REAL*8 N(4)
      DIMENSION S(4,4),T(4,4),U(4),V(4),DFLXQ(2),KQ(2),BQ(4),SSA(2),
     > TTA(2),XQ(4),ZQ(4),VXQ(4),VZQ(4)
      DATA S/0.D0,-.57735D0,0.D0,-1.D0,.57735D0,0.D0,1.D0,0.D0, 0.D0,
     > 1.D0,0.D0,-.57735D0,-1.D0,0.D0,.57735D0,0.D0/, T/0.D0,-1.D0,0.D0,
     >  -.57735D0,-1.D0,0.D0,-.57735D0,0.D0,0.D0, .57735D0,0.D0,1.D0,
     > .57735D0,0.D0,1.D0,0.D0/
      DD=AM*TAU
C
C  INITIALIZE NODAL COMPONENTS OF LINE INTEGRAL
C
      DO 10 IQ=1,2
10       DFLXQ(IQ)=0.
C
C  EVALUATE QUANTITIES FOR USE IN THE JACOBIAN DJAC, BELOW, NECESSARY
C  FOR TRANSFORMATION FROM GLOBAL TO LOCAL COORDINATES
C
      X12 = XQ(1) - XQ(2)
      X13 = XQ(1) - XQ(3)
      X23 = XQ(2) - XQ(3)
      X14 = XQ(1) - XQ(4)
      X24 = XQ(2) - XQ(4)
      X34 = XQ(3) - XQ(4)
      Z13 = ZQ(1) - ZQ(3)
      Z24 = ZQ(2) - ZQ(4)
      Z34 = ZQ(3) - ZQ(4)
      Z12 = ZQ(1)   ZQ(2)
      Z23 = ZQ(2) - ZQ(3)
      Z14 = ZQ(1) - ZQ(4)
      AREA = X13*Z24 - X24*Z13
C
C  DETERMINE LOCAL COORDINATES OF GAUSS-INTEGRATION POINTS KG
C
      LQ=KQ(1)
      MQ=KQ(2)
      SSA(1)=S(LQ,MQ)
      TTA(1)=T(LQ,MQ)
      SSA(2)=S(MQ,LQ)
      TTA(2)=T(MQ,LQ)
      DO 30 KG=1,2
         SS = SSA(KG)
         TT = TTA(KG)
C
C  EVALUATE THE JACOBIAN DJAC
C
         DJ = AREA + SS*(X34*Z12-X12*Z34) + TT*(X23*Z14-X14*Z23)
         DJI = 1./DJ
```

```
      DJAC = .125*DJ
C
C  CALCULATE VALUES OF THE BASIS FUNCTIONS W(IQ) AND THEIR DERIVATIVES
C  V AND U W.R.T. X AND Z, RESPECTIVELY, AT THE GAUSS POINT KG
C
      SM = 1.0 - SS
      SP = 1.0 + SS
      TM = 1.0 - TT
      TP = 1.0 + TT
      U(1)=(-X24+X34*SS+X23*TT)*DJI
      U(2)=(+X13-X34*SS-X14*TT)*DJI
      U(3)=(+X24-X12*SS+X14*TT)*DJI
      U(4)=(-X13+X12*SS-X23*TT)*DJI
      V(1)=(+Z24-Z34*SS-Z23*TT)*DJI
      V(2)=(-Z13+Z34*SS+Z14*TT)*DJI
      V(3)=(-Z24+Z12*SS-Z14*TT)*DJI
      V(4)=(+Z13-Z12*SS+Z23*TT)*DJI
      W(1)=0.25*SM*TM
      W(2)=0.25*SP*TM
      W(3)=0.25*SP*TP
      W(4)=0.25*SM*TP
C
C  INTERPOLATE WITH FUNCTIONS W(IQ), V(IQ), AND U(IQ) TO OBTAIN
C  VALUES OF DARCY VELOCITIES VXQP AND VZQP, CONCENTRATION RQP, AND
C  GRADIENTS DRX AND DRZ AT THE GAUSS INTEGRATION POINT KG
C
      VXK=0.
      VZK=0.
      RQP=0.
      DRX=0.
      DRZ=0.
      DO 20 IQ=1,4
         VXK=VXK+VXQ(IQ)*W(IQ)
         VZK=VZK+VZQ(IQ)*W(IQ)
         RQP=RQP+RQ(IQ)*W(IQ)
         DRX=DRX+V(IQ)*RQ(IQ)
   20    DRZ=DRZ+U(IQ)*RQ(IQ)
C
C  EVALUATE THE NORMAL FLUX AT THE GAUSS POINT AND ACCUMULATE THE
C  INTEGRAL SUM
C
      VK=DSQRT(VXK*VXK+VZK*VZK)
      VKI=1./VK
      DXX=(AL*VXK*VXK+AT*VZK*VZK)*VKI+DD
      DZZ=(AL*VZK*VZK+AT*VXK*VXK)*VKI+DD
      DXZ=(AL-AT)*VXK*VZK*VKI
      FXK=-(DXX*DRX+DXZ*DRZ)+VXK*RQP
      FZK=-(DZZ*DRZ+DXZ*DRX)+VZK*RQP
      FNK=FXK*DCOSXQ+FZK*DCOSZQ
      DPLXQ(1)=DPLXQ(1)+W(LQ)*FNK
      DPLXQ(2)=DPLXQ(2)+W(MQ)*FNK
   30 CONTINUE
      DO 40 IQ=1,2
   40 DPLXQ(IQ)=.5*DL*DPLXQ(IQ)
      RETURN
      END
```

```
      SUBROUTINE Q4SP(DPLXQ,KQ,DL,DCOSXQ,DCOSZQ,XQ,ZQ,VXQ,VZQ,AREA)
C
C
C  FUNCTION OF SUBROUTINE--TO EVALUATE THE SEEPAGE-FLUX INTEGRALS
C  ALONG THE BOUNDARY LINE EXTENDING FROM NODE LQ TO NODE MQ.
