



**ENERCON  
SERVICES, INC.**

Sheet 1 of 7

**Appendix LCPadNC-TH to Calculation PGE-009-CALC-006**

Originator:

*S. C. Tumminelli*  
S. C. Tumminelli

Date:

March 3, 2003

**Appendix LCPadNC-TH**

This Appendix presents the ANSYS plots of the pad vertical displacements for the thermal stress analysis summed Load Cases for the unconstrained model.

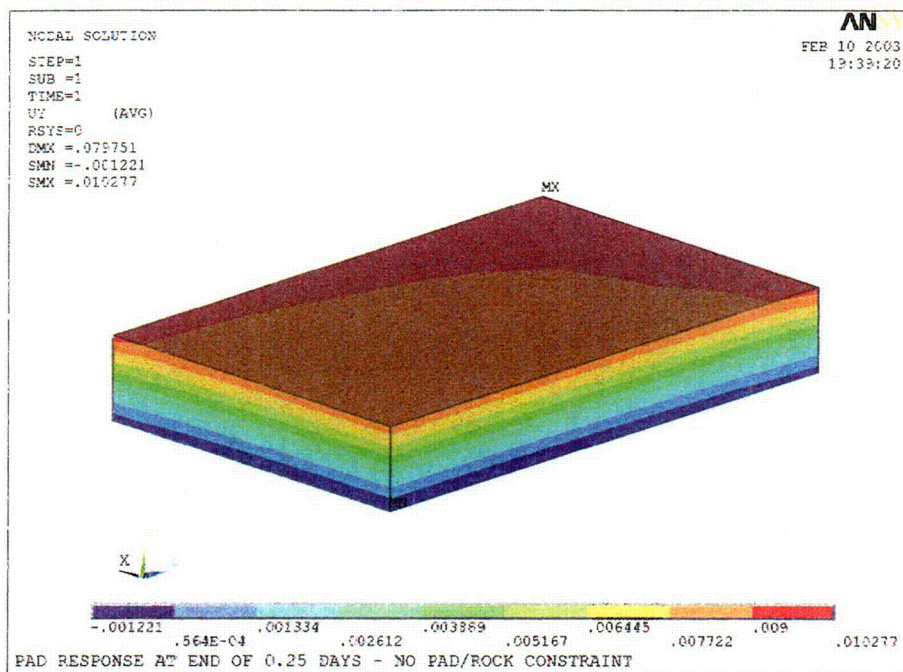
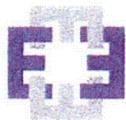


