

土木研究所資料

非引張応力解析プログラム(他) 使用説明書および解説

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まえがき

本書は有限要素法を用いて非引張応力解析（およびせん断破壊基準に従う応力解析）を行う構造解析プログラムについて解説を加え、その取扱い方法を示したものである。

コンピュータを利用した数値解析法の進歩には目覚ましいものがあり、ハードウェアの技術の進歩と相俟って、従来では考えられなかった複雑かつ大容量の計算も比較的容易に行えるようになっている。

数値解析法の特徴は、任意の物性値を与えた計算が自由に行えることであり、その結果、模型実験において常に問題となっていた相似性の問題が解消されたことである。しかしその反面、解析中の基本式が現実の物理現象を正しく捉えているか、また解析に用いた物理定数が妥当であるかによってその解析結果の真びょう性は大きく影響を受け、単なる机上の計算に陥る危険性を十分含んでいることにも注意しなければならない。

特に非線形領域の解析においては、物理現象およびそれに関連するパラメータが複雑であり、一部の特殊なプログラムを除いては、ある種の数学的仮定のもとに定式化が行われているのが一般であり、その取扱いには十分な注意が必要である。本書に示した非線形解析法もそのような解析法の1つであり、初期応力法を用いて非線形問題を近似的に取扱ったものである。

しかし、これら解析法の限界を正しく理解しておけば、非線形性を考慮した解析は実用上十分な意義をもつものと考えられる。本プログラムもそのような用途に供せられれば誠に幸いである。

なお今後は材料の物理学特性をさらに十分に考慮し本プログラムの改良を含めた非線形応力解析法の開発を進めていきたいと考えている。

最後に本解析法のコーディングに際してはセンチュリリサーチセンタ株式会社の沢村忠氏に多大なご協力を願った。ここに深く謝意を表する次第である

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目 次

まえがき

1. 有限要素法の基礎理論	1
1.1 概 要	1
1.2 弾性体の有限要素法	1
1.2.1 有限要素法の基本的な仮定	1
1.2.2 変位関数	1
1.2.3 要素の弾性方程式	3
1.2.4 仮想仕事の原理	4
1.2.5 有限要素法の基本方程式	4
1.2.6 等価節点力の概念	4
1.3 非線形解析	6
1.3.1 概 要	6
1.3.2 剛性変化法	6
1.3.3 初期応力法	6
1.3.4 塑性理論	7
1.4 非引張応力解析	8
1.4.1 概 要	8
1.4.2 非引張応力解析の定式化	8
1.4.3 (付) せん断破壊基準に従う応力解析	10
2. プログラムの入力方法と出力の見方	11
2.1 プログラムの概要	11
2.2 入力データの作成方法	11
2.3 出力データの見方	20
3. 解析例	26
3.1 空洞まわりの応力解析	26
3.1.1 概 要	26
3.1.2 解析結果	26
3.2 有効アーチの解析	30
3.2.1 概 要	30
3.2.2 解析結果	30
付 プログラムリスト	37

1. 有限要素法の基礎理論

1.1 概 要

構造物の応力解析を行う場合、有限要素法は既に必要不可欠な方法として定着し、弾性解析はいうに及ばず、非弾性解析においても多くのプログラムが開発され、利用されている。

本章では、まず弾性問題を例にとり有限要素法の原理について説明を加え、その後に非弾性問題への拡張方法について簡単に触れ、最後に本書に示した非引張応力解析の基本式の導入方法について述べるものとする。

1.2 弾性体の有限要素法

1.2.1 有限要素法の基本的な仮定

有限要素法は次のような仮定の上に導かれている。

- ① 連続体は想像上の線によって数多くの“有限要素”に分割される。
- ② 要素はその境界上にある節点によって互いに結合している。この節点における変位が構造解析上の未知量として取扱われる。
- ③ 各有限要素内の変位は節点変位によって一義的に定まる（これを変位関数という）。
- ④ 節点変位が定まると変位関数によって要素内のひずみが求められる。このひずみと要素の弾性特性によって要素内の応力状態が定まる。
- ⑤ 節点に作用する力と要素内に発生する応力の関係は力学的エネルギーが等価な値をもつように決定される。

このような仮定によって、任意の構造系の応力状態は単純な数学的問題として求められることになる。

1.2.2 変位関数

変位関数は有限要素の変形特性を定める関数であり、節点変位と要素内の座標の関数として定義される。

いま図-1.1のような代表的3節点3角形要素を取出し、その変位関数を座標の関数として $u(x, y)$ で表わすことにする。この場合、この変位関数は3角形要素の各頂点において、節点変位と一致しなければならないから、

$$u(x_i, y_i) = u_i \quad (i = 1, 2, 3) \quad (1)$$

を満足しなければならない。2次元問題では、(1)式は6本の連立方程式を表わすから、 $u(x, y)$ は一般に6つの未知数を係数とする関数として表わされることになる。その最も簡単な例として、

$$u(x, y) = a_1 + a_2 x + a_3 y \quad (2)$$

なる関数が考えられる。一般に3節点3角形要素の変位関数はこの形を有している。この場合係数 a_i

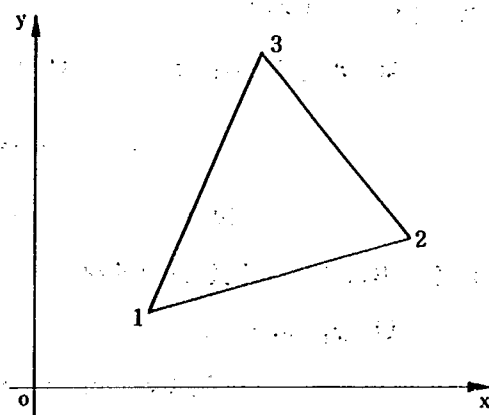


図-1.1 3角形要素

は節点変位 u_j ($j = 1, 2, 3$) によって定まるから、 a_i は節点変位の関数となっていなければならない。
したがって(2)式は次のように改められる。

$$u(x, y) = a_1(u_1, u_2, u_3) + a_2(u_1, u_2, u_3)x + a_3(u_1, u_2, u_3)y \quad \dots\dots\dots (3)$$

ところで、ここでは3節点3角形要素の変位関数として(2)式を仮定したが、(1)式を満足する解は一般には無数にあり、たとえば

$$u(x, y) = a_1 + a_2x + a_3y^2 \quad \dots\dots\dots (4)$$

でもよいことは容易に確かめられる。(4)式を仮定すれば(2)式とは異なった有限要素法が体系づけられるが、物理的に妥当な解を持つためには変位関数はある種の条件を満足しなければならない。すなわち、その条件は次のとおりである。

- ① 変位関数は、節点変位が剛体変位の条件を満足するような場合に、要素内部にひずみを生じるようなものであってはならない。
- ② 変位関数は、節点変位が一定ひずみの状態に適合するような場合に、要素内に一定ひずみを与えるようなものでなければならない。
- ③ 変位関数は要素間の境界面で互いに連続になるようなものでなければならない。

なお厳密には①の条件は②の条件に含まれることに注意されたい。このような条件を満足する関数は3節点3角形要素の場合には(2)式しかないことは容易に確かめられる。

さて、(3)式を u_i を係数となるように書き改めると、

$$u(x, y) = N_1(x, y)u_1 + N_2(x, y)u_2 + N_3(x, y)u_3 \quad \dots\dots\dots (5)$$

または単位行列 I を用いて、

$$\begin{aligned} u(x, y) &= N_1(x, y)I u_1 + N_2(x, y)I u_2 + N_3(x, y)I u_3 \\ &= \{N_1(x, y)I, N_2(x, y)I, N_3(x, y)I\} \begin{Bmatrix} u_1 \\ u_2 \\ u_3 \end{Bmatrix} \\ &= NU \quad \dots\dots\dots (6) \end{aligned}$$

となる。実はこれは(1)式の一般解を表わしている。ここで(5)式の x, y に節点1の座標を代入すると、

$$\begin{aligned} u(x_1, y_1) &= u_1 \\ &= N_1(x_1, y_1)u_1 + N_2(x_1, y_1)u_2 + N_3(x_1, y_1)u_3 \quad \dots\dots\dots (7) \end{aligned}$$

が得られる。節点2, 3についても同様な式をたてると、結局

$$N_i(x_j, y_j) = \delta_{ij} \quad \dots\dots\dots (8)$$

が成立する。すなわち、関数 $N_i(x, y)$ は自分自身の節点 i で1、他の節点 j で0となる関数となっている。この関数 $N_i(x, y)$ を形状関数という。(7)式は一般の多節点要素にも容易に拡張できることは明らかである。また、(7)式は直交座標系 (x, y) 以外の任意の座標系 (ξ, η) に対しても同様に成立する。これは多節点要素の有限要素法には極めて有利な性質である。

3角形要素の場合、図-1.2のように定義した関数

$$N_i(x, y) = \frac{xy_j + x_j y_k + x_k y - xy_k - x_j y - x_k y_j}{x_i y_j + x_j y_k + x_k y_i - x_i y_k - x_j y_i - x_k y_j} \dots\dots\dots (9)$$

は形状関数の条件を満たし、この場合の変位関数 $U(x, y)$

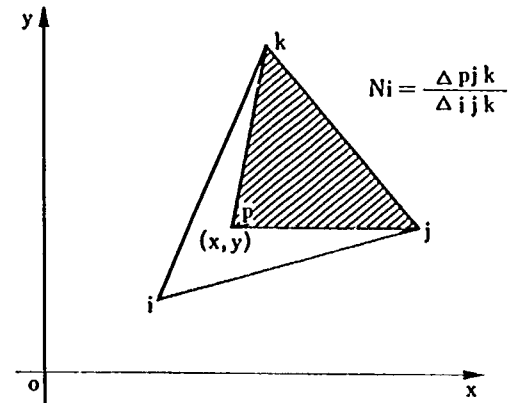
は(3)式と同じ形になっていることが容易に確かめられる。

1. 2. 3 要素の弾性方程式

有限要素内のひずみは(5)式の変位関数から求められる。

いま(5)式を

$$\begin{aligned} u &= N_1(x, y)u_1 + N_2(x, y)u_2 + N_3(x, y)u_3 \\ v &= N_1(x, y)v_1 + N_2(x, y)v_2 + N_3(x, y)v_3 \end{aligned} \dots\dots\dots (10)$$



と書き改めると、要素内のひずみは、

図- 1. 2 形状関数の定義

$$\begin{aligned} \epsilon_x &= \frac{\partial u}{\partial x} = \frac{\partial N_1(x, y)}{\partial x} u_1 + \frac{\partial N_2(x, y)}{\partial x} u_2 + \frac{\partial N_3(x, y)}{\partial x} u_3 \\ \epsilon_y &= \frac{\partial v}{\partial y} = \frac{\partial N_1(x, y)}{\partial y} v_1 + \frac{\partial N_2(x, y)}{\partial y} v_2 + \frac{\partial N_3(x, y)}{\partial y} v_3 \\ \gamma_{xy} &= \frac{\partial u}{\partial y} + \frac{\partial v}{\partial x} = \frac{\partial N_1(x, y)}{\partial y} u_1 + \frac{\partial N_2(x, y)}{\partial y} u_2 + \frac{\partial N_3(x, y)}{\partial y} u_3 \\ &\quad + \frac{\partial N_1(x, y)}{\partial x} v_1 + \frac{\partial N_2(x, y)}{\partial x} v_2 + \frac{\partial N_3(x, y)}{\partial x} v_3 \end{aligned} \dots\dots\dots (11)$$

で表わされる。これを簡単に行列表示で、

$$\begin{aligned} \mathbf{e} &= \mathbf{B}_1 \mathbf{U}_1 + \mathbf{B}_2 \mathbf{U}_2 + \mathbf{B}_3 \mathbf{U}_3 \\ &= \{ \mathbf{B}_1, \mathbf{B}_2, \mathbf{B}_3 \} \begin{Bmatrix} \mathbf{U}_1 \\ \mathbf{U}_2 \\ \mathbf{U}_3 \end{Bmatrix} \\ &= \mathbf{B} \mathbf{U} \end{aligned} \dots\dots\dots (12)$$

と表わすことにする。一般に $\mathbf{B}$ は座標 (x, y) の関数になっている。一方、応力ひずみ関係は、たとえば平面ひずみ状態に対して、

$$\begin{aligned} \sigma_x &= \frac{E}{(1+\nu)(1-2\nu)} \{ (1-\nu) \epsilon_x + \nu \epsilon_y \} \\ \sigma_y &= \frac{E}{(1+\nu)(1-2\nu)} \{ \nu \epsilon_x + (1-\nu) \epsilon_y \} \\ \tau_{xy} &= \frac{E}{(1+\nu)} \gamma_{xy} \end{aligned} \dots\dots\dots (13)$$

で表わされる。これを簡単に行列表示で

$$\mathbf{s} = \mathbf{E} \mathbf{e} \dots\dots\dots (14)$$

と表わすことにする。したがって、(12)式、(13)式から要素の弾性方程式は次式で表わされることになる。

$$S = EBU \quad \dots\dots\dots (15)$$

(11)ないし(12)式は3節点3角形要素に対して求められた式であるが、多節点要素についてもこれと同様な式が成立することは明白であろう。

1.2.4 仮想仕事の原理

要素の弾性方程式が求まると、次に節点に作用する荷重と要素内に発生する変位応力状態の関係を求める必要がある。これには一般に仮想仕事の原理が用いられる。

仮想仕事の原理は次のような原理である。「連続体がある荷重状態のもとで釣合状態にある時、これに任意の微小な仮想変位を与えた場合、外力のなす仕事は仮想変位によって連続体内に蓄積されたひずみエネルギーの変化に相等しい。」これを数式で表わせば、

$$\begin{aligned} & \iint (\sigma_x \delta \epsilon_x + \sigma_y \delta \epsilon_y + \tau_{xy} \delta \gamma_{xy}) dx dy \\ &= \sum (F_x \delta u + F_y \delta v) + \int (p_x \delta u + p_y \delta v) ds \\ &+ \iint (g_x \delta u + g_y \delta v) dx dy \quad \dots\dots\dots (16) \end{aligned}$$

となる。右辺第1項は集中荷重による仕事、第2項は圧力荷重による仕事、第3項は物体力による仕事である。

1.2.5 有限要素法の基本方程式

有限要素は節点を通じて隣接要素と結合しているから、仮想仕事の原理を有限要素に適用した場合、(16)式は次のように表わされる。

$$\iint (\delta \mathbf{e})^t \mathbf{s} dx dy = (\delta \mathbf{U})^t \mathbf{F} \quad \dots\dots\dots (17)$$

ここで(12)式、(15)式を用いれば、(17)式は、

$$\iint (\delta \mathbf{U})^t \mathbf{B}^t \mathbf{E} \mathbf{B} \mathbf{U} dx dy = (\delta \mathbf{U})^t \mathbf{F} \quad \dots\dots\dots (18)$$

または、

$$(\delta \mathbf{U})^t \iint \mathbf{B}^t \mathbf{E} \mathbf{B} dx dy \mathbf{U} = (\delta \mathbf{U})^t \mathbf{F} \quad \dots\dots\dots (19)$$

と改められる。ここで仮想変位 $\delta \mathbf{U}$ は任意であるから、

$$\iint \mathbf{B}^t \mathbf{E} \mathbf{B} dx dy \mathbf{U} = \mathbf{F} \quad \dots\dots\dots (20)$$

が得られる。これが有限要素法の基本方程式である。ここで、

$$\mathbf{K} = \iint \mathbf{B}^t \mathbf{E} \mathbf{B} dx dy \quad \dots\dots\dots (21)$$

を剛性マトリックスという。3角形要素の場合、 $\mathbf{B}$ は(9)、(11)、(12)式より一定値となるから剛性マトリックスは、

$$\mathbf{K} = \mathbf{A} \mathbf{B}^t \mathbf{E} \mathbf{B} \quad \dots\dots\dots (22)$$

となる。ここに $\mathbf{A}$ は3角形要素の面積である。なお一般の要素の場合、(21)式は数値積分によって求められる。

1.2.6 等価節点の概念

有限要素は節点によって要素間の結合を保っており、また外荷重は節点を通じて作用している。しかし、一般的な外荷重は分布荷重であり、実際に有限要素法を使用するにはこのような分布荷重を作用させ得ることが必要である。分布荷重をこれと等価な節点荷重におきかえたものを等価節点力という。

いま(16)式をそのまま有限要素に適用すると、

$$\iint (\delta e)^t s \, dx \, dy = (\delta U)^t F + \iint (\delta U)^t p \, ds + \iint (\delta U)^t g \, dx \, dy \quad \dots\dots\dots (23)$$

となる。ここで(6), (12), (15)式を用いると、

$$(\delta U)^t \iint B^t E B \, dx \, dy U = (\delta U)^t F + (\delta U)^t \int N^t p \, ds + (\delta U)^t \iint N^t g \, dx \, dy \quad \dots\dots\dots (24)$$

が得られる。ここで仮想変位 δU は任意であるから、(24)式は

$$\iint B^t E B \, dx \, dy U = F + \int N^t p \, ds + \iint N^t g \, dx \, dy \quad \dots\dots\dots (25)$$

と同値である。(25)式における $\int N^t p \, ds$, $\iint N^t g \, dx \, dy$ を等価節点力という。ここで圧力荷重 p と要素境界における要素応力とは力の釣合条件を満足していないことに注意されたい。これは要素の変形が外力の分布形によらず、節点変位によって一義的に定まることによるものであり、要素境界において隣接する要素間に応力の釣合条件が成立しないのと同様である。

等価節点力の一例を図-1.3に示す。

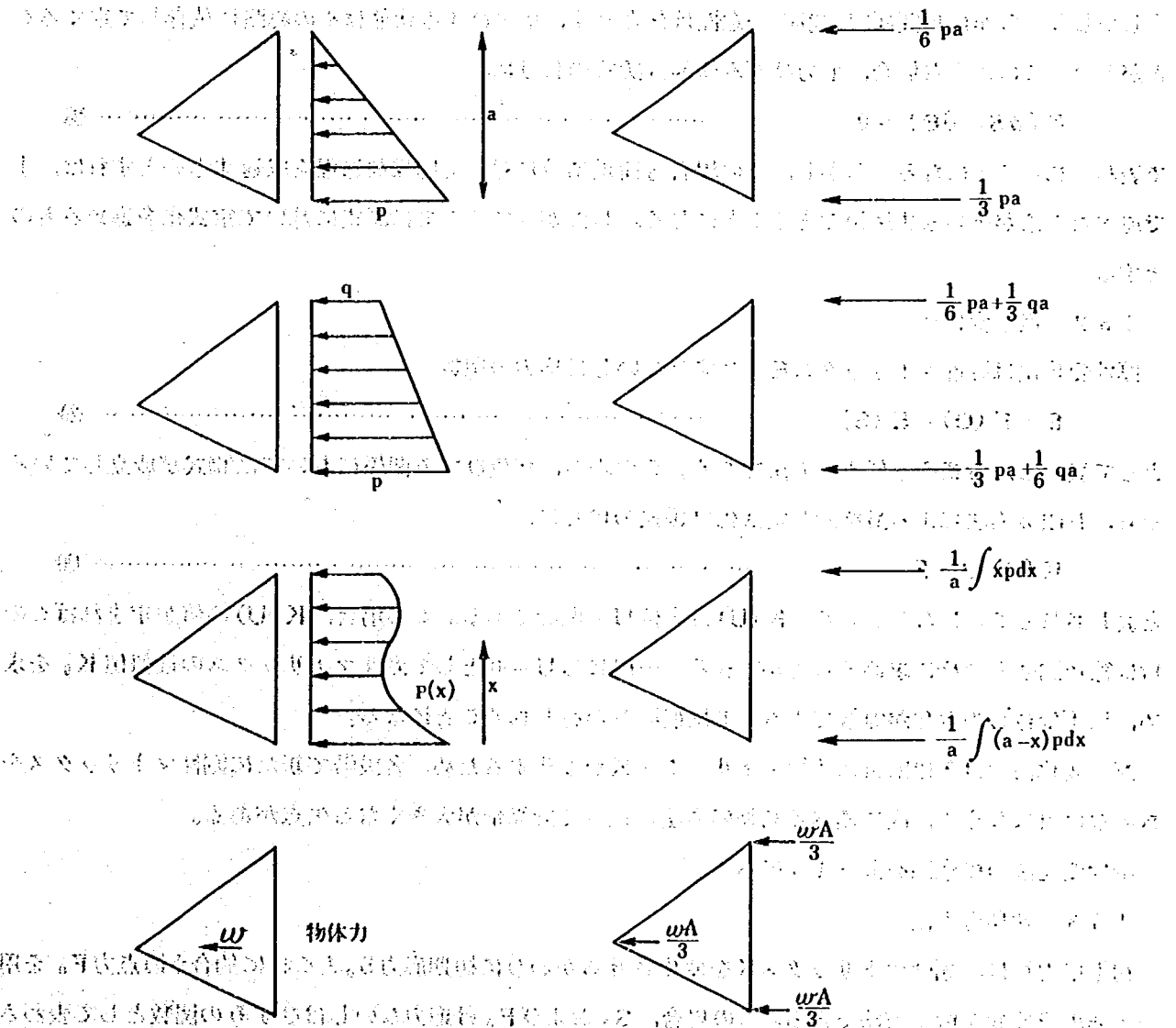


図-1.3 等価節点力の例

1.3 非線形解析

1.3.1 概 要

材料非線形問題は、その基本式を再定式化することなく、線形計算の反復によって解くことができる。すなわち、非線形問題における応力ひずみ関係がある応力状態において

$$F(S, e) = 0 \quad \dots\dots\dots (26)$$

で表わされる場合、解 S_1, e_1 の近傍で

$$S = E(e - e_0) + S_0 \quad \dots\dots\dots (27)$$

が成立するように E, e_0, S_0 が適当に定められれば、非線形問題は形式上(27)式のような弾性問題に置換えられる。すなわち、反復計算によって適切な E, e_0, S_0 の値を定めることができれば、非線形問題の解が求められることになる。

反復計算が弾性マトリックス E を調節して行われる場合、これを剛性変化法と呼び、 S_0 または e_0 を調節して行われる場合、これを初期応力法または初期ひずみ法と呼ぶ。

しかし多くの非線形問題では解の一意性は存在せず、応力ひずみ状態はその経路に依存して定まることが多い。このような場合、応力ひずみ状態は(26)式の代りに、

$$F(\delta S, \delta e) = 0 \quad \dots\dots\dots (28)$$

で表わされることになる。しかし、この場合も荷重増分に対して同様な過程を繰返すものとすれば、上で述べた方法がそのまま適用できることになる。したがってここでは(28)式に基いて定式化を進めるものとする。

1.3.2 剛性変化法

剛性変化法は弾性マトリックス E をひずみないしは応力の関数

$$E = E(e) = E(S) \quad \dots\dots\dots (29)$$

として表わし、(26)式を近似する方法である。この場合、変位ひずみ関係においては(27)式が成立しているから、有限要素法による最終的な定式化は(26)式の代りに、

$$K(U) U = F \quad \dots\dots\dots (30)$$

と表わされることになる。ここに $K(U)$ は変位 U の関数である。この場合、 $K(U)$ の値が定まればこの解は線形問題と同様に求めることができる。一般には $U=0$ として剛性マトリックスの近似値 K_0 を求め、以下変位 U の変化が無視できるまで反復計算が行われることになる。

剛性変化法では各段階毎に剛性マトリックス K が変化するため、各段階で新たに剛性マトリックスを求めなければならない、次に述べる初期応力法に比べて計算量が大きくなる欠点がある。

剛性変化法の概念図を図-1.4に示す。

1.3.3 初期応力法

初期応力法は、剛性マトリックス K を変化させるかわりに初期応力 S_0 とこれに釣合う節点力 F_0 を用いて非線形問題を解く方法である。この場合、 S_0 および F_0 は応力ないしはひずみの関数として表わされ、有限要素法による最終的な定式化は剛性変化法の場合と同様にして、

$$KU = F(U) \dots\dots (31)$$

と表わされることになる。この場合も $U = 0$ として荷重 $F(U)$ の近似値を求め、以下変位 U の変化が無視できるまで反復計算が行われることになる。

初期応力法では剛性マトリックス K は不変であるから、解析は剛性変化法に比べて簡単となる。剛性変化法概念図を図-1.4に示す。

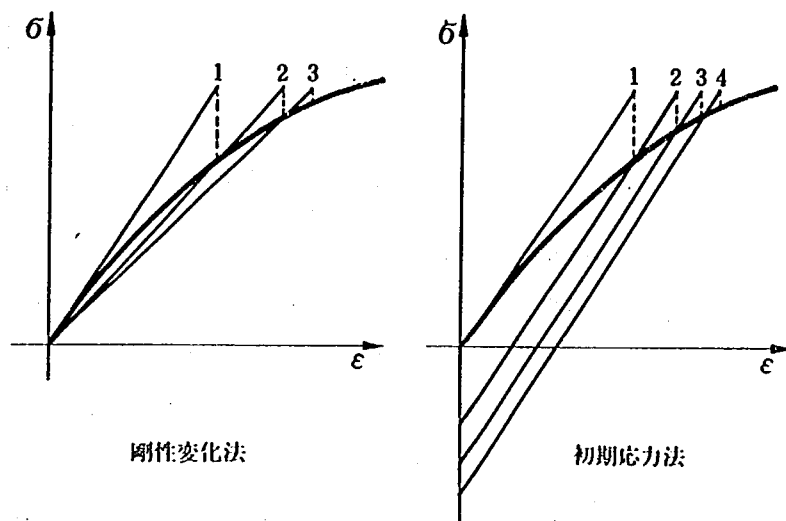


図-1.4 非線形応力解析法

1.3.4 (参考) 塑性理論

塑性は非線形挙動を示す代表的な特性であり、一般に応力状態が、

$$F(S, \kappa) = 0 \dots\dots\dots (32)$$

なる降伏条件を満足した時に降伏が起り、非線形挙動が生じるものとされている。ここに κ はひずみ硬化を表わし、一般に塑性変形の間になされる塑性仕事の量によって表わされる。

降伏条件後の塑性ひずみには、一般に次式が成立する。

$$\delta e_p = \lambda \frac{\partial F}{\partial S} \dots\dots\dots (33)$$

そこで応力の微小増分によるひずみの変化量が弾性ひずみ δe_e と塑性ひずみ δe_p に分解されるものとすれば、全ひずみ量の増分は、

$$\begin{aligned} \delta e &= \delta e_e + \delta e_p \\ &= E^{-1} \delta S + \frac{\partial F}{\partial S} \lambda \dots\dots\dots (34) \end{aligned}$$

と表わされる。また塑性降伏を生じている時にはその応力は(32)式で与えられる降伏面上にあるから、

$$\frac{\partial F}{\partial S} \delta S + \frac{\partial F}{\partial \kappa} \delta \kappa = 0 \dots\dots\dots (35)$$

または、

$$\begin{aligned} \frac{\partial F}{\partial S} \delta S + A \lambda &= 0 \\ A &= \frac{\partial F}{\partial \kappa} \delta \kappa \frac{1}{\lambda} \dots\dots\dots (36) \end{aligned}$$

が成立する。したがって(34)式と(35)式をまとめて表示すれば、

$$\begin{Bmatrix} \delta \varepsilon_x \\ \delta \varepsilon_y \\ \delta \gamma_{xy} \\ 0 \end{Bmatrix} = \begin{Bmatrix} E^{-1} & \begin{Bmatrix} \partial F / \partial \sigma_x \\ \partial F / \partial \sigma_y \\ \partial F / \partial \tau_{xy} \end{Bmatrix} \\ \partial F / \partial \sigma_x, \partial F / \partial \sigma_y, \partial F / \partial \tau_{xy}, & \Lambda \end{Bmatrix} \begin{Bmatrix} \delta \sigma_x \\ \delta \sigma_y \\ \delta \tau_{xy} \\ \lambda \end{Bmatrix} \quad \dots\dots\dots (37)$$

となり、ここで未知数 λ を消去すれば、

$$\delta S = E^* \delta e \quad \dots\dots\dots (38)$$

が得られる。ここでパラメータ Λ は硬化性のない材料については $\Lambda = 0$ となるが、ひずみ硬化のある場合、 Λ を求めるためにはひずみ硬化 κ についての性質が必要となる。一般に κ は塑性変形の間になされる塑性仕事の量によって表わされるから、

$$\delta \kappa = S^t \delta e_p \quad \dots\dots\dots (39)$$

となる。これに(38)式を代入すれば、

$$\delta \kappa = \lambda S^t \frac{\partial F}{\partial S} \quad \dots\dots\dots (40)$$

また、(39)式にこれを代入すれば、

$$\Lambda = \frac{\partial F}{\partial \kappa} S^t \frac{\partial F}{\partial S} \quad \dots\dots\dots (41)$$

となり、 F と κ の関係が陽な形で求められておれば、 Λ を厳密に定めることが可能となり、 E^* が求められることになる。

このように塑性問題は(40)式を解くことに帰着され、したがって剛性変化法によって線形問題と同一な定式化がなされる。また多少の工夫で初期応力法によって解くことも可能である。

1.4 非引張応力解析

1.4.1 概 要

圧縮状態では荷重を支持することができ、引張状態では荷重に抵抗できないような材料は、理想的な塑性材料の1つと考えられることができ、実際にも亀裂性の岩盤やコンクリートなどの材料を近似するものと考えることができる。このような材料に対して応力ひずみ関係を(40)式のような陽な形で表わすことはむずかしいが、初期応力法を用いて引張応力の発生を消去していけば、このような問題の実用的な解を求めることができる。以下に初期応力法による非引張応力解析の定式化について説明を加える。なお、これまでの説明との対応上、ここでは引張応力を正として取扱うものとする。

1.4.2 非引張応力解析の定式化

3節点3角形要素による弾性方程式を再掲すれば次のようになる。

$$\begin{aligned} F &= \mathbf{A} \mathbf{B}^t \mathbf{E} \mathbf{B} \mathbf{U} \\ e &= \mathbf{B} \mathbf{U} \\ S &= \mathbf{E} \mathbf{B} \mathbf{U} \quad \dots\dots\dots (42) \end{aligned}$$

いま、この3角形要素内に引張応力が発生した場合、弾性マトリックスEは引張応力が発生しないようにE-E'に変化することになる。したがって(42)式は次のように変化することになる。

$$F = \Delta B' (E - E') BU$$

$$e = BU$$

$$S = (E - E') BU \quad \dots\dots\dots (43)$$

ここで、

$$S' = E' BU \quad \dots\dots\dots (44)$$

とおけば、(43)式は

$$F + \Delta B' S' = \Delta B' E BU$$

$$e = BU$$

$$S = E BU - S' \quad \dots\dots\dots (45)$$

と改められる。したがって引張応力が生じた場合にこれが0となるようにS'を定めれば、初期応力-S'とこれに釣合う節点力 $\Delta B' S'$ によって非引張応力問題は初期応力法を用いた弾性問題として取扱えることになる。しかしS'は(44)式に示したような変位Uの関数であるから、これをあらかじめ求めることはできない。したがってS'=0を出発点として引張応力の発生が許容誤差として許されるまで逐次計算が行われることになる。

一般に初期応力法では、各反復計算段階における全荷重に対して反復計算を行うよりも、各反復計算段階における引張応力の発生量 $\delta S'$ に対して反復計算を行うことが多い。この場合、反復計算の過程は次式で表わされる。

$$F + \sum \Delta B' \delta S'_n = \Delta B' E B (U + \sum \delta U_n) \quad \dots\dots\dots (46)$$

$$S = E B (U + \sum \delta U_n) - \sum \delta S'_n$$

これは、降伏条件を満足しない応力に対して応力の再配分を行うことを意味し、したがってこのような方法はしばしば応力伝達法とも呼ばれている。いまn回目の反復計算における解を S_n とすれば、n+1回目の反復計算における初期応力 $-\delta S'_{n+1}$ は図-1.5に示したMohrの円における $\delta S'$ で表わされることになる。いま、3角形要素内の応力を $\sigma_x, \sigma_y, \tau_{xy}$ とすれば主応力の大きさは、

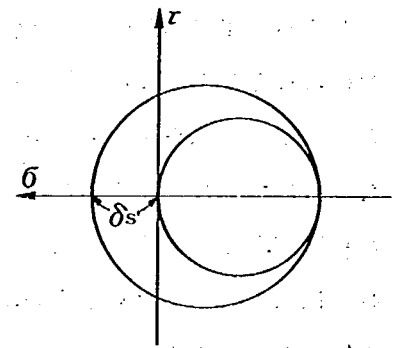


図-1.5 初期応力
(引張応力を正)

$$\sigma_1 = \frac{\sigma_x + \sigma_y}{2} \pm \sqrt{\left(\frac{\sigma_x - \sigma_y}{2}\right)^2 + \tau_{xy}^2}$$

$$\tan 2\theta = \frac{2\tau_{xy}}{\sigma_x - \sigma_y}$$

$$-\pi/2 \leq \theta \leq \pi/2 \quad (\sigma_x \geq \sigma_y)$$

$$\pi/2 \leq \theta \leq 3\pi/2 \quad (\sigma_x \leq \sigma_y) \quad \dots\dots\dots (47)$$

で与えられる。したがってこの時の σ_1, σ_2 の正負を判断して、 σ_1 (σ_2)が圧縮応力の場合 $\sigma'_1 = 0$ ($\sigma'_2 =$

0), $\sigma_1(\sigma_2)$ が引張応力の場合 $\sigma'_1 = -\sigma_1(\sigma'_2 = -\sigma_2)$ とすれば, 初期応力 $-\delta S$ は直交座標系表示に対して

$$\begin{aligned}\sigma'_x &= \frac{\sigma'_1 + \sigma'_2}{2} + \frac{\sigma'_1 - \sigma'_2}{2} \cos 2\theta \\ \sigma'_y &= \frac{\sigma'_1 + \sigma'_2}{2} - \frac{\sigma'_1 - \sigma'_2}{2} \cos 2\theta \\ \tau'_{xy} &= \frac{\sigma'_1 - \sigma'_2}{2} \sin 2\theta\end{aligned}\quad \dots\dots\dots (48)$$

で表わされることになる。

1. 4. 3 (参考) せん断破壊基準に従う応力解析

非引張応力解析では, 降伏条件として $\sigma = 0$ を用いている。この降伏条件を他の降伏条件にかえれば, 非引張応力と同様な方法を用いて別の非線形解析が組立てられる。いまこの降伏条件として Mohr-Coulomb のせん断破壊基準

$$\tau_0 - \sigma \tan \phi - |\tau| = 0 \quad \dots\dots\dots (49)$$

を考えるものとすれば, 適当な初期応力を用いて, せん断破壊基準による降伏条件を考慮した解析が行えることになる。いま(49)式を主応力による表示に改めれば,

$$-\frac{\sigma_1 + \sigma_2}{2} \sin \phi + \tau_0 \cos \phi = \frac{\sigma_1 - \sigma_2}{2} \quad \dots\dots\dots (50)$$

となり,

$$-\frac{\sigma_1 + \sigma_2}{2} \sin \phi + \tau_0 \cos \phi \leq \frac{\sigma_1 - \sigma_2}{2} \quad \dots\dots\dots (51)$$

の場合には応力の再配分が行われることになる。

ところで非線形解析では一般に解の一意性は成立せず, 初期応力の与え方が異なれば異なった応力解が得られることになる。したがって物理的に妥当な解を得るためには, 降伏後の外力の履歴と降伏後の応力ひずみ関係を正しく評価できるような初期応力を与えなければならない。このためには応力履歴を考慮した厳密な解析が必要である(1, 3, 4 参照)。しかし, このような解析にここで述べた初期応力法を適用するには多くの困難を伴うため, ここでは以下に示す便宜的な方法を用いて応力の再配分を行うものとした。すなわち, (51)式に示した降伏状態が得られた場合, 図-1.6 のような降伏条件に達した時点における Mohr の応力円との応力差を再配分力とした。すなわち, 初期応力は主応力表示に対して

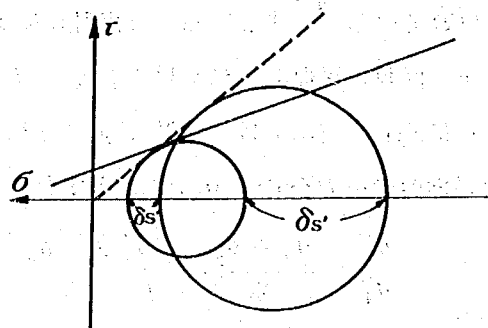


図-1.6 初期応力(引張応力を正)

$$\begin{aligned}\sigma'_1 &= \frac{2\tau_0 \cos \phi}{(\sigma_1 - \sigma_2) - (\sigma_1 + \sigma_2) \sin \phi} \sigma_1 - \sigma_1 \\ \sigma'_2 &= \frac{2\tau_0 \cos \phi}{(\sigma_1 - \sigma_2) - (\sigma_1 + \sigma_2) \sin \phi} \sigma_2 - \sigma_2\end{aligned}\quad \dots\dots\dots (52)$$

とする。この場合, 直交座標系における初期応力は(52)式を(48)式に代入すればよいことになる。

2. プログラムの入力方法と出力の見方

2.1 プログラムの概要

本プログラムは有限要素を用いた2次元応力解析プログラムであり、当研究室で保管している「2次元弾性計算用プログラム」を改良し、弾性解析のほか、非引張応力解析およびせん断破壊基準に従う応力解析の非線形応力解析を行うことができるようにしたものである。本プログラムの開発に当っては元のプログラムの入力書式を損うことなく非線形応力解析を行えるような工夫が施されており、弾性解析を行う場合には従来の入力書式がそのまま使えるようになっている。

本プログラムを利用するに当たっての注意点は次のとおりである。

- ① 解析系として等方性体および直交異方性体を取扱うことができる。
- ② 応力状態は平面ひずみ状態として取扱うことになっている。ただし、弾性係数およびポアソン比を適当に補正することによって平面応力状態の解析を行うことも可能である。
- ③ 使用できる要素は3角形要素のみであり、計算可能な最大節点数は1,000、最大要素数は2,000である。
- ④ 異なる物性値をもつ要素の組合わせは最大10種類まで取扱うことができる。
- ⑤ 要素分割において1つの節点を共有する要素数は8個までである。

(図-2.1 参照)

- ⑥ 荷重ケースは最大5ケースまで取扱うことができる。
- ⑦ 荷重は節点力および物体力しか取扱えない。したがって表面分布荷重は等価節点力として入力しなければならない。

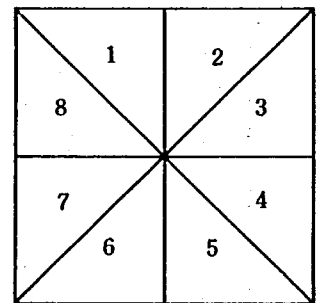


図 2.1 要素の結合

2.2 入力データの作成方法

入力データシートは図-2.2に従って記入する。記入すべき文字、数字は全て指定されたカラムに書かねばならない。実数は指定された枠内のカラムに納まっていれば小数点の位置はどこでもよい。整数は指定された枠内に右に寄せて記入しなければならない。0.0, 0は無記入でよい。

以下、入力様式にしたがって説明を加える。

WRITTEN BY

PROBLEM

PAGE OF

[illegible]

DATA SHEET

PROBLEM

WRITTEN BY

PAGE

OF

[illegible]

① CONT カード

記 号	型	説 明																																																		
B	I	出力する図の種類を示す。Bの値によって次の図化を行う。																																																		
		<table><tr><th>B</th><th>主 応 力 図</th><th>第1主応力の 等高線図</th><th>第2主応力の 等高線図</th><th>最大せん断力の 等高線図</th></tr><tr><td>0</td><td></td><td></td><td></td><td></td></tr><tr><td>1</td><td>○</td><td></td><td></td><td></td></tr><tr><td>2</td><td>○</td><td>○</td><td></td><td></td></tr><tr><td>3</td><td>○</td><td></td><td></td><td>○</td></tr><tr><td>4</td><td>○</td><td>○</td><td></td><td>○</td></tr><tr><td>5</td><td>○</td><td></td><td>○</td><td></td></tr><tr><td>6</td><td>○</td><td>○</td><td>○</td><td></td></tr><tr><td>7</td><td>○</td><td></td><td>○</td><td>○</td></tr><tr><td>8</td><td>○</td><td>○</td><td>○</td><td>○</td></tr></table>	B	主 応 力 図	第1主応力の 等高線図	第2主応力の 等高線図	最大せん断力の 等高線図	0					1	○				2	○	○			3	○			○	4	○	○		○	5	○		○		6	○	○	○		7	○		○	○	8	○	○	○	○
		B	主 応 力 図	第1主応力の 等高線図	第2主応力の 等高線図	最大せん断力の 等高線図																																														
		0																																																		
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		6	○	○	○																																															
7	○		○	○																																																
8	○	○	○	○																																																
C	I	0 : 主応力図に応力値を記入しない。 1 : 主応力図に応力値を記入する。																																																		
D	I	0 : 主応力図に要素分割メッシュを描かない。 1 : 主応力図に要素分割メッシュを描く。																																																		
E	R	主応力図において応力の単位値をE cmに描く。																																																		
F	R	出力図において、座標系の単位長さをF cmに描く。																																																		
G ₁	R	出力図においてx座標最小の節点をプロット用紙上でx軸正方向にG ₁ cm 移動させる。																																																		
G ₂	R	出力図においてy座標最小の節点をプロット用紙でy軸正方向にG ₂ cm 移動させる。																																																		
H	I	0 : 引張応力を正とする。 1 : 圧縮応力を正とする。																																																		
I	I	0 : 15 inch 用紙にプロットする。 0 : 36 inch 用紙にプロットする。																																																		
S	I	0 : 点安全率図を出力しない。 1 : 点安全率図を出力する。																																																		
NOLIN	I	0 : 弾性解析 1 : 非引張応力解析 2 : せん断破壊基準に従う応力解析																																																		

以下のカードは、NOLINが1または2の場合のみに必要となる。NOLINが0の場合、このカードは不要である。

記 号	型	説 明
ITERA	I	繰返し計算を行う場合の最大繰返し回数
NPRNT	I	0 : 繰返し計算の途中結果を出力しない。 1 : 繰返し計算の途中結果を出力する。
ALLOW	R	繰返し計算を中止する場合の許容応力誤差

(説明)

プロッタ用紙は 36 inch, 15 inch の 2 種類があり, タイトル, スケール表示が入るので実用上の大きさはそれぞれ 75cm, 30cm 程度になる。したがって図化の際には解析系の大きさに注意しなければならない。たとえば長さ $L = 100$ を 20cm の長さで図化するには $F = 0.2$ とすればよい。

ペンの移動 (G_1, G_2) は解析系の一部分を図化する時に必要となるが, 一般には無記入でよい。

主応力図における応力の大きさを表わす矢印の大きさは E で調整する。主応力 $\sigma = 100$ を 1cm の長さで図化するには $E = 0.01$ とすればよい。なお主応力をプロットする点については NODE カードで指定する。

応力の等高線図における等高線の間隔は応力の最大値, 最小値に応じて 1, 2, 5, 10, 20, 50, …… の間隔で描かれる。

弾性解析では圧縮, 引張応力のいずれも正として取扱えるが, 非引張応力解析, セン断破壊基準に従う応力解析では圧縮応力を正, したがって $H = 1$ としなければならない。なお $H = 0$ として入力した場合も $H = 1$ と読み直して計算が行われる。

ITERA は非線形解析を行う場合の収束計算の繰返し回数を指示するものであり, 実用的には 10 回程度の繰返しで十分である。また ALLOW は非線形解析の場合の許容誤差応力であり, 解析誤差が ALLOW 以下になれば解は十分収束したものととして繰返し計算は中止される。したがって, 繰返し計算は ITERA または ALLOW のいずれかの条件が満足されれば中止されることになる。

② タイトルカード

タイトルを記入する。

③ PATE カード

記 号	型	説 明
EN	I	要素の物性値パターンの総数。 ($EN \leq 10$)

以下のカードを EN 組用意する。

記 号	型	説 明
E_x, E_y E_z	R	x, y, z 方向の弾性係数
ν_{xy}, ν_{yz} ν_{zx}	R	xy, yz, zx 方向間のポアソン比
G	R	xy 方向間のせん断弾性係数
ρ_x, ρ_y	R	x, y 方向の慣性力に対する単位体積重量
NSW	I	非引張応力解析以外の場合は無記入。 非引張応力解析の場合は次の条件を表わす。 0 : 非引張条件を考えない要素パターン 1 : 非引張条件を考える要素パターン

以下のカードはせん断破壊基準に従う応力解析 (NOLIN=2) の場合のみに必要となる。他の場合には、このカードは不要である。

記 号	型	説 明
TAU	R	せん断強度
TANPHI	R	内部摩擦係数

(説明)

等方性体の場合には、

$$E_x = E_y = E_z = E$$

$$\nu_{xy} = \nu_{yz} = \nu_{zx} = \nu$$

$$G = \frac{E}{2(1+\nu)}$$

となる。なお平面応力の計算を行いたい場合には次のような補正を行えばよい。

$$E_x = E_y = E_z = \frac{1+2\nu}{(1+\nu)^2} E$$

$$\nu_{xy} = \nu_{yz} = \nu_{zx} = \frac{\nu}{1+\nu}$$

$$G = \frac{E}{2(1+\nu)}$$

弾性係数等の物性値の異なる要素パターンを組み合わせる場合には、要素特性を示すカードが EN 組必要となる。したがってせん断破壊基準に従う応力解析を行う場合には、上の 2 枚のカードを 1 組としてこれを EN 組用意しなければならない。

要素の単位体積重量は、一般に $\rho_x = \rho_y > 0$ として記入し、慣性力の大きさ、向きを定める時には

LOAD カードを用いる方が誤まりを生じにくい。

NSWは、非引張応力解析において、ある特定の要素に対して引張応力を認める場合に使用するもので、このような要素の物性値パターンの場合は $NSW=0$ とすればよい。

TAU, TANPHI はせん断破壊基準 $\tau = \tau_0 + f\sigma$ を表わすものであり、ある特定の要素に対してこのような条件を付加させない場合には、TAUの値を十分大きな値にしておけばよい。