C
C
      IMPLICIT REAL*8 (A-H,O-Z)
      REAL*8 W(4)
      DIMENSION S(4,4),T(4,4),U(4),V(4),DPLXQ(2,2),KQ(2),SSA(2), TTA(2),
     > XQ(4),ZQ(4),AKXQ(4),AKZQ(4),VXQ(4),VZQ(4)
      DATA S/0.D0,-.57735D0,0.D0,-1.D0,.57735D0,0.D0,1.D0,0.D0, 0.D0,
     > 1.D0,0.D0,-.57735D0,-1.D0,0.D0,.57735D0,0.D0/, T/0.D0,-1.D0,0.D0,
     >  -.57735D0,-1.D0,0.D0,-.57735D0,0.D0,0.D0, .57735D0,0.D0,1.D0,
```

```
     > .57735D0,0.D0,1.D0,0.D0/
C
C  INITIALIZE NODAL COMPONENTS OF LINE INTEGRAL
C
      DO 10 JQ=1,2
         DO 10 IQ=1,2
   10       DFLXQ(IQ,JQ)=0.
C
C  EVALUATE QUANTITIES FOR USE IN THE JACOBIAN DJAC, BELOW, NECESSARY
C  FOR TRANSFORMATION FROM GLOBAL TO LOCAL COORDINATES
C
      X12 = XQ(1)  - XQ(2)
      X13 = XQ(1)  - XQ(3)
      X23 = XQ(2)  - XQ(3)
      X14 = XQ(1)  - XQ(4)
      X24 = XQ(2)  - XQ(4)
      X34 = XQ(3)  - XQ(4)
      Z13 = ZQ(1)  - ZQ(3)
      Z24 = ZQ(2)  - ZQ(4)
      Z34 = ZQ(3)  - ZQ(4)
      Z12 = ZQ(1)  - ZQ(2)
      Z23 = ZQ(2)  - ZQ(3)
      Z14 = ZQ(1)  - ZQ(4)
      AREA = X13*Z24 - X24*Z13
C
C  DETERMINE LOCAL COORDINATES OF GAUSS-INTEGRATION POINTS KG
C
      LQ=KQ(1)
      MQ=KQ(2)
      SSA(1)=S(LQ,MQ)
      TTA(1)=T(LQ,MQ)
      SSA(2)=S(MQ,LQ)
      TTA(2)=T(MQ,LQ)
      DO 40 KG=1,2
         SS = SSA(KG)
         TT = TTA(KG)
C
C  EVALUATE THE JACOBIAN DJAC
C
         DJ = AREA + SS*(X34*Z12-X12*Z34) + TT*(X23*Z14-X14*Z23)
         DJI = 1./DJ
         DJAC = .125*DJ
C
C  CALCULATE VALUES OF THE BASIS FUNCTIONS W(IQ) AND THEIR DERIVATIVES
C  V AND U W.R.T. X AND Z, RESPECTIVELY, AT THE GAUSS POINT KG
C
         SM = 1.0 - SS
         SP = 1.0 + SS
         TM = 1.0 - TT
         TP = 1.0 + TT
         U(1)=(-X24+X34*SS+X23*TT)*DJI
         U(2)=(+X13-X34*SS-X14*TT)*DJI
         U(3)=(+X24-X12*SS+X14*TT)*DJI
         U(4)=(-X13+X12*SS-X23*TT)*DJI
         V(1)=(+Z24-Z34*SS-Z23*TT)*DJI
         V(2)=(-Z13+Z34*SS+Z14*TT)*DJI
         V(3)=(-Z24+Z12*SS-Z14*TT)*DJI
         V(4)=(+Z13-Z12*SS+Z23*TT)*DJI
         W(1)=0.25*SM*TM
         W(2)=0.25*SP*TM
         W(3)=0.25*SP*TP
         W(4)=0.25*SM*TP
C
C  INTERPOLATE WITH FUNCTIONS W(IQ), V(IQ), AND U(IQ) TO OBTAIN
C  VALUES OF DARCY VELOCITIES VXQP AND VZQP
C
         VXK=0.
         VZK=0.
         DO 20 IQ=1,4
            VXK=VXK+VXQ(IQ)*W(IQ)
   20       VZK=VZK+VZQ(IQ)*W(IQ)
C
C  EVALUATE THE NORMAL DARCY VELOCITY AT THE GAUSS POINT AND ACCUMULATE
C  THE INTEGRAL SUMS
C
```

```
      VNK=VXK*DCOSXQ+VZK*DCOSZQ
      DO 30 JQ=1,2
         NQ=KQ(JQ)
         DO 30 IQ=1,2
            LQ=KQ(IQ)
30          DPLXQ(IQ,JQ)=DPLXQ(IQ,JQ)+W(LQ)*VNK*W(NQ)
40    CONTINUE
   DO 50 JQ=1,2
      DO 50 IQ=1,2
50       DPLXQ(IQ,JQ)=-.5*DL*DPLXQ(IQ,JQ)
   RETURN
   END
```

```
   SUBROUTINE Q4R(RQ,QRM,AREA,XQ,ZQ)
C
C
C  FUNCTION OF SUBROUTINE--TO EVALUATE THE CONCENTRATION INTEGRAL
C  OVER THE AREA OF ONE ELEMENT.