Figure LCNC-1 – Time 0.25 days

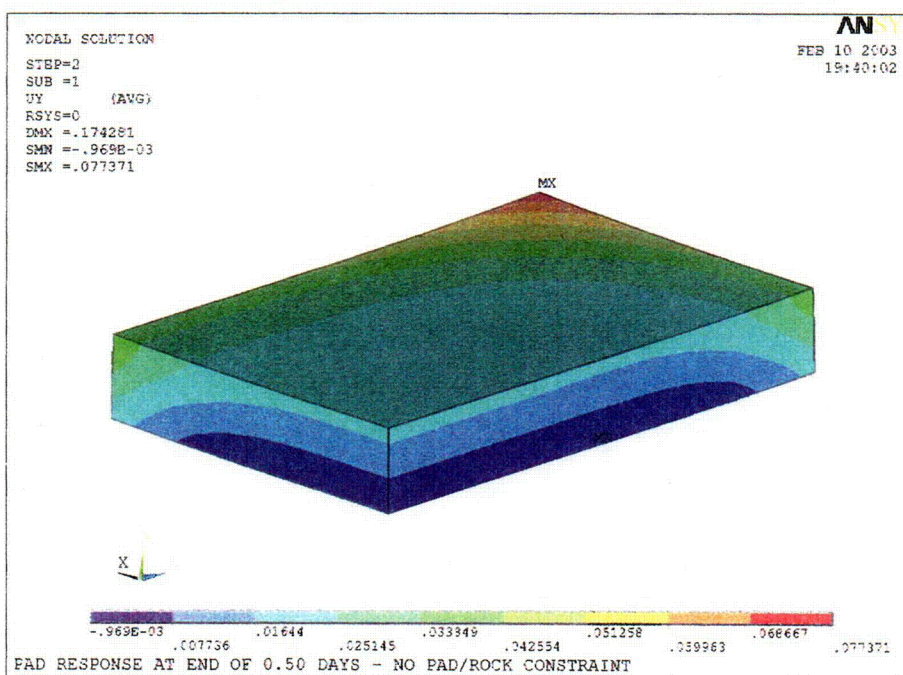


Figure LCNC-2 – Time 0.50 days

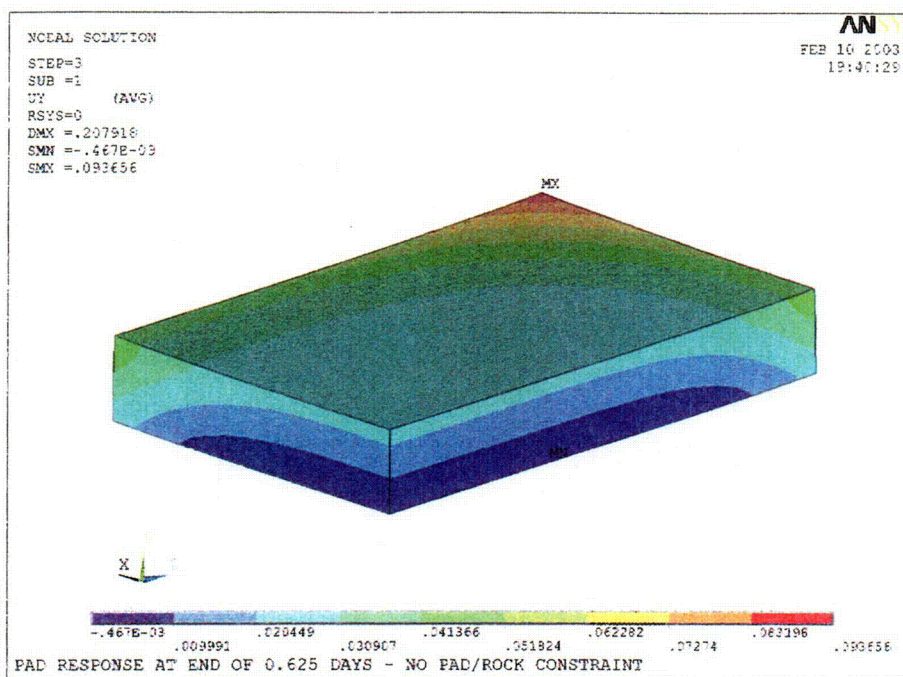
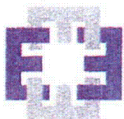


Figure LCNC-3 – Time 0.625 days

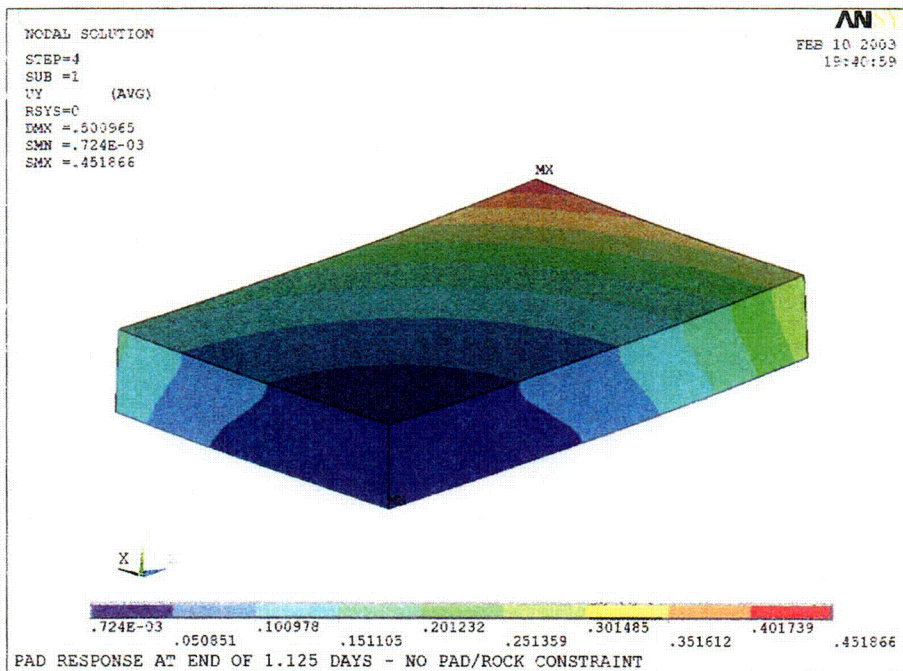


Figure LCNC-4 – Time 1.125 days

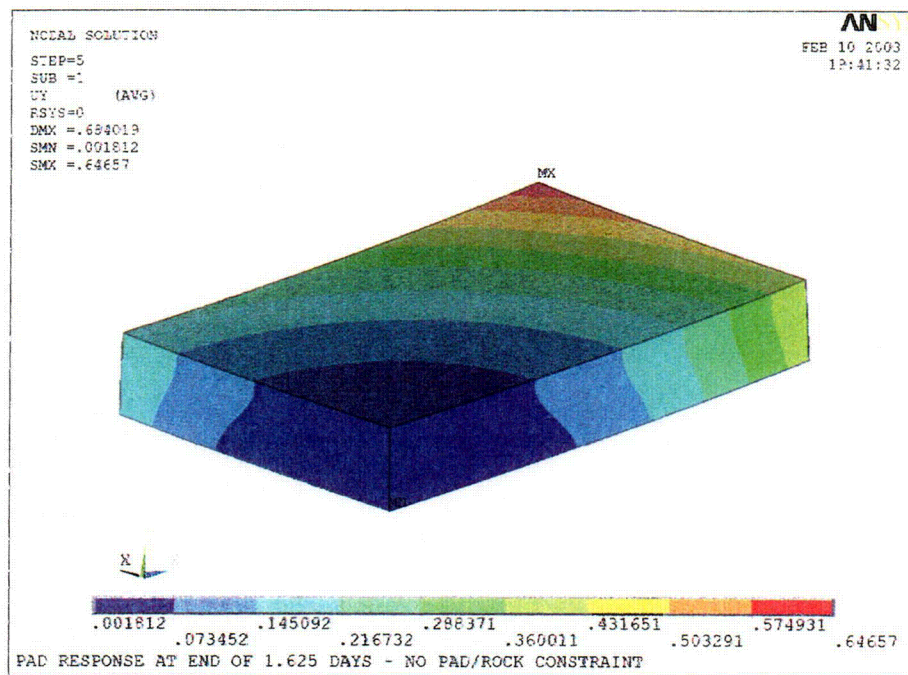
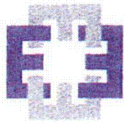