④ 形状カード

以下のカードはプロッタを用いる場合のみ必要となる。

記 号	型	説 明
N	I	解析系の輪郭を書かせる際に必要な節点数 ($N \leq 19$)
$P_1 \sim P_N$	I	節点番号

(説明)

図-2.3のような輪郭を書かせたい場合には、 $N=8$ 、 $P_1 \sim P_8 = 1, 5, 12, 10, 15, 9, 7, 1$ と記入する。最後の節点番号は最初の節点番号と等しくなければならない。

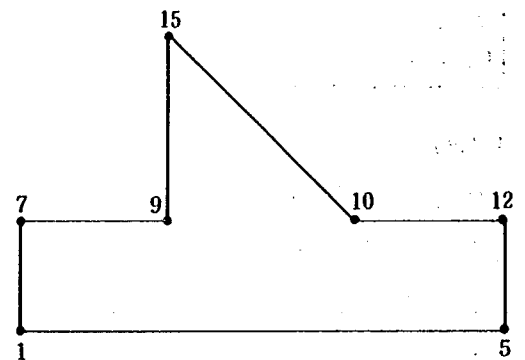


図-2.3 輪郭の表示

⑤ NODE カード

記 号	型	説 明
NL	I	総節点数 ($NL \leq 1,000$)
N	I	節点番号 ($N \leq 4,000$)
x	R	節点のx座標
y	R	節点のy座標
θ	R	固定軸の回転角
X	I	X方向固定条件 (0:自由, 1:固定)
Y	I	Y方向固定条件 (0:自由, 1:固定)

(説明)

総節点数は1,000以下でなければならない。ただし節点番号は4,000以下の番号ならば欠番があってもよい。

主応力図を出力する場合、主応力をプロットする節点番号の前には負号(-)をつけなければならない。
 固定軸の回転角は、節点の固定方向がXまたはY軸方向と異なる方向の場合に、その固定方向を指示するもので、反時計方向の回転角として度単位で記入する。

なお固定される節点の数は50以下でなければならない。

⑥ LMNT カード

記 号	型	説 明
NL	I	総要素数 ($NL \leq 2,000$)
N	I	要素番号 ($N \leq 4,000$)
i, j, k	I	節 点 番 号
P	I	要素のパターン番号 (PATEカード参照)。
$\sigma_{xI}, \sigma_{yI}, \sigma_{zI}, \tau_{xyI}$	R	要素の初期応力

(説明)

総要素数は 2,000 以下でなければならない。ただし節点番号は 4,000 以下の番号ならば欠番があってもよい。要素を構成する節点番号 i, j, k は反時計回りに記入する。

要素初期応力は外力による応力に加算される応力であって、途中の計算においては何ら影響を及ぼさない。

⑦ LOAD カード

記 号	型	説 明
NL	I	荷重ケース総数 ($NL \leq 5$)

以下のLDCN, DESP, SAFEカードを必要に応じてNL組用意する。

⑧ LDCN カード

記 号	型	説 明
LD	I	荷重ケース番号
α_x	R	x方向慣性力 (重力比)
α_y	R	y方向慣性力 (重力比)
ND	I	荷重が作用する節点番号
X	R	X方向荷重
Y	R	Y方向荷重

(説明)

α_x, α_y は重力に対する慣性力の大きさの比を表わし、PATEカードで指定した単位体積重量 ρ_x, ρ_y との積が実際の物体力となる。一般的に、自重を考慮する場合には $\alpha_y = -1.0$ 、水平地震力(震度 k)を考慮する場合には $\alpha_x = k$ となる。

X, Y は節点力であり、水圧荷重等の表面分布荷重は等価節点力に直して入力しなければならない。

⑨ DESP カード

固定条件として規定変位を入力する場合、以下のカードが必要である。

記 号	型	説 明
ND	I	規定変位を与える節点番号
x	R	x方向規定変位
y	R	y方向規定変位

(説明)

規定変位は固定支持の1つとして取扱われる。したがって規定変位を与える場合、NODEカードにおける固定条件は1としておかねばならない。

⑩ SAFE カード

局所せん断摩擦安全率の計算または図化を行う場合、以下のカードが必要である。安全率は節点または要素応力に対して計算することができ、それぞれ1～4カラムにNODE またはLMNT と記入する。

記 号	型	説 明
N	I	局所せん断摩擦安全率を計算する節点(要素)番号
τ_0	R	せん断強度
f	R	内部摩擦係数
D	R	滑り方向を指定する場合の角度
L	I	0:強度安全率を求める場合。 1:荷重安全率を求める場合。
P	I	0:点安全率をプロットする。 1:点安全率をプロットしない。

(説明)

局所せん断摩擦安全率の計算は、最大3種類まで定数を変えて行うことができる。

滑り方向を指定する場合にはDにx軸からの回転角を反時計回りで記入する。ただし滑り方向が0.0の場合、ブランクとすることができない。ブランクとした場合には滑り方向を指定しなかったも

のとして取扱われる。

局所せん断摩擦安全率には強度安全率 N_s と荷重安全率 N_L がある。両者はそれぞれ次式で表わされる。

$$N_s = \frac{\tau_0 + f\sigma}{|\tau|}$$

$$N_L = \frac{\tau_0}{|\tau| - f\sigma}$$

⑪ END カード

END カードはデータの終りを意味する。

2.3 出力データの見方

出力データの例を図-2.4に示す。出力の様式は次のとおりである。

① 入力データのベタ打ち

② 計算タイトル名

③ 荷重ケース番号 (LOAD-CONDITION)

④ 計算繰返し回数 (NUMBER OF ITERATION)

非線形解析の場合の計算繰返し回数を示す。

⑤ 要素ひずみ (STRAINS AT THE CENTER OF ELEMENTS)

ITER	計算繰返し回数
E (X)	直ひずみ ϵ_x
E (Y)	直ひずみ ϵ_y
E (XY)	せん断ひずみ γ_{xy}

⑥ 要素応力 (STRESSES AT THE CENTER OF ELEMENTS)

ITER	計算繰返し回数
S (X)	直応力 σ_x
S (Y)	直応力 σ_y
S (Z)	直応力 σ_z
T (XY)	せん断応力 τ_{xy}
S 1	第1主応力 σ_1
S 2	第2主応力 σ_2
DEG	第1主応力の作用方向がx軸となす角 (反時計回り)
COND	T: 非引張応力解析において引張応力が発生した要素を示す。 S: せん断破壊基準に従う応力解析において基準を満足しない要素を示す。

TWO-DIMENSIONAL ANALYSIS (ELASTIC) BY F.E-METHOD 3

```

CONT      0      0      0.003      0.1      1      0      1      2
      10      1      0.1
KISO GANBAN KAISEKI (SENDAN HAKAI)
PATE
PATE 3
2500000 2500000 2500000      0.2      0.2      0.2 1041667      0.0      2.3      0
1000.0      1.0
500000 500000 500000      0.2      0.2      0.2 206333      0.0      0.0      0
250.0      1.0
50000 50000 50000      0.2      0.2      0.2 20833      0.0      0.0      0
5.0      0.2
8      1 78 85 215 207 60 68 1
NODE 193
NODE -1      150.0      220.0
NODE -2      150.0      200.0
NODE -3      171.0      200.0
.
.
.
NODE 213      290.0      0.0      1      1
NODE 214      320.0      0.0      1      1
NODE 215      250.0      0.0      1      1
LMNT 340
LMNT 1      1      2      3      1
LMNT 2      2      4      5      1
LMNT 3      2      5      3      1
.
.
.
LMNT 368      205      213      214      2
LMNT 369      205      214      215      2
LMNT 370      205      215      206      2
LGAD 1
LDCN 1      0.0 -1.0
LOAD 1      66.7
LOAD 2      400.0
LGAD 4      800.0
.
.
.
LOAD 66      1000.0
LGAD 67      1000.0
LOAD 68      500.0      483.3
SAFE
.
.
.
LMNT 101 250.0 1.0      0
LMNT 102 250.0 1.0      0 1
LMNT 103 250.0 1.0      0
.
.
.
LMNT 368 250.0 1.0      0
LMNT 369 250.0 1.0      0
LMNT 370 250.0 1.0      0
END

```

図-2.4 出力様式

.....
 TWO-DIMENSIONAL ANALYSIS (ELASTIC) BY F.E. METHOD 2

 KISU GANBAN KAISEKI (SENDAN MAKAI)

LOAD-CONDITION..... 1

NUMBER OF ITERATION..... 1

STRAINS AT THE CENTERS OF ELEMENTS

ITER= 1

LOAD-CONDITION	1			
LMNT	E(X)	E(Y)	E(XY)	
1	0.10353E-05	0.29742E-05	0.19834E-05	
2	0.31279E-06	0.30159E-05	0.10914E-06	
3	0.10353E-05	0.45024E-05	0.71001E-05	
•				
368	0.0	0.30442E-04	-0.24162E-04	
369	0.0	0.30442E-04	-0.24162E-04	
370	0.24162E-04	0.19904E-04	-0.10538E-04	

STRESSES AT THE CENTERS OF ELEMENTS

ITER= 1

LOAD-CONDITION	1								
LMNT	S(X)	S(Y)	S(Z)	T(XY)	S1	S2	QEQ	QQU	
1	0.49412E+01	0.89809E+01	0.27844E+01	0.20550E-02	0.89809E+01	0.49412E+01			69 58 13
2	0.54355E+01	0.22464E+02	0.57606E+01	0.11359E+02	0.28575E+02	0.54355E+01			62 39 25
3	0.50024E+01	0.12225E+02	0.38455E+01	0.73959E+01	0.17845E+02	0.13243E+01			58 0 48
•									
368	0.42281E+01	0.16912E+02	0.42281E+01	-0.50338E+01	0.18667E+02	0.24732E+01	-70	46	49
369	0.42281E+01	0.16912E+02	0.42281E+01	-0.50338E+01	0.18667E+02	0.24732E+01	-70	46	49
370	0.16188E+02	0.14414E+02	0.61203E+01	-0.21954E+01	0.17669E+02	0.12933E+02	-33	59	57

FORCES AND DISPLACEMENTS

ITER= 1

LOAD-CONDITION	1				
NODE	F-X	F-Y	DX	DY	
1	0.0	-0.94300E+02	0.38708E-01	-0.93377E-02	
2	0.0	-0.44667E+02	0.24141E-01	-0.92782E-02	
3	0.0	-0.44467E+03	0.34119E-01	-0.14074E-01	
•					
213	0.0	0.0	0.0	0.0	
214	0.0	0.0	0.0	0.0	
215	0.0	0.0	0.0	0.0	

REACTION FORCES			ITER= 1	
LOAD-CONDITION	1			
NODE	R-X	R-Y		
80	-0.74558E+04	0.46621E-05		
85	-0.11005E+03	0.44348E-05		
108	-0.25430E+04	0.27148E-05		
•				
•				
•				
213	-0.59703E+03	0.12881E+04		
214	-0.15101E+03	0.50737E+03		
215	-0.96351E+02	0.29171E+03		

STRESSES AT THE NODAL POINTS							ITER= 1	
LOAD-CONDITION	1							
NODE	S(X)	S(Y)	T(XY)	S1	S2	DES		
1	0.49412E+01	0.89809E+01	0.20660E-02	0.59809E+01	0.49412E+01	89 88 13		
2	0.57930E+01	0.14897E+02	0.62556E+01	0.18651E+02	0.26084E+01	53 1 13		
3	0.86131E+01	0.12439E+02	-0.45595E+01	0.20256E+02	0.89963E+01	-68 18 29		
•								
•								
213	0.10538E+02	0.23668E+02	-0.10295E+02	0.29466E+02	0.49368E+01	-61 27 36		
214	0.42281E+01	0.16912E+02	-0.50336E+01	0.18667E+02	0.24732E+01	-70 46 49		
215	0.10208E+02	0.15663E+02	-0.36146E+01	0.17464E+02	0.84073E+01	-63 31 6		

MAXIMUM DELTA SIGMA..... 186.628

SAFETY FACTOR		LOAD-CONDITION		1		• INDICATES -		THETA IS FROM INPUT		ITER= 1	
IO	IAN-F	N	THETA1	THETA2	IAU	SIGMA					
LMNT 101	0.25000E+03	0.10000E+01	S	0.30454E+01	-7 53 53	-79 44 11	-0.74193E+02	-0.23833E+02			
LMNT 102	0.25000E+03	0.10000E+01	S	0.32367E+01	-3 3 7	-75 52 54	-0.76344E+02	-0.26936E+01			
LMNT 103	0.25000E+03	0.10000E+01	S	0.33729E+01	0 17 19	-73 46 28	-0.75154E+02	0.34866E+01			
•											
•											
LMNT 368	0.25000E+03	0.10000E+01	S	0.32166E+02	-26 40 14	-114 53 23	-0.80930E+01	0.10319E+02			
LMNT 369	0.25000E+03	0.10000E+01	S	0.32166E+02	-26 40 14	-114 53 23	-0.80930E+01	0.10319E+02			
LMNT 370	0.25000E+03	0.10000E+01	S	0.11204E+03	10 44 41	-78 44 36	-0.23677E+01	0.15280E+02			

⑦ 荷重および変位 (FORCES AND DISPLACEMENTS)

N O D E	節 点 番 号
F - X	X 方向 節点荷重
F - Y	Y 方向 節点荷重
D - X	X 方向 節点変位
D - Y	Y 方向 節点変位

⑧ 反 力 (REACTION FORCE)

N O D E	節 点 番 号
R - X	X 方向 反力
R - Y	Y 方向 反力

⑨ 節点応力 (STRESSES AT THE NODAL POINTS)

N O D E	節 点 番 号
S (X)	直 応 力 σ_x
S (Y)	直 応 力 σ_y
T (XT)	せん断応力 τ_{xy}
S 1	第 1 主応力 σ_1
S 2	第 2 主応力 σ_2
D E G	第 1 主応力の作用方向が x 軸となす角 (反時計回り)

⑩ 誤差応力 (MAXIMUM DELTA SIGMA)

非線形解析の場合の各繰返し計算における最大誤差応力を示す。最大誤差応力は図-2.5 で定義される応力である。

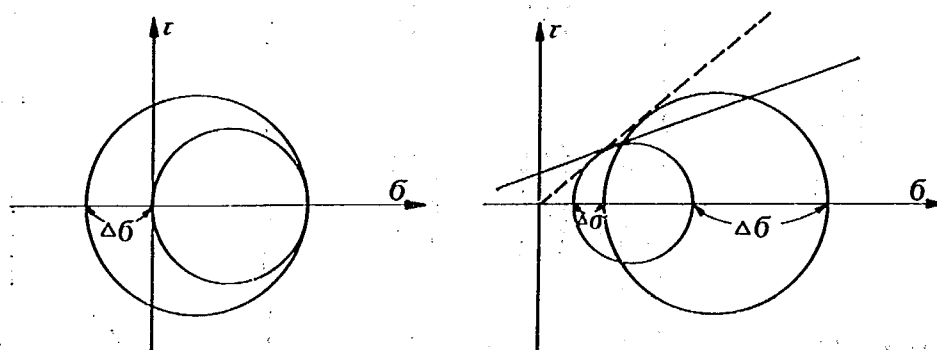


図 2.5 最大誤差応力 (圧縮応力を正)

⑪ 局所せん断摩擦安全率

NODE (LMNT)	節点番号 (要素番号)
T O	せん断強度
TAN. F	内部摩擦係数
N	局所せん断摩擦安全率
THETA 1 THETA 2	滑り方向がx軸となす角。また滑り方向を指定した場合はその方向がx軸となす角。 (反時計回り)
T A U	すべり面上のせん断応力
S I G M A	すべり面上の直応力

3. 解析例

3.1 空洞まわりの応力解析

3.1.1 概 要

ダム堤体内に設けられる通廊、放流管等の空洞部の周辺には、一般に局所的な応力集中が発生する。このような応力集中に対しては一般に弾性理論に基づいた解析が行われ、過大な引張応力の発生個所には鉄筋による補強が行われている。ここでは通廊周辺の局所的な引張破壊を考慮し、その後どのような平衡状態が達せられるのかを非引張応力解析により検討してみる。解析モデルは図-3.1に示す馬蹄形で、高さ2.5m、幅2mである。荷重は単位荷重として100 t/mの鉛直荷重を用いるものとした。

3.1.2 解析結果

(1) 弾性解と非引張応力解析解

弾性解析と非引張解析による通廊周辺の主応力図の比較を図-3.2に示

す。弾性解析で発生している引張応力は非引張応力解析ではほとんど0に収束しているが、主応力の方
向、圧縮の主応力の大きさに対してはほとんど差異が認められない。

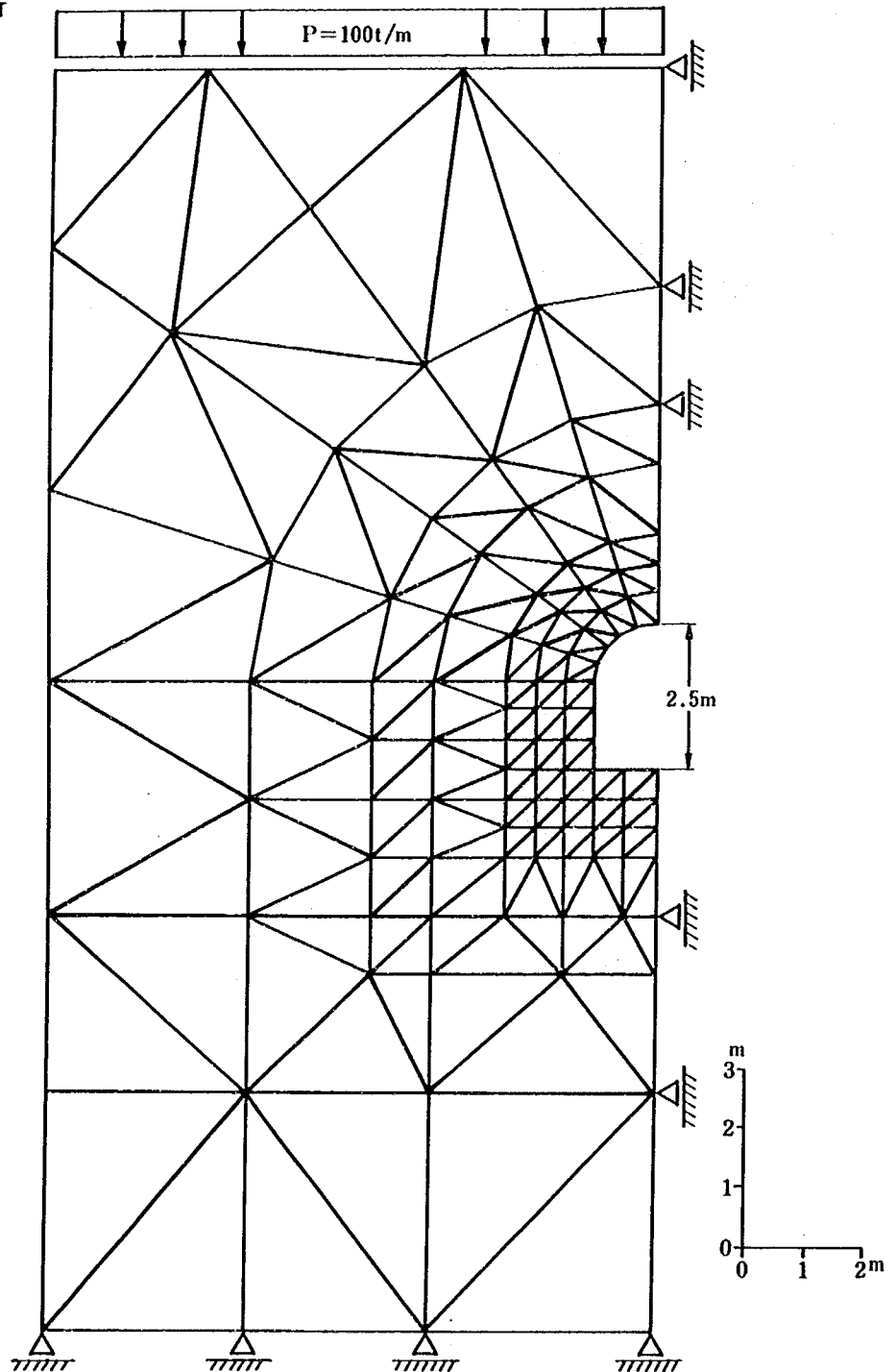


図-3.1 解析モデル

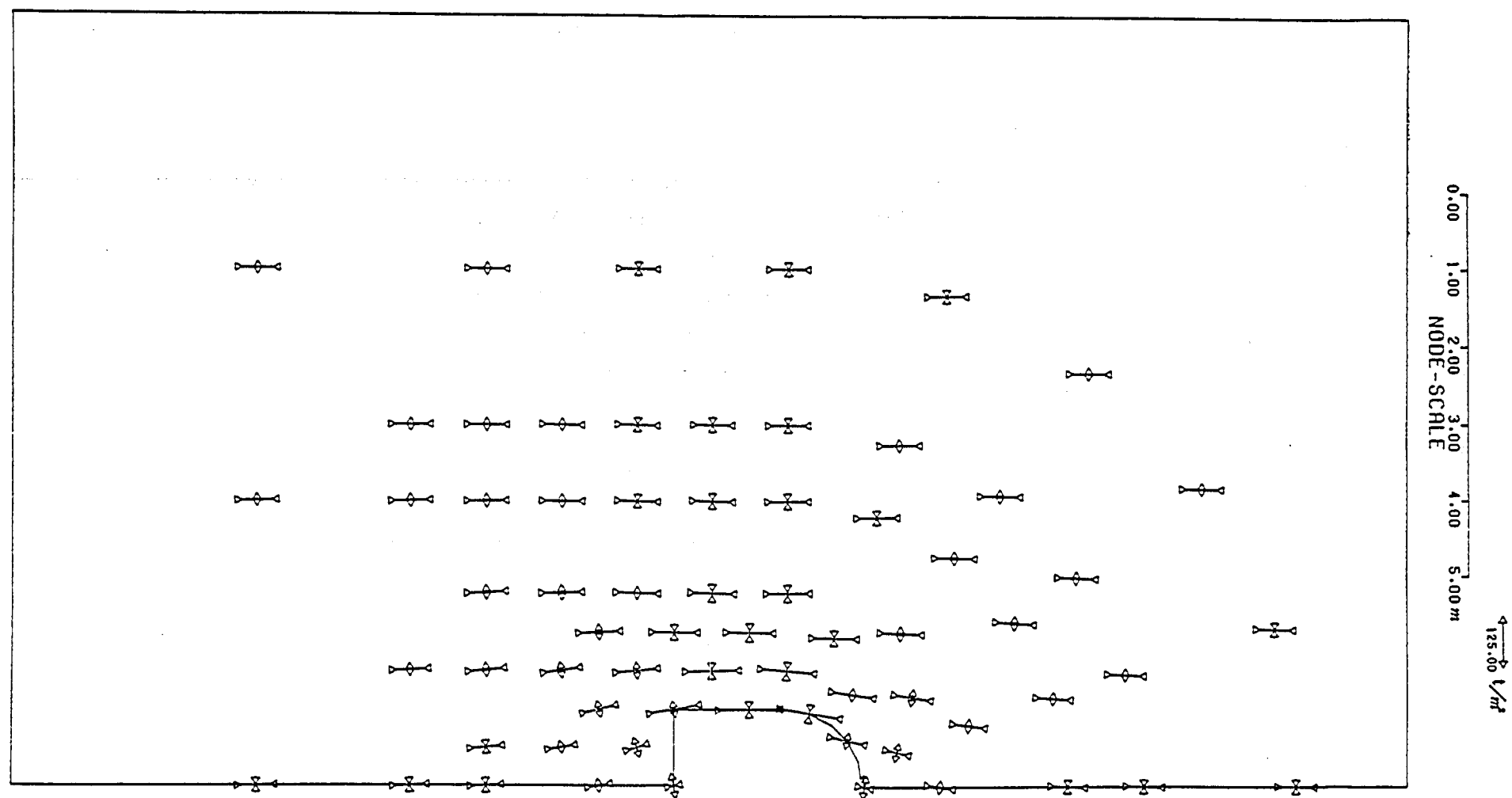


图-3.2(1) 主应力图 (弹性解析)

$\frac{1}{125.00} \frac{1}{m^2}$
 0.00 1.00 2.00 3.00 4.00 5.00 m
 NODE-SCALE

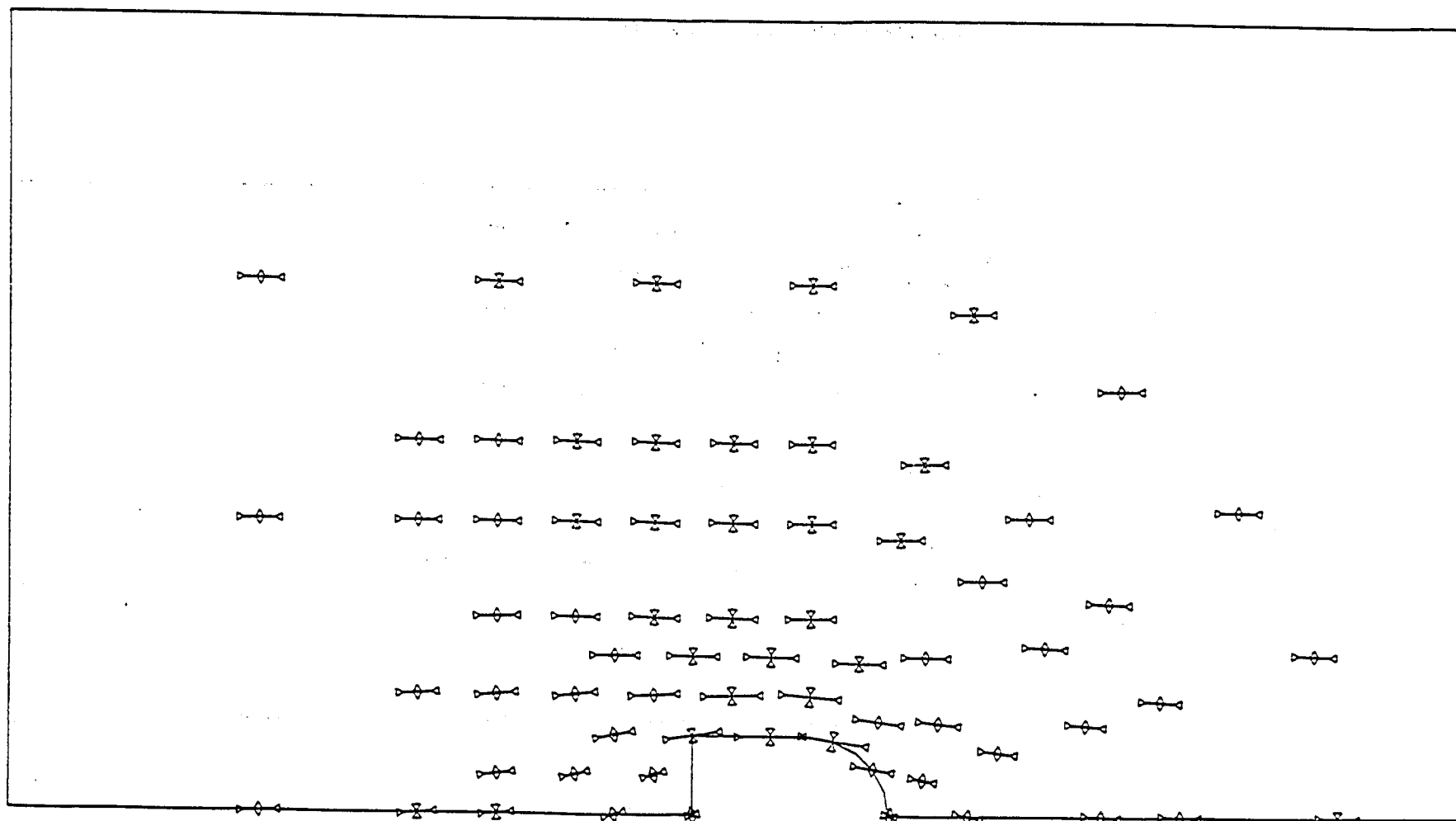


图-3.2(2) 主应力图 (非引张应力解析)

(2) 引張応力域

弾性解析と非引張応力解析における引張応力域の比較を図-3.3に示す。弾性解析で発生している大きな引張応力域は若干その位置が変化するとともに広い領域に変化し、逐次破壊が進行し平衡状態に達していることが理解できる。

(3) 繰り返し計算回数と解の収束状況

非引張応力解析の収束計算回数と圧縮主応力（第一主応力）、引張主応力（第二主応力）の変化の関係を図-3.4～5に示す。

この結果、圧縮主応力は計算回数に関係なくほぼ一定であり、引張主応力は計算回数と共に等比級数的に減少する傾向が認められる。5回の収束計算でほぼ解は一定となり、それ以後収束計算を行っても実用上の効果はあまり得られないようである。

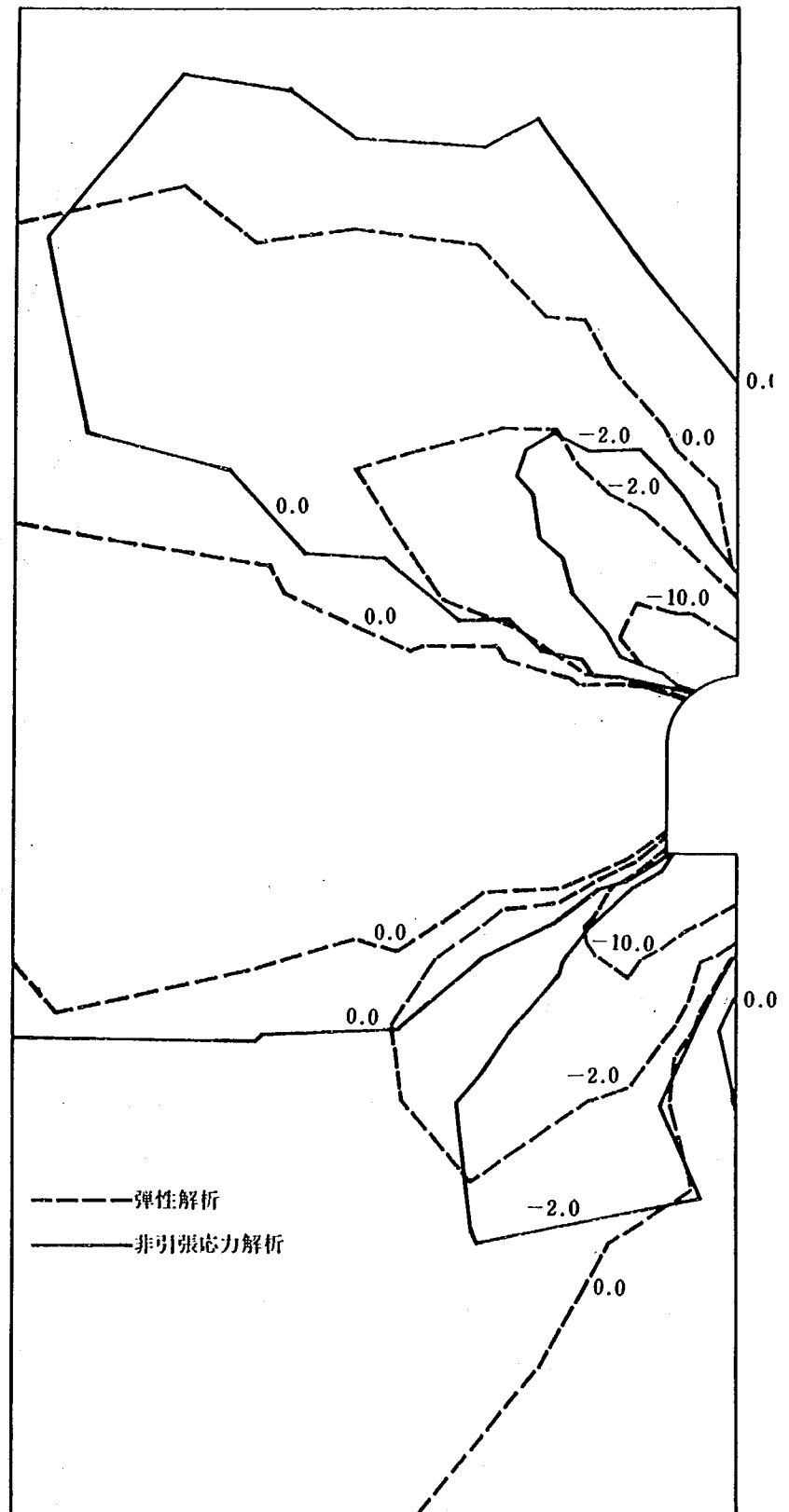


図-3.3 引張応力域図 (t/m^2)

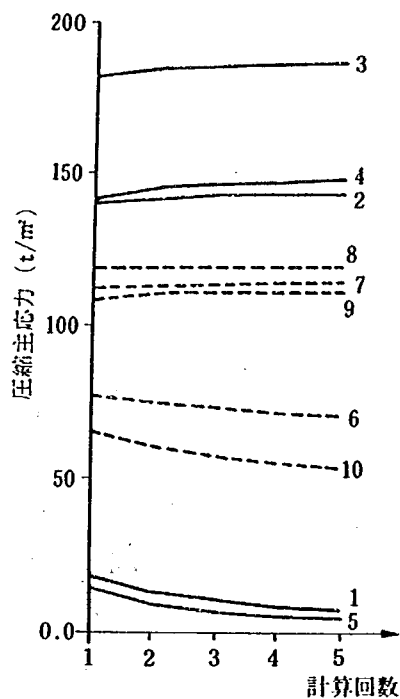


図-3.4 圧縮主応力（第一主応力）と計算回数の関係

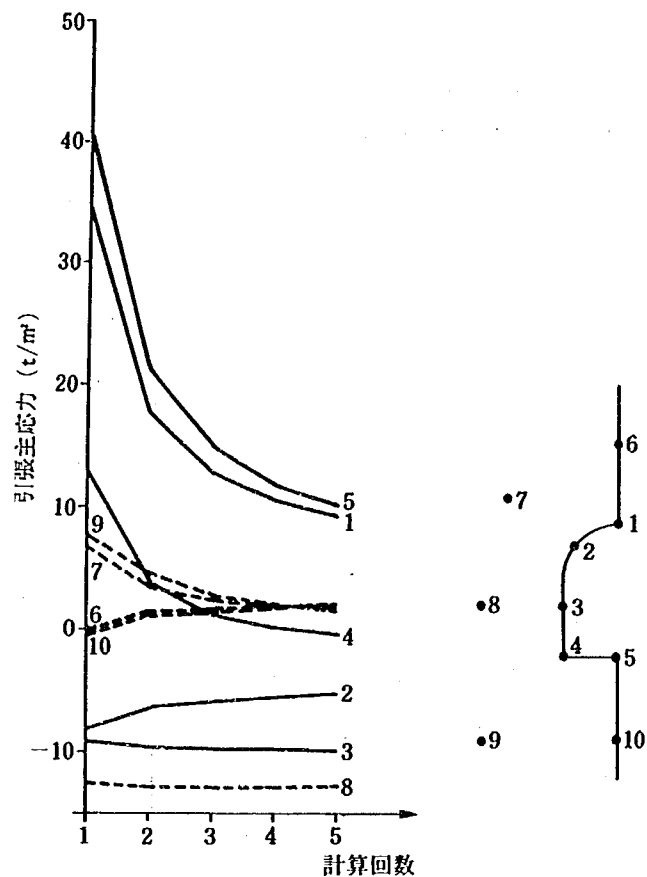


図-3.5 引張主応力（第二主応力）と計算回数の関係

3.2 有効アーチの応力解析

3.2.1 概要

中心角の小さなコンクリートアーチ構造物には一般に局部的に引張応力が発生し、場合によっては局部的な破壊が生じることがある。しかしこのような場合においても新たに有効アーチが構成されて全体的な破壊には至らないとされている。

ここではこのような有効アーチの応力解析を検討してみる。解析モデルは図-3.6に示す断面で、荷重は外側表面に垂直な 100 t/m の外力を作用させた。

3.2.2 解析結果

(1) 弾性解と非引張応力解析解

アーチおよびその基礎の主応力図を図-3.7に示す。弾性解析では、クラウンの内側および基礎取付部の外側に $200 \sim 300 \text{ t/m}^2$ の引張応力が発生しているが、非引張応力解析では、引張応力は無視できる程度まで小さくなり有効アーチの形成が理解できる。

(2) 引張応力域

弾性解析と非引張応力解析における引張応力域の比較を図-3.8に示す。弾性解では、クラウンの内側から基礎取付部の外側にかけて引張応力域が連続的に分布するが、非引張解析では、クラウンの

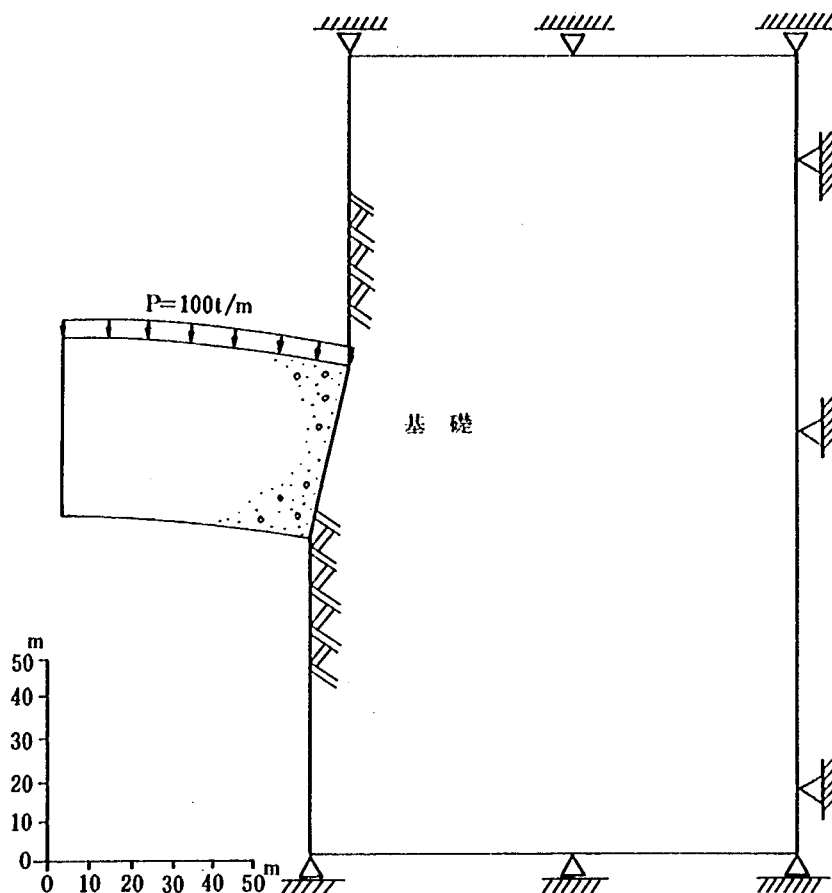


図-3.6 解析モデル

内側の一部に引張応力域が若干残るのみであり、有効アーチの形成が理解される。

(3) 繰り返し計算回数と解の収束状況

非引張応力解析の計算回数と圧縮主応力（第一主応力）、引張主応力（第二主応力）の変化の関係を図-3.9～10に示す。この結果、圧縮主応力は有効アーチを形成する領域では計算回数と共に増加が見られる。一方引張主応力は計算回数と共に等比級数的に減少する傾向が見られる。5回の計算でほぼ解は一定となり、それ以後収束計算を行っても実用上の効果はあまり得られないようである。

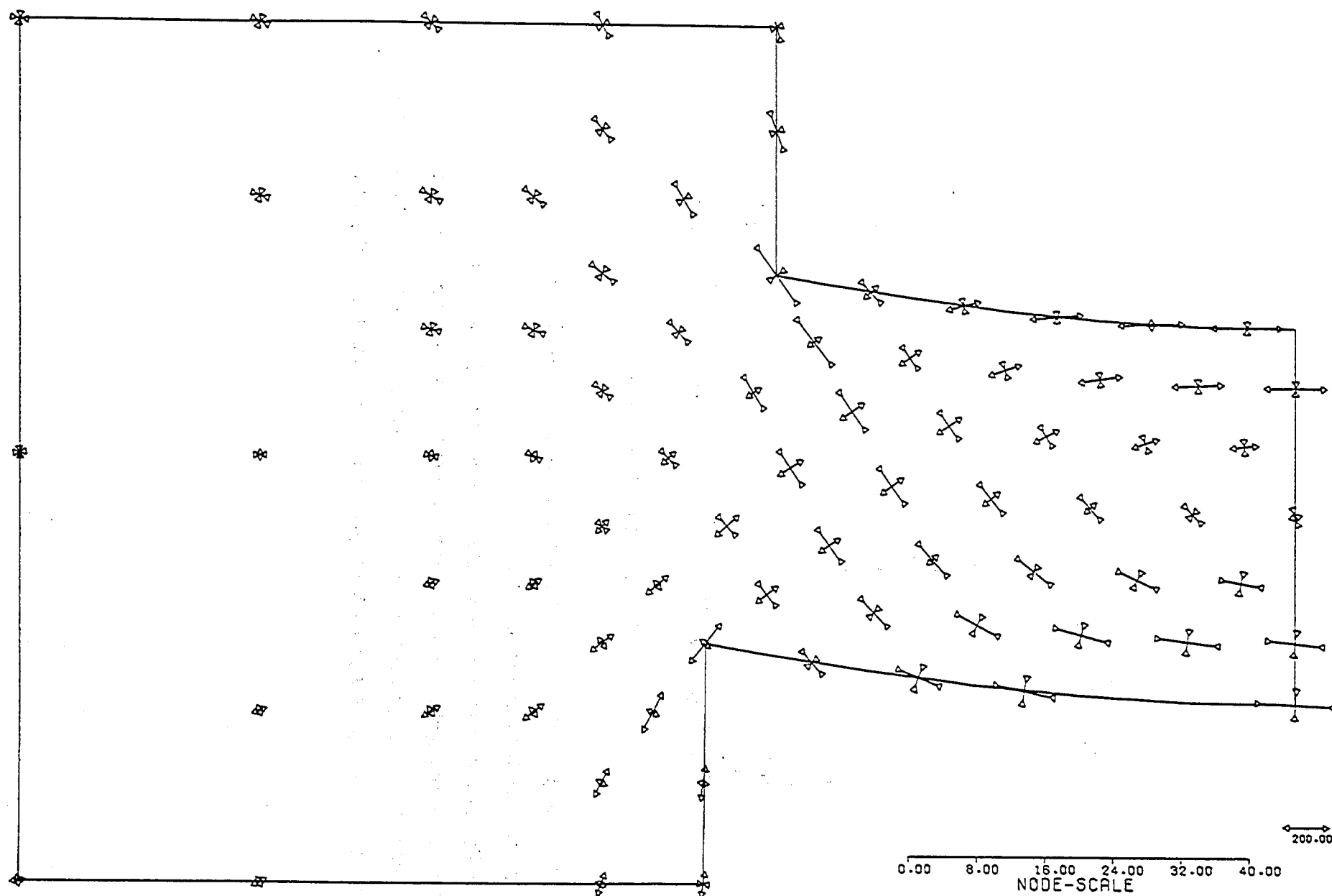


图- 3.7 (1) 主应力图 (弹性解析)

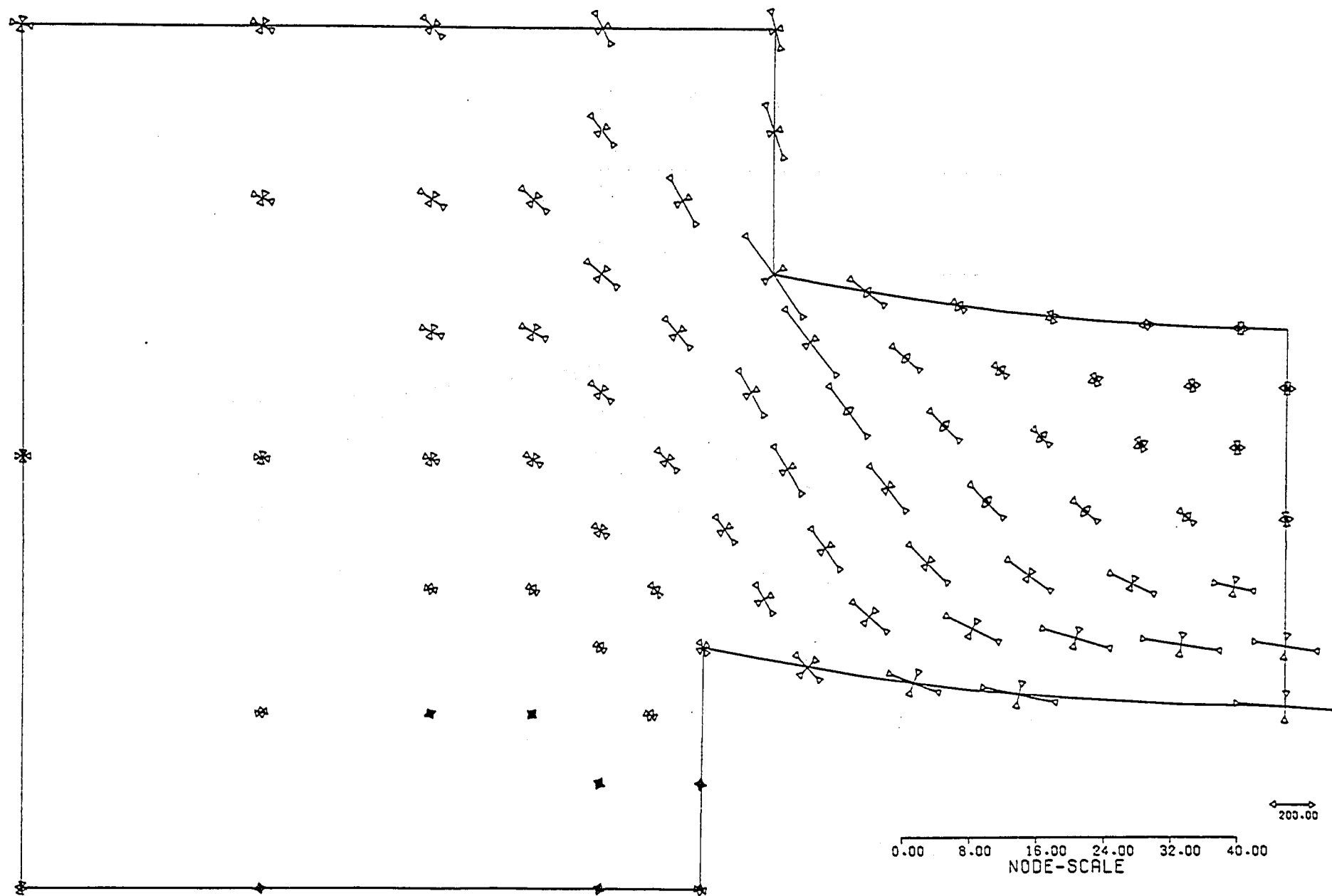


图-3.7(2) 主应力图 (非引张应力解析)