C
C
   IMPLICIT REAL*8 (A-H,O-Z)
   REAL*8 W(4)
   DIMENSION RQ(4),S(4),T(4),XQ(4),ZQ(4)
   DATA P / 0.577350269189626 /, S / -1.0D+00, 1.0D+00, 1.0D+00,-
  > 1.0D+00 /, T / -1.0D+00,-1.0D+00, 1.0D+00, 1.0D+00 /
C
C  EVALUATE QUANTITIES FOR USE IN THE JACOBIAN DJAC, BELOW, NECESSARY
C  FOR TRANSFORMATION FROM GLOBAL TO LOCAL COORDINATES
C
   X12 = XQ(1) - XQ(2)
   X13 = XQ(1) - XQ(3)
   X23 = XQ(2) - XQ(3)
   X14 = XQ(1) - XQ(4)
   X24 = XQ(2) - XQ(4)
   X34 = XQ(3) - XQ(4)
   Z13 = ZQ(1) - ZQ(3)
   Z24 = ZQ(2) - ZQ(4)
   Z34 = ZQ(3) - ZQ(4)
   Z12 = ZQ(1) - ZQ(2)
   Z23 = ZQ(2) - ZQ(3)
   Z14 = ZQ(1) - ZQ(4)
   AREA = X13*Z24 - X24*Z13
   QRM=0.
   DO 20 KG=1,4
C
C  DETERMINE LOCAL COORDINATES (SS,TT) OF GAUSS-INTEGRATION POINT KG
C
      SS = P*S(KG)
      TT = P*T(KG)
C
C  EVALUATE THE JACOBIAN DJAC
C
      DJ = AREA + SS*(X34*Z12-X12*Z34) + TT*(X23*Z14-X14*Z23)
      DJAC = .125*DJ
C
C  CALCULATE VALUES OF THE BASIS-INTERPOLATION FUNCTIONS W(IQ)
C
      SM = 1.0 - SS
      SP = 1.0 + SS
      TM = 1.0 - TT
      TP = 1.0 + TT
      W(1)=0.25*SM*TM
      W(2)=0.25*SP*TM
      W(3)=0.25*SP*TP
      W(4)=0.25*SM*TP
C
C  INTERPOLATE TO OBTAIN THE CONCENTRATION RQP AT THE GAUSS POINT KG
C
      RQP=0.
      DO 10 IQ=1,4
10       RQP=RQP+RQ(IQ)*W(IQ)
```

```
C
C  ACCUMULATE THE SUM TO EVALUATE THE INTEGRAL QNR
C
         QNR=QNR+BQP*DJA
  20     CONTINUE
      RETURN
      END



      SUBROUTINE SOLVE(KKK,C,R,NNP,IHALFB,MAXNP,MAXBW)
C
C
C  FUNCTION OF SUBROUTINE--TO SOLVE THE MATRIX EQUATION CX = R,
C  RETURNING THE SOLUTION X IN R.  IT IS ASSUMED THAT THE ARRAY C(NP,IB)
C  CONTAINS THE FULL BAND OF AN ASYMMETRIC MATRIX.
C
C
      IMPLICIT REAL*8(A-H,O-Z)
      DIMENSION C(MAXNP,MAXBW),R(MAXNP)
      INBP=IHALFB+1
C
C  IF KKK = 1, THEN TRIANGULARIZE THE BAND MATRIX C(NP,IB) , BUT
C  IF KKK = 2, THEN SIMPLY SOLVE WITH THE RIGHT-HAND SIDE R(NP)
C
      IF (KKK.EQ.2) GO TO 50
C
C  TRIANGULARIZE MATRIX C(NP,IB)
C
      NU=NNP-IHALFB
      DO 20 NI=1,NU
         PIVOTI=1./C(NI,INBP)
         NJ=NI+1
         IB=INBP
         NK=NI+IHALFB
         DO 10 NL=NJ,NK
            IB=IB-1
            A=-C(NL,IB)*PIVOTI
            C(NL,IB)=A
            JB=IB+1
            KB=IB+IHALFB
            LB=INBP-IB
            DO 10 MB=JB,KB
               NB=LB+MB
 10            C(NL,MB)=C(NL,MB)+A*C(NI,NB)
 20      CONTINUE
      NR=NU+1
      NU=NNP-1
      NK=NNP
      DO 40 NI=NR,NU
         PIVOTI=1./C(NI,INBP)
         NJ=NI+1
         IB=INBP
         DO 30 NL=NJ,NK
            IB=IB-1
            A=-C(NL,IB)*PIVOTI
            C(NL,IB)=A
            JB=IB+1
            KB=IB+IHALFB
            LB=INBP-IB
            DO 30 MB=JB,KB
               NB=LB+MB
 30            C(NL,MB)=C(NL,MB)+A*C(NI,NB)
 40      CONTINUE
      RETURN
C
C  MODIFY LOAD VECTOR R(NP)
C
 50   NU=NNP+1
      IBAND=2*IHALFB+1
      DO 70 NI=2,INBP
         IB=INBP-NI+1
         NJ=1
```

```
      SUM=0.0
      DO 60 JB=IB,IHALFB
         SUM=SUM+C(NI,JB)*R(NJ)
60       NJ=NJ+1
70    R(NI)=R(NI)+SUM
   IB=1
   NL=IHBP+1
   DO 90 NI=NL,NNP
      NJ=NI-IHBP+1
      SUM=0.0
      DO 80 JB=IB,IHALFB
         SUM=SUM+C(NI,JB)*R(NJ)
80       NJ=NJ+1
90    R(NI)=R(NI)+SUM
C
C  BACK SOLVE
C
   R(NNP)=R(NNP)/C(NNP,IHBP)
   DO 110 IB=2,IHBP
      NI=NU-IB
      NJ=NI
      MB=IHALFB+IB
      SUM=0.0
      DO 100 JB=NL,MB
         NJ=NJ+1
100      SUM=SUM+C(NI,JB)*R(NJ)
110   R(NI)=(R(NI)-SUM)/C(NI,IHBP)
   MB=IBAND
   DO 130 IB=NL,NNP
      NI=NU-IB
      NJ=NI
      SUM=0.0
      DO 120 JB=NL,MB
         NJ=NJ+1
120      SUM=SUM+C(NI,JB)*R(NJ)
130   R(NI)=(R(NI)-SUM)/C(NI,IHBP)
   RETURN
   END
```

APPENDIX D

DEFINITION OF VARIABLES