Figure LCNC-5 – Time 1.625 days

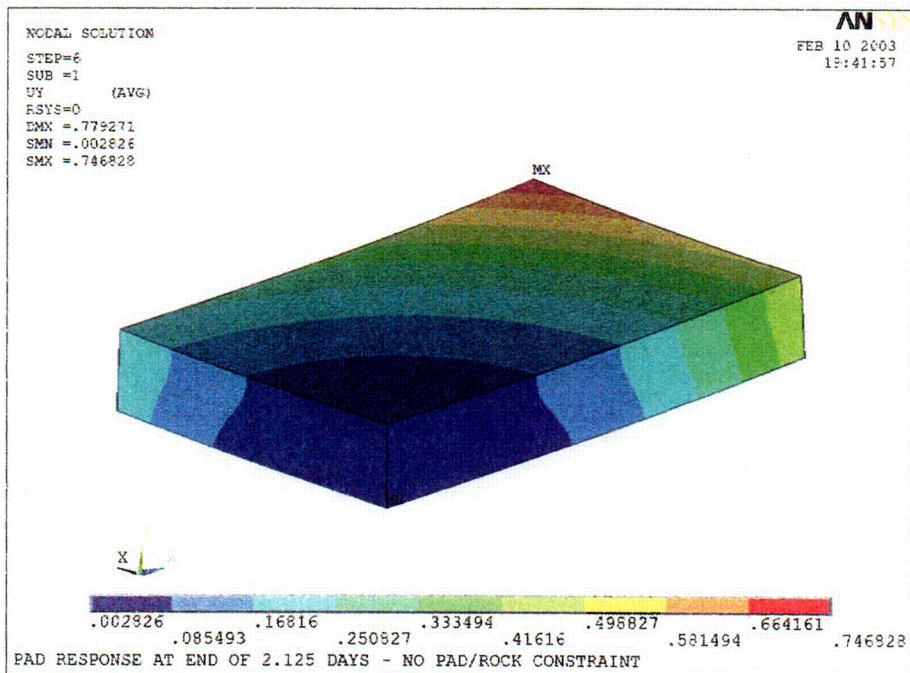


Figure LCNC-6 – Time 2.125 days



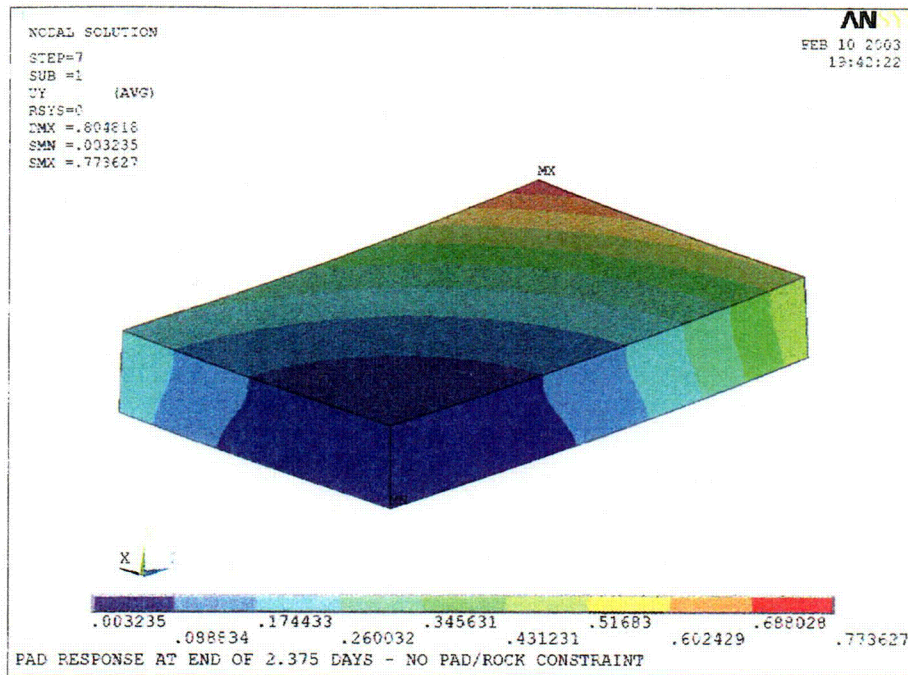
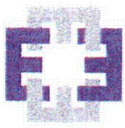