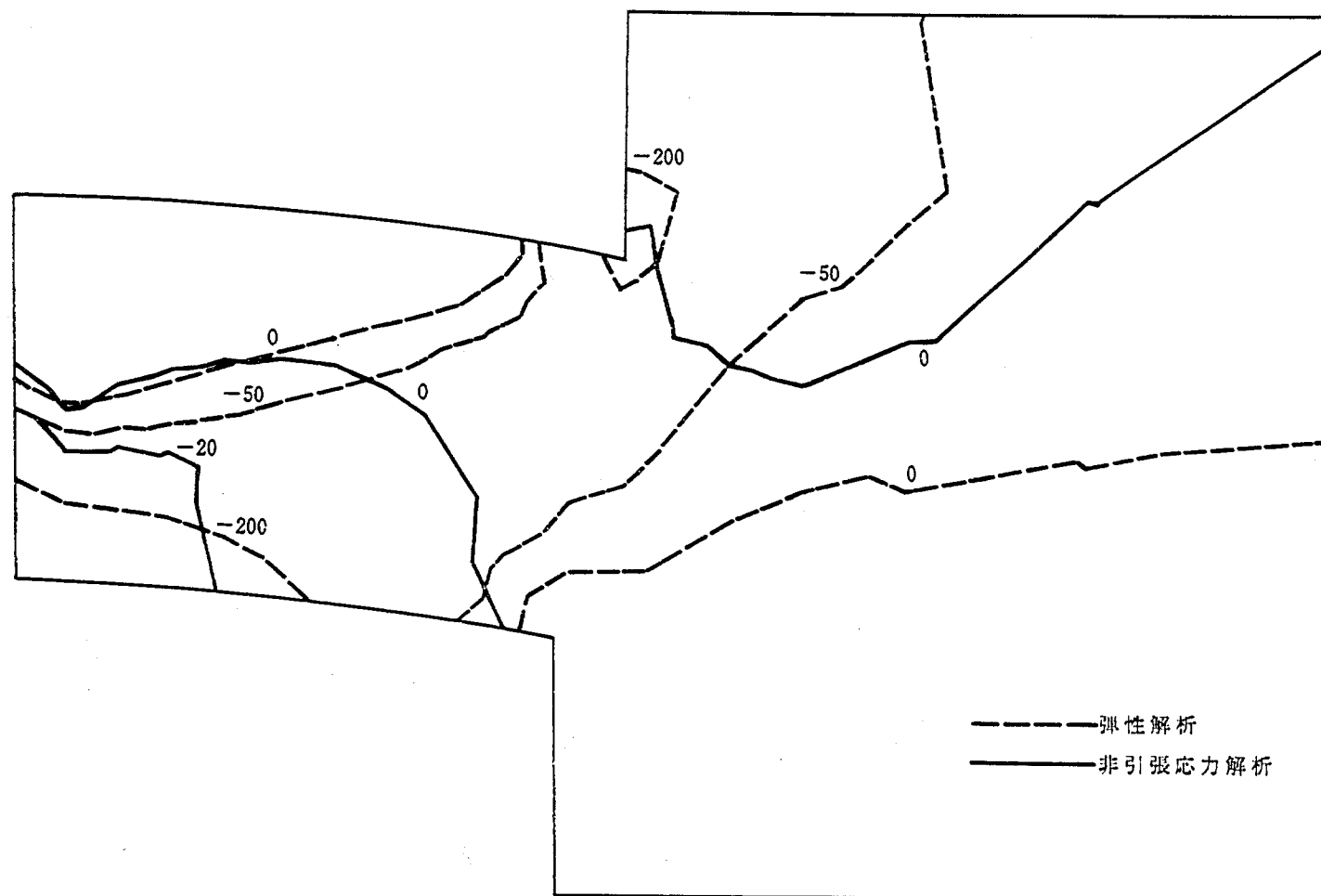


図-3.8 引張応力領域図 (t/m^2)

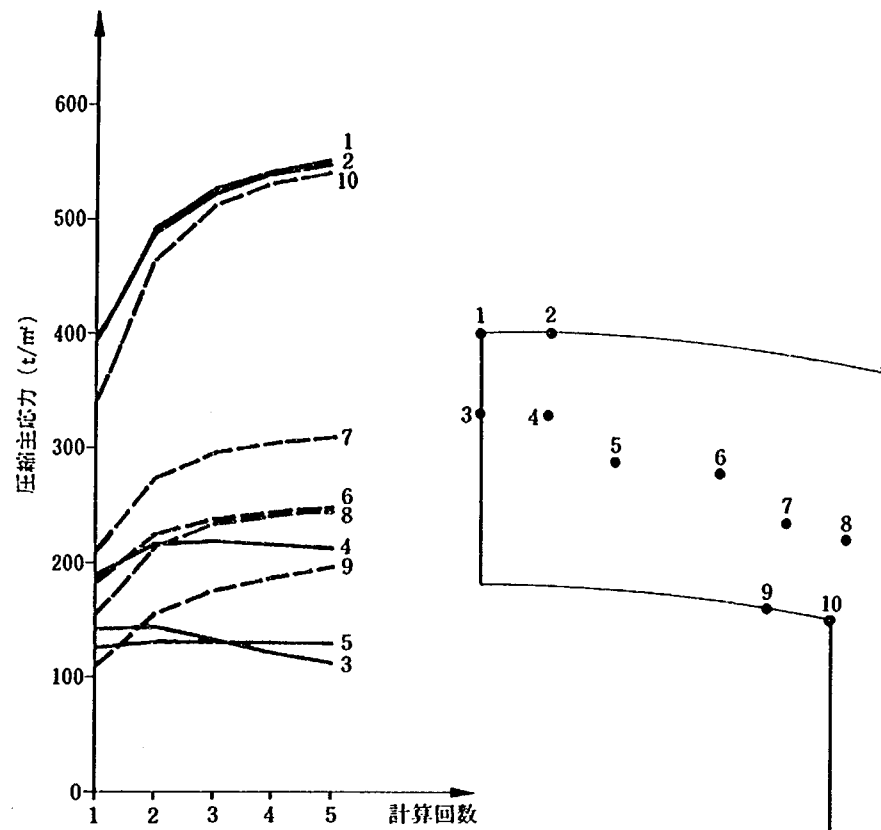


図-3.9 圧縮主応力（第一主応力）と計算回数の関係

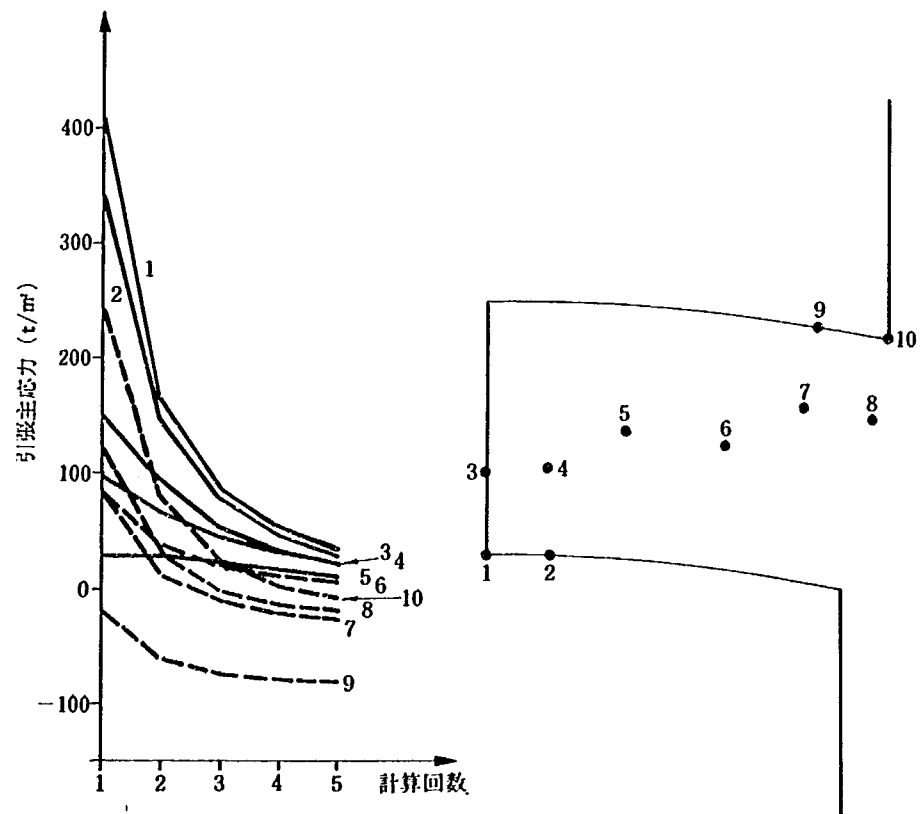


図-3.10 引張主応力（第二主応力）と計算回数関係

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プ ロ グ ラ ム リ ス ト

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	C		FEM	55
	C		FEM	56
	C	... KCHEK MUST BE INTEGER*4	FEM	57
	C		FEM	58
ISN 0034		INTEGER*2 NELML,NELMR,LCHCK,NCHCK,MCHCK	FEM	59
	C		FEM	60
ISN 0035		COMMON /COM03/ NELML(2000,3),NELMR(2000,3),LCHCK(2000,3),	FEM	61
		KCHEK(2000,3),NCHCK(2000,3),MCHCK(2000,3)	FEM	62
	C		FEM	63
	C		FEM	64
ISN 0036		COMMON /COM04/ TITLE(20),XWIDTH,YWIDTH,RHSINP(100)	FEM	65
		,NUMLVL,MNODE,MELMT	FEM	66
	C		FEM	67
ISN 0037		COMMON /COM05/ ICNC	FEM	68
	C		FEM	69
ISN 0038		COMMON / STRAIN / DEX(2000), DEY(2000), DGAMXY(2000)	FEMUP	1
ISN 0039		COMMON / STRESS / DSIGX(2000), DSIGY(2000), DSIGZ(2000),	FEMUP	2
	1	DTAUXY(2000)	FEMUP	3
ISN 0040		COMMON / PTOT / PPT(2,1000)	FEMUP	4
ISN 0041		COMMON / DTOT / DIT(2000)	FEMUP	5
ISN 0042		COMMON / RTOT / RET(100)	FEMUP	6
ISN 0043		COMMON / DASH / ITENS	FEMUP	7
ISN 0044		COMMON / NUTEN / NULIN, ITERA, NPRINT, ALON, NSWCH(10),	FEMUP	8
	1	TAUC(10), TANPHI(10)	FEMUP	9
ISN 0045		COMMON / INTS / SAI(2000), SYI(2000), SZI(2000), TAU1(2000)	FEMUP	10
ISN 0046		COMMON / ITN / INUM	FEMUP	11
	C		FEM	70
	C		FEM	71
ISN 0047		DATA NSLIMIT,LLIMIT /2000,2000/	FEM	72
	C		FEM	73
ISN 0048		CALL ERRSET(244,256,1,0)	FEM	74
ISN 0049		CALL ERRSET(209,256,1,0)	FEM	75
ISN 0050		CALL ERRSET(235,256,1,0)	FEM	76
ISN 0051		CALL ERRSET (212,256,1,0)	FEM	77
ISN 0052		CALL ERRSET (208,256,1,0)	FEM	78
ISN 0053		CALL ERRSET (207,256,1,0)	FEM	79
ISN 0054		IESW = 0	FEM	80
ISN 0055		ETA6=1.E-8	FEM	81
ISN 0056		IEKROK = 0	FEM	82
ISN 0057	111	LDGW = 0	FEM	83
ISN 0058		KSFY = 0	FEM	84
ISN 0059	10000	CONTINUE	FEM	85
	C		FEM	86
ISN 0060		INUM= 0	FEMUP	12
ISN 0061		ICNC = 0	FEM	87
	C		FEM	88
ISN 0062		DO 500 I = 1,LLIMIT	FEM	89
ISN 0063		EX(I)=0.0	FEM	90
ISN 0064		EY(I)=0.0	FEM	91
ISN 0065		GAMXY(I)=0.0	FEM	92
ISN 0066		SIGX(I)= 0.0	FEMUP	13
ISN 0067		SIGY(I)= 0.0	FEMUP	14
ISN 0068		SIGZ(I)= 0.0	FEMUP	15
ISN 0069		TAUXY(I)= 0.0	FEMUP	16
ISN 0070	500	CONTINUE	FEM	93
ISN 0071		DO 1000 I = 1,NSLIMIT	FEM	94
ISN 0072		DIF(I)=0.0	FEM	95
ISN 0073		AMENI(1)=0.0	FEM	96

ISN 0074	OIT(1)= 0.0	FEMUP 17
ISN 0075	1000 CONTINUE	FEM 97
ISN 0076	DO 3000 I=1,100	FEM 98
ISN 0077	REAC(1)=0.0	FEM 99
ISN 0078	RET(1)= 0.0	FEMUP 18
ISN 0079	3000 CONTINUE	FEM 100
ISN 0080	CALL INPT	FEM 101
ISN 0081	DO 5000 I=1,LMAX	FEMUP 19
ISN 0082	SIGX(I)= SX1(I)	FEMUP 20
ISN 0083	SIGY(I)= SY1(I)	FEMUP 21
ISN 0084	SIGZ(I)= SZ1(I)	FEMUP 22
ISN 0085	TAUXY(I)= TAU1(I)	FEMUP 23
ISN 0086	5000 CONTINUE	FEMUP 24
ISN 0087	IF (LDSW.NE.0) GO TO 3300	FEM 102
ISN 0089	CALL STFMX	FEM 103
ISN 0090	3300 CONTINUE	FEM 104
ISN 0091	IF(NGLIN.EQ.0) ITERA= 1	FEMUP 25
ISN 0093	DO 3100 I=1,ITERA	FEMUP 26
ISN 0094	INUM= INUM + 1	FEMUP 27
ISN 0095	CALL CGMC	FEM 105
ISN 0096	CALL STRESK	FEM 106
ISN 0097	C	FEMUP 28
ISN 0098	CALL NOTENS	FEMUP 29
	IF(NPRINT.EQ.0 .AND. ITENS.NE.0 .AND. I.NE.ITERA) GO TO 3100	FEMUP 30
ISN 0100	C	FEMUP 31
	CALL GREEN	FEM 107
ISN 0101	C	FEM 108
	CALL CNTHN	FEM 109
ISN 0102	C	FEM 110
ISN 0104	IF (KSFTY.EQ.0) GO TO 3600	FEM 111
ISN 0105	CALL SAFETY	FEM 112
ISN 0106	3600 CONTINUE	FEM 113
ISN 0108	IF(ITENS.EQ.0) GO TO 3200	FEMUP 32
ISN 0109	3100 CONTINUE	FEMUP 33
ISN 0110	3200 CONTINUE	FEMUP 34
ISN 0112	IF (IESW.EQ.1) GO TO 4000	FEM 114
ISN 0114	IF (IESW.EQ.2) GO TO 111	FEM 115
ISN 0115	LDSW = 1	FEM 116
ISN 0116	KSFTY = 0	FEM 117
ISN 0117	LDCN = LDCND	FEM 118
ISN 0118	GO TO 10000	FEM 119
ISN 0119	4000 CONTINUE	FEM 120
ISN 0121	IF(JCD.NE.0.OR.JBB.NE.0) CALL PLOT(0.,0.,999)	FEM 121
ISN 0122	STOP	FEM 122
	END	FEM 123

ISN 0002	SUBROUTINE INPT	FEM 124
	C	FEM 125
	C.... INPUT ROUTINE	FEM 126
	C READ INPUT CARD ETC.	FEM 127
	C	FEM 128
	C	FEM 129
ISN 0003	COMMON/LOADS/ IXCY,ALALX,ALALY,IXOF	FEM 130
ISN 0004	COMMON/GLORAL/ IERROK,IPEMAX,IGMAX,NMAX,LMAX,ETA6	FEM 131
ISN 0005	COMMON /IPTC/ C1J(9,10),CSD(7,10)	FEM 132
ISN 0006	COMMON /FLG/ IESW,LOSW,KSFY,LOCN,LOCNO	FEM 133
ISN 0007	COMMON/CUNDT/ JHH,JCC,JDD,EEE,FFF,GG1,GG2,JHH,J11,ITA6	FEM 134
ISN 0008	COMMON/CONDS/ ILOSS,IIR(20),IIDC,JDC	FEM 135
ISN 0009	COMMON / NOTEN / NOLIN, ITERA, NPRINT, ALLOW, NSWCH(10),	FEMUP 35
	1 TAUO(10), TANPHI(10)	FEMUP 36
	C	FEM 136
ISN 0010	INTEGER*2 IIDC(1000),JDC(1000,10)	FEM 137
	C	FEM 138
ISN 0011	DATA IDCON1 /'CONT' /	FEM 139
ISN 0012	DATA IPTLMT /10 /	FEM 140
ISN 0013	DIMENSION IA(20),ITS(20)	FEM 141
ISN 0014	DATA IBLANK /1H /	FEM 142
ISN 0015	DATA NRB,NR1 /1HP,3HATE /	FEM 143
	C	FEM 144
ISN 0016	IF (LOSW.NE.0) GO TO 6400	FEM 145
	C	FEM 146
ISN 0018	11111 CONTINUE	FEM 147
ISN 0019	WRITE (6,600)	FEM 148
ISN 0020	WRITE (6,600)	FEM 149
ISN 0021	600 FORMAT (1H1,2EX,20(4H****)	FEM 150
	* / 27X, 40H TWO-DIMENSIONAL ANALYSIS (ELASTIC)	FEM 151
	* 40H BY F.E-METHOD 3	FEM 152
	* / 27X,20(4H****) /)	FEM 153
	C	FEM 154
ISN 0022	ILOSS=0	FEM 155
ISN 0023	READ(5,555) IK, J88, JCC, JDD, EEE, FFF, GG1, GG2,JHH, J11,	FEMUP 37
	1 ITA6, NOLIN, IA	FEMUP 38
ISN 0024	555 FORMAT(A4, 1X, 3I5, 4E10.0, 4I5, T1, 20A4)	FEMUP 39
ISN 0025	WRITE(6,666) IA	FEM 156
ISN 0026	666 FORMAT (27X,20A4)	FEM 157
ISN 0027	NIJK= NOLIN	FEMUP 40
ISN 0028	IF(NIJK.EQ.2) NOLIN= 3	FEMUP 41
ISN 0030	IF(NIJK.EQ.3) NOLIN= 2	FEMUP 42
ISN 0032	IF(IA(1).EQ.IDCON1) GO TO 1000	FEM 160
ISN 0034	GO TO 9888	FEM 161
	C	FEM 162
	C TITLE CARD READ	FEM 163
ISN 0035	1000 CONTINUE	FEM 164
ISN 0036	IF(NOLIN.EQ.0) GO TO 11	FEMUP 43
ISN 0038	READ(5,556) ITERA, NPRINT, ALLOW, IA	FEMUP 44
ISN 0039	556 FORMAT(5X, 2I5, E10.0, T1, 20A4)	FEMUP 45
ISN 0040	WRITE(6,666) IA	FEMUP 46
ISN 0041	11 CONTINUE	FEMUP 47
ISN 0042	READ(5,551) IAB,IA,ITS	FEM 165

ISN 0002		DEFINE FILE 99(510,512,L,IRNXT)	FEM	2
ISN 0003		COMMON /CONDT/ JBB,JCC,JDD,EEE,FFF,GG1,GG2,JHH,JII,ITAB	FEM	3
ISN 0004		COMMON /GLOBAL/ IERRDR,IPEMAX,IGMAX,NMAX,LMAX,ETAB	FEM	4
ISN 0005	C	COMMON /CGC/ AHENI(2000),DREAC(100)	FEM	5
ISN 0006		REAL*E AHENI,DREAC	FEM	6
ISN 0007	C	COMMON /STRESS/ EX(2000),EY(2000),GAMXY(2000),DIF(2000),REAC(100)	FEM	7
ISN 0008		COMMON /PLG/ 1ESW,LDSW,KSFY,LDCN,LDCNG	FEM	8
ISN 0009		COMMON /LOADS/ IXQY,ALALX,ALALY,IXGF	FEM	9
ISN 0010		COMMON /IPTC/ CIJ(9,10),CDD(7,10)	FEM	10
ISN 0011	C	COMMON /CONDS/ ILODS,11B(20),11DC(1000),JDC(1000,10)	FEM	11
ISN 0012		INTEGER*2 11DC,JDC	FEM	12
ISN 0013	C	COMMON /LMNTC/ NLMNT	FEM	13
ISN 0014	C	COMMON /NODEC/ NNS(2000),NSN(1000),X(1000),Y(1000)	FEM	14
ISN 0015	1	JQ(50),NCC(2,50),CM(50)	FEM	15
ISN 0016	C	INTEGER*2 NNS,NSN,NSMN,JQ,NCC	FEM	16
ISN 0017		COMMON /LMNT1/ LSL(2000),IPTE(2000),LLA(4000),NL(2000,2)	FEM	17
ISN 0018		INTEGER*2 LSL,IPTE,LLA,NL	FEM	18
ISN 0019	C	COMMON /LMNT2/ SIGX(2000),SIGY(2000),SIGZ(2000),TAUXY(2000)	FEM	19
ISN 0020		COMMON /LMNT3/ ITN(1000),NLL(1000,10)	FEM	20
ISN 0021	C	INTEGER*2 ITN,NLL	FEM	21
ISN 0022		COMMON /LLDATA/ XLSX(2000),XLSY(2000),LLSD(1000),LLT	FEM	22
ISN 0023	C	INTEGER*2 LLSD,LLT	FEM	23
ISN 0024		COMMON /STFNTX/ TABL(2,12000),ELETAB(2,2000),LTABLE(1000),	FEM	24
ISN 0025		NTABLE(6000),INTAB(50),NONTAB(1000)	FEM	25
ISN 0026	C	INTEGER*2 LTABLE,NTABLE,INTAB,NONTAB	FEM	26
ISN 0027		COMMON /LOADC/ P(2000),PP(2,1000),CLUAD(100)	FEM	27
ISN 0028	C	COMMON /SAFTYC/ SIG1(2000),SIG2(2000),SITAL(2000),	FEM	28
ISN 0029		S1(1000),S2(1000),SITAN(1000)	FEM	29
ISN 0030		COMMON /KESNC/ GKESNX,GKESNY	FEM	30
ISN 0031		COMMON /GRPLOT/ X2MAX,Y2MAX,PAPER,X1MAX,Y1MAX,XXX1	FEM	31
ISN 0032	C	COMMON /LOBUN/ 180UN(20)	FEM	32
ISN 0033		COMMON /PLDATA/ NNSD(1000),NN	FEM	33
ISN 0034	C	INTEGER*2 NNSD,NN	FEM	34
ISN 0035	C	COMMON /COMO1/ CORDM(1000,2),MELEM(3,2000),RHS(1000)	FEM	35
ISN 0036	C	COMMON /COMO2/ CORDL(2000,3,2),CORDK(2000,3,2),RHS(2000,3),	FEM	36
ISN 0037		RHSR(2000,3),CRHS(2000,3,2)	FEM	37

ISN 0043	501	FORMAT(A1,A3,19A4,T1,20A4)	FEM 166
ISN 0044		IF (IAB-EQ-NRB-AND-IA(1)-EQ-NR1) GO TO 1002	FEM 167
ISN 0046	1001	CONTINUE	FEM 168
ISN 0047		WRITE (6,601) IAB,IA	FEM 169
ISN 0048		WRITE (8,601) IAS,IA	FEM 170
ISN 0049	601	FORMAT (27X,A1,A3,19A4)	FEM 171
ISN 0050		IF(IAB-EQ-ISLANK) GO TO 3700	FEM 172
ISN 0052		WRITE (6,602)	FEM 173
ISN 0053	602	FORMAT (16X, 'INPUT ERROR')	FEM 174
ISN 0054		GO TO 9999	FEM 175
ISN 0055	3700	CONTINUE	FEM 176
ISN 0056		ILOSS=1	FEM 177
ISN 0057		DO 15 N=1,20	FEM 178
ISN 0058		11B(N)=ITS(N)	FEM 179
ISN 0059	15	CONTINUE	FEM 180
ISN 0060		GO TO 11	FEMUP 48
	C	PATE CARD READ	FEM 182
ISN 0061	1002	CONTINUE	FEM 183
ISN 0062		WRITE (6,603) IAS,IA	FEM 184
ISN 0063	603	FORMAT (27X,A1,A3,19A4)	FEM 185
ISN 0064		READ (5,604) IPEMAX,IA	FEM 186
ISN 0065	604	FORMAT (4X,12,T1,20A4)	FEM 187
ISN 0066		WRITE (6,605) IA	FEM 188
ISN 0067	605	FORMAT (27X,20A4)	FEM 189
ISN 0068		IF (IPEMAX-LE-COR-IPEMAX-GT-I-TLMT) GO TO 9C2C	FEM 190
ISN 0070	3000	CONTINUE	FEM 191
ISN 0071		DO 2000 IPAT=1,IPEMAX	FEM 192
ISN 0072		READ(5,503) (CIJ(IJ,IPAT),IJ=1,9), NSWCH(IPAT), IA	FEMUP 49
ISN 0073	503	FORMAT(9E10.0, 13, T1, 20A4)	FEMUP 50
ISN 0074		WRITE (6,606) IA	FEM 195
ISN 0075		IF(NOLIN-EC-0) GO TO 2000	FEMUP 51
ISN 0077		READ(5,504) TAUO(IPAT), TANPHI(IPAT), IA	FEMUP 52
ISN 0078	504	FORMAT(2F10.0, T1, 20A4)	FEMUP 53
ISN 0079		WRITE(6,606) IA	FEMUP 54
ISN 0080		TANPHI(IPAT)= ATAN(TANPHI(IPAT))	FEMUP 55
	C		FEM 196
ISN 0081	2000	CONTINUE	FEM 197
ISN 0082		DO 6050 L=1,IPEMAX	FEM 198
ISN 0083		C11=CIJ(1,L)	FEM 199
ISN 0084		C12=CIJ(2,L)	FEM 200
ISN 0085		C13=CIJ(3,L)	FEM 201
ISN 0086		C21=CIJ(4,L)	FEM 202
ISN 0087		C22=CIJ(5,L)	FEM 203
ISN 0088		C23=CIJ(6,L)	FEM 204
ISN 0089		C31=CIJ(7,L)	FEM 205
	C		FEM 206
ISN 0090		CN=C11/C12	FEM 207
ISN 0091		CALPHA=(C12/(1.-2.*C11+C21+C22+C23/C12-C11/C13+C22**2	FEM 208
		-C21**2+C11/C12-C12+C23**2/C13))	FEM 209
	C		FEM 210
ISN 0092		CDD(1,L)=CALPHA*CN*(1.-C12+C23**2/C13)	FEM 211
	C		FEM 212
ISN 0093		CDD(2,L)=CALPHA*CN*(C21+C12+C22+C23/C13)	FEM 213
	C		FEM 214
ISN 0094		CDD(3,L)=CALPHA*CN*(C22+C21+C23)	FEM 215
	C		FEM 216
ISN 0095		CDD(4,L)=CALPHA*(1.-C11/C13+C22**2)	FEM 217
	C		FEM 218

ISN 0096	C	CDD(5,L)=CALPHA*CN*(C23+C12/C11+C21+C22)	FEM 219
ISN 0097	C	CDD(6,L)=C31	FEM 220
ISN 0098	C	CDD(7,L)=C.	FEM 221
ISN 0099	C	8050 CONTINUE	FEM 222
ISN 0100	C	CALL NODE	FEM 223
ISN 0101		CALL LMNT	FEM 224
ISN 0102		IF(JBB.EQ.0.AND.JDD.EQ.1) GO TO 73	FEM 225
ISN 0104	6400	CONTINUE	FEM 226
ISN 0105		CALL LOAD	FEM 227
ISN 0106		RETURN	FEM 228
ISN 0107	73	CONTINUE	FEM 229
ISN 0108		IXCY=1	FEM 230
ISN 0109		CALL GREEN	FEM 231
ISN 0110	C	9020 CONTINUE	FEM 232
ISN 0111		WRITE (6,19020)	FEM 233
ISN 0112	19020	FORMAT (1H, 'THERE ARE TOO MANY PATTERNS INDICATED.')	FEM 234
ISN 0113		GO TO 9990	FEM 235
ISN 0114	C	9999 CONTINUE	FEM 236
ISN 0115		IEKRO=IEKRO+1	FEM 237
ISN 0116		GO TO 1000	FEM 238
ISN 0117	9990	CONTINUE	FEM 239
ISN 0118		IEKRO=IEKRO+1	FEM 240
ISN 0119		GO TO 3000	FEM 241
ISN 0120	9880	CONTINUE	FEM 242
ISN 0121		WRITE (6,6666)	FEM 243
ISN 0122	6666	FORMAT (' CARD-10 ON THE FIRST CARD SHOULD BE CONT')	FEM 244
ISN 0123		STOP	FEM 245
ISN 0124		END	FEM 246

ISN 0002		SUBROUTINE LMNT	FEM 253
	C		FEM 254
	C		FEM 255
	C		FEM 256
	C		FEM 257
	C		FEM 258
ISN 0003		COMMON/GLOBAL/ IERRON,IPEMAX,IUMAX,NMAX,LMAX,ETA6	FEM 259
ISN 0004		COMMON /LMNTC/ NBLMNT	FEM 260
ISN 0005		COMMON /NODEC/ NNS(2000),NSN(1000),X(1000),Y(1000)	FEM 261
ISN 0006		COMMON /NODEC/ JJC(50),NCC(2,50),QM(50)	FEM 262
ISN 0007		COMMON / INTS / SX1(2000), SY1(2000), SZ1(2000), TAU1(2000)	FEM 263
	C		FEM 264
ISN 0008		INTEGER*2 NNS,NSN,NSMN,JJC,NCC	FEM 265
	C		FEM 266
ISN 0009		COMMON /LMNT1/ LSL(2000),IPTC(2000),LLA(4000),NL(2000,3)	FEM 267
	C		FEM 268
ISN 0010		INTEGER*2 LSL,IPTC,LLA,NL	FEM 269
	C		FEM 270
ISN 0011		COMMON /LMNT2/ SIGX(2000),SIGY(2000),SIGZ(2000),TAUXY(2000)	FEM 271
ISN 0012		COMMON /LMNT3/ ITN(1000),NLL(1000,10)	FEM 272
	C		FEM 273
ISN 0013		INTEGER*2 ITN,NLL	FEM 274
	C		FEM 275
ISN 0014		COMMON/COND1/JRB,JCC,JDD,EEE,FFF,GG1,GG2,JHH,J11,17A6	FEM 276
ISN 0015		COMMON/COND3/ ILOSS,I1B(20),I1UC,JDC	FEM 277
	C		FEM 278
ISN 0016		INTEGER*2 I1UC(1000),JDC(1000,10)	FEM 279
	C		FEM 280
ISN 0017		COMMON/LLDATA/XLSX(2000),XLSY(2000),LLSD,LLT	FEM 281
	C		FEM 282
ISN 0018		INTEGER*2 LLSD(1000),LLT	FEM 283
	C		FEM 284
ISN 0019		DIMENSION NSM(4),XM(3),YM(3),IA(20)	FEM 285
	C		FEM 286
ISN 0020		DATA LSLIMT,LLIMT /4000,2000/	FEM 287
ISN 0021		DATA MDLMNT/4HLMNT/	FEM 288
ISN 0022		DATA MDLOAD /"LOAD"/	FEM 289
	C		FEM 290
ISN 0023		FUNC(XI,XJ,XK,YI,YJ,YK)=1./2.*(1.+XJ=YK+1.+XK=YI+X1=YJ+1.-YI=XJ+1.-X1=1.+YK=YJ+XK=1.)	FEM 291
	C		FEM 292
	C		FEM 293
ISN 0024		DO 7000 I=1,1000	FEM 294
ISN 0025		DO 7001 I1=1,10	FEM 295
ISN 0026		JDC(I,I1)=0	FEM 296
ISN 0027	7001	CONTINUE	FEM 297
ISN 0028		I1UC(I)=0	FEM 298
ISN 0029	7000	CONTINUE	FEM 299
ISN 0030		LLT=0	FEM 300
ISN 0031		DO 1000 LA=1,LSLIMT	FEM 301
ISN 0032		LLA(LA)=0	FEM 302
ISN 0033		1000 CONTINUE	FEM 303
	C		FEM 304

ISN 0034		DO 1100 N=1,NMAX	FEM 305
ISN 0035		ITN(N)=0	FEM 306
ISN 0036		1100 CONTINUE	FEM 307
	C		FEM 308
	C		FEM 309
ISN 0037		DO 10000 L=1,20000	FEM 310
ISN 0038		XXXX=0.	FEM 311
ISN 0039		YYYY=0.	FEM 312
ISN 0040		REAC (5,500) IOLMNT,LS,(NSM(M),M=1,3),IPATE,	FEM 313
		RSIGX,RSIGY,RSIGZ,RTAUXY,1A	FEM 314
ISN 0041	500	FORMAT (A4,I5,1X,3I5,2I1X,12,4X,4E6.0,7I1,20A4)	FEM 315
ISN 0042		WRITE (6,600) 1A	FEM 316
ISN 0043	600	FORMAT(1H,20A,20A4)	FEM 317
ISN 0044		IF (IOLMNT.NE.MULMNT) GO TO 10100	FEM 318
ISN 0046		IF (L.GT.LLIMIT) GO TO 9010	FEM 319
ISN 0048		LA=1ABS(LS)	FEM 320
ISN 0049		LSLIL)=LA	FEM 321
ISN 0050		IPTC(L)=IPATE	FEM 322
ISN 0051		SXI(L)= RSIGX	FEMUP 57
ISN 0052		SYI(L)= RSIGY	FEMUP 58
ISN 0053		SZI(L)= RSIGZ	FEMUP 59
ISN 0054		TAUI(L)= RTAUXY	FEMUP 60
ISN 0055		IF (LA.LE.0 .OR.LA.GT.LSLIMT) GO TO 9020	FEM 327
ISN 0057		LLA(LA)=L	FEM 328
ISN 0058		IF (IPATE.LE.0.OR.IPATE.GT.IPEMAX) GO TO 9031	FEM 329
ISN 0060		DO 2000 M=1,3	FEM 330
ISN 0061		NS=NSM(M)	FEM 331
ISN 0062		IF (NS.LE.0.OR.NS.GT.LSLIMT) GO TO 9040	FEM 332
ISN 0064		N=NNS(NS)	FEM 333
ISN 0065		IF (N.LE.0.OR.N.GT.NMAX) GO TO 9040	FEM 334
ISN 0067		NLL(L,M)=N	FEM 335
ISN 0068		ITN(N)=ITN(N)+1	FEM 336
ISN 0069		IITN=ITN(N)	FEM 337
ISN 0070		NLL(N,IITN)=L+10*M	FEM 338
ISN 0071		XM(M)=X(N)	FEM 339
ISN 0072		YM(M)=Y(N)	FEM 340
ISN 0073		XXXX=XXXX+X(N)	FEM 341
ISN 0074		YYYY=YYYY+Y(N)	FEM 342
ISN 0075		IF(JDD.EQ.0) GO TO 2000	FEM 343
ISN 0077		IF(M.EQ.3) GO TO 7300	FEM 344
ISN 0079		MM=MM+1	FEM 345
ISN 0080		GO TO 7400	FEM 346
ISN 0081	7300	CONTINUE	FEM 347
ISN 0082		MM=1	FEM 348
ISN 0083	7400	CONTINUE	FEM 349
ISN 0084		NSMA=NNS(NSM(M))	FEM 350
ISN 0085		NSMB=NNS(NSM(MM))	FEM 351
ISN 0086		IF(NSMA.LE.NSMB) GO TO 7401	FEM 352
ISN 0088		NAREA=NSMA	FEM 353
ISN 0089		NSMA=NSMB	FEM 354
ISN 0090		NSMB=NAREA	FEM 355
ISN 0091	7401	CONTINUE	FEM 356
ISN 0092		IIZ=IIDC(NSMA)	FEM 357
ISN 0093		IF(IIZ.EQ.0) GO TO 7600	FEM 358
ISN 0095		DO 7601 I=1,IIZ	FEM 359
ISN 0096		IF(JDC(NSMA,I).EQ.NSMB) GO TO 7200	FEM 360
ISN 0098	7601	CONTINUE	FEM 361
ISN 0099	7600	CONTINUE	FEM 362

ISN 0100		IIDC(NSMA)=IIDC(NSMA)+1	FEM 363
ISN 0101		MM=112+1	FEM 364
ISN 0102		JDC(NSMA,MM)=NSMB	FEM 365
ISN 0103	7200	CONTINUE	FEM 366
ISN 0104	2000	CONTINUE	FEM 367
	C		FEM 368
ISN 0105		DT=FUNC(XM(1),XM(2),XM(3),YM(1),YM(2),YM(3))	FEM 369
ISN 0106		IF (DT.GT.0) GO TO 3100	FEM 370
ISN 0108		GO TO 9120	FEM 371
	C		FEM 372
ISN 0109	3100	CONTINUE	FEM 373
ISN 0110		XLSX(L)=XXXX*FFF*10./3.	FEM 374
ISN 0111		ALSY(L)=YYYY*FFF*10./3.	FEM 375
ISN 0112		IF(LS.GT.0) GO TO 1601	FEM 376
ISN 0114		LS=-LS	FEM 377
ISN 0115		LLT=LLT+1	FEM 378
ISN 0116		LLSD(LLI)=L	FEM 379
ISN 0117	1601	CONTINUE	FEM 380
ISN 0118	10000	CONTINUE	FEM 381
ISN 0119		GO TO 9840	FEM 382
	C		FEM 383
ISN 0120	10100	CONTINUE	FEM 384
ISN 0121		IF (IDLMNT.NE.MULOAD) GO TO 9710	FEM 385
	C		FEM 386
ISN 0123		LMAX=L-1	FEM 387
ISN 0124		IF (LMAX.NE.NELMNT) GO TO 9720	FEM 388
ISN 0126		IF (LMAX.LE.0) GO TO 9725	FEM 389
ISN 0128		DO 4000 N=1,NMAX	FEM 390
ISN 0129		IF (ITN(N).LE.0) GO TO 9160	FEM 391
ISN 0131	4000	CONTINUE	FEM 392
	C		FEM 393
	C		FEM 394
ISN 0132	10300	CONTINUE	FEM 395
	C	*****	FEM 396
	C	*****	FEM 397
ISN 0133		RETURN	FEM 398
	C	*****	FEM 399
	C	*****	FEM 400
	C		FEM 401
ISN 0134	9010	CONTINUE	FEM 402
ISN 0135		WRITE(6,19010)	FEM 403
ISN 0136	19010	FORMAT (1H ,30HTHERE ARE TOO MANY LMNT-CARDS.)	FEM 404
ISN 0137		GO TO 9991	FEM 405
	C		FEM 406
	C		FEM 407
ISN 0138	9020	CONTINUE	FEM 408
ISN 0139		WRITE(6,19020)	FEM 409
ISN 0140	19020	FORMAT (1H ,30HELEMENT NUMBER IS OUT OF SEQUENCE OR OUT OF RANGE.)	FEM 410
ISN 0141		GO TO 9991	FEM 411
	C		FEM 412
	C		FEM 413
ISN 0142	9031	CONTINUE	FEM 414
ISN 0143		WRITE(6,19031) IPATE	FEM 415
ISN 0144	19031	FORMAT (1X,*IPATE = ',15,' IS OUT OF RANGE.')	FEM 416
ISN 0145		GO TO 9991	FEM 417
	C		FEM 418
	C		FEM 419
ISN 0146	9040	CONTINUE	FEM 420

ISN 0147	WRITE (6,19040) NS	FEM 421
ISN 0148	19040 FORMAT(1H,21HUNDEFINED NODAL POINT,15, 16H IS REFERRED TO.)	FEM 422
ISN 0149	GO TO 9991	FEM 423
	C	FEM 424
	C	FEM 425
ISN 0150	9120 CONTINUE	FEM 426
ISN 0151	WRITE (6,19120)	FEM 427
ISN 0152	19120 FORMAT (1H,29HALLLOCATION OF THE THREE VERTICES IS NOT,	FEM 428
	1 16H COUNTENCLOCKWISE.)	FEM 429
ISN 0153	GO TO 9991	FEM 430
	C	FEM 431
	C	FEM 432
ISN 0154	9160 CONTINUE	FEM 433
ISN 0155	WRITE (6,19160) NSN(N)	FEM 434
ISN 0156	19160 FORMAT (1H,15HTHE NODAL POINT,15, 20H IS NOT REFERRED TO	FEM 435
	1 17HIN ANY LMNT-CARD.)	FEM 436
ISN 0157	GO TO 9994	FEM 437
	C	FEM 438
	C	FEM 439
ISN 0158	9710 CONTINUE	FEM 440
ISN 0159	WRITE (6,19710)	FEM 441
ISN 0160	19710 FORMAT (1H,30HIDENTIFICATION ERROR.	FEM 442
	1 40HCARD SEQUENCE ERROR MIGHT BE PRESUMABLE.)	FEM 443
ISN 0161	GO TO 9991	FEM 444
	C	FEM 445
	C	FEM 446
ISN 0162	9725 CONTINUE	FEM 447
ISN 0163	WRITE (6,19725) NBLMNT,LMAX	FEM 448
ISN 0164	19725 FORMAT (1H,43HTHE NUMBER OF ELEMENTS IS NOT AS INDICATED.	FEM 449
	1 /1H,20HINDICATED 15	FEM 450
	2 /1H,20HACTUALLY READ 15)	FEM 451
ISN 0165	GO TO 9994	FEM 452
	C	FEM 453
	C	FEM 454
ISN 0166	9840 CONTINUE	FEM 455
ISN 0167	WRITE (6,19840) L	FEM 456
ISN 0168	19840 FORMAT (5X,*L IS OVER 2000*,15,* IN LMNT.*)	FEM 457
ISN 0169	GO TO 9992	FEM 458
	C	FEM 459
	C	FEM 460
ISN 0170	9991 CONTINUE	FEM 461
ISN 0171	IERKOR=IERKOR+1	FEM 462
ISN 0172	GO TO 10000	FEM 463
	C	FEM 464
	C	FEM 465
ISN 0173	9992 CONTINUE	FEM 466
ISN 0174	IERKOR=IERKOR+1	FEM 467
ISN 0175	GO TO 10100	FEM 468
	C	FEM 469
	C	FEM 470
ISN 0176	9994 CONTINUE	FEM 471
ISN 0177	IERKOR=IERKOR+1	FEM 472
ISN 0178	GO TO 10300	FEM 473
	C	FEM 474
	C	FEM 475
ISN 0179	END	FEM 476

ISN 0002		SUBROUTINE STPMTA	FEM 477
	C		FEM 478
	C		FEM 479
	C		FEM 480
	C		FEM 481
	C		FEM 482
ISN 0003		COMMON/GLOBAL/ IERROR,IPEMAX,ISMAX,NMAX,LMAX,ETA6	FEM 483
ISN 0004		COMMON /IPTC/ C1J(4,10),CDU(7,10)	FEM 484
ISN 0005		COMMON /NODEC/ NNS(2000),NSN(1000),X(1000),Y(1000)	FEM 485
ISN 0006		COMMON /NODEC/ JU(50),NCC(2,50),QM(50)	FEM 486
ISN 0007	C	INTEGER*2 NNS,NSN,NSMN,JQ,NCC	FEM 487
ISN 0008	C	COMMON /LMNT1/ LSL(2000),IPTE(2000),LLA(4000),NL(2000,3)	FEM 488
ISN 0009	C	INTEGER*2 LSL,IPTE,LLA,NL	FEM 489
ISN 0010	C	COMMON /LMNT2/ SIGX(2000),SIGY(2000),SIGZ(2000),TAUXY(2000)	FEM 490
ISN 0011	C	COMMON /LMNT3/ ITN(1000),NLL(1000,10)	FEM 491
ISN 0012	C	INTEGER*2 ITN,NLL	FEM 492
ISN 0013	C	COMMON /STPMTA/ TABLE(2,12000),ELETAB(2,2000),LTABLE(1000), NTABLE(6000),ICTAB(50),NONTAB(1000)	FEM 493
	C		FEM 494
ISN 0014	C	INTEGER*2 LTABLE,NTABLE,ICTAB,NONTAB	FEM 495
ISN 0015	C	DIMENSION XM(3),YM(3),IM(3)	FEM 496
ISN 0016	C	DIMENSION XXK(2,2000)	FEM 497
ISN 0017	C	DATA NLIMIT,NSLIMIT /1000,2000/	FEM 498
ISN 0018	C	DATA NLMTAB,NLMNTB /12000,6000/	FEM 499
ISN 0019	C	FUNC11(C110,YJK,C130,XXJ,C330,PHI) * =(C110*YJK**2+2.*C130*XXJ*YJK+C330*XXJ**2)/(PHI*2.)	FEM 500
ISN 0020	C	FUNC12(C110,YKI,YJK,C130,XXJ,XIK,C230,PHI) * =(C110*YKI*YJK+C130*(YKI*XXJ+YJK*XIK)+C230*XIK*XXJ)/(PHI*2.)	FEM 501
ISN 0021	C	FUNC13(C110,YIJ,YJK,C130,XJI,XXJ,C330,PHI) * =(C110*YIJ*YJK+C130*(YJK*XJI+YIJ*XXJ)+C330*XJI*XXJ)/(PHI*2.)	FEM 502
ISN 0022	C	FUNC14(C120,YJK,XXJ,C230,C130,C330,PHI) * =(C120*YJK*XXJ+C230*XXJ**2+C130*YJK**2+C330*YJK*XXJ)/(PHI*2.)	FEM 503
ISN 0023	C	FUNC15(C120,YJK,XIK,C230,XXJ,C130,YKI,C330,PHI) * =(C120*YJK*XIK+C230*XXJ*XIK+C130*YKI*YJK+C330*YKI*XXJ)/(PHI *2.)	FEM 504
ISN 0024	C	FUNC16(C120,YJK,XJI,C230,XXJ,C130,YIJ,C330,PHI) * =(C120*YJK*XJI+C230*XXJ*XJI+C130*YIJ*YJK+C330*YIJ*XXJ)/(PHI	FEM 505