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AL	Longitudinal dispersivity of the material within an element.
ALP	Modified coefficient of compressibility...L**(-1).
AM	Molecular diffusivity...L**2 T.
AM0, AM1	In SURF, variables used to establish the signs of the direction cosines.
AREA	Diagnostic element variable...L**2.
AT	Transverse dispersivity of the material within an element.
BB(NPP)	Array for storing the constant material concentrations for Dirichlet boundary conditions...M L**3.
BBI, BBJ	Variables used in automatic generation of constant-concentration Dirichlet boundary conditions BB...M L**3.
BFLX(NP)	Normal boundary flux attributable to node NP...M L T.
BFLXP(NP)	Same as BFLX but for previous time step...M L T.
C(NP,IB)	Assembled matrix W*B+A DELT where B is the spatial operator matrix and A contains the coefficients associated with the time-derivative terms...L**2 T.
CHNG	Multiplier for increasing the time increment.
DCOSX(MP)	Direction cosine of outwardly directed surface normal (with respect to the x-axis) for seepage surface as a function of the boundary element.
DCOSXB(MP)	Same as DCOSX(MP), but for all bounding surfaces.
DD	Effective molecular diffusivity AM*TAU...L**2 T.
DCOSZ(MP)	Direction cosine of outwardly directed surface normal (with respect to the z-axis) for seepage surface as a function of the boundary element.
DCOSZB(MP)	Same as DCOSZ(MP), but for all bounding surfaces.
DELMAX	Maximum value of DELT...T.

DELT	Time increment...T.
DELTI	1/DELT...T**(-1).
DF	Difference in nodal numbers to be used in automatic generation of nodal coordinates.
DFLXI	Surface integral over product of normal flux and basis function N(IQ) for an element...M/T/L.
DFLXJ	Surface integral over product of normal flux and basis function N(JQ) for an element...M/T/L.
DFLXQ(IQ,JQ)	Matrix containing surface integrals for an element side used in seepage boundary conditions...M/T/L.
DH(NP)	Time derivative of the pressure head...L/T.
DHK	Time derivative of the pressure head at Gauss-integration point KG...L/T.
DHQ(IQ)	Time derivative of the pressure head at node IQ of an element...L/T.
DJ	Jacobian times 8...L**2.
DJI	1/DJ...L**(-2).
DL(MP)	Length of seepage boundary side of element MP...L.
DLB(MP)	Length of any boundary side of element MP...L.
DNX(IQ,JQ)	Derivative of basis function N(IQ) with respect to X at position JQ...L**(-1).
DNZ(IQ,JQ)	Derivative of basis function N(IQ) with respect to Z at position JQ...L**(-1).
DP(NP)	Array for storage of constant Neumann boundary conditions...M/L/T.
DRX	Derivative of concentration R with respect to X...M/L**3/L.

DRZ	Derivative of concentration R with respect to Z...M L**3 L.
DTH(M,IQ)	Time derivative of moisture content...L**3 L**3 T.
DX	Incremental distance in X-direction...L.
DXX	XX-component of the dispersion tensor...L**2 T.
DZZ	XZ-component of the dispersion tensor...L**2 T.
DZ	Incremental distance in Z-direction...L.
DZZ	ZZ-component of the dispersion tensor...L**2 T.
EI, EJ, EK	Normal fluxes to be used for flux-type Neumann boundary conditions...M L**2 T.
EL	Length of an element side where flux-type boundary condition is applied...L.
FLOW(I)	Flows across the system boundary during time DELT through nodes having constant Dirichlet conditions (I=1), through nodes having constant Neumann conditions (I=2), by seepage (I=3), due to numerical losses (I=4), and through all boundary nodes (I=5). Flow (6) is the net change in adsorbed material occurring during time DELT, FLOW(7) is the net change in dissolved material occurring during time DELT, and FLOW(8) is the net material loss via radioactive decay in the same time interval...M L.