Figure LCNC-7 – Time 2.375 days

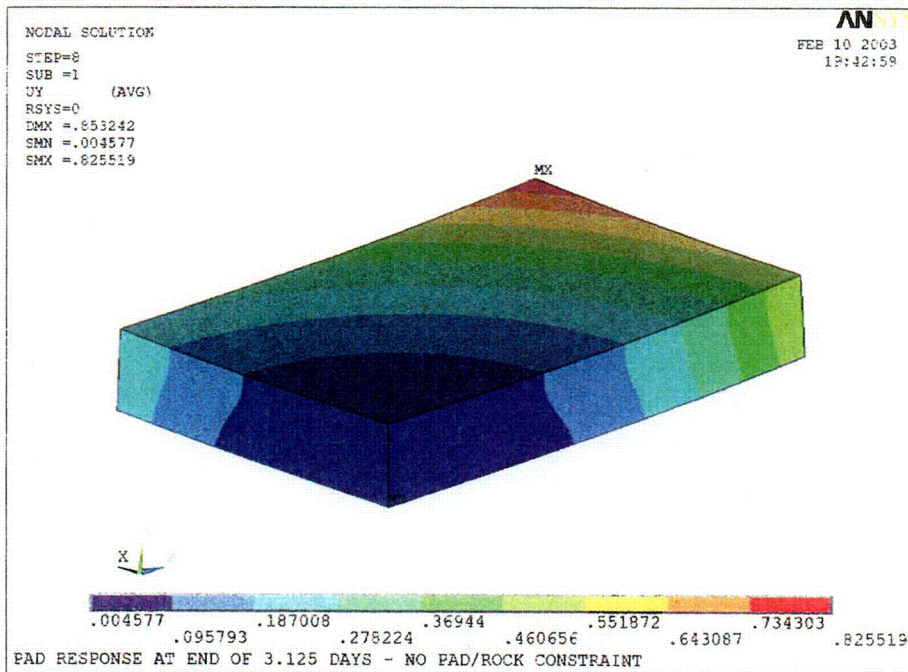


Figure LCNC- 8 – Time 3.125 days

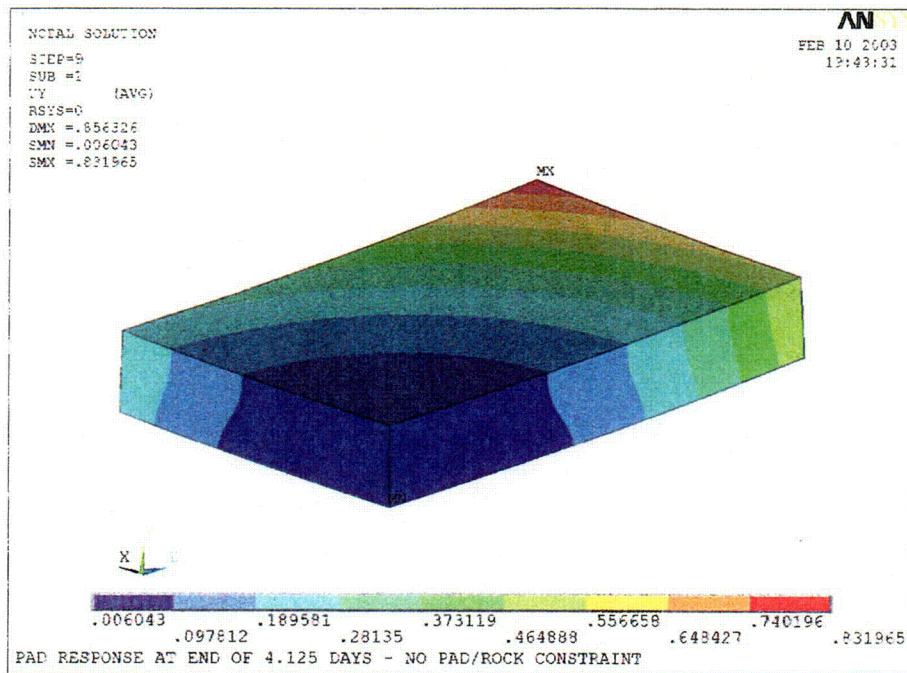
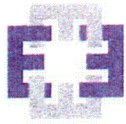