		* 2.)	FEM 530
ISN 0025	C	FUNC22(C110,YK1,C130,X1K,C330,PH1)	FEM 531
		* =(C110*YK1**2+2.*C130*YK1*X1K+C330*X1K**2)/(PH1*2.)	FEM 532
	C		FEM 533
ISN 0026	C	FUNC23(C110,YK1,Y1J,C130,X1K,XJ1,C330,PH1)	FEM 534
		* =(C110*YK1*Y1J+C130*(X1K*Y1J+XJ1*YK1)+C330*XJ1*X1K)/(PH1*2.)	FEM 535
	C		FEM 536
ISN 0027	C	FUNC24(C120,YK1,XKJ,C230,X1K,C130,YJK,C330,PH1)	FEM 537
		* =(C120*YK1*XKJ+C230*X1K*XKJ+C130*YK1*YJK+C330*X1K*YJK)/(PH1*2.)	FEM 538
	C		FEM 539
ISN 0028	C	FUNC25(C120,YK1,X1K,C230,C130,C330,Y1K,PH1)	FEM 540
		* =(C120*YK1*X1K+C230*X1K**2+C130*YK1**2-C330*Y1K*X1K)/(PH1*2.)	FEM 541
	C		FEM 542
ISN 0029	C	FUNC26(C120,YK1,XJ1,C230,X1K,C130,Y1J,C330,PH1)	FEM 543
		* =(C120*YK1*XJ1+C230*X1K*XJ1+C130*YK1*Y1J+C330*X1K*Y1J)/(PH1*2.)	FEM 544
	C		FEM 545
ISN 0030	C	FUNC33(C110,Y1J,C130,XJ1,C330,PH1)	FEM 546
		* =(C110*Y1J**2+2.*C130*(Y1J*XJ1)+C330*XJ1**2)/(PH1*2.)	FEM 547
	C		FEM 548
ISN 0031	C	FUNC34(C120,Y1J,XKJ,C230,XJ1,C130,YJK,C330,PH1)	FEM 549
		* =(C120*Y1J*XKJ+C230*XJ1*XKJ+C130*Y1J*YJK+C330*XJ1*YJK)/(PH1*2.)	FEM 550
	C		FEM 551
ISN 0032	C	FUNC35(C120,Y1J,X1K,C230,XJ1,C130,YK1,C330,Y1K,PH1)	FEM 552
		* =(C120*Y1J*X1K+C230*X1K*XJ1+C130*YK1*Y1J-C330*XJ1*Y1K)/(PH1*2.)	FEM 553
	C		FEM 554
ISN 0033	C	FUNC36(C120,Y1J,XJ1,C230,C130,C330,PH1)	FEM 555
		* =(C120*Y1J*XJ1+C230*XJ1**2+C130*Y1J**2-C330*XJ1*Y1J)/(PH1*2.)	FEM 556
	C		FEM 557
ISN 0034	C	FUNC44(C220,XKJ,C230,YJK,C330,PH1)	FEM 558
		* =(C220*XKJ**2+2.*C230*YJK*XKJ+C330*YJK**2)/(PH1*2.)	FEM 559
	C		FEM 560
ISN 0035	C	FUNC45(C220,XKJ,X1K,C230,YJK,YK1,C330,PH1)	FEM 561
		* =(C220*XKJ*X1K+C230*YJK*X1K+C230*YK1*XKJ+C330*YJK*YK1)/(PH1*2.)	FEM 562
	C		FEM 563
ISN 0036	C	FUNC46(C220,XKJ,XJ1,C230,YJK,Y1J,C330,PH1)	FEM 564
		* =(C220*XKJ*XJ1+C230*YJK*XJ1+C230*XKJ*Y1J+C330*YJK*Y1J)/(PH1*2.)	FEM 565
	C		FEM 566
ISN 0037	C	FUNC55(C220,X1K,C230,YK1,C330,PH1)	FEM 567
		* =(C220*X1K**2+2.*C230*YK1*X1K+C330*YK1**2)/(PH1*2.)	FEM 568
	C		FEM 569
ISN 0038	C	FUNC56(C220,X1K,XJ1,C230,YK1,Y1J,C330,PH1)	FEM 570
		* =(C220*X1K*XJ1+C230*YK1*XJ1+C230*Y1J*X1K+C330*YK1*Y1J)/(PH1*2.)	FEM 571
	C		FEM 572
ISN 0039	C	FUNC66(C220,XJ1,C230,Y1J,C330,PH1)	FEM 573
		* =(C220*XJ1**2+2.*C230*Y1J*XJ1+C330*Y1J**2)/(PH1*2.)	FEM 574
	C		FEM 575
ISN 0040	C	TABLE ZERO SET	FEM 576
		DC 100 I=1,2	FEM 577
	C		FEM 578
	C		FEM 579
	C		FEM 580
	C		FEM 581
	C		FEM 582
	C		FEM 583
	C		FEM 584
	C		FEM 585
	C		FEM 586
	C		FEM 587

ISN 0041	DO 100 J = 1,NLMTAB	FEM 588
ISN 0042	TABLE(I,J)=0.0	FEM 589
ISN 0043	100 CONTINUE	FEM 590
	C	FEM 591
	C	FEM 592
ISN 0044	DO 200 I=1,2	FEM 593
ISN 0045	DO 200 J = 1,NSLIMIT	FEM 594
ISN 0046	ELETAB(I,J)=0.0	FEM 595
ISN 0047	200 CONTINUE	FEM 596
	C	FEM 597
	C	FEM 598
ISN 0048	DO 300 I = 1,NLIMIT	FEM 599
ISN 0049	LTABLE(I)=0	FEM 600
ISN 0050	NTAB(I)=0	FEM 601
ISN 0051	300 CONTINUE	FEM 602
	C	FEM 603
	C	FEM 604
ISN 0052	DO 400 I = 1,NLMNTR	FEM 605
ISN 0053	NTABLE(I)=0	FEM 606
ISN 0054	400 CONTINUE	FEM 607
	C	FEM 608
	C	FEM 609
ISN 0055	DO 500 I=1,50	FEM 610
ISN 0056	ICTAB(I)=0	FEM 611
ISN 0057	500 CONTINUE	FEM 612
	C	FEM 613
	C	FEM 614
ISN 0058	ISUM=0	FEM 615
ISN 0059	IISUM=0	FEM 616
	C	FEM 617
	C	FEM 618
	C	FEM 619
ISN 0060	DO 1000 I=1,NMAX	FEM 620
ISN 0061	DO 800 I1=1,2	FEM 621
ISN 0062	DO 800 J = 1,NSLIMIT	FEM 622
ISN 0063	XXX(I1,J)=0.0	FEM 623
ISN 0064	800 CONTINUE	FEM 624
	C	FEM 625
ISN 0065	LMNT NO SET	FEM 626
ISN 0066	I1=ITN(I)	FEM 627
ISN 0067	DO 2000 I1=1,I1	FEM 628
ISN 0068	LENTNU=NLL(I,I1)	FEM 629
ISN 0069	LND=LENTNU/10	FEM 630
	C	FEM 631
	C	FEM 632
ISN 0070	 ZAHYC KEISAN	FEM 633
ISN 0071	DO 3000 M=1,3	FEM 634
ISN 0072	N=NLL(LND,M)	FEM 635
ISN 0073	XM(M)=X(N)	FEM 636
ISN 0074	YM(M)=Y(N)	FEM 637
ISN 0075	IM(M)=N	FEM 638
	3000 CONTINUE	FEM 639
	C	FEM 640
ISN 0076	XIJ=XM(1)-XM(2)	FEM 641
ISN 0077	XJX=XM(2)-XM(3)	FEM 642
ISN 0078	XKI=XM(3)-XM(1)	FEM 643
ISN 0079	XJI=-XIJ	FEM 644
ISN 0080	XKJ=-XJK	FEM 645
ISN 0081	XIK=-XKI	
ISN 0082	YIJ=YM(1)-YM(2)	

ISN 0083		YJK=YM(2)-YM(3)	FEM 646
ISN 0084		YKI=YM(3)-YM(1)	FEM 647
ISN 0085		YJI=-YIJ	FEM 648
ISN 0086		YKJ=-YJK	FEM 649
ISN 0087		YIK=-YKI	FEM 650
ISN 0088	C	PHI=XJ1-YK1-XK1-YJI	FEM 651
ISN 0089		IPATT = 1PTE(LND)	FEM 652
ISN 0090	C	C11D = COD(1,IPATT)	FEM 653
ISN 0091		C12D = COD(2,IPATT)	FEM 654
ISN 0092		C13D = 0.0	FEM 655
ISN 0093		C22D = COD(4,IPATT)	FEM 656
ISN 0094		C23D = 0.0	FEM 657
ISN 0095		C33D = COD(6,IPATT)	FEM 658
ISN 0096	C	I11=IM(1)*2-1	FEM 659
ISN 0097		JJJ=IM(2)*2-1	FEM 660
ISN 0098		KKK=IM(3)*2-1	FEM 661
ISN 0099		I11=IM(1)*2	FEM 662
ISN 0100		JJ1=IM(2)*2	FEM 663
ISN 0101		KK1=IM(3)*2	FEM 664
ISN 0102		GD TO (4000,4100,4200),IND	FEM 665
ISN 0103	C		FEM 666
ISN 0104	C	4000 CONTINUE	FEM 667
ISN 0105		XK = FUNC11(C11D,YJK,C13D,XKJ,C33D,PHI)	FEM 668
		XXX(1,I11) = XK + XXX(1,I11)	FEM 669
ISN 0106	C	XK = FUNC12(C11D,YKI,YJK,C12D,XKJ,XIK,C33D,PHI)	FEM 670
ISN 0107		XXX(1,JJJ) = XK + XXX(1,JJJ)	FEM 671
ISN 0108	C	XK = FUNC13(C11D,YIJ,YJK,C13D,XJ1,XKJ,C33D,PHI)	FEM 672
ISN 0109		XXX(1,KKK) = XK + XXX(1,KKK)	FEM 673
ISN 0110	C	XK = FUNC14(C12D,YJK,XKJ,C23D,C13D,C33D,PHI)	FEM 674
ISN 0111		XXX(1,I11) = XK + XXX(1,I11)	FEM 675
ISN 0112	C	XK = FUNC15(C12D,YJK,XIK,C23D,XKJ,C13D,YK1,C33D,PHI)	FEM 676
ISN 0113		XXX(1,JJ1) = XK + XXX(1,JJ1)	FEM 677
ISN 0114	C	XK = FUNC16(C12D,YJK,XJ1,C23D,XKJ,C12D,YIJ,C33D,PHI)	FEM 678
ISN 0115		XXX(1,KK1) = XK + XXX(1,KK1)	FEM 679
ISN 0116	C	XK = FUNC14(C12D,YJK,XKJ,C23D,C13D,C33D,PHI)	FEM 680
ISN 0117		XXX(2,I11) = XK + XXX(2,I11)	FEM 681
ISN 0118	C	XK = FUNC24(C12D,YKI,XKJ,C23D,XIK,C13D,YJK,C33D,PHI)	FEM 682
ISN 0119		XXX(2,JJJ) = XK + XXX(2,JJJ)	FEM 683
ISN 0120	C	XK = FUNC34(C12D,YIJ,XKJ,C23D,XJ1,C13D,YJK,C33D,PHI)	FEM 684
ISN 0121		XXX(2,KKK) = XK + XXX(2,KKK)	FEM 685
ISN 0122	C	XK = FUNC44(C22D,XKJ,C23D,YJK,C33D,PHI)	FEM 686
ISN 0123		XXX(2,I11) = XK + XXX(2,I11)	FEM 687
ISN 0124	C	XK = FUNC45(C22D,XKJ,XIK,C23D,YJK, YK1,C33D,PHI)	FEM 688
ISN 0125		XXX(2,JJ1) = XK + XXX(2,JJ1)	FEM 689

ISN 0126	C	XK = FUNC46(C22D,XKJ,XJI,C23D,YJK, YIJ,C33D,PHI)	FEM 704
ISN 0127		XXX(2,KK1) = XK + XXX(2,KK1)	FEM 705
ISN 0128		GO TO 5000	FEM 706
	C		FEM 707
	C		FEM 708
ISN 0129	*100	CONTINUE	FEM 709
ISN 0130		XK = FUNC12(C11D,YKI,YJK,C13D,XKJ,XIK,C33D,PHI)	FEM 710
ISN 0131		XXX(1,III) = XK + XXX(1,III)	FEM 711
	C		FEM 712
ISN 0132		XK = FUNC22(C11D,YKI,C13D,XIK,C33D,PHI)	FEM 713
ISN 0133		XXX(1,JJJ) = XK + XXX(1,JJJ)	FEM 714
	C		FEM 715
ISN 0134		XK = FUNC23(C11D,YKI,YIJ,C13D,XIK,XJI,C33D,PHI)	FEM 716
ISN 0135		XXX(1,KKK) = XK + XXX(1,KKK)	FEM 717
	C		FEM 718
ISN 0136		XK = FUNC24(C12D,YKI,XKJ,C23D,XIK,C13D,YJK,C33D,PHI)	FEM 719
ISN 0137		XXX(1,III) = XK + XXX(1,III)	FEM 720
	C		FEM 721
ISN 0138		XK = FUNC25(C12D,YKI,XIK,C23D,C13D,C33D,YIK,PHI)	FEM 722
ISN 0139		XXX(1,JJI) = XK + XXX(1,JJI)	FEM 723
	C		FEM 724
ISN 0140		XK = FUNC26(C12D,YKI,XJI,C23D,XIK,C13D,YIJ,C33D,PHI)	FEM 725
ISN 0141		XXX(1,KK1) = XK + XXX(1,KK1)	FEM 726
	C		FEM 727
ISN 0142		XK = FUNC15(C12D,YJK,XIK,C23D,XKJ,C13D,YAI,C33D,PHI)	FEM 728
ISN 0143		XXX(2,III) = XK + XXX(2,III)	FEM 729
	C		FEM 730
ISN 0144		XK = FUNC25(C12D,YKI,XIK,C23D,C13D,C33D,YIK,PHI)	FEM 731
ISN 0145		XXX(2,JJJ) = XK + XXX(2,JJJ)	FEM 732
	C		FEM 733
ISN 0146		XK = FUNC35(C12D,YIJ,XIK,C23D,XJI,C13D,YKI,C33D,YIK,PHI)	FEM 734
ISN 0147		XXX(2,KKK) = XK + XXX(2,KKK)	FEM 735
	C		FEM 736
ISN 0148		XK = FUNC45(C22D,XKJ,XIK,C23D,YJK, YAI,C33D,PHI)	FEM 737
ISN 0149		XXX(2,III) = XK + XXX(2,III)	FEM 738
	C		FEM 739
ISN 0150		XK = FUNC55(C22D,XIK,C23D,YKI,C33D,PHI)	FEM 740
ISN 0151		XXX(2,JJI) = XK + XXX(2,JJI)	FEM 741
	C		FEM 742
ISN 0152		XK = FUNC56(C22D,XIK,XJI,C23D,YKI, YIJ,C33D,PHI)	FEM 743
ISN 0153		XXX(2,KK1) = XK + XXX(2,KK1)	FEM 744
ISN 0154		GO TO 5000	FEM 745
	C		FEM 746
	C		FEM 747
ISN 0155	*200	CONTINUE	FEM 748
ISN 0156		XK = FUNC13(C11D,YIJ,YJK,C13D,XJI,XKJ,C33D, PHI)	FEM 749
ISN 0157		XXX(1,III) = XK + XXX(1,III)	FEM 750
	C		FEM 751
ISN 0158		XK = FUNC23(C11D,YKI,YIJ,C13D,XIK,XJI,C33D,PHI)	FEM 752
ISN 0159		XXX(1,JJJ) = XK + XXX(1,JJJ)	FEM 753
	C		FEM 754
ISN 0160		XK = FUNC33(C11D,YIJ,C13D,XJI,C23D,PHI)	FEM 755
ISN 0161		XXX(1,KKK) = XK + XXX(1,KKK)	FEM 756
	C		FEM 757
ISN 0162		XK = FUNC34(C12D,YIJ,XKJ,C23D,XJI,C13D,YJK,C33D,PHI)	FEM 758
ISN 0163		XXX(1,III) = XK + XXX(1,III)	FEM 759
	C		FEM 760
			FEM 761

ISN 0164		XX = FUNC35(C12D,YIJ,XIK,C23D,XJI,C13D,YKI,C33D,YIK,PHI)	FEM	762
ISN 0165		XXX(1,JJ1) = XX + XXX(1,JJ1)	FEM	763
	C		FEM	764
ISN 0166		XX = FUNC36(C12D,YIJ,XJI,C23D,C13D,C33D,PHI)	FEM	765
ISN 0167		XXX(1,KK1) = XX + XXX(1,KK1)	FEM	766
	C		FEM	767
ISN 0168		XX = FUNC16(C12D,YJK,XJI,C23D,XKJ,C13D,YIJ,C33D,PHI)	FEM	768
ISN 0169		XXX(2,III) = XX + XXX(2,III)	FEM	769
	C		FEM	770
ISN 0170		XX = FUNC26(C12D,YKI,XJI,C23D,XIK,C13D,YIJ,C33D,PHI)	FEM	771
ISN 0171		XXX(2,JJJ) = XX + XXX(2,JJJ)	FEM	772
	C		FEM	773
ISN 0172		XX = FUNC36(C12D,YIJ,XJI,C23D,C13D,C33D,PHI)	FEM	774
ISN 0173		XXX(2,KKK) = XX + XXX(2,KKK)	FEM	775
	C		FEM	776
ISN 0174		XX = FUNC46(C22D,XXJ,XJI,C23D,YJA, YIJ,C33D,PHI)	FEM	777
ISN 0175		XXX(2,III) = XX + XXX(2,III)	FEM	778
	C		FEM	779
ISN 0176		XX = FUNC56(C22D,XIK,XJI,C23D,YKI, YIJ,C33D,PHI)	FEM	780
ISN 0177		XXX(2,JJ1) = XX + XXX(2,JJ1)	FEM	781
	C		FEM	782
ISN 0178		XX = FUNC66(C22D,XJI,C23D,YIJ,C33D,PHI)	FEM	783
ISN 0179		XXX(2,KK1) = XX + XXX(2,KK1)	FEM	784
	C		FEM	785
ISN 0180	3000	CONTINUE	FEM	786
	C		FEM	787
	C		FEM	788
ISN 0181	2000	CONTINUE	FEM	789
	C		FEM	790
	C	... SHITEN SHORI	FEM	791
	C		FEM	792
ISN 0182		DO 3100 K=1,IQMAX	FEM	793
ISN 0183		IF (1-NE-JQ(K)) GO TO 3100	FEM	794
ISN 0185		IK=K	FEM	795
ISN 0186		GO TO 3500	FEM	796
ISN 0187	3100	CONTINUE	FEM	797
ISN 0188		GO TO 3900	FEM	798
	C		FEM	799
ISN 0189	3500	CONTINUE	FEM	800
ISN 0190		NMAX2=NMAX+2	FEM	801
	C		FEM	802
ISN 0191		DO 3510 N=2,NMAX2,2	FEM	803
ISN 0192		N1=N-1	FEM	804
ISN 0193		IF (XXX(1,N1)-NE-0.0 .OR. XXX(1,N)-NE-0.0) GO TO 3520	FEM	805
ISN 0195		IF (XXX(2,N1)-NE-0.0 .OR. XXX(2,N)-NE-0.0) GO TO 3520	FEM	806
ISN 0197		GO TO 3510	FEM	807
ISN 0198	3520	CONTINUE	FEM	808
ISN 0199		IQTAB(IK)=IQTAB(IK)+1	FEM	809
ISN 0200		IISUM=IISUM+1	FEM	810
ISN 0201		NONTAB(IISUM)=N/2	FEM	811
ISN 0202		IISUM2=IISUM+2	FEM	812
ISN 0203		IISUM1=IISUM2-1	FEM	813
ISN 0204		ELETAB(1,IISUM1)=XXX(1,N1)	FEM	814
ISN 0205		ELETAB(1,IISUM2)=XXX(1,N)	FEM	815
ISN 0206		ELETAB(2,IISUM1)=XXX(2,N1)	FEM	816
ISN 0207		ELETAB(2,IISUM2)=XXX(2,N)	FEM	817
ISN 0208	3510	CONTINUE	FEM	818
	C		FEM	819

ISN 0209		IF (NCC(1,IK).EQ.1 .AND. NCC(2,IK).EQ.1)	GO TO 3530	FEM 820
ISN 0211		IF (NCC(1,IK).EQ.1 .AND. NCC(2,IK).NE.1)	GO TO 3540	FEM 821
ISN 0213		IF (NCC(1,IK).NE.1 .AND. NCC(2,IK).EQ.1)	GO TO 3550	FEM 822
ISN 0215	C	CONTINUE		FEM 823
ISN 0216	3530	DO 3535 N=1,NMAX2		FEM 824
ISN 0217		DO 3535 NN=1,2		FEM 825
ISN 0218		XXX(INN,N)=0.0		FEM 826
ISN 0219	3535	CONTINUE		FEM 827
ISN 0220		XXX(1,2+I-1)=1.		FEM 828
ISN 0221		XXX(2,2+I)=1.		FEM 829
ISN 0222		GO TO 3500		FEM 830
ISN 0223	C	CONTINUE		FEM 831
ISN 0224	3540	CONTINUE		FEM 832
ISN 0225	C	DO 3545 N=1,NMAX2		FEM 833
ISN 0226		XXX(2,N)=-TAN(QM(1K))*XXX(1,N)+XXX(2,N)		FEM 834
ISN 0227	3545	CONTINUE		FEM 835
ISN 0228		IXFIX=1		FEM 836
ISN 0229		GO TO 3500		FEM 837
ISN 0230	C	CONTINUE		FEM 838
ISN 0231	3550	DO 3555 N=1,NMAX2		FEM 839
ISN 0232		XXX(1,N)=TAN(QM(1K))*XXX(2,N)+XXX(1,N)		FEM 840
ISN 0233		IXFIX=2		FEM 841
ISN 0234	3555	CONTINUE		FEM 842
ISN 0235	C	CONTINUE		FEM 843
ISN 0236	3900	CONTINUE		FEM 844
ISN 0237	C	DO 3200 K=1,INMAX		FEM 845
ISN 0238		IF (NCC(1,K).EQ.1) GO TO 3300		FEM 846
ISN 0239		GO TO 3400		FEM 847
ISN 0240	C	CONTINUE		FEM 848
ISN 0241	3300	KA=J0(K)		FEM 849
ISN 0242		KA2=KA*2		FEM 850
ISN 0243		KA1=KA2-1		FEM 851
ISN 0244		XXX(1,KA2)=-TAN(QM(K))*XXX(1,KA1)+XXX(1,KA2)		FEM 852
ISN 0245		XXX(2,KA2)=-TAN(QM(K))*XXX(2,KA1)+XXX(2,KA2)		FEM 853
ISN 0246		XXX(1,KA1)=0.0		FEM 854
ISN 0247		XXX(2,KA1)=0.0		FEM 855
ISN 0248	3400	CONTINUE		FEM 856
ISN 0249		IF (NCC(2,K).EQ.1) GO TO 3600		FEM 857
ISN 0250		GO TO 3200		FEM 858
ISN 0251	C	CONTINUE		FEM 859
ISN 0252	3600	KA=J0(K)		FEM 860
ISN 0253		KA2=KA*2		FEM 861
ISN 0254		KA1=KA2-1		FEM 862
ISN 0255		XXX(1,KA1)= TAN(QM(K))*XXX(1,KA2)+XXX(1,KA1)		FEM 863
ISN 0256		XXX(2,KA1)= TAN(QM(K))*XXX(2,KA2)+XXX(2,KA1)		FEM 864
ISN 0257		XXX(1,KA2)=0.0		FEM 865
ISN 0258		XXX(2,KA2)=0.0		FEM 866
ISN 0259	3200	CONTINUE		FEM 867
ISN 0260	C	IF (IXFIX.EQ.1) GO TO 3210		FEM 868

ISN 0262	C	GO TO 3230	FEM 878
	C		FEM 879
ISN 0263	3210	CONTINUE	FEM 880
	C		FEM 881
ISN 0264		DO 3220 K=1,NMAX2	FEM 882
ISN 0265		XXX(1,K)=0.0	FEM 883
ISN 0266	3220	CONTINUE	FEM 884
	C		FEM 885
ISN 0267		XXX(1,2+1-1)=1.	FEM 886
ISN 0268		GO TO 5500	FEM 887
	C		FEM 888
ISN 0269	3230	CONTINUE	FEM 889
ISN 0270		IF (IXFIX.EQ.2) GO TO 3240	FEM 890
ISN 0272		GO TO 5500	FEM 891
	C		FEM 892
ISN 0273	3240	CONTINUE	FEM 893
	C		FEM 894
ISN 0274		DO 3250 K=1,NMAX2	FEM 895
ISN 0275		XXX(2,K)=0.0	FEM 896
ISN 0276	3250	CONTINUE	FEM 897
ISN 0277		XXX(2,2+1)=1.	FEM 898
ISN 0278	5500	CONTINUE	FEM 899
ISN 0279		IAFIX=0	FEM 900
	C		FEM 901
	C	COMPRESS AND MAKE TABLE	FEM 902
	C		FEM 903
ISN 0280		NMAX2=NMAX*2	FEM 904
ISN 0281		DO 6000 J1=2,NMAX2,2	FEM 905
ISN 0282		JJ1=J1-1	FEM 906
ISN 0283		IF (XXX(1,JJ1).EQ.0.0 .AND. XXX(1,J1).EQ.0.0) GO TO 6100	FEM 907
ISN 0285		GO TO 6200	FEM 908
ISN 0286	6100	CONTINUE	FEM 909
ISN 0287		IF (XXX(2,JJ1).EQ.0.0 .AND. XXX(2,J1).EQ.0.0) GO TO 6000	FEM 910
ISN 0289	6200	CONTINUE	FEM 911
ISN 0290		JJ2=J1/2	FEM 912
ISN 0291		LTABLE(I)=LTABLE(1)+1	FEM 913
ISN 0292		ISUM=ISUM+1	FEM 914
ISN 0293		IF (ISUM.GT.NLIMIT*6) GO TO 8888	FEM 915
	C		FEM 916
ISN 0295		NTABLE(ISUM)=JJ2	FEM 917
ISN 0296		ISUM1=ISUM-2-1	FEM 918
ISN 0297		ISUM2=ISUM-2	FEM 919
ISN 0298		TABLE(1,ISUM1)=XXX(1,JJ1)	FEM 920
ISN 0299		TABLE(1,ISUM2)=XXX(1,J1)	FEM 921
ISN 0300		TABLE(2,ISUM1)=XXX(2,JJ1)	FEM 922
ISN 0301		TABLE(2,ISUM2)=XXX(2,J1)	FEM 923
ISN 0302	6000	CONTINUE	FEM 924
ISN 0303	1000	CONTINUE	FEM 925
	C		FEM 926
	C		FEM 927
	C	*****	FEM 928
	C		FEM 929
ISN 0304		RETURN	FEM 930
	C		FEM 931
	C	*****	FEM 932
	C		FEM 933
	C		FEM 934
	C		FEM 935

ISN 0305	8888	CONTINUE	FEM 936
ISN 0306		WRITE (6,18888) 1	FEM 937
ISN 0307	18888	FORMAT ('1',10X,'*NTABLE & TABLE HAS EXCEED INDEX',10X, 1 '*AREND AT NODE NO. = ',I4)	FEM 938
	C		FEM 939
	C		FEM 940
ISN 0308		STOP	FEM 941
ISN 0309		END	FEM 942
			FEM 943
ISN 0002		SUBROUTINE CGMD	FEM 944
	C		FEM 945
	C		FEM 946
	C		FEM 947
	C		FEM 948
ISN 0003		REAL*8 A0,B,C0,C1,D0	FEM 949
	C		FEM 950
ISN 0004		COMMON/GLOBAL/ IERROR,IPEMAX,IUMAX,NMAX,LMAX,ETAB	FEM 951
ISN 0005		COMMON /CGC/ DXD(2000),REAC(2,50)	FEM 952
	C		FEM 953
ISN 0006		REAL*8 DXD,REAC,DX(2,1000)	FEM 954
	C		FEM 955
ISN 0007		EQUIVALENCE (DXD(1),DX(1,1))	FEM 956
	C		FEM 957
ISN 0008		REAL*8 RD(2000),R(2,1000),ASUM(2,1000),ASUMD(2000),P(2000)	FEM 958
	C		FEM 959
ISN 0009		EQUIVALENCE (RD(1),R(1,1)),(ASUM(1,1),ASUMD(1))	FEM 960
	C		FEM 961
ISN 0010		COMMON /STNTA/ A(2,12000),ELETA(2,2000),NBON(1000), JNB(6000),IQTAB(50),NONTAB(1000)	FEM 962
	C		FEM 963
	C		FEM 964
ISN 0011		REAL*8 W1,W2	FEM 965
	C		FEM 966
ISN 0012		INTEGER*2 NBON,JNB,IQTAB,NONTAB	FEM 967
	C		FEM 968
ISN 0013		COMMON /NODEC/ NNS(2000),NSN(1000),X(1000),Y(1000)	FEM 969
ISN 0014		COMMON /NODEC/ JQ(50),NCC(2,50),QM(50)	FEM 970
	C		FEM 971
ISN 0015		INTEGER*2 NNS,NSN,NSMN,JQ,NCC	FEM 972
	C		FEM 973
ISN 0016		COMMON /LOADC/ RK(2000),IDUML1(2000),KPLDAD(2,50)	FEM 974
	C		FEM 975
ISN 0017		REAL*4 RKNO(2,1000)	FEM 976
	C		FEM 977
ISN 0018		EQUIVALENCE (RK(1),RKNO(1,1))	FEM 978
	C		FEM 979
	C		FEM 980
ISN 0019		NB1=0	FEM 981
ISN 0020		NB2=0	FEM 982
ISN 0021		DO 8003 N=1,NMAX	FEM 983
ISN 0022		W1=0.0	FEM 984
ISN 0023		W2=0.0	FEM 985
ISN 0024		NB1=NB2+1	FEM 986
ISN 0025		NB2=NB2+NBON(N)	FEM 987
ISN 0026		DO 8003 NB=NB1,NB2	FEM 988
ISN 0027		J=JNB(NB)	FEM 989
ISN 0028		NB01=NB+NB-1	FEM 990
ISN 0029		NB02=NB+NB	FEM 991
ISN 0030		W1=W1 +DX(1,J)*A(1,NB01) +DX(2,J)*A(1,NB02)	FEM 992
ISN 0031		W2=W2 +DX(1,J)*A(2,NB01) +DX(2,J)*A(2,NB02)	FEM 993
ISN 0032	8003	CONTINUE	FEM 994
ISN 0033		R(1,N)=RKNO(1,N)-W1	FEM 995
			FEM 996

ISN 0034	K(2,N)=RKND(2,N)-W2	FEM 997
ISN 0035	8005 CONTINUE	FEM 998
	C	FEM 999
	C	FEM 1000
ISN 0036	ITCG=0	FEM 1001
ISN 0037	C0=C.000	FEM 1002
	C	FEM 1003
ISN 0038	NMAX2=NMAX+NMAX	FEM 1004
	C	FEM 1005
ISN 0039	DO 8010 N=1,NMAX2	FEM 1006
ISN 0040	P(N)=KD(N)	FEM 1007
ISN 0041	C0=C0+RD(N)*RD(N)	FEM 1008
ISN 0042	8010 CONTINUE	FEM 1009
	C	FEM 1010
ISN 0043	10 CONTINUE	FEM 1011
ISN 0044	ITCG=ITCG+1	FEM 1012
ISN 0045	D0=C.000	FEM 1013
ISN 0046	NB1=0	FEM 1014
ISN 0047	NB2=0	FEM 1015
ISN 0048	DO 8020 N=1,NMAX2	FEM 1016
ISN 0049	ASUMD(N)=C.C	FEM 1017
ISN 0050	8020 CONTINUE	FEM 1018
	C	FEM 1019
ISN 0051	DO 8040 N=1,NMAX	FEM 1020
	C	FEM 1021
ISN 0052	NB1=NB2+1	FEM 1022
ISN 0053	NB2=NB2+NECN(N)	FEM 1023
	C	FEM 1024
ISN 0054	DO 8030 NB=NB1,NB2	FEM 1025
ISN 0055	J=JNS(NB)	FEM 1026
	C	FEM 1027
ISN 0056	NBD1=NB+NB-1	FEM 1028
ISN 0057	NBU2=NB+NB	FEM 1029
ISN 0058	JD1 =J+J-1	FEM 1030
ISN 0059	JD2 =J+J	FEM 1031
ISN 0060	ASUM(1,N)=ASUM(1,N) +P(JD1)*A(1,NBD1) +P(JD2)*A(1,NBU2)	FEM 1032
ISN 0061	ASUM(2,N)=ASUM(2,N) +P(JD1)*A(2,NBD1) +P(JD2)*A(2,NBU2)	FEM 1033
ISN 0062	8030 CONTINUE	FEM 1034
	C	FEM 1035
ISN 0063	J1=2*N-1	FEM 1036
ISN 0064	J2=2*N	FEM 1037
ISN 0065	D0=D0+P(J1)*ASUMD(J1)+P(J2)*ASUMD(J2)	FEM 1038
ISN 0066	8040 CONTINUE	FEM 1039
	C	FEM 1040
ISN 0067	A0=C0/D0	FEM 1041
ISN 0068	C1=0.000	FEM 1042
	C	FEM 1043
	C	FEM 1044
ISN 0069	DO 8050 N=1,NMAX2	FEM 1045
	C	FEM 1046
ISN 0070	DXD(N)= DXD(N) +A0*P(N)	FEM 1047
ISN 0071	RD (N)= RD (N) -A0*ASUMD(N)	FEM 1048
	C	FEM 1049
ISN 0072	C1 = C1 +RD(N)*RD(N)	FEM 1050
	C	FEM 1051
ISN 0073	8050 CONTINUE	FEM 1052
	C	FEM 1053
ISN 0074	IF (ETA6.EC.C.C) ETA6=C.C001	FEM 1054

ISN 0076	IF (C1-LT-ETA6) GO TO 5000	FEM 1055
ISN 0078	B=C1/CC	FEM 1056
ISN 0079	CO = C1	FEM 1057
ISN 0080	IF (ITCG-GT-NMAX2) GO TO 5000	FEM 1058
ISN 0082	DO 8060 N=1,NMAX2	FEM 1059
ISN 0083	P (N)=RU(N) +B=P(N)	FEM 1060
ISN 0084	6060 CONTINUE	FEM 1061
ISN 0085	GO TO 10	FEM 1062
	C	FEM 1063
	C	FEM 1064
ISN 0086	5000 CONTINUE	FEM 1065
ISN 0087	WRITE (6,9080) ITCG,C1	FEM 1066
ISN 0088	9080 FORMAT (1X,'%C0(C-G) ITERATION,C1=',I5,E13.5,5X	FEM 1067
	'CONDITION SATISFIED')	FEM 1068
	C	FEM 1069
	C	FEM 1070
	C	FEM 1071
ISN 0089	DO 8070 IQ=1,IQMAX	FEM 1072
ISN 0090	IF (NCC(1,IQ).EQ.1) GO TO 5010	FEM 1073
ISN 0092	IF (NCC(2,IQ).EQ.1) GO TO 5005	FEM 1074
ISN 0094	WRITE (6,9090) NCC(1,IQ),NCC(2,IQ)	FEM 1075
ISN 0095	9090 FORMAT (1X,'%C0(C-G) NCC1-2=',2I5)	FEM 1076
	C	FEM 1077
	C	FEM 1078
	C	FEM 1079
ISN 0096	STOP	FEM 1080
	C	FEM 1081
	C	FEM 1082
	C	FEM 1083
	C	FEM 1084
ISN 0097	5005 CONTINUE	FEM 1085
ISN 0098	DX(2,JQ(IQ))=DX(1,JQ(IQ))*TAN(QM(IQ))	FEM 1086
ISN 0099	GO TO 8070	FEM 1087
	C	FEM 1088
ISN 0100	5010 CONTINUE	FEM 1089
ISN 0101	IF (NCC(2,IQ).EQ.1) GO TO 5020	FEM 1090
	C	FEM 1091
ISN 0103	DX(1,JQ(IQ))=-DX(2,JQ(IQ))*TAN(QM(IQ))	FEM 1092
ISN 0104	GO TO 8070	FEM 1093
	C	FEM 1094
ISN 0105	5020 CONTINUE	FEM 1095
ISN 0106	DX(1,JQ(IQ))=0.0	FEM 1096
ISN 0107	DX(2,JQ(IQ))=0.0	FEM 1097
	C	FEM 1098
ISN 0108	8070 CONTINUE	FEM 1099
ISN 0109	NB1=0	FEM 1100
ISN 0110	NB2=0	FEM 1101
	C	FEM 1102
ISN 0111	DO 8090 IQ=1,IQMAX	FEM 1103
ISN 0112	W1=0.0	FEM 1104
ISN 0113	W2=0.0	FEM 1105
ISN 0114	NB1=NB2+1	FEM 1106
ISN 0115	NB2=NB2+ICTAB(IQ)	FEM 1107
	C	FEM 1108
ISN 0116	DO 8080 NP=NB1,NB2	FEM 1109
ISN 0117	J=NUNTAB(NP)	FEM 1110
ISN 0118	NBD1=NP+NB-1	FEM 1111
ISN 0119	NBD2=NP+NS	FEM 1112
ISN 0120	W1=W1 +DX(1,J)*ELETAB(1,NBD1) +DX(2,J)*ELETAB(1,NBD2)	

ISN 0121	W2=W2 +DX(1,J)*ELETAB(2,NPD1) +DX(2,J)*ELETAB(2,NPD2)	FEM 1113
ISN 0122	8060 CONTINUE	FEM 1114
	C X Y-SUPPORTED	FEM 1115
ISN 0123	REAC(1,10)=W1 - RPLUAD(1,10)	FEM 1116
ISN 0124	REAC(2,10)=W2 - RPLUAD(2,10)	FEM 1117
ISN 0125	8090 CONTINUE	FEM 1118
	C	FEM 1119
	C	FEM 1120
	C	FEM 1121
	C	FEM 1122
ISN 0126	RETURN	FEM 1123
ISN 0127	END	FEM 1124
ISN 0002	SUBROUTINE STRESK	FEM 1125
	C	FEM 1126
	C	FEM 1127
	C	FEM 1128
ISN 0003	COMMON/GLOBAL/ IEXX0X,IPEMAX,ICMAX,NMAX,LMAX,ETAB	FEM 1129
ISN 0004	COMMON /IPTC/ CIJ(4,10),CDD(7,10)	FEM 1130
ISN 0005	COMMON /NODDC/ NNS(2000),NSN(1000),X(1000),Y(1000)	FEM 1131
ISN 0006	COMMON /NODDC/ J2(50),NCC(2,50),QM(50)	FEM 1132
	C	FEM 1133
ISN 0007	INTEGER*2 NNS,NSN,NSMN,JC,NCC	FEM 1134
	C	FEM 1135
ISN 0008	COMMON /LMNT1/ LSL(2000),IPTE(2000),LLA(4000),NL(2000,3)	FEM 1136
	C	FEM 1137
ISN 0009	INTEGER*2 LSL,IPTE,LLA,NL	FEM 1138
	C	FEM 1139
ISN 0010	COMMON /LMNT2/ SIGX(2000),SIGY(2000),SIGZ(2000),TAUXY(2000)	FEM 1140
ISN 0011	COMMON /LMNT3/ ITN(1000),NLL(1000,10)	FEM 1141
	C	FEM 1142
ISN 0012	INTEGER*2 ITN,NLL	FEM 1143
	C	FEM 1144
ISN 0013	COMMON /LOADC/ P(2000),PP(2,1000),CLOAD(100)	FEM 1145
ISN 0014	COMMON /CGC/ AHENI(2000),DREAC(100)	FEM 1146
	C	FEM 1147
ISN 0015	REAL*8 AHENI,DREAC	FEM 1148
	C	FEM 1149
ISN 0016	COMMON /SAFTYC/ SIG1(2000),SIG2(2000),SITAL(2000), S1(1000),S2(1000),SITAN(1000)	FEM 1150
	C	FEM 1151
ISN 0017	REAL*8 RI,RJ,RK,RI1,RJ1,RK1	FEM 1152
	C	FEM 1153
ISN 0018	COMMON /STRESC/ EX(2000),EY(2000),GAMXY(2000),LIF(2000),REAC(100)	FEM 1154
ISN 0019	COMMON /FLG/ IESW,LDSW,KSFY,LDCN,LDCND	FEM 1155
	C	FEM 1156
ISN 0020	COMMON / STRAIN / DEX(2000),DEY(2000), DGAMXY(2000)	FEMUP 61
ISN 0021	COMMON / STRESS / DSIGX(2000),DSIGY(2000), DSIGZ(2000), DTAUXY(2000)	FEMUP 62
	1	FEMUP 63
ISN 0022	COMMON / PTOT / PPT(2,1000)	FEMUP 64
ISN 0023	COMMON / DTOT / CIT(2000)	FEMUP 65
ISN 0024	COMMON / RTOT / RET(100)	FEMUP 66
ISN 0025	COMMON / OKSW / ITENS	FEMUP 67
ISN 0026	COMMON / NUTEN / NULIN, ITERA, NPRINT, ALUN, NSWCH(10), TAUU(10), TANPHI(10)	FEMUP 68
	1	FEMUP 69
ISN 0027	COMMON / ITN / INUM	FEMUP 70
	C	FEMUP 71
ISN 0028	DIMENSION XW(1000),YW(1000)	FEM 1157
ISN 0029	DIMENSION TIGX(2000),TIGY(2000),TIGZ(2000),GAUXY(2000)	FEM 1158
ISN 0030	DIMENSION XM(3),YM(3)	FEM 1159
ISN 0031	DIMENSION MD(2)	FEM 1160
	C	FEMUP 72
		FEM 1161

ISN 0032	DATA PA1/3.1415926E0/	FEM 1162
ISN 0033	DATA MD / 1H , 1MT, 1MS /	FEMUP 73
	C	FEM 1163
	C	FEM 1164
ISN 0034	FUNCX(PH1,YJK,RI,YK1,RJ,YIJ,RK)	FEM 1165
	* $=-1./PH1*(RI=YJK+KJ*YK1+RK*YIJ)$	FEM 1166
	C	FEM 1167
ISN 0035	FUNCY(PH1,XKJ,R11,X1K,RJJ,XJ1,KKK)	FEM 1168
	* $=-1./PH1*(R11=XKJ+RJJ*X1K+KKK*XJ1)$	FEM 1169
	C	FEM 1170
ISN 0036	FUNCXY(PH1,XKJ,R1,YJK,R11,X1K,RJ,YK1,RJJ,XJ1,RK,YIJ,KKK)	FEM 1171
	* $=-1./PH1*(R1=XKJ+R11*YJK+RJJ*X1K+RJJ*YK1+RK*XJ1+KKK*YIJ)$	FEM 1172
	C	FEM 1173
ISN 0037	FUNCST(C1,C2,C3,EX,EY,GXY)	FEM 1174
	* $=C1*EX+C2*EY+C3*GXY$	FEM 1175
	C	FEM 1176
ISN 0038	FUNCST1(FSIGX,FSIGY,FTAUXY)	FEM 1177
	* $=(FSIGX+FSIGY)/2.+SQRT((FSIGX-FSIGY)**2+4.*FTAUXY**2)/2.$	FEM 1178
	C	FEM 1179
ISN 0039	FUNCST2(FSIGX,FSIGY,FTAUXY)	FEM 1180
	* $=(FSIGX+FSIGY)/2.-SQRT((FSIGX-FSIGY)**2+4.*FTAUXY**2)/2.$	FEM 1181
	C	FEM 1182
	C	FEM 1183
	C	FEM 1184
	C	FEM 1185
ISN 0040	DO 1000 M=1,LMAX	FEM 1186
	C	FEM 1187
ISN 0041	DO 2000 I=1,3	FEM 1191
ISN 0042	N=NL(M,1)	FEM 1192
ISN 0043	XM(1)=X(N)	FEM 1193
ISN 0044	YM(1)=Y(N)	FEM 1194
ISN 0045	2000 CONTINUE	FEM 1195
ISN 0046	XIJ=XM(1)-XM(2)	FEM 1196
ISN 0047	XJK=XM(2)-XM(3)	FEM 1197
ISN 0048	XK1=XM(3)-XM(1)	FEM 1198
ISN 0049	XJ1=-XIJ	FEM 1199
ISN 0050	XKJ=-XJK	FEM 1200
ISN 0051	XK1=-XK1	FEM 1201
ISN 0052	YIJ=YM(1)-YM(2)	FEM 1202
ISN 0053	YJK=YM(2)-YM(3)	FEM 1203
ISN 0054	YK1=YM(3)-YM(1)	FEM 1204
ISN 0055	YJ1=-YIJ	FEM 1205
ISN 0056	YKJ=-YJK	FEM 1206
ISN 0057	YK1=-YK1	FEM 1207
ISN 0058	PH1=XJ1*YK1 - XK1*YJ1	FEM 1208
ISN 0059	N=NL(M,1)	FEM 1209
ISN 0060	IN=2*N-1	FEM 1210
ISN 0061	IIN=2*N	FEM 1211
ISN 0062	N=NL(M,2)	FEM 1212
ISN 0063	JN=2*N-1	FEM 1213
ISN 0064	JJN=2*N	FEM 1214
ISN 0065	N=NL(M,3)	FEM 1215
ISN 0066	KN=2*N-1	FEM 1216
ISN 0067	KKN=2*N	FEM 1217
	C	FEM 1218
ISN 0068	R1=AHEN1(IN)	FEM 1219
ISN 0069	RJ=AHEN1(JN)	FEM 1220
ISN 0070	RK=AHEN1(KN)	FEM 1221
ISN 0071	R11=AHEN1(IIN)	FEM 1222
ISN 0072	RJJ=AHEN1(JJN)	FEM 1223
ISN 0073	RKK=AHEN1(KKN)	FEM 1224
	C	FEM 1225
		FEM 1226