FNK	Normal flux at Gauss point KG used in surface integration...M L**2 T.
FNNI, FNNJ	Components of the material flux normal to the boundary surface at nodes NI and NJ, respectively...M L**2 T.
FRATE(I)	Flow rates at a given time corresponding to FLOW(I)...M L T.
FX(M,IQ)	X-component of material flux...M L**2 T.
FXK	X-component of material flux at Gauss-integration point KG along the boundary side of an element...L**2 T.
FZ(M,IQ)	Z-component of material flux...M L**2 T.

FZK	Z-component of the material flux at Gauss-integration point KG along the boundary side of an element. (M/L**2/T).
H(NP)	Pressure head at current time step (L).
HP(NP)	Pressure head at next previous time step (L).
HT(NP)	Total head (L).
IB, JB, etc.	Indices ranging over the band width of the coefficient matrix.
IBAND	Band width of assembled coefficient matrix.
IE(M,IQ)	Element identification array. The entry in IQ=5 identifies the material type for elemem nt M.
IHALFB	(IBAND-1)/2.
IHBP	IHALFB + 1.
INC	Increment in nodal number to be used in automatic generation of boundary conditions.
IQ, JQ, etc.	Local node or basis function identifier having values of 1, 2, 3, or 4.
IQ1	IQ + 1, a local node index.
IS(MP,I)	Surface identification array for seepage elements. Values I=1 and 2 denote global node numbers of the surface side, and I=3 and 4 denote the corresponding local node numbers.
ISB(MP,I)	Same as IS(MP,I) but for all boundary elements.
ISTOP	Index used to count data errors.
IS1, IS2	Global node numbers defining an element side on which seepage boundary conditions are to be applied.
ITM	Index for simulation time.
JQ1	JA + 1, a local node index.
KD	Distribution coefficient of an element (L**3/M).

KDIG	Diagnostic output table counter.
KG	Identifier of the four Gauss integration points within each element.
KINC	Incrementation control used for automatic generation of boundary conditions.
KKK	In SOLVE, index designating function to be performed. Parameter KKK for triangularization and KKK for backward substitutipn.
KOUT	Output table counter.
KPR(ITM)	Printer control for transient problems similar to KPRO as a function of the time under ITM. Used to output desired information for each time increment.
KPRO	Printer control for steady state and initial conditions. If KPRO = 0, only the flow variables FLOW, FRATE, and TFLOW are output. IF KPRO = 1, then concentration variables are printed. If KPRO = 2, material fluxes and those variables mentioned previously are printed. If KPRO = 3, then water contents and Darcy velocities are also output. Finally, if KPRO > 3, all of the variables mentioned previously plus pressure heads and total heads are output.
KSS	Steady state control. If KSS = 0, the steady-state solution is obtained. If KSS = 1, the transient solution is obtained.
KSTR	Control parameter for storage of output on auxiliary storage (tape or disk). If KSTR = 0, there is no storage, but if it does not equal 0, there is storage on logical unit 2.
KVI	Darcy velocity input control. If KVI = 0, there is no input and the velocities are set equal to 0. If KVI = 1, time independent velocities are input If KVI = 2, time dependent velocities are input for each time step. For KVI < 0 card input is used, and for KVI > 0 auxiliary storage (tape or disk, logical unit 1) is used. In the latter case nodal positions and element definitions are also read from the magnetic tape.
LAMBDA	Radioactive decay constant...T**(-1).

LI	Nodal number increment to be used in automatic generation of elements.
M, MI, MJ, MK	Element number
MAXBW	Maximum value of IBAND.
MAXDIF	Maximum nodal difference for all elements.
MAXEL	Maximum number of elements.
MAXMAT	Maximum number of materials.
MAXNP	Maximum number of nodal points.
MAXNTI	Maximum number of time increments.
MINC	Increment in element number.
MND	Maximum nodal difference for a given element.
MODL	Number of elements per layer.
MP, MPI, MPJ	Compressed element index.
MTYP	Material type.
N(IQ)	Basis vector for node IQ.
NBC	Number of constant Dirichlet boundary conditions.
NBE(MP)	Array of boundary element numbers.
NBEL	Number of boundary elements.
NCM	Number of elements with corrected material properties.
ND	Nodal difference.
NEL	Number of elements.
NLAY	Number of layers of elements in regular part of grid.

NMAT	Number of different materials.
NMPPM	Number of material properties per material.
NN	N(IQ)*N(JQ)
NNP	Number of nodal points.
NP, NI, NJ, etc.	Nodal-point number.
NPINC	Nodal-point increment used in automatic generation of Neumann boundary conditions.
NPMIN, NPMAX	Integer variables used in automatic generation of Neumann boundary conditions.
NPN(NPP)	Array for storing the node numbers where constant Dirichlet boundary conditions occur.
NPP, NPPI, NPPJ	Compressed nodal-point index.
NPPMAX	Number of nodal indices in unpacked array NPST.
NPPROB	Output control integer.
NPROB	Problem number.
NPROBM	Dummy variable read from magnetic tape generated by moisture-transport code.
NPST(NPP)	Nodal points at which constant-flux Neumann boundary conditions are applied.
NPTST(NPP)	Absolute node index as a function of compressed index for seepage boundary nodes.
NST	Number of element sides on which flux-type Neumann boundary conditions are applied.