Figure LCNC-9 – Time 4.125 days

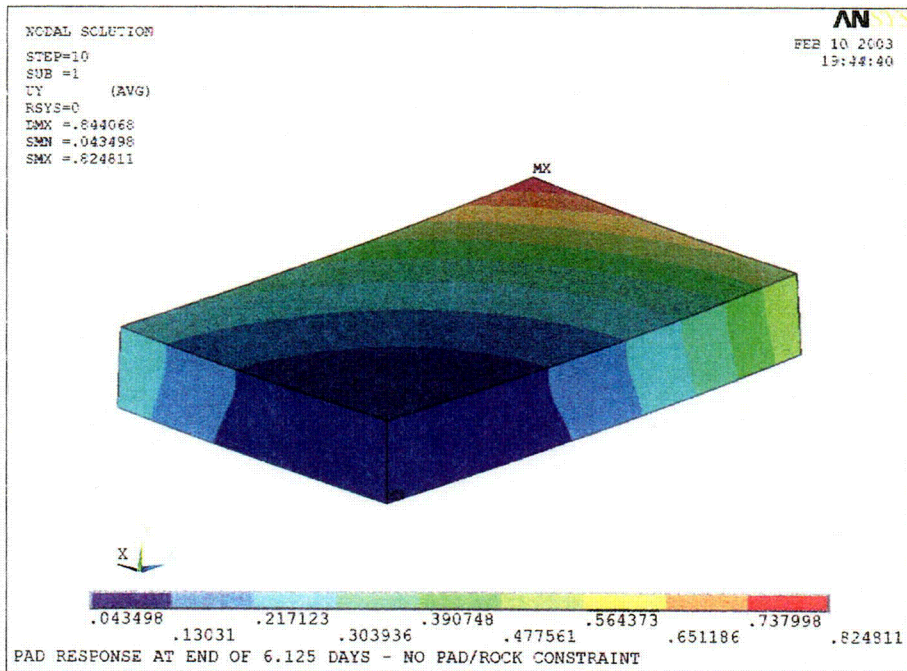


Figure LCNC-10 – Time 6.125 days

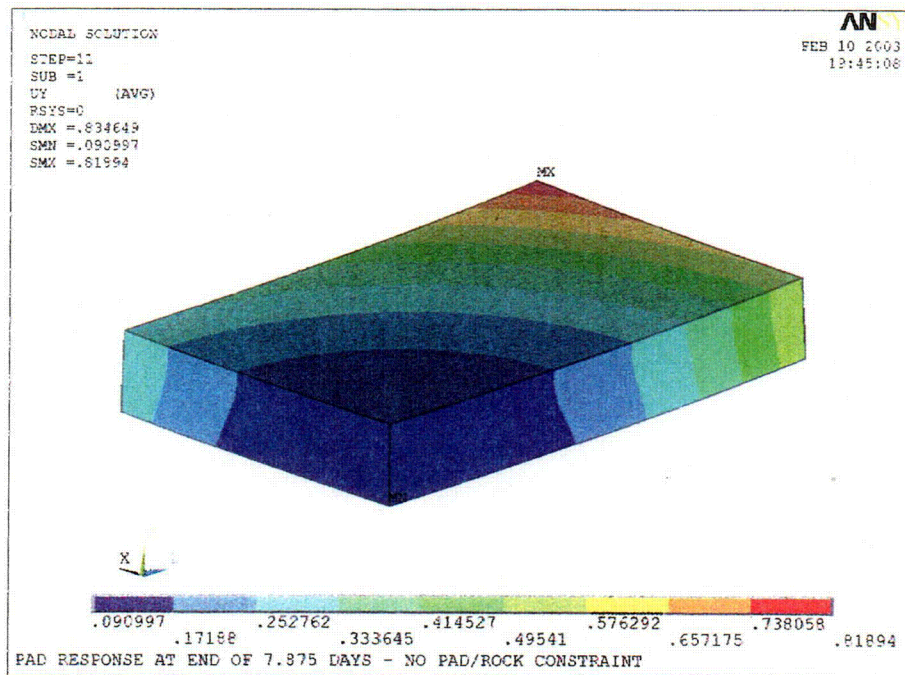
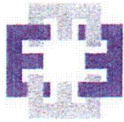


Figure LCNC-11 – Time 7.875 days




**ENERCON  
SERVICES, INC.**

**Sheet 1 of 18**

**Appendix STPadNC-TH to Calculation PGE-009-CALC-006**

Originator:

  
S. C. Tumminelli

Date:

March 3, 2003

## **Appendix STPadNC-TH**

This Appendix presents the ANSYS plots of the pad stresses  $S_x$  and  $S_z$  for the unconstrained thermal stress analysis summed Load Cases.



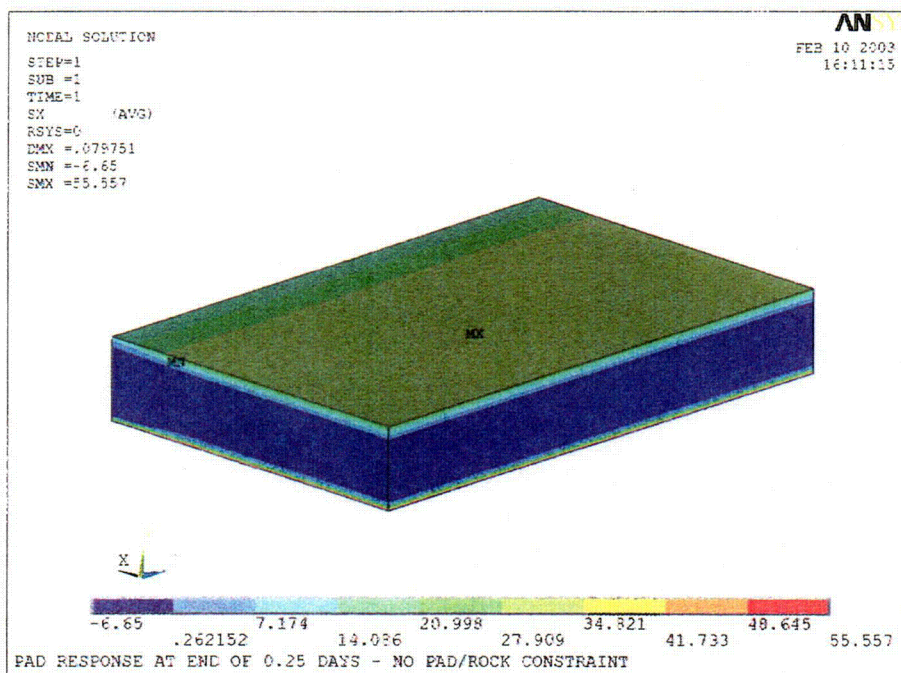
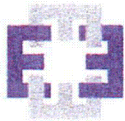


