

```

73      END DO
74  C *****
75      IF (NSHR. EQ. 1) THEN
76          IF (NDI .EQ. 2) THEN          ! for plane stress, which does not happen for
              soils !
              DO I=1,2
77                  STRES (I) = STRESS(I)
78                  DEPS (I) = DSTRAN(I)
79                  STAIN (I) = STRAN(I)
80              END DO
81                  STRES (3) = 0.0D0
82                  DEPS (3) = 0.0D0
83                  STAIN (3) = 0.0D0
84                  STRES (4) = STRESS(3)
85                  DEPS (4) = DSTRAN(3)
86                  STAIN (4) = STRAN(3)
87              ELSE          ! for axisymetric element and plane strain element !
88                  DO I=1,4
89                      STRES (I) = STRESS(I)
90                      DEPS (I) = DSTRAN(I)
91                      STAIN (I) = STRAN(I)
92                  END DO
93              END IF
94  C*****
95      DO I=5,6 ! the other two shear components !
96          STRES (I) = 0.0D0
97          DEPS (I) = 0.0D0
98          STAIN (I) = 0.0D0
99      END DO
100  ELSE
101      DO I = 1, 6
102          STRES (I) = STRESS(I)
103          DEPS (I) = DSTRAN(I)
104          STAIN (I) = STRAN(I)
105      END DO
106  END IF
107  C
108  C
109  *****

110      TOLERF=1.0D-6          ! Tolerance for the Yield function
111      TENSNS=1.D-2          ! zero STIFFNESS WHEN MEAN STRESS IS BELOW 1 PA (10E-6PA)
112  C THIS TOLERANCE SHOULD NOT BE CHANGED, AT LEAST FOR THE STRIP FOOTING PROBLEM
113  C *****
114  C
115      DO I=1,3
116          DO J=1,3
117              IF (I .EQ. J) THEN
118                  DELTA(I,J)=1.D0
119              ELSE
120                  DELTA(I,J)=0.D0
121              END IF
122          END DO
123      END DO
124  C
125  C *****
126      CALL PRAMTS(PROPS, NPROPS, C, DMC, DKH, VOIDC, DLAC, DKSI,
127          $ GO, DNU, FEVR, D1, DPM, DNKP, EA, CH)
128  C
129      ITSVEC = 1 ! STRESS
130      ISTSST = 1 ! VECTOR TO TENSOR
131      CALL TSRVEC(SIGMA, STRES, ISTSST, ITSVEC)
132      ISTSST = 2 ! STRAIN
133      CALL TSRVEC (DEPSLN, DEPS, ISTSST, ITSVEC)
134      CALL TSRVEC (DEPSTT, DEPS, ISTSST, ITSVEC)
135  C*****
136      DNCALL = STATEV(12)          ! LOADING HISTORY INDICATOR ! = 0 for the first
              call & the initial stress state is used to calculate the initial H value
              for the yield function !
137  C*****
138      FABRIC(1) = STATEV(4)
139      FABRIC(2) = STATEV(5)
140      FABRIC(3) = STATEV(6)

```

```

141         FABRIC(4) = STATEV(7)
142         FABRIC(5) = STATEV(8)
143         FABRIC(6) = STATEV(9)
144 C*****

145 C   THE FABRIC TENSOR SHOULD BE ROTATED BEFORE INCREMENT FOR LARGE DEFORMATION!
146 C*****

147     CALL ROTSIG (FABRIC, DROT, SPRIME, 1, 3, 3)
148     F(1,1) = SPRIME(1)
149     F(2,2) = SPRIME(2)
150     F(3,3) = SPRIME(3)
151     F(1,2) = SPRIME(4)
152     F(1,3) = SPRIME(5)
153     F(2,3) = SPRIME(6)
154     F(2,1) = F(1,2)
155     F(3,1) = F(1,3)
156     F(3,2) = F(2,3)
157 C
158 C *****
159     VOIDR = STATEV(1)
160 C *****
161 C
162     HARD = MAX (STATEV (2), 1.0D-15) ! AVOID NEGATIVE HARD VALUE !
163     IF (DNCALL .LT. 0.5D0) THEN
164         CALL STREIV(PROPS, NPROPS, F, SIGMA, P, S, R, RM, Q, FMAG,
165 $             SIN3T, GTHETA, ATHETA, SDGTH,FR,DNORM,ABASE,A,FRMAG)
166         HREAL = RM / GTHETA
167         IF(HREAL.GT.HARD) HARD=HREAL+1.0D-8!!!!
168     END IF
169 C
170 C*****
171 C
172 C   IF MEAN STRESS IS TOO LOW, RETURN THE ORIGINAL STRESS, STDEV, ZERO STIFFNESS
173 C
174 C*****
175     CALL PRINCIPALSTRES (SIGMA,PMEINI,PSINI) ! RETURNS THE MINIMUM NORMAL STRESS
176 C*****
177     ! TO AVOID VERY LOW NORMAL STRESS AFTER TRIAL
178 C*****
179     IF (PMEINI .LT. TENSIN ) THEN ! 1.0D-6 KPa
180         CALL LOWSTRES (PROPS, NPROPS,HARD, F, SIGMA, VOIDR,
181 $             DSIGDE,DEPSLN,PNEWDT,TENSIN)
182
183     DNCALL=DNCALL+DACPLS
184     ITSVEC = 2
185     ISTSST = 1
186     CALL TSRVEC(SIGMA, STRES, ISTSST, ITSVEC)
187     DO I = 1, NTENS
188         STRESS(I) = STRES(I)
189     END DO
190
191     WRITE (7,*) 'THE INITIAL MEAN STRES TOO LOW FOR ELMET', NOEL,
192 $             'AT INTEG POIT', NPT, 'PSINI(1)=' ,PSINI(1) ,
193 $             'PSINI(2)=' , PSINI(2) , 'PSINI(3)=' ,PSINI(3)
194
195 C *****
196     YIELD = 3.0D0
197 C *****
198 C
199     END IF ! DOR SMALL STRES PROBLEM
200 C
201 C *****
202 C
203     IF (PMEINI .GE. TENSIN ) THEN
204 C
205         CALL ELSTMX (PROPS, NPROPS, SIGMA, CELAS, VOIDR, F)
206         CALL ELSUPD (CELAS, DEPSLN, DSIGET)
207         CALL UPDSTE (SIGMA, DSIGET, SIGETR)
208         CALL CNOSCK (PROPS, NPROPS, SIGETR, F, HARD, FTOLRE, NOEL,NPT,1)
209 C
210         CALL PRINCIPALSTRES (SIGETR,WROPFE,PSM2)
211 C

```