NSTN	Number of nodes at which flux-type boundary conditions are applied.
NTI	Number of time increments.

NTIM	Dummy variable read from magnetic tape generated by moisture-transport code
NTSE(MP)	Elements having seepage surfaces
NTSE	Number of elements having seepage surfaces
NTSEN	Number of seepage boundary nodes
NU	N(IQ)*U(JQ), L**(-1)
NV	N(IQ)*V(JQ), L**(-1)
P	0.577350269, position parameter for two-point Gauss quadrature
PIVOTI	1/PIVOT where PIVOT is a diagonal element of matrix C being used in the matrix reduction...1/L**2
PMAT	Data array for storing the names of material properties of the soil system.
POR	Porosity of an element
PROP(MTYP,I)	Material property I for soil type MTYP
QA(IQ,JQ)	A matrix for element M...L**2.
QB(IQ,JQ)	B matrix for element M...L**2/T.
QD	Total adsorbed material at current time step...M/L.
QDM	Adsorbed material within element M...M/L.
QDP	Total adsorbed material at next previous time step...M/L.
QL	Total material lost by radioactive decay at current time step...M/L.
QLM	Total of material in solid phase and material in liquid phase within element M...M/L.
QLP	Total material lost by radioactive decay at next previous time step...M/L.

QR	Total material in solution at current time step (M/L)
QRM	Material in solution in element M (M/L)
QRP	Total material in solution at next previous time step (M/L)
R(NP)	Load vector (M/L**1) and concentration vector (M/L**3)
RD	The retardation factor, 1+KD*RHOB
RHOB	Bulk density of the solid material within an element (M/L**3)
RP(NP)	Concentration vector for next previous time step (M/L**3)
RQ(IQ)	Concentration vector for next previous time step (M/L**3)
RQP	Concentration at a Gauss-integration point (M/L**3)
S(IQ), SS	Local X-coordinates
SM	Variable 1-SS, used in definition of basis functions
SP	Variable 1+SS, used in definition of basis functions
SSA(KG)	Array of local X-coordinates of Gauss-integration points to be used in boundary integration
SUM	Variable used in matrix reduction
T(IQ), TT	Local Z-coordinates
TAU	Tortuosity
TFLOW(I)	Total of the quantities FLOW(I) over all time increments (M/L)
TH(M,IQ)	Moisture content at the nodes of each element for current time step (L**3/L**3)
THK	Moisture content of Gauss-integration point KG (L**3/L**3)
THP(M,IQ)	Moisture content for next previous time step (L**3/L**3)
THQ(IQ)	Moisture content at interpolation time for an element (L**3/L**3)

THW(M,IQ)	Moisture content at the interpolated time, L**3/L**3.
TIME	Total time of simulation, T.
TIMEM	Value of time variable stored on auxiliary storage, T.
TITLE(I)	Array for title of the problem.
(TITLM(I))	Dummy-variable array read from magnetic tape generated by moisture-transport code.
TM	Variable 1-EE, used in definition of basis functions.
TMAX	Maximum value of simulation time, T.
TP	Variable 1+EE, used in definition of basis functions.
TZK(G)	Array of local Z-coordinates of Gauss-integration points to be used in boundary integration.
U(IQ)	Derivative of interpolation function with respect to Z at the Gauss-integration points, L**(-1).
UN	U(IQ)*N(JQ), L**(-1).
UU	U(IQ)*U(JQ), L**(-2).
UV	U(IQ)*V(JQ), L**(-2).
V(IQ)	Derivative of interpolation function with respect to X at the Gauss-integration points, L**(-1).
VK	Darcy velocity at nodal point KQ, L/T.
VKT	T*VK, L.
VN	V(IQ)*N(JQ), L**(-1).
VNNI, VNNJ	Components of the Darcy velocity normal to the surface nodes NI and NJ, respectively, L/T.
VU	V(IQ)*U(JQ), L**(-2).

VV	V(IQ)*V(JQ)...L**(-2).
VX(M,IQ)	X-component of the Darcy velocity at the nodes of each element for the current time step...L/T.
VXK, VZK	Darcy velocity components at Gauss integration point KQ...L/T.
VXP(M,IQ)	X-component of the Darcy velocity for the next previous time step...L/T.
VXQ(IQ)	X-component of the Darcy velocity at the interpolated time step for an element...L/T.
VXW(M,IQ)	X-component of the Darcy velocity at the interpolated time...L/T.
VZ(M,IQ)	Z-component of the Darcy velocity at the nodes of each element for the current time step...L/T.
VZP(M,IQ)	Z-component of the Darcy velocity for the next previous time step...L/T.
VZQ(IQ)	Z-component of the Darcy velocity of the interpolated time for an element...L/T.
VZW(M,IQ)	Z-component of the Darcy velocity at the interpolated time...L/T.
W, W1, W2	Time-integration parameters.
X(NP), Z(NP)	X- and Z-coordinates of node NP...L.
X0, Z0	Fake coordinates used to determine the signs of the direction cosines...L.
X1., X13, etc.	Quantities XIJ = X(I) - X(J) ...L.
XQ(IQ)	X-coordinates of the nodes of a quadrilateral element...L.
Z12, Z13, etc.	Quantities ZIJ = Z(I) - Z(J) ...L.
ZQ(IQ)	Z-coordinates of the nodes of a quadrilateral element...L.

APPENDIX E

DATA INPUT GUIDE

1. *Title*: Format (I5,9A8). One card per problem.