ISN 0074	EXDD = FUNCEX(PH1,YJK,R1,YK1,RJ,YIJ,KK)	FEM 1227
ISN 0075	EYDD = FUNCEY(PH1,XKJ,R11,X1K,KJJ,XJ1,KKK)	FEM 1228
ISN 0076	GAXYDD = FUNCEY(PH1,XKJ,R1,YJK,R11,X1K,KJJ,YK1,KJJ,XJ1,KK,YIJ,KKK)	FEM 1229
	C	FEM 1230
	C STRESS	FEM 1231
	C	FEM 1232
ISN 0077	K = 1/TE(M)	FEM 1233
ISN 0078	SIGXD=FUNCST(CDD(1,K),CDD(2,K),CDD(7,K),EXDD,EYDD,GAXYDD)	FEM 1234
ISN 0079	SIGYD=FUNCST(CDD(2,K),CDD(4,K),CDD(7,K),EAXD,EYDD,GAXYDD)	FEM 1235
ISN 0080	SIGZD=FUNCST(CDD(3,K),CDD(5,K),CDD(7,K),EAXD,EYDD,GAXYDD)	FEM 1236
ISN 0081	TAUXYD=FUNCST(CDD(7,K),CDD(7,K),CDD(6,K),EXDD,EYDD,GAXYDD)	FEM 1237
	C	FEM 1238
ISN 0082	DEX(M)= EXDD	FEM 1239
ISN 0083	DEY(M)= EYDD	FEMUP 74
ISN 0084	DGAMXY(M)= GAXYDD	FEMUP 75
	C	FEMUP 76
ISN 0085	DSIGX(M)= SIGXD	FEMUP 77
ISN 0086	DSIGY(M)= SIGYD	FEMUP 78
ISN 0087	DSIGZ(M)= SIGZD	FEMUP 79
ISN 0088	DIAUXY(M)= TAUXYD	FEMUP 80
ISN 0089	1000 CONTINUE	FEMUP 81
ISN 0090	DO 1001 M=1,LMAX	FEM 1241
ISN 0091	EX(M)= EX(M) + DEX(M)	FEMUP 82
ISN 0092	EY(M)= EY(M) + DEY(M)	FEMUP 83
ISN 0093	GAMXY(M)= GAMXY(M) + DGAMXY(M)	FEMUP 84
ISN 0094	SIGX(M)= SIGX(M) + DSIGX(M)	FEMUP 85
ISN 0095	SIGY(M)= SIGY(M) + DSIGY(M)	FEMUP 86
ISN 0096	SIGZ(M)= SIGZ(M) + DSIGZ(M)	FEMUP 87
ISN 0097	TAUXY(M)= TAUXY(M) + DIAUXY(M)	FEMUP 88
ISN 0098	1001 CONTINUE	FEMUP 89
	C	FEMUP 90
ISN 0099	NMAX2=NMAX*2	FLM 1244
	C	FEM 1250
ISN 0100	DO 8500 N=1,NMAX2	FEM 1251
ISN 0101	DIF(N)= AHENI(N)	FEM 1252
ISN 0102	8500 CONTINUE	FEMUP 91
	C	FEM 1254
ISN 0103	9050 CONTINUE	FEM 1255
ISN 0104	IUMAX2=IUMAX*2	FEM 1256
	C	FEM 1257
ISN 0105	DO 9300 I=1,IUMAX2	FEM 1258
ISN 0106	REAC(I)= OREAC(I)	FEM 1259
ISN 0107	9300 CONTINUE	FEMUP 92
	C	FEM 1261
ISN 0108	9370 CONTINUE	FEM 1262
	C	FEM 1263
	C ZAHYG SHUSE1	FEM 1264
	C	FEM 1265
ISN 0109	DO 9805 N=1,NMAX	FEM 1266
ISN 0110	XW(N)= X(N)	FEM 1267
ISN 0111	YW(N)= Y(N)	FEM 1268
ISN 0112	N2=N*2	FLM 1269
ISN 0113	N1=N2-1	FEM 1270
ISN 0114	X(N)=X(N)+AHENI(N1)	FEM 1271
ISN 0115	Y(N)=Y(N)+AHENI(N2)	FEM 1272
ISN 0116	9805 CONTINUE	FEM 1273
	C	FEM 1274
		FEM 1275

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ISN 0117      WRITE(8,5000) LDCN, INUM
ISN 0118      5000 FORMAT( 1H1 /////////////// 5X, 25HLOAD-CONDITION....., A4
              1          ///          5X, 25HNUMBER OF ITERATION....., 1X, 13 )
C
ISN 0119      9700 CONTINUE
ISN 0120      ITITLE=0
ISN 0121      M=1
ISN 0122      N=52
ISN 0123      L=LMAX/52
ISN 0124      L=L+1
C
ISN 0125      9800 CONTINUE
ISN 0126      IF( NPRINT.EQ.1 .OR. ITENS.EQ.0 ) WRITE(8,19800) INUM, LDCN
ISN 0126      19800 FORMAT(1H1/9A,"STRAINS AT THE CENTERS OF ELEMENTS", 60X,
              *          5HITER=, 12 //
              *          5X,"LOAD-CONDITION",1X,A4 /
              *          5X,"LMNT",7X,"E(1)",11X,"E(Y)",11X,"E(XY)"/)
ISN 0129      ITITLE=ITITLE+1
ISN 0130      IF (L.EQ.ITITLE) GO TO 9810
ISN 0132      GO TO 9820
C
ISN 0133      9810 CONTINUE
ISN 0134      N=LMAX
C
ISN 0135      9820 CONTINUE
ISN 0136      DO 9830 J=M,N
ISN 0137      NS=LSL(J)
ISN 0136      IF( NPRINT.EQ.1 .OR. ITENS.EQ.0 )
              1 WRITE(8,19830) NS, EX(J), EY(J), GAMAY(J)
ISN 0140      19830 FORMAT (1H ,4X,15,3(5X,E12.5))
C
ISN 0141      9830 CONTINUE
C
ISN 0142      IF (N.EQ.LMAX) GO TO 9840
ISN 0144      M=M+52
ISN 0145      N=N+52
ISN 0146      GO TO 9800
C
ISN 0147      9840 CONTINUE
ISN 0148      ITITLE=0
ISN 0149      M=1
ISN 0150      N=52
C
C      WRITE TITLE
C
ISN 0151      9845 CONTINUE
ISN 0152      IF( NPRINT.EQ.1 .OR. ITENS.EQ.0 ) WRITE(8,19840) INUM, LDCN
ISN 0154      19840 FORMAT(1H1/8A,"STRESSES AT THE CENTERS OF ELEMENTS", 60X,
              *          5HITER=, 12 //
              *          5X,"LOAD-CONDITION",1X,A4 /
              *          5X,"LMNT",9X,"S(X)",12X,"S(Y)",12X,"S(Z)",12X,
              *          "T(XY)",12X,"S1",14X,"S2",13X,"DEG",13X,"COND"/)
C
ISN 0155      ITITLE=ITITLE+1
ISN 0156      IF (L.EQ.ITITLE) N=LMAX
C
ISN 0158      DO 9850 J=M,N
ISN 0159      SIG1(J) = FUNC1(SIGX(J),SIGY(J),TAUXY(J))

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FEMUP 93
FEMUP 94
FEMUP 95
FEM 1276
FEM 1277
FEM 1278
FEM 1279
FEM 1280
FEM 1281
FEM 1282
FEM 1283
FEM 1284
FEMUP 96
FEMUP 97
FEMUP 98
FEM 1287
FEM 1288
FEM 1289
FEM 1290
FEM 1291
FEM 1292
FEM 1293
FEM 1294
FEM 1295
FEM 1296
FEM 1297
FEM 1298
FEMUP 99
FEMUP100
FEM 1300
FEM 1301
FEM 1302
FEM 1303
FEM 1304
FEM 1305
FEM 1306
FEM 1307
FEM 1308
FEM 1309
FEM 1310
FEM 1311
FEM 1312
FEM 1313
FEM 1314
FEM 1315
FEM 1316
FEMUP101
FEMUP102
FEMUP103
FEM 1320
FEM 1321
FEMUP104
FEM 1322
FEM 1324
FEM 1325
FEM 1326
FEM 1327
FEM 1328

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ISN 0160		SIG2(J) = FUNC2(SIGX(J),SIGY(J),TAUXY(J))	FEM 1329
ISN 0161		IF (SIGX(J).LT.SIGY(J).AND.TAUXY(J).GE.C.O) GO TO 1100	FEM 1330
ISN 0163		IF (SIGX(J).LT.SIGY(J).AND.TAUXY(J).LT.C.O) GO TO 1200	FEM 1331
ISN 0165		SITAD=0.0	FEM 1332
ISN 0166		GO TO 1200	FEM 1333
ISN 0167	1100	CONTINUE	FEM 1334
ISN 0168		SITAD=PA1/2.	FEM 1335
ISN 0169		GO TO 1300	FEM 1336
ISN 0170	C		FEM 1337
ISN 0171	1200	CONTINUE	FEM 1338
		SITAD=-PA1/2.	FEM 1339
ISN 0172	C		FEM 1340
ISN 0173	1300	CONTINUE	FEM 1341
ISN 0174		SS=2.*TAUXY(J)/(SIGX(J)-SIGY(J))	FEM 1342
ISN 0175		SITAL(J) = 1./2.*ATAN(SS)+SITAD	FEM 1343
ISN 0176		SITA = SITAL(J)+180./PA1	FEM 1344
ISN 0177		W=ABS(SITA)	FEM 1345
ISN 0178		IDEG=W	FEM 1346
ISN 0179		W=(W-FLUAT(IDEG))*40.	FEM 1347
ISN 0180		IMIN=W	FEM 1348
		ISEC=(W-FLUAT(IMIN))*60.0	FEM 1349
ISN 0181	C		FEM 1350
	C	IF (SITA.LT.C.O) IDEG=-IDEG	FEM 1351
ISN 0183		IF(NOLIN.NE.O) GO TO 15	FEM 1352
ISN 0185		IJ= 1	FEMUP105
ISN 0186		GO TO 25	FEMUP106
ISN 0187	15	CONTINUE	FEMUP107
ISN 0188		GO TO (35, 45, 45), NOLIN	FEMUP108
ISN 0189	45	CONTINUE	FEMUP109
ISN 0190		IPP= IPTE(J)	FEMUP110
ISN 0191		TAU= TAU0(IPP)	FEMUP111
ISN 0192		PA= TANPM1(IPP)	FEMUP112
ISN 0193		SF= (0.5*(SIG1(J)+SIG2(J))*SIN(PA) + TAU*COS(PA)) /	FEMUP113
		1 ((SIG1(J) - SIG2(J)) *C.)	FEMUP114
ISN 0194		IJ= 1	FEMUP115
ISN 0195		IF(SF.LE.1.0) IJ= 3	FEMUP116
ISN 0197		GO TO 25	FEMUP117
ISN 0198	35	CONTINUE	FEMUP118
ISN 0199		IPP= IPTE(J)	FEMUP119
ISN 0200		IJ= 1	FEMUP120
ISN 0201		IF(NSWCH(IPP).EQ.O) GO TO 25	FEMUP121
ISN 0203		SF1= (SIGX(J) + SIGY(J)) * 0.5	FEMUP122
ISN 0204		SF2= SIGX(J)*SIGY(J) - TAUXY(J)*TAUXY(J)	FEMUP123
ISN 0205		IJ= 1	FEMUP124
ISN 0206		IF(SF1.LE.0.0 .OR. SF2.LE.C.O) IJ= 2	FEMUP125
ISN 0208	25	CONTINUE	FEMUP126
ISN 0209	C		FEMUP127
ISN 0210		NS=LSL(J)	FEMUP128
		IF(NPINT.EQ.1 .OR. ITENS.EQ.O)	FEM 1353
	1	WRITE(8,19850) NS, SIGX(J), SIGY(J), SIGZ(J), TAUXY(J).	FEMUP129
	2	SIG1(J), SIG2(J), IDEG, IMIN, ISEC, MU(IJ)	FEMUP130
ISN 0212	C		FEMUP131
	19850	FORMAT(1H,4X,15,5X,6(E12.5,4X),13,2X,12,2X,12,8X,A1)	FEM 1356
ISN 0213	C		FEMUP132
		WRITE (7,19855) NS,SIGX(J),SIGY(J),SIGZ(J),TAUXY(J)	FEM 1358
ISN 0214	C		FEM 1359
	19855	FORMAT ('LMNT ',14,1X,4(E15.5))	FEM 1360
			FEM 1361

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C
9850 CONTINUE
C
ISN 0215      IF (N=EQ-LMAX)   GO TO 9860
ISN 0216      M=M+52
ISN 0218      N=N+52
ISN 0219      GO TO 9845
ISN 0220
C
C      NODE PRINT
C
ISN 0221      9860 CONTINUE
ISN 0222      ITITLE=0
ISN 0223      M=1
ISN 0224      N=52
ISN 0225      L=NMAX/52
ISN 0226      L=L+1
C
ISN 0227      9870 CONTINUE
ISN 0228      IF( NPRINT.EQ.1 .OR. ITENS.EQ.0 ) WRITE(8,19870) INUM, LDCN
ISN 0230      19870 FORMAT(1H1/9X,'FORCES AND DISPLACEMENTS' 7CX, 5HITER=, 12 //
*              5X,'LOAD-CONDITION',1X,A4 /
*              5X,'NODE',14X,'R-X',17X,'R-Y',16X,'UX',16X,'UY'//)
ISN 0231      ITITLE=ITITLE+1
ISN 0232      IF (L=EQ-ITITLE)   N=NMAX
ISN 0234      DO 9880 J=M,N
ISN 0235          NS = NSN(J)
ISN 0236          J2=J+2
ISN 0237          J1=J2-1
ISN 0238          PPT(1,J)= PPT(1,J) + PP(1,J)
ISN 0239          PPT(2,J)= PPT(2,J) + PP(2,J)
ISN 0240          DIT(J1)= DIT(J1) + DIF(J1)
ISN 0241          DIT(J2)= DIT(J2) + DIF(J2)
ISN 0242          IF( NPRINT.EQ.1 .OR. ITENS.EQ.0 )
1              WRITE(8,19880) NS, PPT(1,J), PPT(2,J), DIT(J1), DIT(J2)
ISN 0244      19880 FORMAT (1H ,4X,15.10X,4(E12.5,5X))
ISN 0245      9880 CONTINUE
ISN 0246      IF (N=EQ-NMAX)   GO TO 9890
ISN 0248      M=M+52
ISN 0249      N=N+52
ISN 0250      GO TO 9870
C
ISN 0251      9890 IF( NPRINT.EQ.1 .OR. ITENS.EQ.0 ) WRITE(8,19890) INUM, LDCN
ISN 0253      19890 FORMAT(1H1/9X,'REACTION FORCES' /5X, 5HITER=, 12 //
*              5X,'LOAD-CONDITION',1X,A4 /
*              5X,'NODE',14X,'R-X',17X,'R-Y' / )
ISN 0254      DO 9900 I=1,IQMAX
ISN 0255          N=JQ(I)
ISN 0256          NS = NSN(N)
ISN 0257          I2=I+2
ISN 0258          I1=I2-1
ISN 0259          RET(I1)= RET(I1) + REAC(I1) - PP(1,NS)
ISN 0260          RET(I2)= RET(I2) + REAC(I2) - PP(2,NS)
ISN 0261          IF( NPRINT.EQ.1 .OR. ITENS.EQ.0 )
1              WRITE(8,19920) NS, RET(I1), RET(I2)
ISN 0263      19920 FORMAT (1H ,4X,15.10X,E12.5,8X,E12.5)
C
ISN 0264      9900 CONTINUE
C

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FEM 1362
FEM 1363
FEM 1364
FEM 1365
FEM 1366
FEM 1367
FEM 1368
FEM 1369
FEM 1370
FEM 1371
FEM 1372
FEM 1373
FEM 1374
FEM 1375
FEM 1376
FEM 1377
FEM 1378
FEM 1379
FEMUP133
FEMUP134
FEM 1382
FEM 1383
FEM 1384
FEM 1385
FEM 1386
FEM 1387
FEM 1388
FEM 1389
FEMUP135
FEMUP136
FEMUP137
FEMUP138
FEMUP139
FEMUP140
FEM 1391
FEM 1392
FEM 1393
FEM 1394
FEM 1395
FEM 1396
FEM 1397
FEMUP141
FEMUP142
FEM 1400
FEM 1401
FEM 1402
FEM 1403
FEM 1404
FEM 1405
FEM 1406
FEMUP143
FEMUP144
FEMUP145
FEMUP146
FEM 1408
FEM 1409
FEM 1410
FEM 1411

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	C	STRESS AT THE NODAL POINTS	FEM 1412
ISN 0265	C	ITITLE=0	FEM 1413
ISN 0266		M=1	FEM 1414
ISN 0267		N=52	FEM 1415
ISN 0268		L=NMAX/52	FEM 1416
ISN 0269		L=L+1	FEM 1417
ISN 0270	9910	CONTINUE	FEM 1418
ISN 0271		IF (NPRINT.EQ.1 .OR. ITEND.EQ.0) WRITE(6,19910) INUM, LCN	FEM 1419
ISN 0273	19910	FORMAT(1H1,4X,'STRESSES AT THE NODAL POINTS' 60X,	FEMUP147
		5M1EX, 12 //	FEMUP148
		5X,'LOAD-CONDITION',1X,A4 /	FEMUP149
		5X,'NODE',4X,'S(X)',15X,'S(Y)',15X,'I(XY)',15X,'S1',	FEM 1423
		15X,'S2',14X,'DEG'//	FEM 1424
			FEM 1425
ISN 0274	C	ITITLE=ITITLE+1	FEM 1426
ISN 0275	C	IF (L.EQ.ITITLE) N=NMAX	FEM 1427
	C		FEM 1428
ISN 0277		DO 9950 N1=M,N	FEM 1429
ISN 0278		NS = NSN(N1)	FEM 1430
ISN 0279		SA=0.0	FEM 1431
ISN 0280		SY=0.0	FEM 1432
ISN 0281		TAU=0.0	FEM 1433
ISN 0282		IITN=IITN(N1)	FEM 1434
ISN 0283		DO 9960 N2=1,IITN	FEM 1435
ISN 0284		L1=NL(N1,N2)	FEM 1436
ISN 0285		M1=L1/10	FEM 1437
ISN 0286		SA=SA+S10X(M1)	FEM 1438
ISN 0287		SY=SY+S10Y(M1)	FEM 1439
ISN 0288		TAU=TAU+TAUXY(M1)	FEM 1440
ISN 0289	9960	CONTINUE	FEM 1441
ISN 0290		XIITN=IITN	FEM 1442
ISN 0291		SA=SA/XIITN	FEM 1443
ISN 0292		SY=SY/XIITN	FEM 1444
ISN 0293		TAU=TAU/XIITN	FEM 1445
ISN 0294		S1(N1) = FUNCS1(SA,SY,TAU)	FEM 1446
ISN 0295		S2(N1) = FUNCS2(SA,SY,TAU)	FEM 1447
ISN 0296		IF (SX.LT.SY.AND.TAU.GE.0.0) GO TO 9951	FEM 1448
ISN 0298		IF (SX.LT.SY.AND.TAU.LT.0.0) GO TO 9952	FEM 1449
ISN 0300		SITAD=0.0	FEM 1450
ISN 0301		GO TO 9953	FEM 1451
	C		FEM 1452
ISN 0302	9951	CONTINUE	FEM 1453
ISN 0303		SITAD=PA1/2.	FEM 1454
ISN 0304		GO TO 9953	FEM 1455
	C		FEM 1456
ISN 0305	9952	CONTINUE	FEM 1457
ISN 0306		SITAD=-PA1/2.	FEM 1458
	C		FEM 1459
ISN 0307	9953	CONTINUE	FEM 1460
ISN 0308		SS=2.*TAU/(SX-SY)	FEM 1461
ISN 0309		SITAN(N1) = 1./2.*ATAN(SS)+SITAD	FEM 1462
ISN 0310		SITA = SITAN(N1)*180./PA1	FEM 1463
ISN 0311		W=ABS(SITA)	FEM 1464
ISN 0312		IDEG=W	FEM 1465
ISN 0313		W=(W-FLDAT(IDEG))*60.0	FEM 1466
ISN 0314		IMIN=W	FEM 1467
			FEM 1468
			FEM 1469

ISN 0315	ISEC=(W-PLUAT(IMIN))*60.0	FEM 1470
ISN 0316	IF (SITA.LT.0.0) IOEG=-IOEG	FEM 1471
ISN 0318	IF(NPRINT.EQ.1 .OR. ITENS.EQ.0)	FEMUP150
	1 WRITE(6,19950) NS, SX, SY, TAU, S1(N1), S2(N1), IOEG,	FEMUP151
	2 IMIN, ISEC	FEMUP152
	C	FEM 1473
ISN 0320	19950 FORMAT (1H,4X,15,5(5X,E12.5),5X,13,2X,12,2X,12)	FEM 1474
	C	FEM 1475
ISN 0321	9950 CONTINUE	FEM 1476
ISN 0322	IF (N.EQ.NMAX) GO TO 2700	FEM 1477
ISN 0324	M=M+52	FEM 1478
ISN 0325	N=N+52	FEM 1479
ISN 0326	GO TO 5910	FEM 1480
	C	FEM 1481
	C RESTORE FOR NEXT LOAD-CONDITION	FEM 1482
	C	FEM 1483
ISN 0327	2700 CONTINUE	FEM 1484
	C	FEM 1485
ISN 0328	DO 2800 N = 1,NMAX	FEM 1486
ISN 0329	X(N) = XW(N)	FEM 1487
ISN 0330	Y(N) = YW(N)	FEM 1488
ISN 0331	2800 CONTINUE	FEM 1489
	C	FEM 1490
	C	FEM 1491
	C	FEM 1492
	C	FEM 1493
	C	FEM 1494
	C	FEM 1495
ISN 0332	RETURN	FEM 1500
ISN 0333	END	FEM 1501
		FEM 1502

ISN 0002		SUBROUTINE NOTENS	FEMUP153
	C		FEMUP154
	C		FEMUP155
	C		FEMUP156
ISN 0003		COMMON / NUTEN / NOLIN, ITERA, NPRINT, ALOW, NSWCH(10),	FEMUP157
	1	TAUU(10), TANPHI(10)	FEMUP158
ISN 0004		COMMON / GLOBAL / IERROR, IPEMAX, IQMAX, NMAX, LMAX, ETAC	FEMUP159
ISN 0005		COMMON / NODLC / NNS(2000), NSN(1000), X(1000), Y(1000),	FEMUP160
	1	JG(50), NCC(2,50), QM(50)	FEMUP161
ISN 0006		INTEGER*2 NNS, NSN, JG, NCC	FEMUP162
ISN 0007		COMMON / LMNT1 / LSL(2000), IPTE(2000), LLA(4000), NL(2000,3)	FEMUP163
ISN 0008		INTEGER*2 LSL, IPTE, LLA, NL	FEMUP164
ISN 0009		COMMON / LMNT2 / SIGX(2000), SIGY(2000), SIGZ(2000), TAUXY(2000)	FEMUP165
ISN 0010		COMMON / LOAUC / P(2000), PP(2,1000), CLOAD(100)	FEMUP166
	C		FEMUP167
ISN 0011		COMMON / DSIG / DSX(2000), DSY(2000), DSZ(2000), DTXY(2000)	FEMUP168
ISN 0012		COMMON / DKSX / ITENS	FEMUP169
	C		FEMUP170
ISN 0013		DO 10 I=1,NMAX	FEMUP171
ISN 0014		DO 20 J=1,2	FEMUP172
ISN 0015		PP(J,I)= 0.0	FEMUP173
ISN 0016	20	CONTINUE	FEMUP174
ISN 0017	10	CONTINUE	FEMUP175
ISN 0018		NN= NMAX + 2	FEMUP176
ISN 0019		DO 30 I=1,NN	FEMUP177
ISN 0020		P(I)= 0.0	FEMUP178
ISN 0021	30	CONTINUE	FEMUP179
ISN 0022		DO 40 I=1,LMAX	FEMUP180
ISN 0023		DSX(I)= 0.0	FEMUP181
ISN 0024		DSY(I)= 0.0	FEMUP182
ISN 0025		DSZ(I)= 0.0	FEMUP183
ISN 0026		DTXY(I)= 0.0	FEMUP184
ISN 0027	40	CONTINUE	FEMUP185
	C		FEMUP186
ISN 0028		IF(NOLIN.NE.0) GO TO 15	FEMUP187
ISN 0030		ITENS= 0	FEMUP188
ISN 0031		RETURN	FEMUP189
	C		FEMUP190
ISN 0032	15	CONTINUE	FEMUP191
	C		FEMUP192
ISN 0033		CALL CALF(NOLIN, LMAX, X, Y, NL, IPTE, SIGX, SIGY, TAUXY,	FEMUP193
	1	TAUU, TANPHI, NSWCH, ALOW,	FEMUP194
	2	DSX, DSY, DTXY, P, PP, ITENS)	FEMUP195
	C		FEMUP196
ISN 0034		DO 50 I=1,LMAX	FEMUP197
ISN 0035		SIGX(I)= SIGX(I) + DSX(I)	FEMUP198
ISN 0036		SIGY(I)= SIGY(I) + DSY(I)	FEMUP199
ISN 0037		TAUXY(I)= TAUXY(I) + DTXY(I)	FEMUP200
ISN 0038	50	CONTINUE	FEMUP201
	C		FEMUP202
	C		FEMUP203
ISN 0039		RETURN	FEMUP204
ISN 0040		END	FEMUP205

ISN 0002	SUBROUTINE CALF(ISW, NE, X, Y, NL, IPTE, SX, SY, TXY,	FEMUP206
	1 TO, PHI, NSWCH, ALUM,	FEMUP207
	2 DSA, DSY, DTX, P, PP, ITENS)	FEMUP208
	C	FEMUP209
	C	FEMUP210
ISN 0003	INTEGER*2 NL, IPTE	FEMUP211
ISN 0004	DIMENSION X(1), Y(1), NL(2000,1), IPTE(2), SA(1), SY(1), TXY(1),	FEMUP212
	1 TU(1), PHI(1), NSWCH(1), DSA(1), DSY(1), DTX(1),	FEMUP213
	2 P(1), PP(2,1)	FEMUP214
ISN 0005	DIMENSION SIG1(2000), SIG2(2000), THET(2000)	FEMUP215
ISN 0006	DIMENSION PE(6)	FEMUP216
	C	FEMUP217
	C	FEMUP218
	C	FEMUP219
ISN 0007	DO 1000 I=1,NE	FEMUP220
ISN 0008	DSX(I)= 0.0	FEMUP221
ISN 0009	DSY(I)= 0.0	FEMUP222
ISN 0010	DTXY(I)= 0.0	FEMUP223
ISN 0011	1000 CONTINUE	FEMUP224
ISN 0012	DO 2000 I=1,2000	FEMUP225
ISN 0013	P(I)= 0.0	FEMUP226
ISN 0014	2000 CONTINUE	FEMUP227
ISN 0015	DO 2010 I=1,1000	FEMUP228
ISN 0016	DO 2020 J=1,2	FEMUP229
ISN 0017	PP(J,I)= 0.0	FEMUP230
ISN 0018	2020 CONTINUE	FEMUP231
ISN 0019	2010 CONTINUE	FEMUP232
ISN 0020	DSMAX= 0.0	FEMUP233
ISN 0021	LIM1= 0	FEMUP234
	C	FEMUP235
	C	FEMUP236
ISN 0022	100 FORMAT(1H1, SA, SHCALF //)	FEMUP237
	C	FEMUP238
	C	FEMUP239
	C	FEMUP240
ISN 0023	DO 1001 I=1,NE	FEMUP241
ISN 0024	S1= SX(I) + SY(I)	FEMUP242
ISN 0025	S2= (SX(I) - SY(I))**2 + 4.0 * TXY(I)**2	FEMUP243
ISN 0026	SIG1(I)= 0.5*S1 + 0.5*SQRT(S2)	FEMUP244
ISN 0027	SIG2(I)= 0.5*S1 - 0.5*SQRT(S2)	FEMUP245
ISN 0028	T1= 2.0 * TXY(I)	FEMUP246
ISN 0029	T2= SX(I) - SY(I)	FEMUP247
ISN 0030	THET(I)= 0.5 * ATAN2(T1,T2)	FEMUP248
	C	FEMUP249
ISN 0031	200 FORMAT(10X, 6E15.5)	FEMUP250
ISN 0032	1001 CONTINUE	FEMUP251
	C	FEMUP252
	C	FEMUP253
ISN 0033	300 WRITE(6,200) ISW	FEMUP254
ISN 0034	300 FORMAT(/// 10X, SHISW = , I2 //)	FEMUP255
	C	FEMUP256
	C	FEMUP257
	C	FEMUP258
	C	
	SENDANHAKAI KIJUN	

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ISN 0035      2 CONTINUE
ISN 0036      ITENS= 0

ISN 0037      C
ISN 0038      DU 1002 1=1,NE
ISN 0039      IP= IPTE(I)
ISN 0040      TAU= TU(IP)
ISN 0041      PA= PHI(IP)

ISN 0041      C
ISN 0042      SF= ( 0.5*(SIG1(I)+SIG2(I))*SIN(PA) + TAU*COS(PA) ) /
ISN 0043      1 ( ( SIG1(I) - SIG2(I) ) * 0.5 )
ISN 0042      C
ISN 0043      5000 WRITE(6,5000) 1, TAU, PA, SF
ISN 0043      5000 FORMAT( // 2X, I3, 10X, 3E15.5 )
ISN 0043      IF( SF.GT.1.0 ) GO TO 1002

ISN 0045      C
ISN 0046      ITENS= 1
ISN 0046      IF( ISW.EQ.3 ) GO TO 3
ISN 0046      IF( SIG2(I).GE.(-TAU/TAN(PA)) ) GO TO 22
ISN 0050      11 CONTINUE
ISN 0051      SIG1D= SIG2(I)
ISN 0052      SIG2D= SIG2(I)
ISN 0053      C
ISN 0053      5100 WRITE(6,5100) SIG1D, SIG2D
ISN 0054      5100 FORMAT( 10X, 5H5100A, 2E15.5 )
ISN 0055      GO TO 13
ISN 0056      22 CONTINUE
ISN 0056      SIG1D= ( 2.0*(TAU*COS(PA) + SIG2(I)*(1.0+SIN(PA))) ) /
ISN 0057      1 ( 1.0 - SIN(PA) )
ISN 0057      SIG2D= SIG2(I)
ISN 0057      C
ISN 0057      5200 WRITE(6,5200) SIG1D, SIG2D
ISN 0059      5200 FORMAT( 10X, 5H5200B, 2E15.5 )
ISN 0059      GO TO 13
ISN 0060      3 CONTINUE
ISN 0061      ES= ( SIG1(I)-SIG2(I) ) - ( SIG1(I)+SIG2(I) ) * SIN(PA)
ISN 0062      SIG1D= 2.0 * TAU * COS(PA) = SIG1(I) / ES
ISN 0063      SIG2D= 2.0 * TAU * COS(PA) = SIG2(I) / ES

ISN 0064      C
ISN 0064      13 CONTINUE
ISN 0065      DSIG1= SIG1D - SIG1(I)
ISN 0066      DSIG2= SIG2D - SIG2(I)
ISN 0067      ADS1= ABS( DSIG1 )
ISN 0068      ADS2= ABS( DSIG2 )
ISN 0069      IF( ADS1.GT.USMAX ) USMAX= ADS1
ISN 0071      IF( ADS2.GT.USMAX ) USMAX= ADS2
ISN 0073      IF( ADS1.GT.ALLOW ) LIMIT= 1
ISN 0075      IF( ADS2.GT.ALLOW ) LIMIT= 1

ISN 0077      C
ISN 0077      C
ISN 0077      5300 WRITE(6,5300) DSIG1, DSIG2
ISN 0077      5300 FORMAT( 10X, 5H5300C, 2E15.5 )

ISN 0076      C
ISN 0076      USX(I)= DSIG1*(COS(THET(I)))**2 + DSIG2*(SIN(THET(I)))**2
ISN 0079      DSY(I)= DSIG1*(SIN(THET(I)))**2 + DSIG2*(COS(THET(I)))**2
ISN 0080      DTX(I)= (DSIG1-DSIG2)*SIN(THET(I))*COS(THET(I))
ISN 0081      C
ISN 0081      5400 WRITE(6,5400) DSY(I), DTX(I)
ISN 0081      5400 FORMAT( 10X, 5H5400D, 3E15.5 )

ISN 0082      C
ISN 0082      C
ISN 0082      C
ISN 0082      KAJYU KEISAN

ISN 0082      C
ISN 0082      CALL DELTP( X, Y, NL, 1, USX(I), DSY(I), DTX(I), PE )
ISN 0082      C
ISN 0082      WRITE(6,5500) ( PE(J),J=1,N )

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ISN 0083      5500 FORMAT( 10X, 5HPE  + 6E15.5 )
C
C      ASSEMBLE
C
ISN 0084      DO 1003 M=1,3
ISN 0085      N= NL(1,M)
ISN 0086      N2= N+2
ISN 0087      N1= N-1
ISN 0088      P(N1)= P(N1) + PE(M+2-1)
ISN 0089      P(N2)= P(N2) + PE(M+2)
ISN 0090      PP(1,N)= PP(1,N) + PE(M+2-1)
ISN 0091      PP(2,N)= PP(2,N) + PE(M+2)
ISN 0092      1003 CONTINUE
C
ISN 0093      1002 CONTINUE
C
ISN 0094      WRITE(6,6000) DSMAX
ISN 0095      6000 FORMAT( 7777 5X, 'MAXIMUM DELTA SIGMA.....', F10.3 )
C
ISN 0096      IF( LIMIT.EQ.0 ) ITENS= 0
C
ISN 0098      RETURN
ISN 0099      1 CONTINUE
C
ISN 0100      WRITE(6,200) ISW
ISN 0100      ITENS= 0
C
ISN 0101      DO 3001 I=1,NE
ISN 0102      IP= IPTI(I)
C
C      WRITE(6,400) I, IP, NSWCH(IP)
ISN 0103      400 FORMAT( 5X, 315 )
ISN 0104      IF( NSWCH(IP).EQ.0 ) GO TO 3001
C
ISN 0106      SF1= ( SX(1) + SY(1) ) * 0.5
ISN 0107      SF2= SX(1)*SY(1) - TAY(1)*IAY(1)
C
ISN 0108      WRITE(6,500) SF1, SF2
ISN 0108      500 FORMAT( 10X, 2H5F, 2E15.5 )
C
ISN 0109      IF( SF1.LE.0.0 .OR. SF2.LE.0.0 ) GO TO 14
ISN 0111      GO TO 3001
C
ISN 0112      14 CONTINUE
ISN 0113      ITENS= 1
ISN 0114      IF( SIG1(I).LT.0.0 ) GO TO 15
ISN 0116      IF( SIG2(I).LT.0.0 ) GO TO 16
ISN 0118      GO TO 17
ISN 0119      15 CONTINUE
ISN 0120      SIG1(I)= 0.0
ISN 0121      16 CONTINUE
ISN 0122      SIG2(I)= 0.0
C
ISN 0123      17 CONTINUE
ISN 0124      DSX(I)= ( SIG1(I)+SIG2(I) ) * 0.5 +
ISN 0125      1      ( SIG1(I)-SIG2(I) ) * 0.5 * COS(2.0*THET(I)) - SX(I)
ISN 0125      DSY(I)= ( SIG1(I)+SIG2(I) ) * 0.5 -
ISN 0125      1      ( SIG1(I)-SIG2(I) ) * 0.5 * COS(2.0*THET(I)) - SY(I)
ISN 0126      DTXY(I)= ( SIG1(I)-SIG2(I) ) * 0.5 * SIN(2.0*THET(I)) - TXY(I)
ISN 0127      SA= DSX(I) + DSY(I)

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ISN 0128	SB= (DSX(1) - DSY(1))**2 + 4.0 = DTXY(1)**2	FEMUP375
ISN 0129	DSIG1= 0.5*SA + 0.5*SQR(SB)	FEMUP376
ISN 0130	DSIG2= 0.5*SA - 0.5*SQR(SB)	FEMUP377
	C	FEMUP378
ISN 0131	ADS1= ABS(DSIG1)	FEMUP379
ISN 0132	ADS2= ABS(DSIG2)	FEMUP380
ISN 0133	IF(ADS1.GT.DSMAX) DSMAX= ADS1	FEMUP381
ISN 0135	IF(ADS2.GT.DSMAX) DSMAX= ADS2	FEMUP382
ISN 0137	IF(ADS1.GT.ALUM) LIMIT= 1	FEMUP383
ISN 0139	IF(ADS2.GT.ALUM) LIMIT= 1	FEMUP384
	C	FEMUP385
	C	FEMUP386
ISN 0141	WRITE(6,600) DSX(1), DSY(1), DTXY(1)	FEMUP387
	600 FORMAT(10X, 2HDS, 3E15.5)	FEMUP388
	C	FEMUP389
	C	FEMUP390
ISN 0142	CALL DELTP(X, Y, NL, 1, DSX(1), DSY(1), DTXY(1), PE)	FEMUP391
	C	FEMUP392
ISN 0143	WRITE(6,700) (PE(J),J=1,6)	FEMUP393
	700 FORMAT(10X, 2HPE, 6E15.5 /)	FEMUP394
	C	FEMUP395
	C	FEMUP396
	C	FEMUP397
ISN 0144	DO 3002 M=1,3	FEMUP398
ISN 0145	N= NL(1,M)	FEMUP399
ISN 0146	N2= N-2	FEMUP400
ISN 0147	N1= N2-1	FEMUP401
ISN 0148	P(N1)= P(N1) + PE(M-2-1)	FEMUP402
ISN 0149	P(N2)= P(N2) + PE(M-2)	FEMUP403
ISN 0150	PP(1,N)= PP(1,N) + PE(M-2-1)	FEMUP404
ISN 0151	PP(2,N)= PP(2,N) + PE(M-2)	FEMUP405
ISN 0152	3002 CONTINUE	FEMUP406
	C	FEMUP407
ISN 0153	3001 CONTINUE	FEMUP408
	C	FEMUP409
ISN 0154	WRITE(5,6000) DSMAX	FEMUP410
	C	FEMUP411
ISN 0155	IF(LIMIT.EQ.0) ITENS= 0	FEMUP412
	C	FEMUP413
	C	FEMUP414
ISN 0157	RETURN	FEMUP415
ISN 0158	END	

ISN 0002		SUBROUTINE DELT(A, Y, NL, I, SA, SY, TAY, PE)	FEMUP416
	C		FEMUP417
	C		FEMUP418
	C		FEMUP419
ISN 0003		INTEGER*2 NL	FEMUP420
ISN 0004		DIMENSION X(1), Y(1), NL(2000,1), PE(1)	FEMUP421
ISN 0005		DIMENSION B(3,6)	FEMUP422
	C		FEMUP423
ISN 0006		II= NL(1,1)	FEMUP424
ISN 0007		JJ= NL(1,2)	FEMUP425
ISN 0008		KK= NL(1,3)	FEMUP426
ISN 0009		XI= X(II)	FEMUP427
ISN 0010		YI= Y(II)	FEMUP428
ISN 0011		XJ= X(JJ)	FEMUP429
ISN 0012		YJ= Y(JJ)	FEMUP430
ISN 0013		XK= X(KK)	FEMUP431
ISN 0014		YK= Y(KK)	FEMUP432
	C		FEMUP433
ISN 0015		DEL= (XJ-XI)*(YK-YI) - (XK-XI)*(YJ-YI)	FEMUP434
	C		FEMUP435
ISN 0016		DO 10 J=1,3	FEMUP436
ISN 0017		DO 20 K=1,6	FEMUP437
ISN 0018		B(I,J,K)= 0.0	FEMUP438
ISN 0019		20 CONTINUE	FEMUP439
ISN 0020		10 CONTINUE	FEMUP440
	C		FEMUP441
ISN 0021		B(1,1)= (YJ-YK) / DEL	FEMUP442
ISN 0022		B(1,3)= (YK-YI) / DEL	FEMUP443
ISN 0023		B(1,5)= (YI-YJ) / DEL	FEMUP444
ISN 0024		B(2,2)= (XK-XJ) / DEL	FEMUP445
ISN 0025		B(2,4)= (XI-XK) / DEL	FEMUP446
ISN 0026		B(2,6)= (XJ-XI) / DEL	FEMUP447
ISN 0027		B(3,1)= (XK-XJ) / DEL	FEMUP448
ISN 0028		B(3,3)= (YJ-YK) / DEL	FEMUP449
ISN 0029		B(3,5)= (XI-XK) / DEL	FEMUP450
ISN 0030		B(3,4)= (YK-YI) / DEL	FEMUP451
ISN 0031		B(3,6)= (XJ-XI) / DEL	FEMUP452
ISN 0032		B(3,2)= (YI-YJ) / DEL	FEMUP453
	C		FEMUP454
ISN 0033		S= DEL * 0.5	FEMUP455
ISN 0034		DO 30 J=1,6	FEMUP456
ISN 0035		PE(J)= (B(1,J)*SX + B(2,J)*SY + B(3,J)*TXY) * S	FEMUP457
ISN 0036		30 CONTINUE	FEMUP458
	C		FEMUP459
	C		FEMUP460
ISN 0037		RETURN	FEMUP461
ISN 0038		END	FEMUP462

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ISN 0002      FUNCTION FUNC(A,B,C,N)
              C
              C
              C
ISN 0003      IF(N.EQ.1) GO TO 10
ISN 0005      FUNC=A*COS(B)*C
              C
              C
              C
ISN 0006      RETURN
ISN 0007      10 CONTINUE
ISN 0008      FUNC=A*SIN(B)*C
              C
              C
              C
ISN 0009      RETURN
ISN 0010      END

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FEM 1503
FEM 1504
FEM 1505
FEM 1506
FEM 1507
FEM 1508
FEM 1509
FEM 1510
FEM 1511
FEM 1512
FEM 1513
FEM 1514
FEM 1515
FEM 1516
FEM 1517
FEM 1518
FEM 1519

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ISN 0002		SUBROUTINE LOAD	FEM 1520
	C		FEM 1521
	C		FEM 1522
	C		FEM 1523
ISN 0003		COMMON /KESNC/ GKESNX,GKESNY	FEM 1524
ISN 0004		COMMON/GLOBAL/ IERROR,IPEMAX,IWMAX,NMAX,LMAX,ETA6	FEM 1525
ISN 0005		COMMON /IPTC/ CIJ(9,10),CDD(7,10)	FEM 1526
ISN 0006		COMMON /NODEC/ NNS(2000),NSN(1000),X(1000),Y(1000)	FEM 1527
ISN 0007		COMMON /NODEC/ JU(50),NCC(2,50),JM(50)	FEM 1528
ISN 0008		INTEGER*2 NNS,NSN,NSMN,JU,NCC	FEM 1529
ISN 0009		COMMON /LMNT1/ LSL(2000),IPTE(2000),LLA(4000),NL(2000,3)	FEM 1530
ISN 0010		INTEGER*2 LSL,IPTE,LLA,NL	FEM 1531
ISN 0011		COMMON /LMNT2/ SIGX(2000),SIGY(2000),SIGZ(2000),TAUXY(2000)	FEM 1532
ISN 0012		COMMON /LMNT3/ ITN(1000),NLL(1000,10)	FEM 1533
ISN 0013		INTEGER*2 ITN,NLL	FEM 1534
ISN 0014		COMMON /LOADC/ PL(2000),PP(2,1000),CLUAD(100)	FEM 1535
ISN 0015		COMMON /PLC/ IESW,LDSW,KDSFTY,LDCN,LUCND	FEM 1536
ISN 0016		COMMON /LOADS/ IXQY,ALALA,ALALY,IXQF	FEM 1537
ISN 0017		COMMON /LOADS/ IXQY,ALALA,ALALY,IXQF	FEM 1538
	C	COMMON /LOADS/ IXQY,ALALA,ALALY,IXQF	FEM 1539
	C	COMMON /LOADS/ IXQY,ALALA,ALALY,IXQF	FEM 1540
ISN 0018		DATA NLIMIT,NSLIMIT /1000,2000/	FEM 1541
ISN 0019		DATA MULOAD /4MLQAD/	FEM 1542
ISN 0020		DATA ZERO /0.000/	FEM 1543
ISN 0021		DATA THRLMT /180.180/	FEM 1544
	C		FEM 1545
ISN 0022		DATA FACTU /1.745329E-2/	FEM 1546
ISN 0023		DATA IDLCN /'LDCN'/	FEM 1547
ISN 0024		DATA IDENC,IDRSTA,IDSFTY /'END ','RSTR','SAFE'/	FEM 1548
	C		FEM 1549
ISN 0025		DO 3000 NS=1,NLIMIT	FEM 1550
ISN 0026		DO 3000 J=1,2	FEM 1551
ISN 0027		PP(I,NS)=0.0	FEM 1552
ISN 0028		3000 CONTINUE	FEM 1553
	C		FEM 1554
ISN 0029		NLIMIT2=NLIMIT*2	FEM 1555
ISN 0030		DO 4000 NS=1,NLIMIT2	FEM 1556
ISN 0031		PP(NS)=0.0	FEM 1557
ISN 0032		4000 CONTINUE	FEM 1558
	C		FEM 1559
ISN 0033		IF (LDSW.NE.0) GO TO 10001	FEM 1560
	C		FEM 1561
ISN 0035		READ(5,5000) IXQF,GKESNX,GKESNY,IA	FEM 1562
ISN 0036		5000 FORMAT(4X,14,2X,2F5.0,T1,20A4)	FEM 1563
	C		FEM 1564
ISN 0037		WRITE (6,6000) IA	FEM 1565
ISN 0038		6000 FORMAT (27X,20A4)	FEM 1566
	C		FEM 1567
ISN 0039		IF (IA(1).NE.IDLCN) GO TO 9100	FEM 1568
ISN 0041		LDCN = IA(2)	FEM 1569
	C		FEM 1570
ISN 0042		10001 CONTINUE	FEM 1571
ISN 0043		IXQY=IXQF	FEM 1572
ISN 0044		ALALA=GKESNX	

