

```

; =====
;
;   Simulation of an laterally loaded pile - full gap
;
; =====
set logfile pl2.log
set log on
;
new
title
Laterally Loaded Pile Demonstration Problem
;
; =====
; Create a single soil block, set its material properties,
; specify boundary conditions, apply in-situ stresses,
; turn on gravity, and ensure that the gravity forces are
; in balance with the in-situ stresses.
;
gen zone brick size 7 7 7 edge=11
;
mod elastic
pro bulk=5e9 she=1e9 density=2000
;
fix z range z=(-0.01, 0.01)
fix x range x=(-0.01, 0.01)
fix x range x=(10.99, 11.01)
fix y range y=(-0.01, 0.01)
fix y range y=(10.99, 11.01)
;
init szz -2.20e5 grad=(0, 0, 2.0e4)
init sxx -1.32e5 grad=(0, 0, 1.2e4)
init syy -0.88e5 grad=(0, 0, 8.0e3)
;
set gravity=(0.0, 0.0, -10.0)
solve
;
; =====
; Create a pile in the center of the soil block; set the
; properties of the pile.
;
sel pile id=1 begin=(5.5, 5.5, 12.0) end=(5.5, 5.5, 4.0) nseg=8
;
sel pile prop Emod=8.0e10 Nu=0.30 XCArea=0.7854 &
              XCJ=9.82e-2 XCIy=4.91e-2 XCIZ=4.91e-2 &

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                Per=3.14 &
                CS_sK=1.3e11 CS_sCoh=1.0e10 CS_sFric=30.0 &
                CS_nK=1.3e09 CS_nCoh=1.0e04 CS_nFric=0.0 CS_nGap=on
;
; =====
; Set up histories for monitoring model behavior
;
history nstep=10
hist id=1 unbal
hist id=20 sel node xdisp id=1
;
hist id=100 sel pileSEL Fz id=1
hist id=200 sel pileSEL Fz id=3
hist id=300 sel pileSEL Fz id=5
hist id=400 sel pileSEL Fz id=7
hist id=500 sel pileSEL Fz id=8
;
hist id=101 sel pileSEL My id=1
hist id=201 sel pileSEL My id=3
hist id=301 sel pileSEL My id=5
hist id=401 sel pileSEL My id=7
hist id=501 sel pileSEL My id=8
;
; =====
; Apply the displacements (three phases: forward, back, forward)
;
;
def initval
    push_vel = 1.0e-8
    push_velm = -push_vel
end
initval
;
cycle 1 ; force the local-nodal systems of all nodes associated with
        ; pile to be updated
sel node FIX x range cid=1
sel node INIT xVel=push_vel range cid=1
cycle 40000
sav pl2_1.sav
;
sel node INIT xVel=push_velm range cid=1
cycle 80000
sav pl2_2.sav
;

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```
sel node INIT xVel=push_vel range cid=1
cycle 40000
sav pl2_3.sav
;
; =====
; Turn off logfile
;
set log off
;
; =====
return
```