NPROB	
5	77

2. *Basic real parameters*: Format (16I5). One card per problem.

NNP	NEL	NMAT	NCN	NTI	NBC	NST	NTST	KVI	KSTR	KSS
5	10	15	20	25	30	35	40	45	50	55

3. *Basic real parameters*: Format (8F10.0). Two cards per problem. Use of an E-, D- or another F-type field specification in the input card overrides any of the F10.0 specifications of the format.

DELT	CHNG	DELMAX	TMAX	W
10	20	30	40	50

4. *Printer output control*: Format (80I1). The number of cards here depends on the number of time increments NTI.

KPRO	KRP(1)	KRP(2)	. . .	KPR(NTI)
1	2	3		

5. *Material properties*: Format (8F10.0). A total of NMAT cards, one for each material.

PROP(1,1)	PROP(1,2)	. . .	PROP(1,NMPM)
.			
.			
.			
PROP(NMAT,1)	PROP(NMAT,2)	. . .	PROP(NMAT,NMPM)
10	20		

In the variable PROP(I,J), I is the material type and J is the specific material property. For example, PROP(I,1) is KD(I), PROP(I,2) is RHOB(I), PROP(I,3) is AL(I), PROP(I,4) is AT(I), PROP(I,5) is LAMBDA(I), PROP(I,6) is POR(I), and PROP(I,NMPPM) is ALPT(I). (NMPPM=7 is currently prescribed by a data statement in routine MAIN.)

6. *Nodal-point positions.* Format (I5,2F10.3). These cards are necessary if and only if KVI = 0. Usually one card per node is needed, i.e., a total of NNP cards. However, if some nodes fall on a straight line and are equidistant, data for only the first and last points of this group are needed. Intermediate nodal positions are automatically generated by linear interpolation.

NJ	X(NJ)	Z(NJ)
5	15	25

7. *Element definitions.* Format (16I5). These cards are usually necessary if and only if KVI = 0. Usually one card per element is needed, i.e., a total of NEL cards.

MI	IE(MI,1)	. . .	IE(MI,5)	MODL	NLAY
5	10		25 30	35	40

IE(MI,1) - IE(MI,4) are the nodal numbers of element MI (beginning with the lower left and progressing around the element in a counterclockwise direction), and IE(MI,5) is the material type MTYP. For rectangular blocks of elements having the same material type and sequentially numbered nodes, it is only necessary to specify the first element, the width of the region MODL, and the length of the region NLAY, where MODL and NLAY are measured in elements. Element numbering proceeds most rapidly along the MODL dimension and least rapidly along the NLAY dimension. Figure C.1 provides an example. The object is considered to be rectangular since it has width MODL = 3 on two opposite sides and length NLAY = 5 on the other two sides. To generate definitions of elements 2 through 15 automatically, including both corner node identification and material type, only one card is necessary.

1	1	5	6	2	1	3	5
5	10	15	20	25	30	35	40

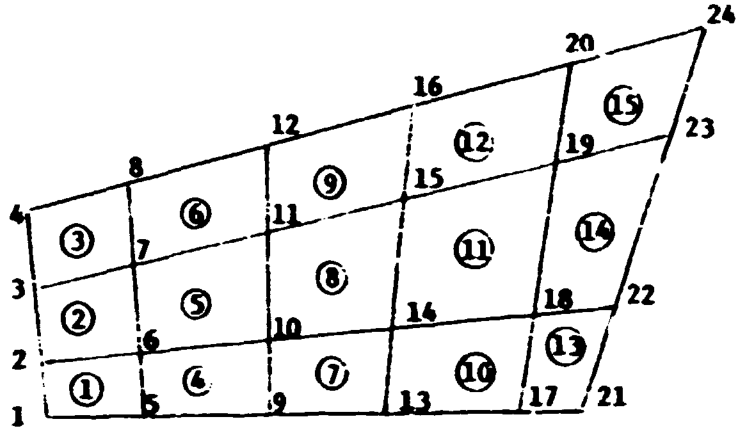


Fig. C.1. Automatic generation of element numbers. Element numbers are circled to distinguish them from nodal numbers.

8. *Nodal-point and element definitions from auxiliary storage:* If KVI > 0, this information will be obtained from auxiliary storage (magnetic tape, for example). Two unformatted READ statements are used for this purpose:

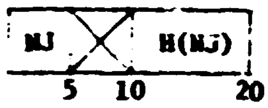
```
READ(1)(TITLEM(I),I=1,9)NPROBM,NNP,NEL,NTIM
READ(1)(X(NP),NP=1,NNP),(Z(NP),NP=1,NNP),((IE(M,IQ),M=1,NEL),IQ=4)
```

Note on auxiliary storage units: Logical unit 1 is used for input if KVI > 0, and logical unit 2 is used for output if KSTR = 0. Proper identification of these units must be made in the job control language if either of these two options is used.

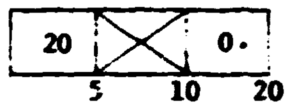
9. *Material correction:* Format (16I5). Cards are required here only if NCM > 0. In many cases one card is required per material change. However, in those cases where numbers of the affected elements range from a lower limit of MI to an upper limit of MK with an increment MINC, automatic correction may be used. Fields MK and MINC are left blank if the automatic-generation facility is not used.