ISN 0045	ALALY=GKESNY	FEM 1573
ISN 0046	C	FEM 1574
ISN 0047	10000 CONTINUE	FEM 1575
ISN 0048	READ(5,200) IDLOAD,NS,GKESNA,GKESNY,THRN,P1N,P2N,IA	FEM 1576
	500 FORMAT (A4,I5,I5,2F5.0,10X,3E10.0,T1,20A4)	FEM 1577
ISN 0049	C	FEM 1578
ISN 0050	WRITE (6,600) IA	FEM 1579
	600 FORMAT (1H,26X,20A4)	FEM 1580
ISN 0051	C	FEM 1581
ISN 0053	IF (IDLOAD.EQ.MDLOAD) GO TO 2100	FEM 1582
	GO TO 10100	FEM 1583
	C	FEM 1584
ISN 0054	C	FEM 1585
ISN 0055	2100 CONTINUE	FEM 1586
ISN 0057	IF (NS.LE.0.OR.NS.GT.NSLMT) GO TO 4050	FEM 1587
	N=NS(NS)	FEM 1588
ISN 0058	C	FEM 1589
	IF (N.LE.0.OR.N.GT.NMAX) GO TO 4040	FEM 1590
ISN 0060	C	FEM 1591
	IF (THRN.EQ.ZERO) GO TO 2200	FEM 1592
ISN 0062	C	FEM 1593
	IF (ABS(THRN).GT.THRLMT) GO TO 4050	FEM 1594
ISN 0064	C	FEM 1595
ISN 0065	Q=THRN*FACTQ	FEM 1596
ISN 0066	CW= COS(Q)	FEM 1597
ISN 0067	SQ= SIN(Q)	FEM 1598
ISN 0068	W=CQ*P1N-SQ*P2N	FEM 1599
ISN 0069	P2N=SQ*P1N+CW*P2N	FEM 1600
	P1N=W	FEM 1601
ISN 0070	C	FEM 1602
ISN 0071	2200 CONTINUE	FEM 1603
ISN 0072	PP(1,N)=P1N +PP(1,N)	FEM 1604
ISN 0073	PP(2,N)=P2N +PP(2,N)	FEM 1605
ISN 0074	N2=N+2	FEM 1606
ISN 0075	N1=N2-1	FEM 1607
ISN 0076	P(N1) = P1N + P(N1)	FEM 1608
	P(N2) = P2N + P(N2)	FEM 1609
ISN 0077	C	FEM 1610
ISN 0078	10200 CONTINUE	FEM 1611
	GO TO 10000	FEM 1612
	C	FEM 1613
ISN 0079	C	FEM 1614
ISN 0080	10100 CONTINUE	FEM 1615
ISN 0082	IF (IA(1).EQ.IDSFY) GO TO 7000	FEM 1616
ISN 0084	IF (IA(1).EQ.IDLDCN) GO TO 7100	FEM 1617
ISN 0086	IF (IA(1).EQ.IDEND) GO TO 7200	FEM 1618
ISN 0088	IF (IA(1).EQ.IDRSTR) GO TO 7300	FEM 1619
	GO TO 5720	FEM 1620
ISN 0089	C	FEM 1621
ISN 0090	7000 CONTINUE	FEM 1622
ISN 0091	KSFY = 1	FEM 1623
	GO TO 7500	FEM 1624
ISN 0092	C	FEM 1625
ISN 0093	7100 CONTINUE	FEM 1626
ISN 0094	LDCNU = IA(2)	FEM 1627
ISN 0095	IXUF=NS/10	FEM 1628
	GO TO 7500	FEM 1629
	C	FEM 1630

ISN 0096	7200	CONTINUE	FEM 1631
ISN 0097		IESW = 1	FEM 1632
ISN 0098		GO TO 7500	FEM 1633
	C		FEM 1634
ISN 0099	7300	CONTINUE	FEM 1635
ISN 0100		IESW = 2	FEM 1636
	C		FEM 1637
	C	JIJU KEISAN	FEM 1638
	C		FEM 1639
ISN 0101	7500	CONTINUE	FEM 1640
	C		FEM 1641
ISN 0102	DO 7600	I=1,LMAX	FEM 1642
ISN 0103		DO 7700 M=1,3	FEM 1643
ISN 0104		N=NL(I,M)	FEM 1644
ISN 0105		XM(M)=X(N)	FEM 1645
ISN 0106		YM(M)=Y(N)	FEM 1646
ISN 0107		IM(M)=N	FEM 1647
ISN 0108	7700	CONTINUE	FEM 1648
ISN 0109		XJ1=XM(2)-XM(1)	FEM 1649
ISN 0110		XX1=XM(3)-XM(1)	FEM 1650
ISN 0111		YJ1=YM(2)-YM(1)	FEM 1651
ISN 0112		YK1=YM(3)-YM(1)	FEM 1652
ISN 0113		IPATE = 1/12(1)	FEM 1653
ISN 0114		ALUW=C1J(8,IPATE)	FEM 1654
ISN 0115		YLUW=C1J(9,IPATE)	FEM 1655
ISN 0116		GX=1./6.*(XJ1+YK1 - XK1+YJ1)*ALUW+ALALX	FEM 1656
ISN 0117		GY=1./6.*(XJ1+YK1 - XX1+YJ1)*YLUW+ALALY	FEM 1657
	C		FEM 1658
ISN 0118	DO 7900	M=1,3	FEM 1659
ISN 0119		N=IM(M)	FEM 1660
ISN 0120		N2=N+2	FEM 1661
ISN 0121		N1=N2-1	FEM 1662
ISN 0122		P(N1) = P(N1) + GX	FEM 1663
ISN 0123		PP(1,N) = PP(1,N) + GX	FEM 1664
ISN 0124		P(N2) = P(N2) + GY	FEM 1665
ISN 0125		PP(2,N) = PP(2,N) + GY	FEM 1666
ISN 0126	7900	CONTINUE	FEM 1667
ISN 0127	7600	CONTINUE	FEM 1668
	C		FEM 1669
	C	LOAD TABLE ON FIXED POINT	FEM 1670
	C		FEM 1671
ISN 0128	7800	CONTINUE	FEM 1672
	C		FEM 1673
ISN 0129	DO 4600	N=1,10MAX	FEM 1674
ISN 0130		NS=JU(N)	FEM 1675
ISN 0131		NS2=NS+2	FEM 1676
ISN 0132		NS1=NS2-1	FEM 1677
ISN 0133		SITA=QM(N)	FEM 1678
ISN 0134		N2=N+2	FEM 1679
ISN 0135		N1=N2-1	FEM 1680
	C		FEM 1681
ISN 0136		IF (NCC(1,N).EQ.1 .AND. NCC(2,N).EQ.0) GO TO 4100	FEM 1682
ISN 0138		IF (NCC(1,N).EQ.0 .AND. NCC(2,N).EQ.1) GO TO 4200	FEM 1683
ISN 0140		IF (NCC(1,N).EQ.1 .AND. NCC(2,N).EQ.1) GO TO 4300	FEM 1684
	C		FEM 1685
ISN 0142	4100	CONTINUE	FEM 1686
ISN 0143		CLOAD(N1)=P(NS1)	FEM 1687
ISN 0144		P(NS2)=P(NS2)-TAN(SITA)*P(NS1)	FEM 1688

ISN 0145		CLOAD(N2)=0.0		FEM 1689
ISN 0146		P(NS1)=0.0		FEM 1690
ISN 0147		GO TO 4500		FEM 1691
ISN 0148	C			FEM 1692
ISN 0149	4200	CONTINUE		FEM 1693
ISN 0150		P(NS1)=P(NS1)+TAN(SITA)*P(NS2)		FEM 1694
ISN 0151		CLOAD(N1)=0.0		FEM 1695
ISN 0152		CLOAD(N2)=P(NS2)		FEM 1696
ISN 0153		P(NS2)=0.0		FEM 1697
		GO TO 4500		FEM 1698
ISN 0154	C			FEM 1699
ISN 0155	4500	CONTINUE		FEM 1700
ISN 0156		CLOAD(N1)=P(NS1)		FEM 1701
ISN 0157		CLOAD(N2)=P(NS2)		FEM 1702
ISN 0158		P(NS1)=0.0		FEM 1703
ISN 0159		P(NS2)=0.0		FEM 1704
ISN 0160	4500	CONTINUE		FEM 1705
ISN 0161	4600	CONTINUE		FEM 1706
		GO TO 9993		FEM 1707
	C			FEM 1708
ISN 0162	C			FEM 1709
ISN 0163	9030	CONTINUE		FEM 1710
ISN 0164		WRITE (6,19030)		FEM 1711
	19030	FORMAT (1H ,	38HLOAD CARD CONTAINS A NOVAL POINT NUMBER.	FEM 1712
ISN 0165	1	24HR WHICH IS OUT OF RANGE.)		FEM 1713
		GO TO 9991		FEM 1714
	C			FEM 1715
ISN 0166	C			FEM 1716
ISN 0167	9040	CONTINUE		FEM 1717
ISN 0168		WRITE (6,19040)		FEM 1718
	19040	FORMAT (1H ,	38HLOAD CARD CONTAINS AN UNDEFINED NOVAL	FEM 1719
ISN 0169	1	6HPOINT.)		FEM 1720
		GO TO 9991		FEM 1721
	C			FEM 1722
ISN 0170	C			FEM 1723
ISN 0171	9050	CONTINUE		FEM 1724
ISN 0172		WRITE (6,19050) THRN		FEM 1725
	19050	FORMAT (1H ,	38HLOAD CARD CONTAINS AN ILLEGAL VALUE.	FEM 1726
ISN 0173	1	/1H ,15HOBlique ANGLE,1PE15-7, 17H IS OUT OF RANGE.)		FEM 1727
		GO TO 9991		FEM 1728
	C			FEM 1729
ISN 0174	C			FEM 1730
ISN 0175	9720	CONTINUE		FEM 1731
ISN 0176		WRITE (6,19720)		FEM 1732
	19720	FORMAT (1H ,	38HLOAD CARD CONTAINS (OK IS FOLLOWED BY,	FEM 1733
	1	50H) AN ILLEGAL CARD WHOSE IDENTIFICATION IS NEITHER,	FEM 1734	
ISN 0177	2	* LOAD,SFTY,END,RS1H, NOR LCCN*)		FEM 1735
		GO TO 9992		FEM 1736
	C			FEM 1737
ISN 0178	C			FEM 1738
ISN 0179	9991	CONTINUE		FEM 1739
ISN 0180		IERROR=IERROR+1		FEM 1740
		GO TO 10200		FEM 1741
	C			FEM 1742
ISN 0181	C			FEM 1743
ISN 0182	9992	CONTINUE		FEM 1744
		IERROR=IERROR+1		FEM 1745
	C			FEM 1746

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ISN 0183      9993 CONTINUE
ISN 0184      IF (IERROR.NE.C) GO TO 9994
C
C
ISN 0186      RETURN
C
C
ISN 0187      9994 CONTINUE
ISN 0188      WRITE (6,19994) IERROR
ISN 0189      19994 FORMAT (1H1,27X,20(4H*))
C
C
ISN 0190      STOP
ISN 0191      9100 CONTINUE
ISN 0192      WRITE (6,6100)
ISN 0193      6100 FORMAT (' CARD-ID SHOULD BE LDCN')
C
C
ISN 0194      STOP
ISN 0195      END

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FEM 1747
FEM 1748
FEM 1749
FEM 1750
FEM 1751
FEM 1752
FEM 1753
FEM 1754
FEM 1755
FEM 1756
FEM 1757
FEM 1758
FEM 1759
FEM 1760
FEM 1761
FEM 1762
FEM 1763
FEM 1764
FEM 1765
FEM 1766
FEM 1767
FEM 1768

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ISN 0002		SUBROUTINE SAFETY	FEM 1769
	C		FEM 1770
	C	TEN=ANZEN-R17SU KEISAN	FEM 1771
	C		FEM 1772
ISN 0003		COMMON /SAFTYC/ S1(2000),S16(2000),S1AL(2000),	FEM 1773
		S1(1000),S2(1000),S1TAN(1000)	FEM 1774
ISN 0004		COMMON /NUDEC/ NNS(2000),NSN(1000),X(1000),Y(1000),	FEM 1775
		JU(50),NCC(2,50),WM(50)	FEM 1776
ISN 0005		COMMON /LMNT1/ LSL(2000),IPTE(2000),LLA(4000),NL(2000,2)	FEM 1777
ISN 0006		COMMON /FLG/ IESW,LDSW,KSP1Y,LUCN,LUCNC	FEM 1778
ISN 0007		COMMON /KESNC/ GKESAX,GKESNY	FEM 1779
ISN 0008		COMMON /LLDATA/ ALSA(2000),XLSY(2000),LLSD,LLT	FEM 1780
ISN 0009		INTEGER*2 LLSD(1000),LLT,IP1YN(1000,2),MIPP(3)	FEM 1781
ISN 0010		COMMON /CRPLUT/ X2MAX,Y2MAX,PAPEX,X1MAX,Y1MAX,MAX1	FEM 1782
ISN 0011		COMMON/CUNDT/JHH,JCC,JDD,EEE,FFF,GG1,GG2,JHH,J11,ITA6	FEM 1783
ISN 0012		COMMON/LOADE/ IALY,ALALA,ALALY,IACH	FEM 1784
ISN 0013		COMMON/GLOBAL/ IERXCN,IPEMAX,ISMAX,NMAX,LMAX,ETAB	FEM 1785
ISN 0014		COMMON/IDUN/IDUN(20)	FEM 1786
ISN 0015		COMMON/CUNDS/ILDS,115(20),11DC,JDC	FEM 1787
ISN 0016		COMMON / NOTEN / NCLIN, ITERA, NPMINT, ALCN, NSWCH(10),	FEM 1788
		TAUU(10), TANPHI(10)	FEM 1789
ISN 0017		COMMON / ITN / INUM	FEM 1790
	C		FEM 1791
ISN 0018		INTEGER*2 11DC(1000),JDC(1000,10)	FEM 1792
ISN 0019		DIMENSION AREA(1000,3),L9(3),AKEC1(1000,3),AKEC2(1000,3),	FEM 1793
		PX(1000,3),PY(1000,3)	FEM 1794
	C		FEM 1795
ISN 0020		DIMENSION IA(20),IAA(40)	FEM 1796
ISN 0021		DIMENSION FU(3),F1(3),DEG(2),L1(3),IP1(3)	FEM 1797
ISN 0022		DIMENSION THETA(2),LUC1(2),LOG2(2),LOG3(2)	FEM 1798
	C		FEM 1799
ISN 0023		INTEGER*2 LLU(1000,3)	FEM 1800
ISN 0024		INTEGER*2 IAA,IBLNK	FEM 1801
ISN 0025		INTEGER*2 NNS,NSN,NSMN,JQ,NCC	FEM 1802
ISN 0026		INTEGER*2 LSL,IPTE,LLA,NL	FEM 1803
ISN 0027		INTEGER*2 IFLG,IAS1	FEM 1804
	C		FEM 1805
ISN 0028		DATA NSLIMT,LSLIMT /2000,4000/	FEM 1806
ISN 0029		DATA IDLUCN,IDRSTR,IDEND /*LOCN*,*RSTR*,*END */	FEM 1807
ISN 0030		DATA IDNODE,IDLMT,IBLNK /*NODE*,*LMNT*,* */	FEM 1808
ISN 0031		DATA PAI /3.1415926/	FEM 1809
ISN 0032		DATA ILL,ISS,IAS1 /*L*,*S*,* */	FEM 1810
	C		FEM 1811
ISN 0033		REWIND 11	FEM 1812
	C		FEM 1813
	C		FEM 1814
ISN 0034		FF10=FFF=10.0	FEM 1815
ISN 0035		IPCTR = 53	FEM 1816
ISN 0036		IECTR = 0	FEM 1817
ISN 0037		DO 11 I=1,3	FEM 1818
ISN 0038		MIPP(I)=1	FEM 1819
ISN 0039		L9(I)=0	FEM 1820
ISN 0040		DO 11 M=1,1000	FEM 1821

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ISN 0041      IPIYN(M,1)=1
ISN 0042      11 CONTINUE
C
ISN 0043      30 CONTINUE
ISN 0044      IF( INUM.NE.1 ) GO TO 105
ISN 0046      READ (5,5020) (IAA(I),I=1,40),ID,NUM,(TU(J),F1(J),DEG(J),
*              L1(J),IPI(J),J=1,3),IA
ISN 0047      WRITE(11)      (IAA(I),I=1,40),ID,NUM,(TU(J),F1(J),DEG(J),
1              L1(J),IPI(J),J=1,3)
C
ISN 0048      5020 FORMAT (40A2,T1,A4,1X,14,1X,3(5E5.0,1X,11,1X,11,1X),T1,20A4)
C
ISN 0049      WRITE (6,6100) IA
ISN 0050      6100 FORMAT (27X,2CA4)
ISN 0051      GO TO 115
C
ISN 0052      105 CONTINUE
ISN 0053      READ (11)      (IAA(I),I=1,40),ID,NUM,(TU(J),F1(J),DEG(J),
1              L1(J),IPI(J),J=1,3)
C
ISN 0054      115 CONTINUE
C
C
C*** CARD-ID CHECK ***
C
ISN 0055      IF (ID.NE.IDNODE2.AND.ID.NE.IDLMNT) GO TO 7000
ISN 0057      IF (ID.EQ.IDLMNT) GO TO 150
C
C*** SAFETYFACT ON NODE ***
C
ISN 0059      IF (NUM.LE.0.OR.NUM.GT.NSLIM1) GO TO 9010
C
ISN 0061      I1 = NNS(NUM)
ISN 0062      IF (I1.LE.0) GO TO 9010
C
ISN 0064      SG1 = S1(I1)
ISN 0065      SG2 = S2(I1)
ISN 0066      THT = S1TAN(I1)
ISN 0067      XX=X(I1)*FF10
ISN 0068      YY=Y(I1)*FF10
ISN 0069      GO TO 200
C
C*** SAFETYFACT ON ELEMENT ***
C
ISN 0070      150 CONTINUE
C
ISN 0071      IF (NUM.LE.0.OR.NUM.GT.LSLIM1) GO TO 9030
C
ISN 0073      J1 = LLA(NUM)
ISN 0074      IF (J1.LE.0) GO TO 9030
C
ISN 0076      SG1 = SIG1(J1)
ISN 0077      SG2 = SIG2(J1)
ISN 0078      THT = S1TAL(J1)
ISN 0079      XX=XLSX(J1)
ISN 0080      YY=XLSY(J1)
C
ISN 0081      200 CONTINUE

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FEM 1816
FEM 1817
FEM 1818
FEM 1819
FEMUP464
FEM 1820
FEM 1821
FEMUP470
FEMUP471
FEM 1822
FEM 1823
FEM 1824
FEM 1825
FEM 1826
FEMUP472
FEMUP473
FEMUP474
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FEMUP478
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FEM 1855
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FEM 1857
FEM 1858
FEM 1859
FEM 1860
FEM 1861
FEM 1862

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ISN 0082	C	DU 220 I = 16,20	FEM 1863
ISN 0083		IF (IAA(I).NE.IPLNK) GO TO 230	FEM 1864
ISN 0085		220 CONTINUE	FEM 1865
ISN 0086		KAI = 1	FEM 1866
ISN 0087		GO TO 300	FEM 1867
	C		FEM 1868
ISN 0088	C	230 CONTINUE	FEM 1869
	C		FEM 1870
ISN 0089		DU 240 I = 20,30	FEM 1871
ISN 0090		IF (IAA(I).NE.IBLNK) GO TO 260	FEM 1872
ISN 0092		240 CONTINUE	FEM 1873
ISN 0093		KAI = 2	FEM 1874
ISN 0094		GO TO 300	FEM 1875
	C		FEM 1876
	C		FEM 1877
ISN 0095		260 CONTINUE	FEM 1878
ISN 0096		KAI = 3	FEM 1879
	C		FEM 1880
ISN 0097	C	300 CONTINUE	FEM 1881
	C		FEM 1882
ISN 0098		IF (IPCTR+KAI.LE.50) GO TO 305	FEM 1883
	C		FEM 1884
	C	*** HEADING ***	FEM 1885
	C		FEM 1886
ISN 0100		IF (NPRINT.EQ.1 .OR. ITENS.EQ.0) WRITE(5,6666) INUM, LOCN	FEM 1887
ISN 0102		6666 FORMAT(1H1, 1X, 10HSAFETYFACT, 2DA, 5HITEM#, 12 /	FEM 1888
		4X, 10HLOAD-CONDITION, 1A4,	FEM 1889
		174, 10HINDICATES - / 175, 10HTHETA IS FROM INPUT /	FEM 1890
		17A, 10H12X, 12X, 10HTAN-F, 16X, 10HN, 13X, 10HTHETA1,	FEM 1891
		10X, 10HTHETA2, 12X, 10HTAU, 12X, 10HSIGMA /)	FEM 1892
ISN 0103		IPCTR = 0	FEM 1893
	C		FEM 1894
	C		FEM 1895
ISN 0104	C	305 CONTINUE	FEM 1896
	C		FEM 1897
ISN 0105		DO 1000 I = 1,KAI	FEM 1898
ISN 0106		IF (IP1(I).EQ.0) MIPP(I)=0	FEM 1899
ISN 0108		J = 11 + 10*(I-1)	FEM 1900
ISN 0109		K = J + 2	FEM 1901
ISN 0110		DO 320 J1 = J,K	FEM 1902
ISN 0111		IF (IAA(J1).NE.IBLNK) GO TO 300	FEM 1903
ISN 0113		320 CONTINUE	FEM 1904
	C		FEM 1905
ISN 0114		IF (L1(I).EQ.1) GO TO 360	FEM 1906
ISN 0116		IF (L1(I).EQ.0) GO TO 340	FEM 1907
ISN 0118		GO TO 9050	FEM 1908
	C		FEM 1909
ISN 0119		340 CONTINUE	FEM 1910
ISN 0120		LS = ISS	FEM 1911
ISN 0121		WK = SG1 - SG2	FEM 1912
ISN 0122		IF (WK.EQ.0.) GO TO 350	FEM 1913
	C		FEM 1914
ISN 0124		WK3 = ABS((TU(I)+F1(I)*SG1)+(TU(1)+F1(1)*SG2))	FEM 1915
ISN 0125		VN = 2.*SQRT(WK3)/WK	FEM 1916
ISN 0126		IF (VN.EQ.0.) GO TO 355	FEM 1917
	C		FEM 1918
			FEM 1919
			FEM 1920

ISN 0128		WK4 = F1(1)/VN	FEM 1921
ISN 0129		THETA(1) = PA1/4. - ATAN(WK4)/2. + THT	FEM 1922
ISN 0130		THETA(2) = ATAN(WK4)/2. - PA1/4. + THT	FEM 1923
ISN 0131		GO TO 380	FEM 1924
	C		FEM 1925
	C		FEM 1926
ISN 0132	350	VN = 0.0	FEM 1927
ISN 0133		THETA(1) = PA1/4. + THT	FEM 1928
ISN 0134		THETA(2) = -PA1/4. + THT	FEM 1929
ISN 0135		GO TO 380	FEM 1930
	C		FEM 1931
	C		FEM 1932
ISN 0136	355	THETA(1) = THT	FEM 1933
ISN 0137		THETA(2) = THT	FEM 1934
ISN 0138		GO TO 380	FEM 1935
	C		FEM 1936
	C		FEM 1937
ISN 0139	360	CONTINUE	FEM 1938
ISN 0140		LS = 1LL	FEM 1939
ISN 0141		WKTAN=ATAN(F1(1))	FEM 1940
ISN 0142		WK1=(SG1-SG2)/2.-(SG1+SG2)*SIN(WKTAN)/2.	FEM 1941
ISN 0143		IF(WK1.EQ.0.) GO TO 370	FEM 1942
ISN 0145		VN=TU(1)*COS(WKTAN)/WK1	FEM 1943
ISN 0146		GO TO 375	FEM 1944
	C		FEM 1945
	C		FEM 1946
ISN 0147	370	CONTINUE	FEM 1947
ISN 0148		VN = 0.0	FEM 1948
	C		FEM 1949
ISN 0149	375	CONTINUE	FEM 1950
ISN 0150		THETA(1) = PA1/4. - ATAN(F1(1))/2. + THT	FEM 1951
ISN 0151		THETA(2) = ATAN(F1(1))/2. - PA1/4. + THT	FEM 1952
	C		FEM 1953
ISN 0152	380	CONTINUE	FEM 1954
ISN 0153		SGMA = (SG1+SG2)/2. - (SG1-SG2)/2.*COS(2.*(THETA(1)-THT))	FEM 1955
ISN 0154		TAU = (SG2-SG1)/2.*SIN(2.*(THETA(1)-THT))	FEM 1956
	C		FEM 1957
ISN 0155		DO 750 N = 1,2	FEM 1958
ISN 0156		WKW = THETA(N)*180./PA1	FEM 1959
ISN 0157		WK = ABS(WKW)	FEM 1960
ISN 0158		IDG1(N) = WK	FEM 1961
ISN 0159		WK = (WK - FLOAT(IDG1(N)))*60.	FEM 1962
ISN 0160		IDG2(N) = WK	FEM 1963
ISN 0161		IDG3(N) = (WK - FLOAT(IDG2(N)))*60.	FEM 1964
ISN 0162		IF (WKW.LT.0.) IDG1(N) = -IDG1(N)	FEM 1965
ISN 0164	750	CONTINUE	FEM 1966
	C		FEM 1967
ISN 0165		IF(NPRINT.EQ.1 .OR. ITENS.EQ.C)	FEM 1968
	1	WRITE(8,6820) ID,NUM,TU(1),F1(1),LS,VN,	FEM 1969
	*	(IDG1(L),IDG2(L),IDG3(L),L=1,2),	FEM 1970
	*	TAU,SGMA	FEM 1971
ISN 0167	6820	FORMAT (' ',A4,1X,14,2(3X,E12.5),3X,A1,3X,E12.5,	FEM 1972
	*	2(4X,14,2X,I2,2X,12),5X,E12.5,5X,E12.5)	FEM 1973
	C		FEM 1974
ISN 0168		IF(IP1(1).EQ.1) GO TO 581	FEM 1975
	C		FEM 1976
ISN 0170		L9(I)=L9(I)+1	FEM 1977
ISN 0171		L2=L9(I)	

ISN 0172		AREC1(L2,1)=THETA(1)	FEM 1978
ISN 0173		AREC2(L2,1)=THETA(2)	FEM 1979
ISN 0174		GO TO 800	FEM 1980
	C		FEM 1981
	C		FEM 1982
ISN 0175	500	CONTINUE	FEM 1983
ISN 0176		WKS = ABS(DEG(1))	FEM 1984
ISN 0177		IDG1(1) = WKS	FEM 1985
ISN 0178		IDG2(1) = (WKS - FLOAT(IDG1(1)))*100. + 0.5	FEM 1986
ISN 0179		WK = FLOAT(IDG1(1)) + FLOAT(IDG2(1))/60.	FEM 1987
ISN 0180		DEGREE = WK*PI/180.	FEM 1988
ISN 0181		IF (DEG(1).GE.0.0) GO TO 511	FEM 1989
	C		FEM 1990
ISN 0183		IDG1(1) = -IDG1(1)	FEM 1991
ISN 0184		DEGREE = -DEGREE	FEM 1992
	C		FEM 1993
ISN 0185	511	CONTINUE	FEM 1994
ISN 0186		SGMA = (SG1+SG2)/2. - (SG1-SG2)/2.*COS(2.*(DEGREE-THT))	FEM 1995
ISN 0187		TAU = (SG2-SG1)/2.*SIN(2.*(DEGREE-THT))	FEM 1996
	C		FEM 1997
ISN 0188		IF (L1(I).EQ.1) GO TO 550	FEM 1998
ISN 0190		IF (L1(I).EQ.0) GO TO 600	FEM 1999
ISN 0192		GO TO 9050	FEM 2000
	C		FEM 2001
	C		FEM 2002
ISN 0193	550	CONTINUE	FEM 2003
ISN 0194		LS = 1LL	FEM 2004
ISN 0195		VN = TU(1)/(ABS(TAU)-F1(I)*SGMA)	FEM 2005
ISN 0196		GO TO 610	FEM 2006
	C		FEM 2007
	C		FEM 2008
ISN 0197	600	CONTINUE	FEM 2009
ISN 0198		LS = 1SS	FEM 2010
ISN 0199		VN = (TU(1)+F1(I)*SGMA)/ABS(TAU)	FEM 2011
	C		FEM 2012
ISN 0200	610	CONTINUE	FEM 2013
ISN 0201		IF (NPRINT.EQ.1 .OR. ITENS.EQ.C)	FEMUP464
	1	WRITE(6,6061) ID,NUM,TU(1),F1(1),LS,VN,	FEMUP465
	*	IDG1(1),IDG2(1),IAST,TAU,SGMA	FEM 2015
ISN 0203	6061	FORMAT (' ',A4,1X,14,2(3X,12.5),3X,A1,3X,E12.5,4X,	FEM 2016
	*	14,2X,12,13X,A1,11X,E12.5,3X,E12.5)	FEM 2017
	C		FEM 2018
ISN 0204		IF(IP1(I).EQ.1) GO TO 881	FEM 2019
	C		FEM 2020
ISN 0206		LS(I)=L9(I)+1	FEM 2021
ISN 0207		L2=L9(I)	FEM 2022
ISN 0208		AREC1(L2,1)=DEGREE	FEM 2023
ISN 0209		AREC2(L2,1)=5001.	FEM 2024
	C		FEM 2025
ISN 0210	860	CONTINUE	FEM 2026
ISN 0211		AREA(L2,1)=VN	FEM 2027
ISN 0212		IP1YN(L2,1)=0	FEM 2028
ISN 0213		PX(L2,1)=XX	FEM 2029
ISN 0214		PY(L2,1)=YY	FEM 2030
ISN 0215		LLU(L2,1)=0	FEM 2031
ISN 0216		IF(L1(I).EQ.1) LLU(L2,1)=1	FEM 2032
	C		FEM 2033
ISN 0218	881	CONTINUE	FEM 2034

ISN 0219		IPCTR = IPCTR + 1	FEM 2035
ISN 0220	C	1000 CONTINUE	FEM 2036
ISN 0221		GO TO 30	FEM 2037
	C		FEM 2038
	C		FEM 2039
ISN 0222		7000 CONTINUE	FEM 2040
ISN 0223		IF(1TA6.NE.1) GO TO 7020	FEM 2041
	C		FEM 2042
ISN 0225		DO 10 M=1,3	FEM 2043
ISN 0226		IF(MIPP(M).EQ.1) GO TO 23	FEM 2044
ISN 0228		CALL PLOT(X2MAX,C.-3)	FEM 2045
ISN 0229		ACMAX=XX1+100.0	FEM 2046
ISN 0230		YH=PAPEH-Y2MAX	FEM 2047
ISN 0231		CALL GF0UR(J11,ILUSS,X1MAX,FFF,116,JBF,EEE,2,IXQY,M,YH)	FEM 2048
ISN 0232		CALL GTWO(NMAX,X,Y,IIDC,JDC,160UN,JDD,NNS,FF10)	FEM 2049
ISN 0233		IJK=L9(M)	FEM 2050
ISN 0234		DO 20 LL=1,IJK	FEM 2051
ISN 0235		IF(1P1YN(LL,M).EQ.1) GO TO 20	FEM 2052
ISN 0237		AR1=AREC1(LL,M)	FEM 2053
ISN 0238		AR2=AREC2(LL,M)	FEM 2054
ISN 0239		XX1=PX(LL,M)+5.*COS(AR1)	FEM 2055
ISN 0240		YY1=PY(LL,M)+5.*SIN(AR1)	FEM 2056
ISN 0241		XX2=XX1-10.*COS(AR1)	FEM 2057
ISN 0242		YY2=YY1-10.*SIN(AR1)	FEM 2058
ISN 0243		CALL PLOT(XX1,YY1,3)	FEM 2059
ISN 0244		CALL PLOT(XX2,YY2,2)	FEM 2060
ISN 0245		IF(AR2.GT.5000.)GO TO 50	FEM 2061
ISN 0247		XX11=PX(LL,M)+5.*COS(AR2)	FEM 2062
ISN 0248		YY11=PY(LL,M)+5.*SIN(AR2)	FEM 2063
ISN 0249		XX22=XX11-10.*COS(AR2)	FEM 2064
ISN 0250		YY22=YY11-10.*SIN(AR2)	FEM 2065
ISN 0251		CALL PLCT(XX11,YY11,3)	FEM 2066
ISN 0252		CALL PLDT(XX22,YY22,2)	FEM 2067
ISN 0253		CONTINUE	FEM 2068
	50		FEM 2069
	C		FEM 2070
ISN 0254		AR3=AR1+PA1/4.	FEM 2071
ISN 0255		XX1=PX(LL,M)+5.*COS(AR3)	FEM 2072
ISN 0256		YY1=PY(LL,M)+5.*SIN(AR3)	FEM 2073
ISN 0257		AR2=AREA(LL,M)	FEM 2074
ISN 0258		AQ2=160.*AR1/PA1	FEM 2075
ISN 0259		CALL NUMBER(XX1,YY1,2.,AR2,AQ2,2)	FEM 2076
ISN 0260		CONTINUE	FEM 2077
	20		FEM 2078
	C		FEM 2079
ISN 0261		23 CONTINUE	FEM 2080
ISN 0262		IF(XA1.EQ.M) GO TO 7020	FEM 2081
ISN 0264		10 CONTINUE	FEM 2082
	C		FEM 2083
ISN 0265		7020 CONTINUE	FEM 2084
ISN 0266		IF (1D.EQ.IDEND) GO TO 8000	FEM 2085
ISN 0268		IF (1D.EQ.IDRSTK) GO TO 8050	FEM 2086
ISN 0270		IF (1D.EQ.IDLOCN) GO TO 8200	FEM 2087
ISN 0272		GO TO 9070	FEM 2088
	C		FEM 2089
	C		FEM 2090
ISN 0273		8000 CONTINUE	FEM 2091
ISN 0274		IESW = 1	FEM 2092
ISN 0275		GO TO 8300	

	C		FEM 2093
ISN 0276	C		FEM 2094
ISN 0277	8050	CONTINUE	FEM 2095
ISN 0278		IESW = 2	FEM 2096
		GO TO 8300	FEM 2097
	C		FEM 2098
	C		FEM 2099
ISN 0279	8200	CONTINUE	FEM 2100
ISN 0280		LDCNU = 1A(2)	FEM 2101
ISN 0281		IXGF=NUM/10	FEM 2102
ISN 0282		GKESNX=TU(1)	FEM 2103
ISN 0283		GKESNY=F1(1)	FEM 2104
	C		FEM 2105
ISN 0284	8300	CONTINUE	FEM 2106
	C		FEM 2107
ISN 0285	C	RETURN	FEM 2108
	C		FEM 2109
	C		FEM 2110
	C	*** ERROR MESSAGE PRINT ***	FEM 2111
	C		FEM 2112
ISN 0286	9010	CONTINUE	FEM 2113
ISN 0287		WRITE (6,6011) IAA,NUM	FEM 2114
ISN 0288	6011	FORMAT (' * ,40A2, '*** NOODAL POINT ',14,' IS INVALID')	FEM 2115
ISN 0289		GO TO 4900	FEM 2116
	C		FEM 2117
	C		FEM 2118
ISN 0290	9030	CONTINUE	FEM 2119
ISN 0291		WRITE (6,6033) IAA,NUM	FEM 2120
ISN 0292	6033	FORMAT (' * ,40A2, '*** ELEMENT NO. ',14,' IS INVALID')	FEM 2121
ISN 0293		GO TO 9900	FEM 2122
	C		FEM 2123
	C		FEM 2124
ISN 0294	9050	CONTINUE	FEM 2125
ISN 0295		WRITE (6,6055) IAA	FEM 2126
ISN 0296	6055	FORMAT (' * ,40A2, '*** L IS NOT 1, 0, OR BLANK')	FEM 2127
ISN 0297		GO TO 9900	FEM 2128
	C		FEM 2129
	C		FEM 2130
ISN 0298	9070	CONTINUE	FEM 2131
ISN 0299		WRITE (6,6077) (IAA(1),1=1,5)	FEM 2132
ISN 0300	6077	FORMAT (' * ,5A2, '..... *** CARD-10 SHOULD BE NODE,LMNT, ',	FEM 2133
		* ,LDCN,RSTR, OR END')	FEM 2134
ISN 0301		IECTR = IECTR + 1	FEM 2135
	C		FEM 2136
ISN 0302		IF (IECTR.GT.10) GO TO 9870	FEM 2137
	C		FEM 2138
ISN 0304	9900	CONTINUE	FEM 2139
ISN 0305		GO TO 30	FEM 2140
	C		FEM 2141
	C		FEM 2142
ISN 0306	9870	CONTINUE	FEM 2143
ISN 0307		WRITE (6,6870)	FEM 2144
ISN 0308	6870	FORMAT (' * ,10X, '*** LOST CARD (OR CARDS) , OR ',	FEM 2145
		* ,CARD-SEQUENCE ERROR')	FEM 2146
	C		FEM 2147
	C		FEM 2148
ISN 0309		STOP	FEM 2149
	C		FEM 2150
ISN 0310		END	FEM 2151
			FEM 2152

ISN 0002		SUBROUTINE NODE	FEM 2153
	C		FEM 2154
	C		FEM 2155
	C		FEM 2156
	C		FEM 2157
ISN 0003		COMMON/GLOBAL/ IERROR,IPEMAX,IQMAX,NMAX,LMAX,ETA6	FEM 2158
ISN 0004		COMMON /LMNTC/ NSLMNT	FEM 2159
ISN 0005		COMMON /NODEC/ NNS(2000),NSN(1000),X(1000),Y(1000)	FEM 2160
ISN 0006		COMMON /NODEC/ JU(50),NCC(2,50),QM(50)	FEM 2161
ISN 0007		COMMON/IUBUN/IROUN(20)	FEM 2162
ISN 0008		COMMON/CONDT/JRE,JCC,JDD,EEE,FFF,G01,GG2,JHM,JII,ITA6	FEM 2163
ISN 0009		COMMON/PLDATA/NNSD,NN	FEM 2164
ISN 0010		COMMON /GRPLUT/ X2MAX,Y2MAX,PAPER,X1MAX,Y1MAX,XXX1	FEM 2165
ISN 0011		INTEGER*2 NNS,NSN,NSMN,JU,NCC,NN	FEM 2166
ISN 0012		INTEGER*2 NNSD(1000)	FEM 2167
ISN 0013		DIMENSION IA1E(1E),IA(20),ICC(2)	FEM 2168
	C		FEM 2169
ISN 0014		DATA NSLIMIT,NLIMIT /2000,1000/	FEM 2170
ISN 0015		DATA THULMT/1E0,1E0/	FEM 2171
ISN 0016		DATA ISLIMIT/50/	FEM 2172
ISN 0017		DATA MDNODE/4HNODE/	FEM 2173
ISN 0018		DATA IBLANK/1H /	FEM 2174
ISN 0019		DATA ZERO/0.0E0/	FEM 2175
ISN 0020		DATA MULMNT/4HLMNT/	FEM 2176
ISN 0021		DATA WWAL,WWYL/2000.,750./	FEM 2177
ISN 0022		DATA WWXS,WWYS/2000.,200./	FEM 2178
	C		FEM 2179
ISN 0023		X1MIN=2000.	FEM 2180
ISN 0024		Y1MIN=2000.	FEM 2181
ISN 0025		X1MAX=-2000.	FEM 2182
ISN 0026		Y1MAX=-2000.	FEM 2183
ISN 0027		NN=0	FEM 2184
	C		FEM 2185
ISN 0028		IF(JDD.EQ.1) GO TO 10	FEM 2186
ISN 0030		IF(JEE.EQ.0) GO TO 10	FEM 2187
	C		FEM 2188
ISN 0032		READ(5,503) IBOUND,IA	FEM 2189
ISN 0033	503	FORMAT(20I4,T1,20A4)	FEM 2190
ISN 0034		WRITE(6,600) IA	FEM 2191
	C		FEM 2192
ISN 0035		10 CONTINUE	FEM 2193
ISN 0036		READ(5,500) IDNODE,NBNODE,IA1E,IA	FEM 2194
ISN 0037	500	FORMAT(A4,I5,A2,17A4,T1,20A4)	FEM 2195
ISN 0038		WRITE(6,600) IA	FEM 2196
ISN 0039	600	FORMAT(1H,20X,20A4)	FEM 2197
	C		FEM 2198
ISN 0040		IF (IDNODE.NE.MDNODE) GO TO 9005	FEM 2199
	C		FEM 2200
ISN 0042		DO 1010 I=1,IE	FEM 2201
ISN 0043		IF (IA1E(I).NE.IBLANK) GO TO 9005	FEM 2202
ISN 0045		1010 CONTINUE	FEM 2203
	C		FEM 2204
ISN 0046		2000 CONTINUE	FEM 2205

ISN 0047	C	DO 1000 NS=1, NSLIMIT	FEM 2206
ISN 0048		NNS(NS)=0	FEM 2207
ISN 0049		1000 CONTINUE	FEM 2208
ISN 0050	C	DO 1500 NS=1, NLIMIT	FEM 2209
ISN 0051		NNN(NS)=0	FEM 2210
ISN 0052		X(NS)=0.	FEM 2211
ISN 0053		Y(NS)=0.	FEM 2212
ISN 0054		1500 CONTINUE	FEM 2213
ISN 0055	C	IQMAX=0	FEM 2214
ISN 0056	C	DO 1600 NS=1, ISLIMIT	FEM 2215
ISN 0057		JQ(NS)=0	FEM 2216
ISN 0058		QM(NS)=0.	FEM 2217
ISN 0059		1600 CONTINUE	FEM 2218
ISN 0060	C	DO 1800 NS=1, ISLIMIT	FEM 2219
ISN 0061		DO 1800 I=1, 2	FEM 2220
ISN 0062		NCC(I, NS)=0	FEM 2221
ISN 0063		1800 CONTINUE	FEM 2222
ISN 0064	C	PAPER=E40.	FEM 2223
ISN 0065		IF(J11.EQ.1) PAPER=255.	FEM 2224
ISN 0067		X2MAX=GG1=10.	FEM 2225
ISN 0068		Y2MAX=GG2=10.	FEM 2226
ISN 0069		IJGINT=0	FEM 2227
ISN 0070	C	DO 10000 N=1, 20000	FEM 2228
ISN 0071		READ(5, 201) IONDD=, NS, XN, YN, THQN, ICC(1), ICC(2), IA	FEM 2229
ISN 0072	201	FORMAT (A4, I5, 1X, 5E10.0, 20X, 2I5, T1, 20A4)	FEM 2230
ISN 0073		WRITE (6, 500) IA	FEM 2231
ISN 0074		IF (IONDD=, NE, MDNODE) GO TO 10100	FEM 2232
ISN 0076		IF (N.GT.NLIMIT) GO TO 9010	FEM 2233
ISN 0078		IF(NS.GT.C) GO TO 7000	FEM 2234
ISN 0080		NS=-NS	FEM 2235
ISN 0081		NN=NN+1	FEM 2236
ISN 0082		NNSD(NN)=N	FEM 2237
ISN 0083	C	7000 CONTINUE	FEM 2238
ISN 0084		IF(NS.LE.0.OR.NS.GT.NSLIMIT) GO TO 9020	FEM 2239
ISN 0086		NNS(NS) = N	FEM 2240
ISN 0087		NNN(N) = NS	FEM 2241
ISN 0088		X(N)=XN	FEM 2242
ISN 0089		Y(N)=YN	FEM 2243
ISN 0090		IF (ICC(1).EQ.0 .AND. ICC(2).EQ.0) GO TO 2500	FEM 2244
ISN 0092		GO TO 3000	FEM 2245
ISN 0093	C	2500 CONTINUE	FEM 2246
ISN 0094		IF (THQN.EQ.ZERO) GO TO 10000	FEM 2247
ISN 0096		GO TO 9035	FEM 2248
ISN 0097	C	3000 CONTINUE	FEM 2249
ISN 0098		IF (ICC(1).EQ.0 .OR. ICC(1).EQ.1) GO TO 3100	FEM 2250
ISN 0100		GO TO 9040	FEM 2251
			FEM 2252
			FEM 2253
			FEM 2254
			FEM 2255
			FEM 2256
			FEM 2257
			FEM 2258
			FEM 2259
			FEM 2260
			FEM 2261
			FEM 2262
			FEM 2263