Figure STNC-1 – Sx at time 0.25 days

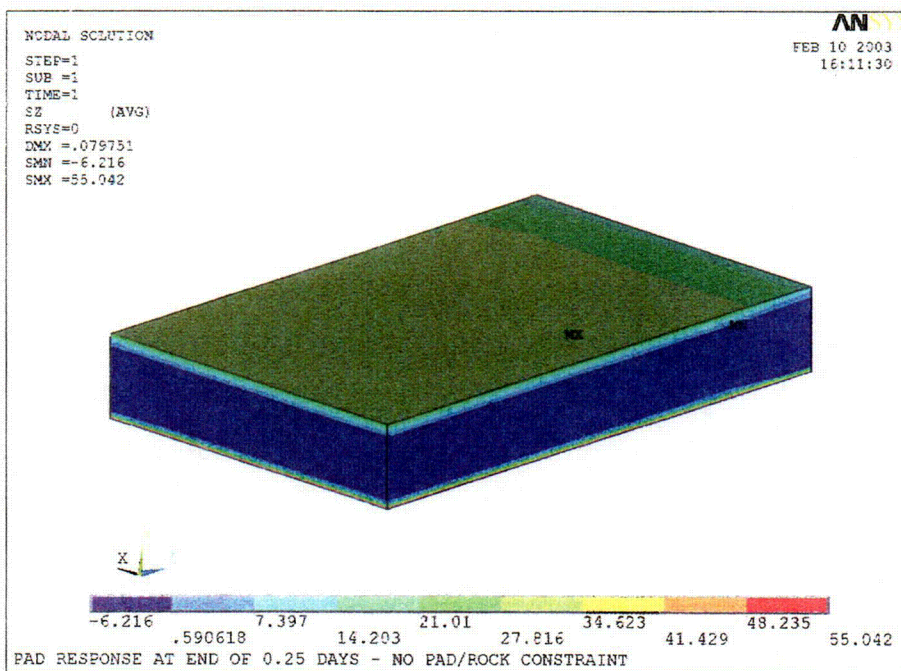


Figure STNC-2 – Sz at time 0.25 days

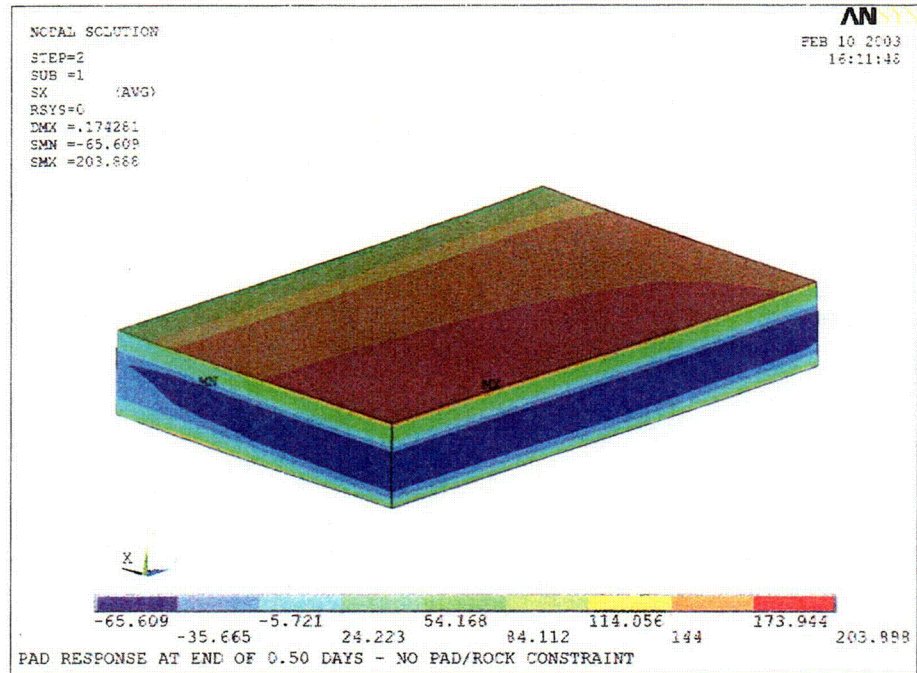
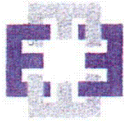