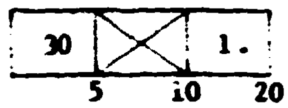
MI	MTYP	MK	MINC
5	10	15	20

10. *Input for initial conditions:* Format (I5,5X,F10.0). In the most general case there is one card per node, i.e., a total of NNP cards.



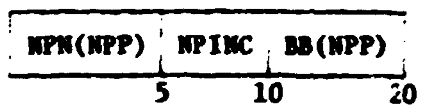
Frequently, however, groups of neighboring nodal points NJ have identical values R(NJ). If a gap is recognized in the input sequence of nodal numbers, the initial concentrations are assumed to be identical to the concentration at the lower boundary of the gap. For example, if two neighboring cards of the form





were encountered, nodes 21-29 would be assigned values R = 0.

11. *Dirichlet concentration-type boundary conditions:* Format (2I5,2F10.0). These cards are necessary if and only if NBC $>$ 0. If automatic generation is not used (NPINC = 0), NBC cards are required of the form:



If NPINC $>$ 0, automatic generation proceeds in the same manner as described for Data Set 10. That is, an algebraic sequence is built on the nodal number NN of the card immediately preceding, and each such node is given boundary condition BB of that card.

12. *Neumann flux-type boundary conditions*: Format (3I5,5X,2F10.0). Cards of this type must be used if and only if NST > 0. Usually a number of cards equal to NST must be used. However, if some of the KINC are greater than zero, some boundary conditions will be generated internally, and NST cards will not be necessary.

NI	NJ	KINC		EI	EJ
5	10	15	20	30	40

If KINC > 0, then the nodal-point increment is formed from NI and NJ of the immediately preceding card:

NPINC = NJ - NI

Two sequences are formed:

NI + NPINC, NI + 2*NPINC ...
NJ + NPINC, NJ + 2*NPINC ...

Both are terminated when the largest integer is reached that is less than both current values of NI and NJ. Corresponding nodal points for these two sequences define a surface. Quantity EI is the dot product of the flux at NI with an outwardly directed unit vector normal to the element side (NI,NJ). A similar definition holds for EJ.

13. *Seepage surface elements*: Format (16I5). Input is necessary here if and only if NTST > 0. Typically, one card is required for each side of each element on which such a boundary condition is to be applied.

NTSE(MP)	IS(MP,1)	IS(MP,2)	KINC
5	10	15	20

However, if KINC > 0, automatic generation is employed in the following manner. Nodal-point-number and element-number increments are formed from information on the input card immediately preceding the current one:

NPINC = IS(MP,2) - IS(MP,1)
MINC = NPINC - 1

where the vertical bars denote absolute value. A sequence of element numbers is then obtained:

M = NRSE(MP) (previous card)
NRSE(MP+1) = M + MINC
NRSE(MP+2) = M + 2*MINC

.
.
.

The sequence is continued until the largest element number is encountered that has a value less than NTSE of the current card. Corresponding nodal point sequences are also generated:

NI = IS(MP,1) (previous card)
IS(MP+1,1) = NI + NPINC
IS(MP+2,1) = NI + 2*NPINC

.
.
.

NJ = IS(MP,2)
IS(MP+1,2) = NJ + NPINC
IS(MP+2,2) = NJ + 2*NPINC

.
.
.

14. *Card input of pressure heads at time t = 0*: Format (8F10.0). If KVI < 0, NNP values of H must appear as follows:

```
| H(1) | H(2) | . . . | H(8) |
      10     20      70     80
              .
              .
              .
          | H(NNP) |
```

15. *Card input of water contents at this time t = 0*: Format (8F10.0). If KVI < 0, NEL cards are required:

TH(1,1)	TH(1,2)	TH(1,3)	TH(1,4)
⋮			
TH(NEL,1)	TH(NEL,2)	TH(NEL,3)	TH(NEL,4)
10	20	30	40

16. *Card input of Darcy velocities at time t = 0*: Format (8F10.0). If KVI < 0, NEL cards are required:

VX(1,1)	. . .	VX(1,4)	VZ(1,1)	. . .	VZ(1,4)
⋮					
VX(NEL,1)	. . .	VX(NEL,4)	VZ(NEL,1)	. . .	VZ(NEL,4)
10	30	40	50	70	80

17. *Input of moisture-transport variables from auxiliary storage at time t = 0*: If KVI > 0, an unformatted READ statement is used.

```
READ(1) TIMEM,(H(NP),NP=1,NNP),(HT(NP)NP=1,NNP),
 ((TH(M,IQ),M=1,NEL),IQ=1,4)((VX(M,IQ),M=1,NEL),
  IQ=1,4),(VZ(M,IQ),M=1,NEL),IQ=4)
```

18. *Card input of moisture transport variables for times t > 0*: When KVI = -1, a steady-state moisture transport is assumed and no update is required for t > 0. If, however, KVI = -2, transient moisture transport is assumed, and three sets of cards like those shown in paragraphs 14, 15, and 16 are required for each time step.
19. *Input of moisture-transport variables from auxiliary storage for times t > 0*: When KVI = 1, a steady-state moisture transport is assumed and no update is required for t > 0. If, however, KVI = 2, transient moisture transport is assumed, and moisture-transport variables are read from auxiliary storage by the unformatted READ statement of Data Set 17.