	C		FEM 2264
	C		FEM 2265
ISN 0101	3100	CONTINUE	FEM 2266
ISN 0102		IF (ICC(2).EQ.0 .OR. ICC(2).EQ.1) GO TO 3200	FEM 2267
ISN 0104		GO TO 9040	FEM 2268
	C		FEM 2269
	C		FEM 2270
ISN 0105	3200	CONTINUE	FEM 2271
ISN 0106		IF (ABS(THON).GT.7*JLMT) GO TO 9030	FEM 2272
	C		FEM 2273
ISN 0108		IQMAX=IQMAX+1	FEM 2274
ISN 0109		IF (IQMAX.GT.1SLMT) GO TO 9065	FEM 2275
	C		FEM 2276
ISN 0111		JQ(IQMAX)=N	FEM 2277
ISN 0112		NCC(1,IQMAX)=ICC(1)	FEM 2278
ISN 0113		NCC(2,IQMAX)=ICC(2)	FEM 2279
ISN 0114		QM(IQMAX)=THON	FEM 2280
	C		FEM 2281
ISN 0115		IF (ICC(1).EQ.1) IJOINT=IJOINT+1	FEM 2282
ISN 0117		IF (ICC(2).EQ.1) IJOINT=IJOINT+1	FEM 2283
	C		FEM 2284
ISN 0119	10000	CONTINUE	FEM 2285
ISN 0120		GO TO 9992	FEM 2286
	C		FEM 2287
	C		FEM 2288
ISN 0121	10100	CONTINUE	FEM 2289
ISN 0122		IF (IDNODE.NE.MDLMT) GO TO 9710	FEM 2290
	C		FEM 2291
ISN 0124		NBLMNT=NS	FEM 2292
ISN 0125		NMAX=N-1	FEM 2293
	C		FEM 2294
ISN 0126		IF (NMAX.NE.NBNODE) GO TO 9725	FEM 2295
ISN 0128		IF (NMAX.LE.0) GO TO 9730	FEM 2296
ISN 0130		IF (IJOINT.LT.3) GO TO 9740	FEM 2297
ISN 0132		IF(JHE.LE.0) GO TO 10200	FEM 2298
	C		FEM 2299
ISN 0134	40000	CONTINUE	FEM 2300
	C		FEM 2301
ISN 0135		DO 4000 N=1,NMAX	FEM 2302
ISN 0136		X1MIN=AMIN1(X(N),X1MIN)	FEM 2303
ISN 0137		Y1MIN=AMIN1(Y(N),Y1MIN)	FEM 2304
ISN 0138		X1MAX=AMAX1(X(N),X1MAX)	FEM 2305
ISN 0139		Y1MAX=AMAX1(Y(N),Y1MAX)	FEM 2306
ISN 0140	4000	CONTINUE	FEM 2307
	C		FEM 2308
ISN 0141		DO 4100 N=1,NMAX	FEM 2309
ISN 0142		X(N)=X(N)-X1MIN	FEM 2310
ISN 0143		Y(N)=Y(N)-Y1MIN	FEM 2311
ISN 0144	4100	CONTINUE	FEM 2312
	C		FEM 2313
ISN 0145		XX1Z=X1MAX-X1MIN	FEM 2314
ISN 0146		YY1Z=Y1MAX-Y1MIN	FEM 2315
ISN 0147		XX1=XX1Z*FFF*10.	FEM 2316
ISN 0148		WY1=YY1Z*FFF*10. + GG2*10.	FEM 2317
ISN 0149		IF(JII.EQ.1) GO TO 7200	FEM 2318
	C		FEM 2319
ISN 0151		WXX=WXL	FEM 2320
ISN 0152		WY=WYL	FEM 2321

ISN 0153	GO TO 7300	FEM 2322
	C	FEM 2323
ISN 0154	7200 CONTINUE	FEM 2324
ISN 0155	WWW=XXS	FEM 2325
ISN 0156	WWW=XXS	FEM 2326
	C	FEM 2327
ISN 0157	7300 CONTINUE	FEM 2328
ISN 0158	IF(WXX-LT.WXX1) GO TO 7400	FEM 2329
	C	FEM 2330
ISN 0160	7350 CONTINUE	FEM 2331
ISN 0161	IF(WYY-LT.WYY1) GO TO 7450	FEM 2332
ISN 0163	GO TO 10200	FEM 2333
	C	FEM 2334
	C	FEM 2335
ISN 0164	7400 CONTINUE	FEM 2336
ISN 0165	WRITE(6,20000)	FEM 2337
	C	FEM 2338
ISN 0166	20000 FORMAT(1H,38HPLUTTER PAPER IS LITTLE IN X-DIRECTION)	FEM 2339
ISN 0167	IERKOK=IERKOK+1	FEM 2340
ISN 0168	JBB=0	FEM 2341
ISN 0169	GO TO 7350	FEM 2342
	C	FEM 2343
	C	FEM 2344
ISN 0170	7450 CONTINUE	FEM 2345
ISN 0171	WRITE(6,20100)	FEM 2346
ISN 0172	20100 FORMAT(1H,38HPLUTTER PAPER IS LITTLE IN Y-DIRECTION)	FEM 2347
	C	FEM 2348
ISN 0173	IERKOK=IERKOK+1	FEM 2349
ISN 0174	JBB=0	FEM 2350
	C	FEM 2351
ISN 0175	10200 CONTINUE	FEM 2352
	C	FEM 2353
	C	FEM 2354
	C	FEM 2355
ISN 0176	RETURN	FEM 2356
	C	FEM 2357
	C	FEM 2358
	C	FEM 2359
ISN 0177	9000 CONTINUE	FEM 2360
ISN 0178	WRITE (6,19005)	FEM 2361
ISN 0179	19005 FORMAT (1H,41HWRONG CARD OTHER THAN NODE HEADER CARD.)	FEM 2362
ISN 0180	GO TO 9990	FEM 2363
	C	FEM 2364
	C	FEM 2365
ISN 0181	9010 CONTINUE	FEM 2366
ISN 0182	WRITE (6,19010)	FEM 2367
ISN 0183	19010 FORMAT (1H,30HTHEAR ARE TOO MANY NODE-CARDS.)	FEM 2368
ISN 0184	GO TO 9991	FEM 2369
	C	FEM 2370
	C	FEM 2371
ISN 0185	9020 CONTINUE	FEM 2372
ISN 0186	WRITE (6,19020)	FEM 2373
ISN 0187	19020 FORMAT (1H,35HMODAL POINT NUMBER IS OUT OF RANGE.)	FEM 2374
ISN 0188	GO TO 9991	FEM 2375
	C	FEM 2376
	C	FEM 2377
ISN 0189	9030 CONTINUE	FEM 2378
		FEM 2379

ISN 0190	WRITE (6,19030) THON	FEM 2380
ISN 0191	19030 FORMAT (1H,13HOBlique ANGLE,1PE15.7, 17H IS OUT OF RANGE.)	FEM 2381
ISN 0192	GO TO 9991	FEM 2382
	C	FEM 2383
	C	FEM 2384
ISN 0193	9035 CONTINUE	FEM 2385
ISN 0194	WRITE (6,19035) NS	FEM 2386
ISN 0195	19035 FORMAT (1H,5HNOUE,14.35HIS NOT FIXED POINT. OBLIQUE MUST BE,	FEM 2387
	1 5HZERO.)	FEM 2388
ISN 0196	GO TO 9991	FEM 2389
	C	FEM 2390
	C	FEM 2391
ISN 0197	9065 CONTINUE	FEM 2392
ISN 0198	WRITE (6,19065)	FEM 2393
ISN 0199	19065 FORMAT(1H,22HTOO MANY FIXED POINTS.)	FEM 2394
ISN 0200	GO TO 9991	FEM 2395
	C	FEM 2396
	C	FEM 2397
ISN 0201	9710 CONTINUE	FEM 2398
ISN 0202	WRITE (6,19710)	FEM 2399
ISN 0203	19710 FORMAT(1H,30HIDENTIFICATION ERROR.	FEM 2400
	1 40HCARD SEQUENCE ERROR MIGHT BE PRESUMABLE.)	FEM 2401
ISN 0204	GO TO 9991	FEM 2402
	C	FEM 2403
	C	FEM 2404
ISN 0205	9725 CONTINUE	FEM 2405
ISN 0206	WRITE (6,19725) NNODE,NMAX	FEM 2406
ISN 0207	19725 FORMAT (1H,47HTHE NUMBER OF NODAL POINTS IS NOT AS INDICATED.	FEM 2407
	1 /1H,20HINDICATED 15	FEM 2408
	2 /1H,20HACTUALLY READ 15)	FEM 2409
ISN 0208	GO TO 9993	FEM 2410
	C	FEM 2411
	C	FEM 2412
ISN 0209	9730 CONTINUE	FEM 2413
ISN 0210	WRITE (6,19730)	FEM 2414
ISN 0211	19730 FORMAT(1H,26HTHERE ARE NO NODAL POINTS.)	FEM 2415
ISN 0212	GO TO 9993	FEM 2416
	C	FEM 2417
	C	FEM 2418
ISN 0213	9740 CONTINUE	FEM 2419
ISN 0214	WRITE (6,19740)	FEM 2420
ISN 0215	19740 FORMAT(1H,38HTHE STRUCTURE IS NOT SUPPORTED STABLY.)	FEM 2421
ISN 0216	GO TO 9993	FEM 2422
	C	FEM 2423
	C	FEM 2424
ISN 0217	9040 CONTINUE	FEM 2425
ISN 0218	WRITE (6,19040)	FEM 2426
ISN 0219	19040 FORMAT(1H,24HCONDITION CODE IS WRONG.)	FEM 2427
ISN 0220	GO TO 9991	FEM 2428
	C	FEM 2429
	C	FEM 2430
ISN 0221	9990 CONTINUE	FEM 2431
ISN 0222	IERROM=IERROM+1	FEM 2432
ISN 0223	GO TO 2000	FEM 2433
	C	FEM 2434
	C	FEM 2435
ISN 0224	9991 CONTINUE	FEM 2436
ISN 0225	IERROM=IERROM+1	FEM 2437

ISN 0226	C	GO TO 10000	FEM 2438
	C		FEM 2439
ISN 0227		9992 CONTINUE	FEM 2440
ISN 0228		IERKOR=IERKOR+1	FEM 2441
ISN 0229		GO TO 10100	FEM 2442
	C		FEM 2443
	C		FEM 2444
ISN 0230		9993 CONTINUE	FEM 2445
ISN 0231		IERKOR=IERKOR+1	FEM 2446
ISN 0232		GO TO 10200	FEM 2447
	C		FEM 2448
	C		FEM 2449
ISN 0233		END	FEM 2450
	C		FEM 2451
ISN 0002		SUBROUTINE GREEN	
	C		FEM 2452
	C		FEM 2453
	C		FEM 2454
	C		FEM 2455
ISN 0003		COMMON/CONDY/J98,JCC,JDC,EEB,FFF,GG1,GG2,JMH,JII,ITA6	FEM 2456
ISN 0004		COMMON/CONDS/ILOSS,II8(20),IIDC,JDC	FEM 2457
ISN 0005		COMMON/IOBUN/IBOUN(20)	FEM 2458
ISN 0006		COMMON/PLDATA/NNSD,NN	FEM 2459
ISN 0007		COMMON/LLDATA/XLSX(2000),XLSY(2000),LLSD,LLT	FEM 2460
ISN 0008		INTEGER*2 IIDC(1000),JDC(1000,10),NNSD(1000),NN,LLSD(1000),LLT	FEM 2461
ISN 0009		COMMON/GLOBAL/ IERKOR,IPEMAX,IPMAX,NMAX,LMAX,ETAC	FEM 2462
ISN 0010		COMMON/GRPLD7/ X2MAX,Y2MAX,PAPEW,X1MAX,Y1MAX,XXX1	FEM 2463
ISN 0011		COMMON/FLG/ IESW,LDSW,KSFY,LDCN,LDCND	FEM 2464
ISN 0012		COMMON/NUDEC /NNS(2000),NSN(1000),G(1000),R(1000),	FEM 2465
		JJ(50),NCC(2,50),NM(50)	FEM 2466
ISN 0013		INTEGER*2 NNS,NSN,JJ,NCC	FEM 2467
ISN 0014		COMMON/SAFTYC/SIG1(2000),SIG2(2000),SITAL(2000),	FEM 2468
		1 SIG1(1000),S2(1000),SITAN(1000)	FEM 2469
ISN 0015		COMMON/LOADR/ IXWY,ALALX,ALALY,IXQF	FEM 2470
ISN 0016		COMMON / ITN / INUM	FEM 2471
ISN 0017		REAL*4 X(1000),Y(1000)	FEM 2472
	C		FEM 2473
	C		FEM 2474
	C		FEM 2475
	C		FEM 2476
ISN 0018		IF(JDC.EQ.0.AND.J98.EQ.0) RETURN	FEM 2477
	C		FEM 2478
ISN 0020		IF(NN.EQ.0.AND.LLT.EQ.0) GO TO 5001	FEM 2479
	C		FEM 2480
ISN 0022		FF10=FFF*10.0	FEM 2481
ISN 0023		IF(IXQY.NE.1) GO TO 100	FEM 2482
	C		FEM 2483
ISN 0025		DO 8000 N=1,NMAX	FEM 2484
ISN 0026		X(N)=G(N)*FF10	FEM 2485
ISN 0027		Y(N)=R(N)*FF10	FEM 2486
ISN 0028		8000 CONTINUE	FEM 2487
ISN 0029		IF(INUM.GE.2) GO TO 100	FEM 2488
	C		FEM 2489
ISN 0031		CALL PLUTS(DUM,DUM,1)	FEM 2490
ISN 0032		CALL MILLI	FEM 2491
ISN 0033		CALL P1036H	FEM 2492
ISN 0034		CALL PLUNIT(=MILLI)	FEM 2493
ISN 0035		IF(Y2MAX.NE.0.0) GO TO 80	FEM 2494
	C		FEM 2495
ISN 0037		Y2MAX=30.0	

ISN 0038	IF(J11.EQ.1) Y2MAX=10.0	FEM 2496
ISN 0040	C	FEM 2497
ISN 0041	80 CONTINUE	FEM 2498
	CALL PLUT(X2MAX,Y2MAX,-3)	FEM 2499
ISN 0042	C	FEM 2500
ISN 0043	100 CONTINUE	FEM 2501
ISN 0044	CALL PLOT(X2MAX,0.,-3)	FEM 2502
ISN 0045	X2MAX=XXX1+100.0	FEM 2503
ISN 0046	XH=PAPER-Y2MAX+40.	FEM 2504
ISN 0047	XL=-Y2MAX	FEM 2505
ISN 0048	YH=XH+40.0	FEM 2506
ISN 0049	N=1	FEM 2507
ISN 0051	IF(J88.EQ.0) N=4	FEM 2508
ISN 0052	CALL GF0UR(J11,ILOSS,X1MAX,FFF,I16,J88,EEE,N,IXUY,M,YH)	FEM 2509
ISN 0053	CALL GTWC(NMAX,0,K,I10C,JCC,IBGUN,JUD,NNS,FF10)	FEM 2510
	IF(J55.EQ.0) GO TO 60	FEM 2511
ISN 0055	C	FEM 2512
ISN 0056	L=JHH	FEM 2513
	IF(LLT.EQ.0) GO TO 200	FEM 2514
ISN 0058	C	FEM 2515
	CALL GFIVE(LLT,SIG1,SIG2,SITAL,XLSX,XLSY,L,LLSD,EEE,JCC,XH,XL)	FEM 2516
ISN 0059	C	FEM 2517
ISN 0060	200 CONTINUE	FEM 2518
	IF(NN.EQ.0) GO TO 300	FEM 2519
ISN 0062	C	FEM 2520
ISN 0063	300 CONTINUE	FEM 2521
ISN 0064	CALL GFIVE(NN,S1,S2,SITAN,X,Y,L,NNSD,EEE,JCC,XH,XL)	FEM 2522
	RETURN	FEM 2523
ISN 0065	C	FEM 2524
ISN 0066	5001 CONTINUE	FEM 2525
ISN 0067	WRITE(6,5001)	FEM 2526
	5001 FORMAT(1H ,19X,'NEGATIVE NOT FOUND')	FEM 2527
ISN 0068	C	FEM 2528
	RETURN	FEM 2529
ISN 0069	C	FEM 2530
ISN 0070	60 CONTINUE	FEM 2531
ISN 0071	CALL PLUT(0.,0.,999)	FEM 2532
ISN 0072	WRITE(6,10)	FEM 2533
	10 FORMAT(1H1,T20,'***** CHECK PLOT ENDED *****')	FEM 2534
ISN 0073	C	FEM 2535
ISN 0074	C	FEM 2536
	STOP	FEM 2537
	END	FEM 2538

ISN 0002		SUBROUTINE GFUCK(J11,ILOSS,X1MAX,FFF,116,J88,EE8,10,LC,M,PYY)	FEM 2539
	C		FEM 2540
ISN 0003		COMMON / ITN / INUM	FEM 2541
	C		FEMUP488
ISN 0004		DIMENSION I16(1),IDA(6),IDF(5),IDC(6),IDD(5),IDE(7)	FEM 2542
ISN 0005		DIMENSION IDH(5), IUG(5)	FEM 2543
ISN 0006		DATA IUG /'NUDE',' STR','ESS ',' LOC','N= '/,	FEMUP489
	1	IDA /'MIN','C1PA','L ST','KESS',' LD','CN= '/,	FEM 2544
	2	IUC /'SAFT','YFAC','T ',' LOC','N= ',' M= '/	FEM 2545
ISN 0007		DATA IDG /'ITER','ATID','N= '/	FEM 2546
	C		FEMUP490
	C		FEM 2547
ISN 0008		DATA IDG / 1216, 1, 221, 479, 105 /	FEM 2548
	C		FEM 2549
ISN 0009		DATA IDE / 1254, 113, 24, 56, 1176, 479, 105 /	FEM 2550
	C		FEM 2551
ISN 0010		DATA IDH / 1216, 2, 221, 479, 105 /	FEM 2552
	C		FEMUP491
ISN 0011		TC=LC	FEMUP492
ISN 0012		M=M	FEM 2553
ISN 0013		X3MIN=X1MAX*FFF/8.	FEM 2554
ISN 0014		X3MIN=AMIN1(X3MIN,10.)	FEM 2555
ISN 0015		X3MIN=AMAX1(X3MIN,3.)	FEM 2556
	C		FEM 2557
	C		FEM 2558
	C		FEM 2559
ISN 0016		IF(ILOSS.NE.1) GO TO 9703	FEM 2560
ISN 0018		PYY=PYY-X3MIN	FEM 2561
ISN 0019		CALL SYMBOL(40.,PYY,X3MIN,116,0.,60)	FEM 2562
	C		FEM 2563
ISN 0020		9703 CONTINUE	FEM 2564
ISN 0021		PYY= PYY - X3MIN - 5.0	FEMUP493
ISN 0022		PXX= 45.0 + 10.0*X3MIN	FEMUP494
ISN 0023		CALL SYMBOL(45.0, PYY, X3MIN, IUG, 0.0, 10)	FEMUP495
ISN 0024		CALL NUMBER(PXX, PYY, X3MIN, FLOAT(INUM), 0.0, -1)	FEMUP496
	C		FEMUP497
ISN 0025		PYY=PYY-X3MIN-5.0	FEM 2566
ISN 0026		PXX=45.+24.*X3MIN	FEM 2567
ISN 0027		PXXX=45.+25.*X3MIN	FEM 2568
ISN 0028		PYYY=PYY-20.	FEM 2569
ISN 0029		ASDF=1./(10*FFF)	FEM 2570
	C		FEM 2571
ISN 0030		PPX = 45.0 + 10.0*X3MIN	FEM 2572
	C		FEM 2573
ISN 0031		PPXX = PPX + 6.0*X3MIN	FEM 2574
	C		FEM 2575
	C		FEM 2576
ISN 0032		GO TO (10,20,30,50,100,200,500) , ID	FEMUP498
	C		FEM 2578
ISN 0033		10 CONTINUE	FEM 2579
ISN 0034		CALL SYMBOL(45.,PYY,X3MIN,IDA,0.,24)	FEM 2580
ISN 0035		GO TO 40	FEM 2581

ISN 0036	C		FEM 2582
ISN 0037	C	20 CONTINUE	FEM 2583
ISN 0038		CALL SYMBOL(45.,PYY,X3MIN,108,0.,18)	FEM 2584
		GO TO 40	FEM 2585
	C		FEM 2586
ISN 0039	C	30 CONTINUE	FEM 2587
ISN 0040		CALL SYMBOL(45.,PYY,X3MIN,108,0.,24)	FEM 2588
ISN 0041		CALL NUMBER(PXXX,PYY,X3MIN,W,0.,-1)	FEM 2589
ISN 0042		PXX=45.+19.*X3MIN	FEM 2590
	C		FEM 2591
ISN 0043	C	40 CONTINUE	FEM 2592
ISN 0044		CALL NUMBER(PXX,PYY,X3MIN,TC,0.,-1)	FEM 2593
	C		FEM 2594
ISN 0045	C	50 CONTINUE	FEM 2595
ISN 0046		CALL AXIS(10.,PYYY,*NODE-SCALE*, -10,100.,0.,0.,ASDF,10.)	FEM 2596
	C		FEM 2597
ISN 0047		IF(J96.EQ.0) RETURN	FEM 2598
ISN 0049		IF(I0.EQ.2) RETURN	FEM 2599
	C		FEM 2600
ISN 0051		PEE=1./CEE	FEM 2601
ISN 0052		PYYY=PYYY+9.	FEM 2602
	C		FEM 2603
ISN 0053	C	CALL ARQ40(120.,PYYY,133.46,PYYY,1.73,2.,21)	FEM 2604
	C		FEM 2605
ISN 0054		PYYY=PYYY-4.	FEM 2606
ISN 0055		CALL NUMBER(123.,PYYY,2.,PEE,0.,2)	FEM 2607
	C		FEM 2608
ISN 0056		RETURN	FEM 2609
	C		FEM 2610
ISN 0057	C	100 CONTINUE	FEM 2611
ISN 0058		CALL KANJI (45.0,PYY,X3MIN,108,0.0,5)	FEM 2612
	C		FEM 2613
ISN 0059		CALL SYMBOL(PXX,PYY,X3MIN,108(4),0.0,6)	FEM 2614
	C		FEM 2615
ISN 0060		CALL NUMBER(PXXX,PYY,X3MIN,TC,0.0,-1)	FEM 2616
	C		FEM 2617
ISN 0061		GO TO 300	FEM 2618
	C		FEM 2619
ISN 0062	C	200 CONTINUE	FEM 2620
ISN 0063		CALL KANJI (45.0,PYY,X3MIN,108,0.0,7)	FEM 2621
	C		FEM 2622
ISN 0064		CALL SYMBOL(PXX,PYY,X3MIN,108(4),0.0,6)	FEM 2623
	C		FEM 2624
ISN 0065		CALL NUMBER(PXXX,PYY,X3MIN,TC,0.0,-1)	FEM 2625
	C		FEM 2626
ISN 0066		GO TO 300	FEM 2627
	C		FEM 2628
ISN 0067	C	300 CONTINUE	FEMUP2459
ISN 0068		CALL KANJI(45.0, PYY, X3MIN, 108, 0.0, 5)	FEMUP2459
	C		FEMUP2459
ISN 0069		CALL SYMBOL(PXX, PYY, X3MIN, 108(4), 0.0, 6)	FEMUP2459
	C		FEMUP2459
ISN 0070		CALL NUMBER(PXXX, PYY, X3MIN, TC, 0.0, -1)	FEMUP2459
ISN 0071	C	300 CONTINUE	FEMUP2459
ISN 0072		CALL AXIS(10.,PYYY,*NODE-SCALE*, -10,100.,0.,0.,ASDF,10.)	FEMUP2459
	C		FEMUP2459
ISN 0073		RETURN	FEMUP2459
ISN 0074		END	FEMUP2459

ISN 0002		SUBROUTINE GFIVE(MAX,S1,S2,SS,X,Y,ID,NNSD,E,JCC,XH,XL)	FEM 2634
	C		FEM 2635
	C	MAX=KOSU	FEM 2636
	C		FEM 2637
ISN 0003		DIMENSION S1(1),S2(1),SS(1),X(1),Y(1),NNSD(1)	FEM 2638
ISN 0004		REAL ZA(3),ZY(3),AX(11),AY(11)	FEM 2639
ISN 0005		INTEGER=2 MAX,NNSD	FEM 2640
ISN 0006		DATA PAI,SGT/3.1415926,1.73205/,QNM/G.01/	FEM 2641
	C		FEM 2642
ISN 0007		HFPPI=PAI/2.	FEM 2643
ISN 0008		SXPAI=PAI/6.	FEM 2644
ISN 0009		DEG=180./PAI	FEM 2645
	C		FEM 2646
ISN 0010		DO 10 J=1,MAX	FEM 2647
ISN 0011		N=NNSD(J)	FEM 2648
ISN 0012		JJ=1	FEM 2649
ISN 0013		XP=X(N)	FEM 2650
ISN 0014		YP=Y(N)	FEM 2651
ISN 0015		SP=S1(N)	FEM 2652
ISN 0016		SA=SP*E*10.	FEM 2653
ISN 0017		SZ=SS(N)	FEM 2654
	C		FEM 2655
ISN 0018		300 CONTINUE	FEM 2656
ISN 0019		SZA=SZ*DEG	FEM 2657
ISN 0020		ABCA=ABS(COS(SZ))	FEM 2658
ISN 0021		ABCR=ABS(SIN(SZ))	FEM 2659
ISN 0022		IF(ID.EQ.1) SA=-SA	FEM 2660
ISN 0024		IF(SA.LE.0.) GO TO 100	FEM 2661
	C		FEM 2662
ISN 0026		K=SA/2.	FEM 2663
ISN 0027		SZ1=SZ+HFPPI	FEM 2664
ISN 0028		SZ2=SZ-HFPPI	FEM 2665
ISN 0029		ZXSTD=FUNC(K,SZ,C.,0)	FEM 2666
ISN 0030		ZYSTD=FUNC(K,SZ,0.,1)	FEM 2667
ISN 0031		ZX(1)=FUNC(1.,SZ1,ZXSTD,0)	FEM 2668
ISN 0032		ZY(1)=FUNC(1.,SZ1,ZYSTD,1)	FEM 2669
ISN 0033		ZX(2)=FUNC(SGT,SZ,ZXSTD,0)	FEM 2670
ISN 0034		ZY(2)=FUNC(SGT,SZ,ZYSTD,1)	FEM 2671
ISN 0035		ZX(3)=FUNC(1.,SZ2,ZXSTD,0)	FEM 2672
ISN 0036		ZY(3)=FUNC(1.,SZ2,ZYSTD,1)	FEM 2673
ISN 0037		AXSTD=XP+ZXSTD	FEM 2674
ISN 0038		AYSTD=YP+ZYSTD	FEM 2675
	C		FEM 2676
ISN 0039		DO 20 K=1,3	FEM 2677
ISN 0040		KK=K+1	FEM 2678
ISN 0041		AX(KK)=XP+ZX(K)	FEM 2679
ISN 0042		AY(KK)=YP+ZY(K)	FEM 2680
ISN 0043		KL=K+7	FEM 2681
ISN 0044		AX(KL)=XP-ZX(K)	FEM 2682
ISN 0045		AY(KL)=YP-ZY(K)	FEM 2683
ISN 0046		20 CONTINUE	FEM 2684
	C		FEM 2685
ISN 0047		AX(5)=AXSTD	FEM 2686

ISN 0048		AY(5)=AYSTD	FEM 2687
ISN 0049		AX(6)=XP	FEM 2688
ISN 0050		AY(6)=YP	FEM 2689
ISN 0051		AX(7)=XP-ZXSTD	FEM 2690
ISN 0052		AY(7)=YP-ZYSTD	FEM 2691
ISN 0053		AX(11)=AX(7)	FEM 2692
ISN 0054		AY(11)=AY(7)	FEM 2693
ISN 0055		M=11	FEM 2694
ISN 0056		GO TO 200	FEM 2695
	C		FEM 2696
	C		FEM 2697
ISN 0057	100	CONTINUE	FEM 2698
ISN 0058		K=-SA/2.	FEM 2699
ISN 0059		SZ1=SZ+SXPA1	FEM 2700
ISN 0060		SZ2=SZ-SXPA1	FEM 2701
ISN 0061		ZASTO=FUNC(R,SZ,C.,0)	FEM 2702
ISN 0062		ZYSTU=FUNC(K,SZ,G.,1)	FEM 2703
ISN 0063		ZX(1)=FUNC(2.,SZ1,ZASTO,0)	FEM 2704
ISN 0064		ZY(1)=FUNC(2.,SZ1,ZYSTO,1)	FEM 2705
ISN 0065		ZX(2)=FUNC(2.,SZ2,ZASTO,0)	FEM 2706
ISN 0066		ZY(2)=FUNC(2.,SZ2,ZYSTO,1)	FEM 2707
ISN 0067		AXSTD=XP+ZASTO	FEM 2708
ISN 0068		AYSTD=YP+ZYSTO	FEM 2709
ISN 0069		AX(4)=AXSTD	FEM 2710
ISN 0070		AY(4)=AYSTD	FEM 2711
	C		FEM 2712
ISN 0071		DO 50 K=1,2	FEM 2713
ISN 0072		KK=K+1	FEM 2714
ISN 0073		KL=K+6	FEM 2715
ISN 0074		AX(KK)=XP+ZX(K)	FEM 2716
ISN 0075		AY(KK)=YP+ZY(K)	FEM 2717
ISN 0076		AX(KL)=XP-ZX(K)	FEM 2718
ISN 0077		AY(KL)=YP-ZY(K)	FEM 2719
ISN 0078	50	CONTINUE	FEM 2720
	C		FEM 2721
ISN 0079		AX(5)=XP	FEM 2722
ISN 0080		AY(5)=YP	FEM 2723
ISN 0081		AX(6)=XP-ZXSTD	FEM 2724
ISN 0082		AY(6)=YP-ZYSTD	FEM 2725
ISN 0083		AX(9)=AX(6)	FEM 2726
ISN 0084		AY(9)=AY(6)	FEM 2727
ISN 0085		M=9	FEM 2728
ISN 0086	200	CONTINUE	FEM 2729
	C		FEM 2730
ISN 0087		CALL PLOT(AXSTD,AYSTD,5)	FEM 2731
	C		FEM 2732
ISN 0088		DO 45 KK=2,M	FEM 2733
ISN 0089		ZZX=AX(KK)	FEM 2734
ISN 0090		ZZY=AY(KK)	FEM 2735
ISN 0091		IF(ZZY.LE.XH) GO TO 50	FEM 2736
ISN 0093		ZZY=XH	FEM 2737
ISN 0094		IF(ABCA.LT.QNM) GO TO 50	FEM 2738
ISN 0096		IF(ABCB.LT.QNM) GO TO 50	FEM 2739
ISN 0098		ZZX=ZZX-(ZZY-XH)/TAN(SZ)	FEM 2740
ISN 0099	50	CONTINUE	FEM 2741
ISN 0100		IF(ZZY.GE.XL) GO TO 40	FEM 2742
ISN 0102		ZZY=XL	FEM 2743
ISN 0103		IF(ABCA.LT.QNM) GO TO 40	FEM 2744

ISN 0105		IF(ABCE-LT.QNM) GO TO 40	FEM 2742
ISN 0107		ZZX=ZZA-(XL-ZZY)/TAN(SZ)	FEM 2743
ISN 0108	40	CONTINUE	FEM 2744
ISN 0109		CALL PLOT(ZZX,ZZY,Z)	FEM 2745
ISN 0110	45	CONTINUE	FEM 2746
	C		FEM 2747
ISN 0111		IF (JCC -EQ. 0) GO TO 400	FEM 2750
	C		FEM 2751
ISN 0113		IF (JJ -NE. 1) GO TO 60	FEM 2752
	C		FEM 2753
ISN 0115		ZNX = FUNC(3.0,SZ,AP,0) + FUNC(4.0,SZ,0.0,1)	FEM 2754
ISN 0116		ZNY = FUNC(3.0,SZ,YP,1) - FUNC(4.0,SZ,0.0,0)	FEM 2755
ISN 0117		GO TO 70	FEM 2756
	C		FEM 2757
	C		FEM 2758
ISN 0118	60	CONTINUE	FEM 2759
ISN 0119		ZNX = FUNC(3.0,SZ,AP,0) - FUNC(2.0,SZ,0.0,1)	FEM 2760
ISN 0120		ZNY = FUNC(3.0,SZ,YP,1) + FUNC(2.0,SZ,0.0,0)	FEM 2761
	C		FEM 2762
ISN 0121	70	CONTINUE	FEM 2763
ISN 0122		CALL NUMBER(ZNX,ZNY,2.,SP,SZA,2)	FEM 2764
ISN 0123	400	CONTINUE	FEM 2765
ISN 0124		SP=S2(N)	FEM 2766
ISN 0125		SA=SP*E*10.	FEM 2767
ISN 0126		SZ=SZ+HFPAL	FEM 2768
ISN 0127		JJ=JJ+1	FEM 2769
ISN 0128		IF(JJ-GT.2) GO TO 10	FEM 2770
	C		FEM 2771
ISN 0130		GO TO 300	FEM 2772
ISN 0131	10	CONTINUE	FEM 2773
	C		FEM 2774
	C		FEM 2775
	C		FEM 2776
ISN 0132		RETURN	FEM 2777
	C		FEM 2778
	C		FEM 2779
	C		FEM 2780
ISN 0133		END	FEM 2781
			FEM 2782

ISN 0002		SUBROUTINE GTWC (NMAX,X,Y,IIOC,J,IB,JDD,K,FF10)	FEM 2783
	C		FEM 2784
	C	MESH	FEM 2785
	C		FEM 2786
ISN 0003		DIMENSION X(1),Y(1),IIOC(1),J(1000,1),IE(1)	FEM 2787
ISN 0004		INTEGER*2 IIOC,J,K(1)	FEM 2788
	C		FEM 2789
	C	IB= IADUN	FEM 2790
	C	J = JDC	FEM 2791
	C		FEM 2792
ISN 0005		IF(JDD.EQ.0) GO TO 15	FEM 2793
	C		FEM 2794
ISN 0007		NMAX1=NMAX-1	FEM 2795
ISN 0008		DO 8110 N=1,NMAX1	FEM 2796
ISN 0009		Q=X(N)*FF10	FEM 2797
ISN 0010		R=Y(N)*FF10	FEM 2798
ISN 0011		CALL PLUT(Q,R,3)	FEM 2799
ISN 0012		ILAST=IIOC(N)	FEM 2800
ISN 0013		IF(ILAST.EQ.0) GO TO 8110	FEM 2801
	C		FEM 2802
ISN 0015		DO 8100 I=1,ILAST	FEM 2803
ISN 0016		NODE=J(N,I)	FEM 2804
ISN 0017		QN=X(NODE)*FF10	FEM 2805
ISN 0018		RN=Y(NODE)*FF10	FEM 2806
ISN 0019		CALL PLUT(QN,RN,2)	FEM 2807
ISN 0020		CALL PLUT(Q,R,3)	FEM 2808
ISN 0021	8100	CONTINUE	FEM 2809
ISN 0022	8110	CONTINUE	FEM 2810
	C		FEM 2811
	C		FEM 2812
ISN 0023		RETURN	FEM 2813
	C		FEM 2814
	C		FEM 2815
ISN 0024	15	CONTINUE	FEM 2816
ISN 0025		M=IB(2)	FEM 2817
ISN 0026		N=K(M)	FEM 2818
ISN 0027		Q=X(N)*FF10	FEM 2819
ISN 0028		R=Y(N)*FF10	FEM 2820
ISN 0029		CALL PLUT(Q,R,3)	FEM 2821
ISN 0030		IBU=IB(1)+2	FEM 2822
ISN 0031		IB(IBU)=IB(2)	FEM 2823
	C		FEM 2824
ISN 0032		DO 10 I=2,180	FEM 2825
ISN 0033		M=IB(1)	FEM 2826
ISN 0034		N=K(M)	FEM 2827
ISN 0035		Q=X(N)*FF10	FEM 2828
ISN 0036		R=Y(N)*FF10	FEM 2829
ISN 0037		CALL PLUT(Q,R,2)	FEM 2830
ISN 0038	10	CONTINUE	FEM 2831
	C		FEM 2832
	C		FEM 2833
ISN 0039		RETURN	FEM 2834
ISN 0040		END	FEM 2835

ISN 0002	C	SUBROUTINE CNTMN	FEM 2836
	C		FEM 2837
ISN 0003		COMMON /CUNDT/ JBE,JCC,JDD,EEE,FFF,GG1,GG2,JMM,J11,ITAB	FEM 2838
ISN 0004		COMMON /GLOBAL/ IEMKUR,IEMAX,IUMAX,NMAX,LMAX,ETAB	FEM 2839
	C		FEM 2840
ISN 0005		COMMON /CGC/ AHENI(2000),DREAC(100)	FEM 2841
ISN 0006		REAL*8 AHENI,DREAC	FEM 2842
	C		FEM 2843
ISN 0007		COMMON /STRESC/ EX(2000),EY(2000),GAMXY(2000),DIF(2000),REAC(100)	FEM 2844
ISN 0008		COMMON /FLG/ IESW,LDSW,KSFY,LDCN,LCCND	FEM 2845
ISN 0009		COMMON /LOADS/ IXCY,ALALX,ALALY,IXOF	FEM 2846
ISN 0010		COMMON /IPTC/ CIJ(9,10),COD(7,10)	FEM 2847
	C		FEM 2848
ISN 0011		COMMON /CUNDS/ ILOSS,IIB(20),IIOC(1000),JDC(1000,10)	FEM 2849
ISN 0012		INTEGER*2 IIOC,JDC	FEM 2850
	C		FEM 2851
ISN 0013		COMMON /LMNTC/ NLMNI	FEM 2852
	C		FEM 2853
ISN 0014		COMMON /NODEC/ NNS(2000),NSN(1000),X(1000),Y(1000)	FEM 2854
		1 JC(50),NCC(2,50),GM(50)	FEM 2855
ISN 0015		INTEGER*2 NNS,NSN,NSMN,JQ,NCC	FEM 2856
	C		FEM 2857
ISN 0016		COMMON /LMNT1/ LSL(2000),IPTS(2000),LLA(4000),NL(2000,3)	FEM 2858
ISN 0017		INTEGER*2 LSL,IPTS,LLA,NL	FEM 2859
	C		FEM 2860
ISN 0018		COMMON /LMNT2/ SIGX(2000),SIGY(2000),SIGZ(2000),TAUXY(2000)	FEM 2861
	C		FEM 2862
ISN 0019		COMMON /LMNT3/ ITN(1000),NLL(1000,10)	FEM 2863
ISN 0020		INTEGER*2 ITN,NLL	FEM 2864
	C		FEM 2865
ISN 0021		COMMON /LLDATA/ XLSX(2000),XLSY(2000),LLSD(1000),LLT	FEM 2866
ISN 0022		INTEGER*2 LLSD,LLT	FEM 2867
	C		FEM 2868
ISN 0023		COMMON /STFNTX/ TABLE(2,12000),ELETAP(2,2000),LTABLE(1000),	FEM 2869
		NTABLE(6000),IQTAB(50),NONTAB(1000)	FEM 2870
ISN 0024		INTEGER*2 LTABLE,NTABLE,IQTAB,NONTAB	FEM 2871
	C		FEM 2872
ISN 0025		COMMON /LOADC/ P(2000),PP(2,1000),CLOAD(100)	FEM 2873
	C		FEM 2874
ISN 0026		COMMON /SAFTYC/ SIG1(2000),SIG2(2000),SITAL(2000),	FEM 2875
		S1(1000),S2(1000),SITAN(1000)	FEM 2876
ISN 0027		COMMON /KESNC/ GKESNX,GKESNY	FEM 2877
ISN 0028		COMMON /GRPLUT/ X2MAX,Y2MAX,PAPER,X1MAX,Y1MAX,XXX1	FEM 2878
ISN 0029		COMMON /IDBUN/ IBOUN(20)	FEM 2879
	C		FEM 2880
ISN 0030		COMMON /PLDATA/ NNSD(1000),NN	FEM 2881
ISN 0031		INTEGER*2 NNSD,NN	FEM 2882
	C		FEM 2883
	C		FEM 2884
ISN 0032		COMMON /COMO1/ CORDH(1000,2),MELEM(2,2000),MMS(1000)	FEM 2885
	C		FEM 2886
	C		FEM 2887
	C		FEM 2888

ISN 0033		COMMON /COM02/ CORDL(2000,3,2),CORDR(2000,3,2),RMSL(2000,3),	FEM 2889
		* RMSK(2000,3),CRMS(2000,3,2)	FEM 2890
ISN 0034	C	INTEGER*2 NELML,NELMR,LCHK,NCHK,MCHK	FEM 2891
	C		FEM 2892
ISN 0035		COMMON /COM03/ NELML(2000,3),NELMR(2000,3),LCHK(2000,3),	FEM 2893
		* KCHK(2000,3),NCHK(2000,3),MCHK(2000,3)	FEM 2894
	C		FEM 2895
	C		FEM 2896
ISN 0036		COMMON /COM04/ TITLE(20),XWIDTH,YWIDTH,RHSINP(100)	FEM 2897
		* NUMLVL,MNODE,MELMT	FEM 2898
	C		FEM 2899
ISN 0037		COMMON /COM05/ ICNC	FEM 2900
	C		FEM 2901
	C		FEM 2902
	C		FEM 2903
ISN 0038		DIMENSION XB(20),YB(20)	FEM 2904
ISN 0039		DATA XGCD / 1000000.0 /	FEM 2905
	C		FEM 2906
	C		FEM 2907
	C		FEM 2908
ISN 0040		IF (JBB .LE. 1) * RETURN	FEM 2909
	C		FEM 2910
ISN 0042		ICNC = ICNC + 1	FEM 2911
	C		FEM 2912
ISN 0043		IF (ICNC .NE. 1) GO TO 1000	FEM 2913
	C		FEM 2914
	C		FEM 2915
	C	... MAKE MELMT , MELEM(*,3) , CORDM(*,2)	FEM 2916
	C		FEM 2917
	C		FEM 2918
ISN 0045		CALL AFS (CORDM,XGCD,NMAX)	FEM 2919
	C		FEM 2920
ISN 0046		FF10 = FFF*10.0	FEM 2921
	C		FEM 2922
ISN 0047		IF (JDD .NE. 0) GO TO 200	FEM 2923
	C		FEM 2924
ISN 0049		NB = IBOUND(1)	FEM 2925
	C		FEM 2926
ISN 0050		DO 100 I=1,NB	FEM 2927
ISN 0051		J = 1 + 1	FEM 2928
ISN 0052		J = IBOUND(J)	FEM 2929
ISN 0053		J = NNS(J)	FEM 2930
	C		FEM 2931
ISN 0054		XB(I) = X(J)*FF10	FEM 2932
ISN 0055		YB(I) = Y(J)*FF10	FEM 2933
ISN 0056		100 CONTINUE	FEM 2934
	C		FEM 2935
	C		FEM 2936
ISN 0057		200 CONTINUE	FEM 2937
	C		FEM 2938
	C		FEM 2939
	C		FEM 2940
ISN 0058		ML = 0	FEM 2941
	C		FEM 2942
ISN 0059		DO 600 L=1,LMAX	FEM 2943
ISN 0060		I1 = NL(L,1)	FEM 2944
ISN 0061		I2 = NL(L,2)	FEM 2945
ISN 0062		I3 = NL(L,3)	FEM 2946

ISN 0063	C	X1 = X(11)*FF10	FEM 2947
ISN 0064		X2 = X(12)*FF10	FEM 2948
ISN 0065		X3 = X(13)*FF10	FEM 2949
ISN 0066		Y1 = Y(11)*FF10	FEM 2950
ISN 0067		Y2 = Y(12)*FF10	FEM 2951
ISN 0068		Y3 = Y(13)*FF10	FEM 2952
ISN 0069	C	IF (JDD .NE. 0) GO TO 400	FEM 2953
ISN 0071	C	XG = (X1 + X2 + X3)/3.0	FEM 2954
ISN 0072		YG = (Y1 + Y2 + Y3)/3.0	FEM 2955
ISN 0073	C	CALL PNTPLG (NB,XB,YB,XG,YG,IS,IP,U.01)	FEM 2956
ISN 0074	C	IF (IS .EQ. 1) GO TO 600	FEM 2957
ISN 0076	C		FEM 2958
ISN 0077	C		FEM 2959
ISN 0078	C	400 CONTINUE	FEM 2960
ISN 0079		ML = ML + 1	FEM 2961
ISN 0080	C		FEM 2962
ISN 0081	C	MELEM(1,ML) = 11	FEM 2963
ISN 0082		MELEM(2,ML) = 12	FEM 2964
ISN 0083		MELEM(3,ML) = 13	FEM 2965
ISN 0084	C		FEM 2966
ISN 0085	C	CORDM(11,1) = X1	FEM 2967
ISN 0086		CORDM(12,1) = X2	FEM 2968
		CORDM(13,1) = X3	FEM 2969
ISN 0087	C		FEM 2970
ISN 0088	C	CORDM(11,2) = Y1	FEM 2971
		CORDM(12,2) = Y2	FEM 2972
		CORDM(13,2) = Y3	FEM 2973
ISN 0089	C		FEM 2974
ISN 0090	C	600 CONTINUE	FEM 2975
ISN 0091	C		FEM 2976
ISN 0092	C	MELMT = ML	FEM 2977
ISN 0093	C		FEM 2978
ISN 0094	C		FEM 2979
ISN 0095	C		FEM 2980
ISN 0096	C	1000 CONTINUE	FEM 2981
ISN 0097		YM = PAPER - Y2MAX	FEM 2982
ISN 0098	C		FEM 2983
ISN 0099	C	IF (JBB.NE.2 .AND. JRB.NE.4 .AND. JBB.NE.6 .AND. JBB.NE.8)	FEM 2984
		1 GO TO 2000	FEM 2985
ISN 0100	C		FEM 2986
ISN 0101	C		FEM 2987
ISN 0102	C	... NO.1 MAXIMUM STRESS	FEM 2988
ISN 0103	C		FEM 2989
ISN 0104	C	VMX = -1.0E+70	FEMUP507
ISN 0105		VMN = 1.0E+70	FEMUP508
ISN 0106	C		FEM 2991
ISN 0107	C	DO 1200 I=1,NMAX	FEM 2992
ISN 0108		C = CORDM(I,1)	FEM 2993
ISN 0109	C		FEM 2994
ISN 0110	C	IF (C .EQ. X000) GO TO 1200	FEM 2995
ISN 0111	C		FEM 2996
ISN 0112	C	C = S1(I)	FEM 2997
ISN 0113			FEM 2998
ISN 0114			FEM 2999
ISN 0115			FEM 3000
ISN 0116			FEM 3001
ISN 0117			FEM 3002
ISN 0118			FEM 3003

