

```

;-----
; pillar.dat      evolution of peak load
;                  in a rectangular pillar
;-----
def parm
ratl=1.14
rat_1=1.0/ratl
end
parm

def s_base
pnt=gp_head
sum=0.0
loop while pnt # null
  if gp_zpos(pnt)<-9.9 then
    sum=sum-gp_zfunbal(pnt)
  end_if
  pnt=gp_next(pnt)
end_loop
s_base=sum/(13.0*7.5)
end

gen zon cylint p1 7.5 0 0 p2 0 7.5 0 p3 0 0 4.75 dim 2 2 2 2 2 2 &
size 6 6 6 6 6 ratio ratl ratl 1 ratl
group cylint

gen zon radcyl p0 13 0 0 p1 13 4.75 0 p2 7.5 0 0 p3 13 0 4.75 &
p4 7.5 4.75 0 p5 7.5 0 4.75 p6 13 3.75 4.75 p7 7.5 3.75 4.75 &
dim 2 2 2 2 size 1 3 6 6 rat 1 .8 1 ratl
group radcyl range group cylint not

gen zon brick p0 13 4.75 0 p1 13 7.5 0 p2 7.5 4.75 0 p3 13 3.75 4.75 &
p4 7.5 7.5 0 p5 7.5 3.75 4.75 p6 13 7.5 4.75 p7 7.5 7.5 4.75 &
size 6 3 3 rat ratl .8 1
group brick1 range group cylint not group radcyl not

gen zon radtun p0 7.5 7.5 10 p1 0 7.5 10 p2 7.5 7.5 4.75 p3 7.5 0 10 &
dim 5.5 5.5 3.75 3.75 size 6 5 6 3 rat rat_1 0.8 rat_1 1 fill
group radtun range group cylint not group radcyl not group brick1 not

gen zon bri p0 7.5 0 4.75 p1 13 0 4.75 p2 7.5 3.75 4.75 p3 7.5 0 10 &
p4 13 3.75 4.75 p5 7.5 2 10 p6 13 0 10 p7 13 2 10 &
size 3 3 5 rat 1.25 1 1.25

```

```

gen zon bri p0 7.5 3.75 4.75 p1 13 3.75 4.75 p2 7.5 7.5 4.75 p3 7.5 2 10 &
    p4 13 7.5 4.75 p5 7.5 7.5 10 p6 13 2 10 p7 13 7.5 10 &
    size 3 6 5 rat 1.25 rat1 1.25

;lower portion of the grid

gen zon tunint p1 0 7.5 0 p2 7.5 0 0 p3 0 0 -4.75 dim 2 2 2 2 2 2 2 &
    size 6 6 4 4 6 rat rat1 rat1 1 1 rat1

gen zon radtun p0 13 0 0 p1 13 0 -4.75 p2 7.5 0 0 p3 13 4.75 0 &
    p4 7.5 0 -4.75 p5 7.5 4.75 0 p6 13 3.75 -4.75 p7 7.5 3.75 -4.75 &
    dim 2 2 2 2 size 4 3 4 6 rat 1 .8 1 rat1

gen zon brick p0 7.5 3.75 -4.75 p1 13 3.75 -4.75 p2 7.5 7.5 -4.75 &
    p3 7.5 4.75 0 p4 13 7.5 -4.75 p5 7.5 7.5 0 p6 13 4.75 0 &
    p7 13 7.5 0 size 3 6 4 rat 1.25 rat1 1

gen zon radtun p0 7.5 7.5 -4.75 p1 0 7.5 -4.75 p2 7.5 7.5 -10 p3 7.5 0 -4.75 &
    dim 3.75 3.75 5 5 size 6 5 6 4 rat rat_1 1.25 rat_1 1 fill

gen zon brick p0 7.5 0 -10 p1 13 0 -10 p2 7.5 2.5 -10 p3 7.5 0 -4.75 &
    p4 13 2.5 -10 p5 7.5 3.75 -4.75 p6 13 0 -4.75 p7 13 3.75 -4.75 &
    size 3 4 5 rat 1.25 1 .8

gen zon bri p0 7.5 2.5 -10 p1 13 2.5 -10 p2 7.5 7.5 -10 p3 7.5 3.75 -4.75 &
    p4 13 7.5 -10 p5 7.5 7.5 -4.75 p6 13 3.75 -4.75 p7 13 7.5 -4.75 &
    size 3 6 5 rat 1.25 rat1 .8

mo ss
fix y range y -.1 .1
fix y range y 7.4 7.5
fix x range x -.1 .1
fix x range x 12.9 13.1
fix z range z -10.1 -9.9
apply szz -17e6 range z 9.9 10.1

pro bulk 14.1e9 she 8.87e9 fric 35 coh 4e6 ten 5e5 ftab 1 ctab 2
table 1 0 35 0.01 32 0.02 30 .5 30
table 2 0 4e6 0.01 0.5e6 0.02 0 .5 0

ini sxx -25e6
ini syy -30e6
ini szz -17e6

```

```
hist unbal
hist gp zdisp 0 0 2
hist gp xdisp 2 7.5 0
hist gp ydisp 13 2 0
;
step 4000
;
save pillar1.sav
fix z range z 9.9 10.1
ini zvel -1e-5 range z 9.9 10.1
hist gp zdisp 13 7.5 10
hist s_base
step 1740
save pillar2.sav
step 1645
save pillar3.sav

ret
```