Figure STNC-3 – Sx at time 0.50 days

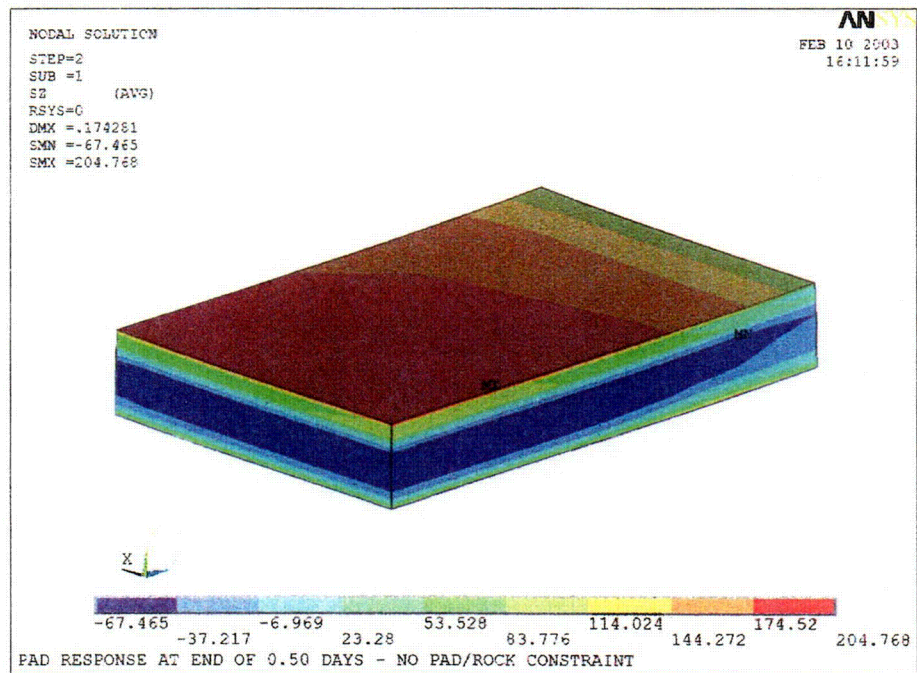


Figure STNC-4 – Sz at time 0.50 days

C09

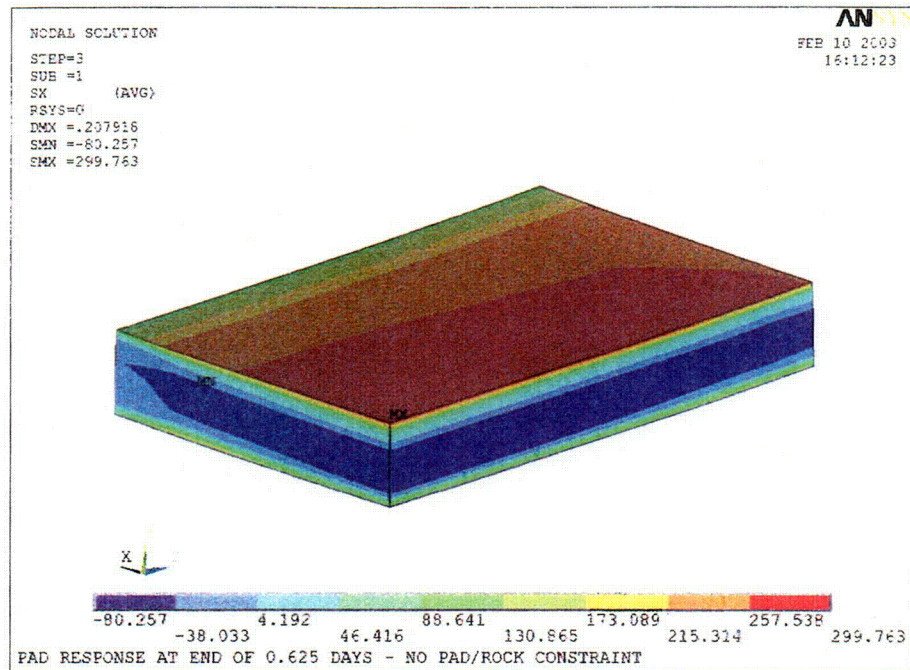
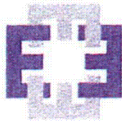