ISN 0100	C	RMS(1) = C	FEM 3004
	C		FEM 3005
ISN 0101		IF (VMX .LT. C) VMX = C	FEM 3006
ISN 0103		IF (VMN .GT. C) VMN = C	FEM 3007
ISN 0105	1200	CONTINUE	FEM 3008
	C		FEM 3009
ISN 0106		W = VMN - 100.0	FEM 3010
	C		FEM 3011
ISN 0107		DO 1300 I=1,NMAX	FEM 3012
ISN 0108		C = CORDM(I,1)	FEM 3013
	C		FEM 3014
ISN 0109		IF (C .EQ. X000) RMS(1) = W	FEM 3015
ISN 0111	1300	CONTINUE	FEM 3016
	C		FEM 3017
	C		FEM 3018
ISN 0112		CALL CVSET (VMX,VMN,DUM,NUMLEV,RMSINP,NPN)	FEM 3019
	C		FEM 3020
ISN 0113		CALL PLOT (X2MAX,C.0, -3)	FEM 3021
	C		FEM 3022
ISN 0114		CALL GFOUR (J11,1LOSS,X1MAX,FFF,110,JBB,EEE,5,1X2Y,M,YH)	FEM 3023
	C		FEM 3024
ISN 0115		CALL GTWU (NMAX,X,Y,11UC,JDC,1EDUN,JDU,NNS,FF10)	FEM 3025
	C		FEM 3026
ISN 0116		CALL CNTER (NPN)	FEM 3027
	C		FEM 3028
ISN 0117	2000	CONTINUE	FEM 3029
	C		FEM 3030
ISN 0118		IF(JBB.NE.3 .AND. JBB.NE.4 .AND. JBB.NE.7 .AND. JBB.NE.8)	FEM 3031
	1	GO TO 2000	FEMUP309
	C		FEMUP310
	C		FEM 3033
	C	... MAXIMUM SHEAR STRESS.	FEM 3034
	C		FEM 3035
ISN 0120		VMX = -1.0E+70	FEM 3036
ISN 0121		VMN = 1.0E+70	FEM 3037
	C		FEM 3038
ISN 0122		DO 2200 I=1,NMAX	FEM 3039
ISN 0123		C = CORDM(I,1)	FEM 3040
	C		FEM 3041
ISN 0124		IF (C .EQ. X000) GO TO 2200	FEM 3042
	C		FEM 3043
ISN 0126		C = ABS(S1(I) - S2(I))	FEM 3044
	C		FEM 3045
ISN 0127		RMS(1) = C	FEM 3046
	C		FEM 3047
ISN 0128		IF (VMX .LT. C) VMX = C	FEM 3048
ISN 0130		IF (VMN .GT. C) VMN = C	FEM 3049
ISN 0132	2200	CONTINUE	FEM 3050
	C		FEM 3051
ISN 0133		W = VMN - 100.0	FEM 3052
	C		FEM 3053
ISN 0134		DO 2300 I=1,NMAX	FEM 3054
ISN 0135		C = CORDM(I,1)	FEM 3055
	C		FEM 3056
ISN 0136		IF (C .EQ. X000) RMS(1) = W	FEM 3057
ISN 0138	2300	CONTINUE	FEM 3058
	C		FEM 3059
			FEM 3060

ISN 0139	C	CALL CVSET (VMX,VMN,DUM,NUMLVL,RHSINP,NPN)	FEM 3061
	C		FEM 3062
ISN 0140	C	CALL PLOT (X2MAX,0.0,-3)	FEM 3063
	C		FEM 3064
ISN 0141	C	CALL GF0UR(J11,ILOSS,X1MAX,FFF,I1B,J9B,EEE,6,IXUY,M,YH)	FEM 3065
	C		FEM 3066
ISN 0142	C	CALL GTWO (NMAX,X,Y,IIDC,JDC,IBOUN,JDD,NNS,FF1C)	FEM 3067
	C		FEM 3068
ISN 0143	C	CALL CTER (NPN)	FEM 3069
	C		FEM 3070
	C		FEM 3071
ISN 0144	C	3000 CONTINUE	FEM 3072
	C		FEM 3073
ISN 0145	C	IF(J9B.LE.4) GO TO 5000	FEMUP511
	C		FEMUP512
	C		FEMUP513
	C	NO.2 MINIMUM STRESS	FEMUP514
	C		FEMUP515
ISN 0147	C	VMX= -1.0E+70	FEMUP516
ISN 0148	C	VMN= 1.0E+70	FEMUP517
	C		FEMUP518
ISN 0149	C	DO 3200 I=1,NMAX	FEMUP519
ISN 0150	C	C= CORDM(1,1)	FEMUP520
	C		FEMUP521
ISN 0151	C	IF(C.EQ.X000) GO TO 3200	FEMUP522
	C		FEMUP523
ISN 0153	C	C= S2(1)	FEMUP524
	C		FEMUP525
ISN 0154	C	RHS(1)= C	FEMUP526
ISN 0155	C	IF(VMA.LT.C) VMA= C	FEMUP527
ISN 0157	C	IF(VMN.GT.C) VMN= C	FEMUP528
ISN 0159	C	3200 CONTINUE	FEMUP529
	C		FEMUP530
ISN 0160	C	W= VMN - 100.0	FEMUP531
	C		FEMUP532
ISN 0161	C	DO 3300 I=1,NMAX	FEMUP533
ISN 0162	C	C= CORDM(1,1)	FEMUP534
ISN 0163	C	IF(C.EQ.X000) RHS(1)= W	FEMUP535
ISN 0165	C	3300 CONTINUE	FEMUP536
	C		FEMUP537
	C		FEMUP538
ISN 0166	C	CALL CVSET(VMX, VMN, DUM, NUMLVL, RHSINP, NPN)	FEMUP539
	C		FEMUP540
ISN 0167	C	CALL PLOT(X2MAX, 0.0, -3)	FEMUP541
	C		FEMUP542
ISN 0168	C	CALL GF0UR(J11,ILOSS,X1MAX,FFF,I1B,J9B,EEE,7,IXUY,M,YH)	FEMUP543
	C		FEMUP544
ISN 0169	C	CALL GTWO(NMAX,X,Y,IIDC,JDC,IBOUN,JDD,NNS,FF1C)	FEMUP545
	C		FEMUP546
ISN 0170	C	CALL CTER(NPN)	FEMUP547
	C		FEMUP548
	C		FEMUP549
ISN 0171	C	5000 CONTINUE	FEMUP550
ISN 0172	C	RETURN	FEMUP551
ISN 0173	C	END	FEM 3074
			FEM 3075

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ISN 0002      SUBROUTINE AFS (A,B,N)
ISN 0003      C      DIMENSION A(N)
ISN 0004      C
ISN 0004      DO 100 I=1,N
ISN 0005      A(I) = B
ISN 0006      100 CONTINUE
ISN 0007      C
ISN 0007      RETURN
ISN 0008      END

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FEM 3076
FEM 3077
FEM 3078
FEM 3079
FEM 3080
FEM 3081
FEM 3082
FEM 3083
FEM 3084
FEM 3085

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ISN 0002	C	SUBROUTINE CINTER (NPN)	FEM 3086
	C	*****	FEM 3087
	C	**	FEM 3088
	C	** PLOTTING CONTOURS OF FIRST PRINCIPAL STRESS AND **	FEM 3089
	C	** MAXIMUM SHEAR STRESS AT NODE POINT **	FEM 3090
	C	** WHICH ARE SOLVED BY FEM N02 PROGRAM. **	FEM 3091
	C	**	FEM 3092
	C	*****	FEM 3093
	C		FEM 3094
ISN 0003	C	COMMON /COM01/ CORDM(1000,2),MELEM(2,2000),RMS(1000)	FEM 3095
	C		FEM 3096
	C		FEM 3097
ISN 0004	C	COMMON /COM02/ CORDL(2000,3,2),CUMD(2000,3,2),RMSL(2000,3),	FEM 3098
	C	* RMSR(2000,3),CHRS(2000,3,2)	FEM 3099
	C		FEM 3100
ISN 0005	C	INTEGER*2 NELML,NELMR,LCHK,NCHK,MCHK,ICHEK,JCHK	FEM 3101
	C		FEM 3102
ISN 0006	C	COMMON /COM03/ NELML(2000,3),NELMR(2000,3),LCHK(2000,3),	FEM 3103
	C	* NCHK(2000,3),MCHK(2000,3),	FEM 3104
	C	* ICHEK(2000,3),JCHK(2000,3)	FEM 3105
	C		FEM 3106
	C		FEM 3107
ISN 0007	C	COMMON /COM04/ TITLE(20),XWIDTH,YWIDTH,RMSINP(100)	FEM 3108
	C	* NUMLVLM,NODE,MELMT	FEM 3109
	C		FEM 3110
	C		FEM 3111
ISN 0008	C	CIMENSION INDL(3),INDR(3)	FEM 3112
	C		FEM 3113
ISN 0009	C	DATA INDL / 1, 2, 3 / ,	FEM 3114
	C	* INDR / 3, 1, 2 /	FEM 3115
	C	---	FEM 3116
	C	INITIALIZATION	FEM 3117
	C		FEM 3118
ISN 0010	C	DO 200 J=1,3	FEM 3119
ISN 0011	C	DU 200 I=1,2000	FEM 3120
ISN 0012	C	NELML(I,J) = 0	FEM 3121
ISN 0013	C	NELMR(I,J) = 0	FEM 3122
ISN 0014	C	LCHK(I,J) = 1	FEM 3123
ISN 0015	C	ICHEK(I,J) = 0	FEM 3124
ISN 0016	C	JCHK(I,J) = 0	FEM 3125
ISN 0017	C	NCHK(I,J) = 0	FEM 3126
ISN 0018	C	MCHK(I,J) = 0	FEM 3127
ISN 0019	C	200 CONTINUE	FEM 3128
ISN 0020	C	300 CONTINUE	FEM 3129
	C		FEM 3130
	C	---	FEM 3131
	C	LEFT AND RIGHT NODE NO. / NODE COORDINATE / NODE VALUE SET	FEM 3132
	C		FEM 3133
ISN 0021	C	DO 900 I=1,MELMT	FEM 3134
ISN 0022	C	DO 800 J=1,3	FEM 3135
ISN 0023	C	JL=INDL(J)	FEM 3136
ISN 0024	C	JR=INDR(J)	FEM 3137
ISN 0025	C	ND=MELEM(J,1)	FEM 3138

ISN 0026	NELML(I,JL)=ND	FEM 3139
ISN 0027	NELMR(I,JR)=ND	FEM 3140
ISN 0028	CORDL(I,JL,1)=CORDM(ND,1)	FEM 3141
ISN 0029	CORDL(I,JL,2)=CORDM(ND,2)	FEM 3142
ISN 0030	COROK(I,JR,1)=CORDM(ND,1)	FEM 3143
ISN 0031	COROK(I,JR,2)=CORDM(ND,2)	FEM 3144
ISN 0032	RMSL(I,JL)=RMS(ND)	FEM 3145
ISN 0033	RMSK(I,JR)=RMS(ND)	FEM 3146
ISN 0034	800 CONTINUE	FEM 3147
ISN 0035	900 CONTINUE	FEM 3148
C		FEM 3149
C ---	LCHEK SET (FOR PLOTTING FINITE ELEMENT MESH)	FEM 3150
C	LCHEK = 0 ; NOT PLOT	FEM 3151
C	LCHEK = 1 ; PLOT (BOUNDARY SIDE)	FEM 3152
C	LCHEK = 2 ; PLOT	FEM 3153
C		FEM 3154
ISN 0036	MELMT1=MELMT-1	FEM 3155
ISN 0037	DO 1400 I=1,MELMT1	FEM 3156
ISN 0038	II=I+1	FEM 3157
ISN 0039	DO 1300 J=1,3	FEM 3158
ISN 0040	IF(LCHEK(I,J).EQ.0) GO TO 1300	FEM 3159
ISN 0042	DO 1100 II=1,MELMT	FEM 3160
ISN 0043	DO 1000 JJ=1,3	FEM 3161
ISN 0044	IF(NELML(I,J).EQ.NELML(II,JJ).AND.NELMR(I,J).EQ.NELMR(II,JJ))	FEM 3162
	* GO TO 1200	FEM 3163
ISN 0046	IF(NELML(I,J).EQ.NELMR(II,JJ).AND.NELMR(I,J).EQ.NELML(II,JJ))	FEM 3164
	* GO TO 1200	FEM 3165
ISN 0048	1000 CONTINUE	FEM 3166
ISN 0049	1100 CONTINUE	FEM 3167
ISN 0050	GO TO 1300	FEM 3168
ISN 0051	1200 LCHEK(I,J)=LCHEK(I,J)+1	FEM 3169
ISN 0052	LCHEK(II,JJ)=LCHEK(II,JJ)-1	FEM 3170
ISN 0053	1300 CONTINUE	FEM 3171
ISN 0054	1400 CONTINUE	FEM 3172
C		FEM 3173
C ---	ICHEK AND	FEM 3174
C ---	JCHEK SET (FOR CHECK NEXT SIDE TO EACH OTHER)	FEM 3175
C	I : II=ICHEK(I,J)	FEM 3176
C	J : JJ=JCHEK(I,J)	FEM 3177
C		FEM 3178
ISN 0055	DO 1900 I=1,MELMT1	FEM 3179
ISN 0056	II=I+1	FEM 3180
ISN 0057	DO 1800 J=1,3	FEM 3181
ISN 0058	IJK = ICHEK(I,J) + JCHEK(I,J)	FEM 3182
ISN 0059	IF(IJK.NE.0) GO TO 1800	FEM 3183
ISN 0061	NML = NELML(I,J)	FEM 3184
ISN 0062	NMR = NELMR(I,J)	FEM 3185
C		FEM 3186
ISN 0063	DO 1600 II=1,MELMT	FEM 3187
ISN 0064	DO 1500 JJ=1,3	FEM 3188
ISN 0065	IF(NML.EQ.NELML(II,JJ).AND.NMR.EQ.NELMR(II,JJ))	FEM 3189
	* GO TO 1700	FEM 3190
ISN 0067	IF(NML.EQ.NELMR(II,JJ).AND.NMR.EQ.NELML(II,JJ))	FEM 3191
	* GO TO 1700	FEM 3192
ISN 0069	1500 CONTINUE	FEM 3193
ISN 0070	1600 CONTINUE	FEM 3194
ISN 0071	GO TO 1800	FEM 3195
ISN 0072	1700 CONTINUE	FEM 3196

ISN 0073		ICHEK(I,J)=11		
ISN 0074		JCHEK(I,J)=JJ		FEM 3198
ISN 0075		ICHEK(11,JJ)=1		FEM 3199
ISN 0076		JCHEK(11,JJ)=J		FEM 3200
ISN 0077	1800	CONTINUE		FEM 3201
ISN 0078	1900	CONTINUE		FEM 3202
	C			FEM 3203
	C	--- NCHEK SET (FOR CHECK BOUNDARY SIDE)		FEM 3204
	C	NCHEK = 0 : NOT BOUNDARY SIDE		FEM 3205
	C	NCHEK = 1 : BOUNDARY SIDE		FEM 3206
	C			FEM 3207
ISN 0079		DO 2100 I=1,MELMT		FEM 3208
ISN 0080		DO 2000 J=1,3		FEM 3209
ISN 0081		IF (LCHEK(I,J).NE.1) GO TO 2000		FEM 3210
ISN 0083		NCHEK(I,J)=1		FEM 3211
ISN 0084	2000	CONTINUE		FEM 3212
ISN 0085	2100	CONTINUE		FEM 3213
	C			FEM 3214
ISN 0086		DO 7010 M=1,NUMLVL		FEM 3215
ISN 0087		RMSIN = RMSIN*(M)		FEM 3216
	C	*** INITIALIZATION		FEM 3217
ISN 0088		DO 2400 I=1,MELMT		FEM 3218
ISN 0089		DO 2400 J=1,3		FEM 3219
ISN 0090		MCHEK(I,J)=0		FEM 3220
ISN 0091		CRHS(I,J,1)=0.0		FEM 3221
ISN 0092		CRHS(I,J,2)=0.0		FEM 3222
ISN 0093	2400	CONTINUE		FEM 3223
ISN 0094	2500	CONTINUE		FEM 3224
	C	*** MCHEK SET (FOR PLOTTING EQUAL NODE VALUE)		FEM 3225
	C	MCHEK = 0 : NONE		FEM 3226
	C	MCHEK = 1 : BETWEEN NODE AND OTHER NODE ; = 11 : BOUNDARY		FEM 3227
	C	MCHEK = 2 : TOP NODE (1,2,3) ; = 12 : BOUNDARY		FEM 3228
	C	*** CALC. COORDINATE OF EQUAL NODE VALUE (CRHS)		FEM 3229
		DO 2700 I=1,MELMT		FEM 3230
		DO 3600 J=1,3		FEM 3231
ISN 0095		IF (RHS(I,J).LT.RHSL(I,J)) GO TO 2600		FEM 3232
ISN 0096		IF (RHSIN.GE.RHSL(I,J).AND.RHSIN.LE.RHSR(I,J)) GO TO 2700		FEM 3233
ISN 0097		GO TO 2600		FEM 3234
ISN 0099		IF (RHSIN.GE.RHSR(I,J).AND.RHSIN.LE.RHSL(I,J)) GO TO 2700		FEM 3235
ISN 0101		GO TO 3600		FEM 3236
ISN 0102	2600	IF (RHSIN.GE.RHSR(I,J).AND.RHSIN.LE.RHSL(I,J)) GO TO 2700		FEM 3237
ISN 0104		GO TO 3600		FEM 3238
ISN 0105	2700	MCHEK(I,J)=1		FEM 3239
	C			FEM 3240
ISN 0106		X1=CORDL(I,J,1)		FEM 3241
ISN 0107		Y1=CORDL(I,J,2)		FEM 3242
ISN 0108		X2=CUROR(I,J,1)		FEM 3243
ISN 0109		Y2=CUROR(I,J,2)		FEM 3244
ISN 0110		EPL=RHSL(I,J)		FEM 3245
ISN 0111		EPR=RHSR(I,J)		FEM 3246
ISN 0112		IF (EPL.NE.EPR) GO TO 2900		FEM 3247
ISN 0114		MCHEK(I,J)=2		FEM 3248
ISN 0115		IF (J.EQ.1.OR.J.EQ.3) GO TO 2800		FEM 3249
ISN 0117		CRHS(I,J,1)=X2		FEM 3250
ISN 0118		CRHS(I,J,2)=Y2		FEM 3251
ISN 0119		GO TO 3100		FEM 3252
ISN 0120	2800	CRHS(I,J,1)=X1		FEM 3253
ISN 0121		CRHS(I,J,2)=Y1		FEM 3254
ISN 0122		GO TO 3100		
ISN 0123	2900	CRHS(I,J,1)=(X2+EPL-X1+EPR+(X1-X2)*RHSIN)/(EPL-EPR)		

ISN 0124		CRMS(I,J,2)=(Y2+EPL-Y1)*EPR+(Y1-Y2)*RHSIN/(EPL-EPR)	FEM 3255
	C		FEM 3256
ISN 0125	3100	IF(RHSIN.EQ.RHSL(I,J)) GO TO 3200	FEM 3257
ISN 0127		IF(RHSIN.EQ.RHSL(I,J)) GO TO 3400	FEM 3258
ISN 0129		GO TO 3600	FEM 3259
ISN 0130	3200	IF(J.EQ.1.OR.J.EQ.3) GO TO 3300	FEM 3260
ISN 0132		MCHEK(I,J)=2	FEM 3261
ISN 0133		GO TO 3600	FEM 3262
ISN 0134	3300	MCHEK(I,J)=2	FEM 3263
ISN 0135		GO TO 3600	FEM 3264
ISN 0136	3400	IF(J.EQ.1.OR.J.EQ.3) GO TO 3500	FEM 3265
ISN 0138		MCHEK(I,J)=2	FEM 3266
ISN 0139		GO TO 3600	FEM 3267
ISN 0140	3500	MCHEK(I,J)=2	FEM 3268
ISN 0141	3600	CONTINUE	FEM 3269
ISN 0142	3700	CONTINUE	FEM 3270
	C		FEM 3271
ISN 0143		DO 3900 I=1,MELMT	FEM 3272
ISN 0144		DO 3800 J=1,3	FEM 3273
ISN 0145		IF(MCHEK(I,J).EQ.0) GO TO 3600	FEM 3274
ISN 0147		IF(MCHEK(I,J).EQ.0) GO TO 3800	FEM 3275
ISN 0149		MCHEK(I,J)=MCHEK(I,J)+10	FEM 3276
ISN 0150	3800	CONTINUE	FEM 3277
ISN 0151	3900	CONTINUE	FEM 3278
	C		FEM 3279
	C	*** PLOT FROM BOUNDARY SIDE TO OTHER BOUNDARY SIDE	FEM 3280
	C		FEM 3281
ISN 0152	4000	CONTINUE	FEM 3282
	C		FEM 3283
ISN 0153		DO 4200 I=1,MELMT	FEM 3284
ISN 0154		DO 4100 J=1,3	FEM 3285
ISN 0155		IF(MCHEK(I,J).GE.10) GO TO 4300	FEM 3286
ISN 0157	4100	CONTINUE	FEM 3287
ISN 0158	4200	CONTINUE	FEM 3288
ISN 0159		GO TO 4500	FEM 3289
	C	*** STACK PLOT FROM BOUNDARY SIDE	FEM 3290
ISN 0160	4300	I1=1	FEM 3291
ISN 0161		J1=J	FEM 3292
ISN 0162		X1=CRMS(I1,J1,1)	FEM 3293
ISN 0163		Y1=CRMS(I1,J1,2)	FEM 3294
ISN 0164		CALL NUMBER(X1+1.,Y1+2.,RHSIN,0.C,NPN)	FEM 3295
ISN 0165		CALL PLOT(X1,Y1,3)	FEM 3296
ISN 0166		MCHEK(I1,J1)=0	FEM 3297
	C	*** SEARCH UN SAME FINITE ELEMENT MESH	FEM 3298
ISN 0167	4400	CONTINUE	FEM 3299
ISN 0168		JS = J1+1	FEM 3300
ISN 0169		JE = JS+1	FEM 3301
ISN 0170		DO 4500 JJ=JS,JE	FEM 3302
ISN 0171		J = JJ	FEM 3303
ISN 0172		IF (JJ.GT.3) J=J-3	FEM 3304
ISN 0174		IF(MCHEK(I1,J).NE.0) GO TO 4600	FEM 3305
ISN 0176	4500	CONTINUE	FEM 3306
ISN 0177		GO TO 4700	FEM 3307
ISN 0178	4600	J1=J	FEM 3308
ISN 0179		X1=CRMS(I1,J1,1)	FEM 3309
ISN 0180		Y1=CRMS(I1,J1,2)	FEM 3310
ISN 0181		CALL PLOT(X1,Y1,2)	FEM 3311
ISN 0182		MCHEK(I1,J1)=0	FEM 3312

ISN 0183	GO TO 4400	FEM 3313
ISN 0184	C *** CHECK BOUNDARY SIDE	FEM 3314
	4700 IF(MCHEK(I1,J1).EQ.1) GO TO 4000	FEM 3315
ISN 0186	C *** NEXT SIDE TO EACH OTHER	FEM 3316
ISN 0187	4800 I2=ICHEK(I1,J1)	FEM 3317
ISN 0188	JX=JCHEK(I1,J1)	FEM 3318
	MCHEK(I2,JX)=0	FEM 3319
ISN 0189	C *** CHECK NEXT FINITE ELEMENT MESH	FEM 3320
ISN 0190	DO 4900 J=1,3	FEM 3321
ISN 0192	IF(MCHEK(I2,J).NE.0) GO TO 5000	FEM 3322
ISN 0193	4900 CONTINUE	FEM 3323
ISN 0194	GO TO 4000	FEM 3324
	5000 J2=0	FEM 3325
	C *** SEARCH ON SAME FINITE ELEMENT MESH	FEM 3326
ISN 0195	5100 JT=J2+1	FEM 3327
ISN 0196	IF(JT.GT.3) GO TO 5400	FEM 3328
ISN 0198	DO 5200 J=JT,3	FEM 3329
ISN 0199	IF(MCHEK(I2,J).NE.0) GO TO 5300	FEM 3330
ISN 0201	5200 CONTINUE	FEM 3331
ISN 0202	GO TO 5400	FEM 3332
ISN 0203	5300 J2=J	FEM 3333
ISN 0204	X1=CRHS(I2,J2,1)	FEM 3334
ISN 0205	Y1=CRHS(I2,J2,2)	FEM 3335
ISN 0206	CALL PLOT(X1,Y1,2)	FEM 3336
ISN 0207	MCHEK(I2,J2)=0	FEM 3337
ISN 0208	GO TO 5100	FEM 3338
	C *** CHECK BOUNDARY SIDE	FEM 3339
ISN 0209	5400 IF(MCHEK(I2,J2).EQ.1) GO TO 4000	FEM 3340
	C *** NEXT SIDE TO EACH OTHER	FEM 3341
ISN 0211	I1=I2	FEM 3342
ISN 0212	J1=J2	FEM 3343
ISN 0213	GO TO 4800	FEM 3344
	C	FEM 3345
	C *** PLOT CLOSED LOOP (INSIDE)	FEM 3346
	C	FEM 3347
ISN 0214	5500 CONTINUE	FEM 3348
	C	FEM 3349
ISN 0215	DO 5700 I=1,MELMT	FEM 3350
ISN 0216	DO 5600 J=1,3	FEM 3351
ISN 0217	IF(MCHEK(I,J).NE.0) GO TO 5800	FEM 3352
ISN 0219	5600 CONTINUE	FEM 3353
ISN 0220	5700 CONTINUE	FEM 3354
ISN 0221	GO TO 7000	FEM 3355
	C *** START PLOT FROM INSIDE AND START POINT SET	FEM 3356
ISN 0222	5800 I1=1	FEM 3357
ISN 0223	J1=J	FEM 3358
ISN 0224	I3=I	FEM 3359
ISN 0225	J3=J	FEM 3360
ISN 0226	X1=CRHS(I1,J1,1)	FEM 3361
ISN 0227	Y1=CRHS(I1,J1,2)	FEM 3362
ISN 0228	CALL NUMBER(X1+1.,Y1+2.,RHSIN,C.C,NPN)	FEM 3363
ISN 0229	CALL PLOT(X1,Y1,3)	FEM 3364
ISN 0230	MCHEK(I1,J1)=0	FEM 3365
	C *** SEARCH ON SAME FINITE ELEMENT MESH	FEM 3366
ISN 0231	5900 JT=J1+1	FEM 3367
ISN 0232	IF(JT.GT.3) GO TO 6200	FEM 3368
ISN 0234	DO 6000 J=JT,3	FEM 3369
ISN 0235	IF(MCHEK(I1,J).NE.0) GO TO 6100	FEM 3370

ISN 0237	6000	CONTINUE	FEM 3371
ISN 0238		GO TO 6200	FEM 3372
ISN 0239	6100	J1=J	FEM 3373
ISN 0240		X1=CRHS(11,J1,1)	FEM 3374
ISN 0241		Y1=CRHS(11,J1,2)	FEM 3375
ISN 0242		CALL PLOT(X1,Y1,2)	FEM 3376
ISN 0243		MCHEK(11,J1)=0	FEM 3377
ISN 0244		GO TO 5900	FEM 3378
	C	*** NEXT SIDE TO EACH OTHER	FEM 3379
ISN 0245	6200	I2=ICHEK(11,J1)	FEM 3380
ISN 0246		JX=JCHEK(11,J1)	FEM 3381
ISN 0247		MCHEK(12,JX)=0	FEM 3382
	C	*** CHECK NEXT FINITE ELEMENT MESH	FEM 3383
ISN 0248		DO 6300 J=1,3	FEM 3384
ISN 0249		IF(MCHEK(12,J).NE.0) GO TO 6400	FEM 3385
ISN 0251	6300	CONTINUE	FEM 3386
ISN 0252		GO TO 6900	FEM 3387
ISN 0253	6400	J2=0	FEM 3388
	C	*** SEARCH ON SAME FINITE ELEMENT MESH	FEM 3389
ISN 0254	6500	JT=J2+1	FEM 3390
ISN 0255		IF(JT.GT.3) GO TO 6800	FEM 3391
ISN 0257		DO 6600 J=JT,3	FEM 3392
ISN 0258		IF(MCHEK(12,J).NE.0) GO TO 6700	FEM 3393
ISN 0260	6600	CONTINUE	FEM 3394
ISN 0261		GO TO 6800	FEM 3395
ISN 0262	6700	J2=J	FEM 3396
ISN 0263		X1=CRHS(12,J2,1)	FEM 3397
ISN 0264		Y1=CRHS(12,J2,2)	FEM 3398
ISN 0265		CALL PLOT(X1,Y1,2)	FEM 3399
ISN 0266		MCHEK(12,J2)=0	FEM 3400
ISN 0267		GO TO 6500	FEM 3401
	C	*** NEXT SIDE TO EACH OTHER	FEM 3402
ISN 0268	6800	I1=I2	FEM 3403
ISN 0269		J1=J2	FEM 3404
ISN 0270		GO TO 6200	FEM 3405
	C	*** RETURN START POINT	FEM 3406
ISN 0271	6900	X1=CRHS(13,J3,1)	FEM 3407
ISN 0272		Y1=CRHS(13,J3,2)	FEM 3408
ISN 0273		CALL PLOT(X1,Y1,2)	FEM 3409
ISN 0274		GO TO 5500	FEM 3410
	C		FEM 3411
	C	--- PLOTTING FINITE ELEMENT MESH AND TITLE	FEM 3412
	C		FEM 3413
ISN 0275	7000	CONTINUE	FEM 3414
ISN 0276	7010	CONTINUE	FEM 3415
	C		FEM 3416
	C		FEM 3417
	C		FEM 3418
	C		FEM 3419
ISN 0277		RETURN	FEM 3420
ISN 0278		END	FEM 3421

ISN 0002	C	SUBROUTINE CVSET (VMX,VMN,DEL,NCN,CNV,NPN)	FEM 3422
	C	*****	FEM 3423
	C	DEFINE NO. OF CONTER VALUE (IN NCN)	FEM 3424
	C	CONTER VALUE (IN CNV(*))AND	FEM 3425
	C	NU. OF FIGUR AFTER PRIUD (IN NPN)	FEM 3426
	C	*****	FEM 3427
	C	USING MAX VALUE (=VMX) AND MINIMUM VALUE (=VMN)	FEM 3428
	C	*****	FEM 3429
	C	*****	FEM 3430
ISN 0003	C	DIMENSION CNV(1)	FEM 3431
	C		FEM 3432
ISN 0004	C	VR = VMX - VMN	FEM 3433
ISN 0005	C	SF = ALOG10(VR)	FEM 3434
ISN 0006	C	II = SF	FEM 3435
ISN 0007	C	IF (SF .LT. 0.0) II = II - 1	FEM 3436
	C		FEM 3437
ISN 0009	C	PP = 10.0**II	FEM 3438
ISN 0010	C	CC = VR/PP	FEM 3439
	C		FEM 3440
ISN 0011	C	IF (CC .GT. 1.0) GO TO 400	FEM 3441
ISN 0013	C	IF (CC .GT. 2.5) GO TO 300	FEM 3442
ISN 0015	C	IF (CC .GT. 1.25) GO TO 200	FEM 3443
	C		FEM 3444
	C		FEM 3445
	C	--- 1.0 < CC < 1.25	FEM 3446
	C		FEM 3447
ISN 0017	C	DEL = PP/20.0	FEM 3448
ISN 0018	C	GO TO 500	FEM 3449
	C		FEM 3450
	C		FEM 3451
	C		FEM 3452
	C	--- 1.25 < CC < 2.5	FEM 3453
	C		FEM 3454
ISN 0019	C	200 CONTINUE	FEM 3455
ISN 0020	C	DEL = PP/10.0	FEM 3456
ISN 0021	C	GO TO 500	FEM 3457
	C		FEM 3458
	C		FEM 3459
	C	--- 2.5 < CC < 5.0	FEM 3460
	C		FEM 3461
ISN 0022	C	300 CONTINUE	FEM 3462
ISN 0023	C	DEL = PP/5.0	FEM 3463
ISN 0024	C	GO TO 500	FEM 3464
	C		FEM 3465
	C		FEM 3466
	C	--- 5.0 < CC < 10.0	FEM 3467
	C		FEM 3468
ISN 0025	C	400 CONTINUE	FEM 3469
ISN 0026	C	DEL = PP/2.0	FEM 3470
ISN 0027	C	GO TO 500	FEM 3471
	C		FEM 3472
	C		FEM 3473
	C		FEM 3474

ISN 0026	C		FEM 3475
ISN 0029	C	500 CONTINUE	FEM 3476
ISN 0030		SP = ALOG10(DEL)	FEM 3477
ISN 0031		NPN = -1	FEM 3478
		IF (SP .LT. 0.0) NPN = 1 - SP	FEM 3479
	C		FEM 3480
ISN 0033	C	II = VMN/DEL	FEM 3481
ISN 0034		IF (VMN .LT. 0.0) II = II + 1	FEM 3482
	C		FEM 3483
ISN 0036	C	VS = DEL*II - DEL	FEM 3484
	C		FEM 3485
ISN 0037		GG = DEL*0.001	FEM 3486
ISN 0038		VX = VMX + GG	FEM 3487
ISN 0039		VN = VMN - GG	FEM 3488
	C		FEM 3489
	C		FEM 3490
ISN 0040		NCN = 0	FEM 3491
	C		FEM 3492
ISN 0041	C	DO 600 I=1,100	FEM 3493
ISN 0042		VS = VS + DEL	FEM 3494
ISN 0043		IF (VS .LT. VN) GO TO 600	FEM 3495
ISN 0045		IF (VS .GT. VX) GO TO 700	FEM 3496
	C		FEM 3497
ISN 0047		NCN = NCN + 1	FEM 3498
ISN 0048		CONV(NCN) = VS	FEM 3499
	C		FEM 3500
ISN 0049	C	600 CONTINUE	FEM 3501
	C		FEM 3502
	C		FEM 3503
ISN 0050	C	700 CONTINUE	FEM 3504
ISN 0051		RETURN	FEM 3505
ISN 0052		END	FEM 3506
			FEM 3507
			FEM 3508

```

C      ***
C      ...POINT NONCONVEX-POLYGON PROBLEM...
C      ***
C      ***
C      ITS FUNCTION IS TO DETERMINE WHETHER A SINGLE POINT
C      LIES INSIDE, OUTSIDE, ON A VERTEX, OR ON A POLYGON
C      SIDE.
C      ***
C      ***
C      POINT.....(X0,Y0)
C      POLYGON.... N,X(N),Y(N)
C      IS=1 ..... OUTSIDE
C      2 ..... INSIDE
C      3 ..... INSIDE
C      4 ..... ON A POLYGON
C      5 ..... ON A VERTEX
C      IP ..... POINT OR LINE NO. IF IS=3,4
C      ***
C      SUBROUTINE PNTPLG(N,XX,YY,X0,Y0,IS,IP,EDL)
C      DIMENSION XX(1),YY(1),X(99),Y(99),KSIGN(9,9)
C      DIMENSION KS(99),KSS(99)
C      DATA KSIGN/1,3,0,1,7,5,1,1,5,
C      1      2,4,2,4,2,4,2,4,2,
C      2      6,3,1,1,7,1,1,1,1,
C      3      1,3,1,1,7,4,1,1,5,
C      4      8,5,8,8,9,8,4,8,8,
C      5      5,3,1,4,7,1,1,1,1,
C      6      1,3,1,1,4,1,1,1,1,
C      7      1,3,1,1,7,1,1,1,0,
C      8      5,3,1,5,7,1,1,6,1/
C      .....
C      DO 1000 I=1,N
C      X(I)=XX(I)-X0
C      Y(I)=YY(I)-Y0
C      IF(1.GT.1) GO TO 900
C      XMAX=X(I)
C      XMIN=X(I)
C      YMAX=Y(I)
C      YMIN=Y(I)
C      GO TO 1000
C      900 IF(X(I).GT.XMAX) XMAX=X(I)
C      IF(X(I).LT.XMIN) XMIN=X(I)
C      IF(Y(I).GT.YMAX) YMAX=Y(I)
C      IF(Y(I).LT.YMIN) YMIN=Y(I)
C      1000 CONTINUE
C      IS=1
C      IF(XMAX.LT.0.) RETURN
C      IF(XMIN.GT.0.) RETURN
C      IF(YMAX.LT.0.) RETURN
C      IF(YMIN.GT.0.) RETURN
C      KCK=0
C      DO 1500 I=1,N
C      IP=1
C      CALL SIGN2P(X(I),Y(I),EDL,KS(I))
C      IF(KS(I).EQ.2) GO TO 7210
C      IF(KS(I).EQ.5) GO TO 1500
C      IF(KS(I).EQ.7) GO TO 1500
C      IF(KCK.EQ.0) KST=I
C      KCK=1
C      1500 CONTINUE
C      DO 1600 I=1,N

```

ISN 0002
ISN 0003
ISN 0004
ISN 0005

ISN 0006
ISN 0007
ISN 0008
ISN 0009
ISN 0011
ISN 0012
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FEM 3509
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FEM 3561
FEM 3562
FEM 3563
FEM 3564
FEM 3565
FEM 3566
FEM 3567
FEM 3568
FEM 3569

ISN 0049	K1=1	FEM 3570
ISN 0050	K2=1+1	FEM 3571
ISN 0051	IF(1.EQ.N) K2=1	FEM 3572
ISN 0053	KK1=KS(K1)	FEM 3573
ISN 0054	KK2=KS(K2)	FEM 3574
ISN 0055	KSS(1)=KSIGN(KK1,KK2)	FEM 3575
ISN 0056	1000 CONTINUE	FEM 3576
ISN 0057	K1=KST	FEM 3577
ISN 0058	NCRS=0	FEM 3578
	C..... CHECK START.	FEM 3579
ISN 0059	3100 KSGN=KSS(K1)	FEM 3580
ISN 0060	GO TO (5000,7000,7200,7400,4000,4200,5000,3100,9000),KSGN	FEM 3581
ISN 0061	3300 KOLD=KS(K1)	FEM 3582
ISN 0062	K1=K1+1	FEM 3583
ISN 0063	IF(K1.GT.N) K1=1	FEM 3584
ISN 0065	KSGN=KSS(K1)	FEM 3585
ISN 0066	GO TO (9000,7000,9000,7400,9000,9000,3400,9000,3500),KSGN	FEM 3586
ISN 0067	3400 K2=K1+1	FEM 3587
ISN 0068	IF(K2.GT.N) K2=1	FEM 3588
ISN 0070	KXNT=KS(K2)	FEM 3589
ISN 0071	IF(KOLD.EQ.3) GO TO 3450	FEM 3590
ISN 0073	IF(KOLD.EQ.6) GO TO 3450	FEM 3591
ISN 0075	IF(KOLD.EQ.9) GO TO 3450	FEM 3592
ISN 0077	IF(KOLD.EQ.2) GO TO 9000	FEM 3593
ISN 0079	IF(KOLD.EQ.5) GO TO 9000	FEM 3594
ISN 0081	IF(KOLD.EQ.7) GO TO 9000	FEM 3595
	C..... KOLD=1,4,8	FEM 3596
ISN 0083	IF(KXNT.EQ.1) GO TO 5100	FEM 3597
ISN 0085	IF(KXNT.EQ.4) GO TO 5100	FEM 3598
ISN 0087	IF(KXNT.EQ.6) GO TO 5100	FEM 3599
ISN 0089	IF(KXNT.EQ.2) GO TO 9000	FEM 3600
ISN 0091	IF(KXNT.EQ.5) GO TO 9000	FEM 3601
ISN 0093	IF(KXNT.EQ.7) GO TO 9000	FEM 3602
	C..... CRUSS.	FEM 3603
ISN 0095	3420 NCRS=NCRS+1	FEM 3604
ISN 0096	GO TO 5100	FEM 3605
	C..... KOLD=3,6,9	FEM 3606
ISN 0097	3450 IF(KXNT.EQ.3) GO TO 5100	FEM 3607
ISN 0099	IF(KXNT.EQ.6) GO TO 5100	FEM 3608
ISN 0101	IF(KXNT.EQ.9) GO TO 5100	FEM 3609
ISN 0103	IF(KXNT.EQ.1) GO TO 3420	FEM 3610
ISN 0105	IF(KXNT.EQ.4) GO TO 3420	FEM 3611
ISN 0107	IF(KXNT.EQ.8) GO TO 3420	FEM 3612
ISN 0109	GO TO 9000	FEM 3613
	C.....	FEM 3614
ISN 0110	3500 K1=K1+1	FEM 3615
ISN 0111	IF(K1.GT.N) K1=1	FEM 3616
ISN 0113	IF(K1.EQ.NST) GO TO 9000	FEM 3617
ISN 0115	KSGN=KSS(K1)	FEM 3618
ISN 0116	IF(KSGN.EQ.9) GO TO 3500	FEM 3619
ISN 0118	IF(KSGN.EQ.7) GO TO 3400	FEM 3620
ISN 0120	IF(KSGN.EQ.2) GO TO 7000	FEM 3621
ISN 0122	IF(KSGN.EQ.3) GO TO 7200	FEM 3622
ISN 0124	IF(KSGN.EQ.4) GO TO 7400	FEM 3623
ISN 0126	GO TO 9000	FEM 3624
	C..... CRUSS.	FEM 3625
ISN 0127	4000 NCRS=NCRS+1	FEM 3626
ISN 0128	GO TO 5000	FEM 3627
	C..... Y-Axis CHECK.	FEM 3628
ISN 0129	4200 K2=K1+1	FEM 3629
ISN 0130	IF(K2.GT.N) K2=1	FEM 3630
ISN 0132	E=Y(K1)-(Y(K2)-Y(K1))/(X(K2)-X(K1))*X(K1)	FEM 3631

ISN 0133	IF(B-GE-EDL) GO TO 4000	FEM 3632
ISN 0135	IF(R-LE-EDL) GO TO 5000	FEM 3633
ISN 0137	GO TO 7400	FEM 3634
	C.... NEXT LINE CHECK.	FEM 3635
ISN 0138	5000 K1=K1+1	FEM 3636
ISN 0139	IF(K1-GT-N) K1=1	FEM 3637
ISN 0141	5100 IF(K1-NE-KST) GO TO 3100	FEM 3638
	C	FEM 3639
	C.... INSIDE/OUTSIDE CHECK.	FEM 3640
ISN 0143	6000 IS=2	FEM 3641
ISN 0144	IF(MOD(NCNS,2)-EQ-0) IS=1	FEM 3642
ISN 0146	RETURN	FEM 3643
	C	FEM 3644
	C.... ON VERTEX.	FEM 3645
ISN 0147	7000 IS=4	FEM 3646
ISN 0148	IP=K1+1	FEM 3647
ISN 0149	IF(IP-GT-N) IP=1	FEM 3648
ISN 0151	RETURN	FEM 3649
	C	FEM 3650
ISN 0152	7200 IP=K1	FEM 3651
ISN 0153	7210 IS=4	FEM 3652
ISN 0154	RETURN	FEM 3653
	C	FEM 3654
	C.... UN POLYGON LINE.	FEM 3655
ISN 0155	7400 IS=3	FEM 3656
ISN 0156	IP=K1	FEM 3657
ISN 0157	RETURN	FEM 3658
	C	FEM 3659
	C.... ALGORITHM ERROR.	FEM 3660
ISN 0158	9000 CONTINUE	FEM 3661
	C9000 WRITE(6,20) X0,Y0,K1	FEM 3662
	C 20 FORMAT(1H,'PNTPLG...ERROR (X0,Y0)...',2F7.2,3X,'K1=',I2)	FEM 3663
	C WRITE(6,25) N,((XX(I),YY(I)),I=1,N)	FEM 3664
	C 25 FORMAT(1H,' N=',I2,2X,'(X,Y)...',18F6.1)	FEM 3665
ISN 0159	IS=-1	FEM 3666
ISN 0160	RETURN	FEM 3667
ISN 0161	END	FEM 3668

ISN 0002		SUBROUTINE SIGNEP(X,Y,EDL,IS)		FEM 3669
	C	***	***	FEM 3670
	C	*** THIS SUBROUTINE DETERMINES IDENTIFICATION	***	FEM 3671
	C	*** OF POINT (X,Y) .	***	FEM 3672
	C	***	***	FEM 3673
	C	*** X... + 0 - + 0 - 0 + -	***	FEM 3674
	C	*** Y... + 0 - 0 + 0 - - +	***	FEM 3675
	C	*** IS.. 1 2 3 4 5 6 7 8 9	***	FEM 3676
	C			FEM 3677
ISN 0003		IF(X-GE-EDL) GO TO 1000		FEM 3678
ISN 0005		IF(X-LE-EDL) GO TO 1100		FEM 3679
ISN 0007		IS=2		FEM 3680
ISN 0008		IF(Y-GE-EDL) IS=5		FEM 3681
ISN 0010		IF(Y-LE-EDL) IS=7		FEM 3682
ISN 0012		GO TO 2000		FEM 3683
ISN 0013	1000	CONTINUE		FEM 3684
ISN 0014		IS=4		FEM 3685
ISN 0015		IF(Y-GE-EDL) IS=1		FEM 3686
ISN 0017		IF(Y-LE-EDL) IS=8		FEM 3687
ISN 0019		GO TO 2000		FEM 3688
ISN 0020	1100	CONTINUE		FEM 3689
ISN 0021		IS=6		FEM 3690
ISN 0022		IF(Y-GE-EDL) IS=9		FEM 3691
ISN 0024		IF(Y-LE-EDL) IS=3		FEM 3692
ISN 0026	2000	CONTINUE		FEM 3693
ISN 0027		RETURN		FEM 3694
ISN 0028		END		FEM 3695

非引張応力解析プログラム (他)
使用説明書および解説

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有限要素法, せん断破壊, 初期応力法

要旨

有限要素法を用いた非引張応力解析 (およびせん断破壊基準に従う応力解析) を行う構造解析プログラムについて解説を加え, その取扱い方法を示したものである

郵便はがき

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四十円切手
をはって下
さい

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