Figure STNC-5 – Sx at time 0.625 days

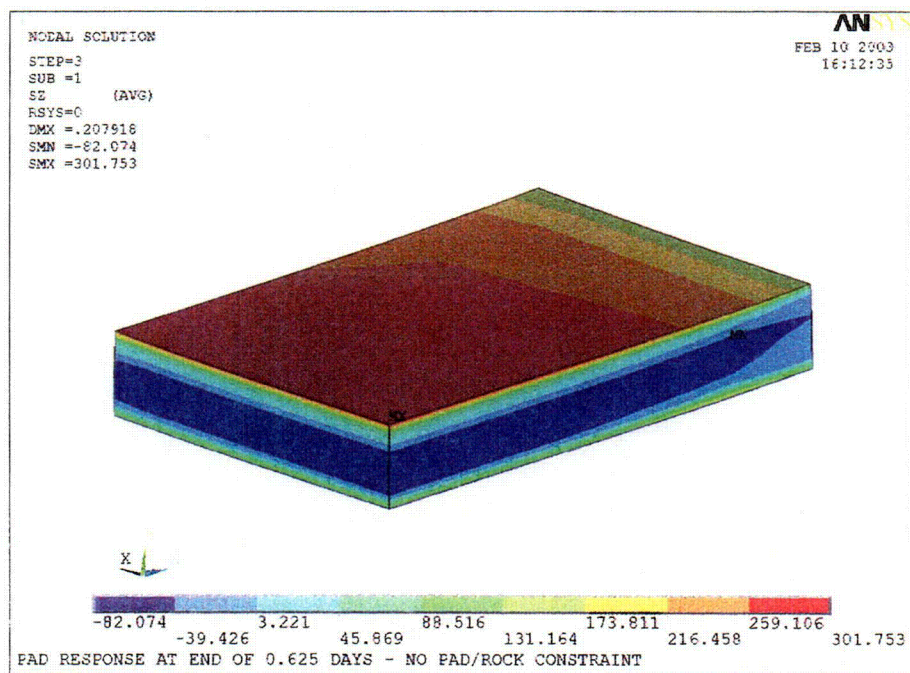


Figure STNC-6 – Sz at time 0.625 days

C09



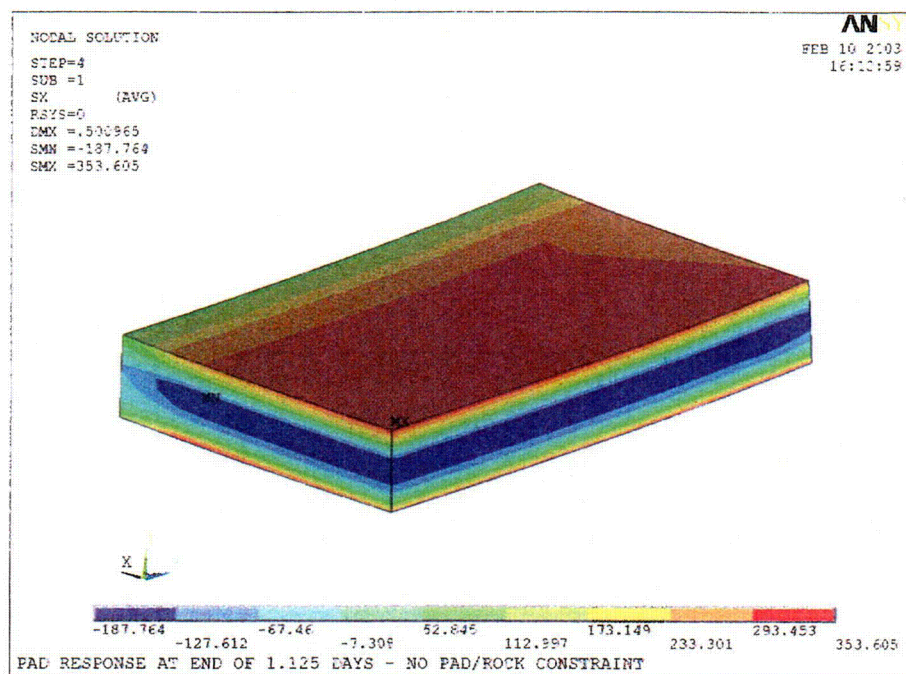
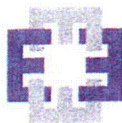


Figure STNC-7 – Sx at time 1.125 days

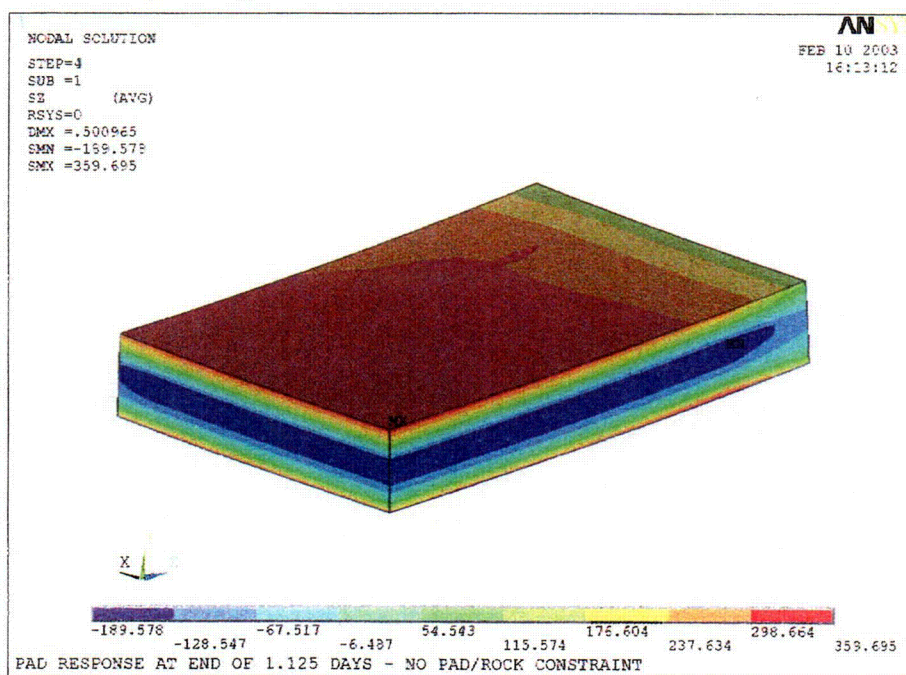


Figure STNC-8 – Sz at time 1.125 days



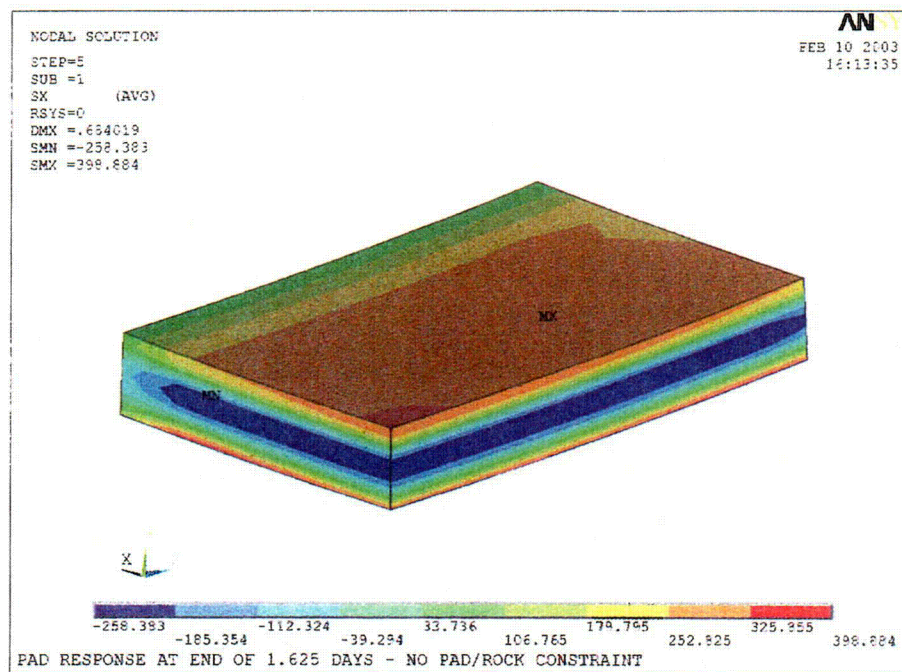
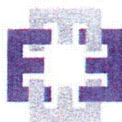


Figure STNC-9 – Sx at time 1.625 days

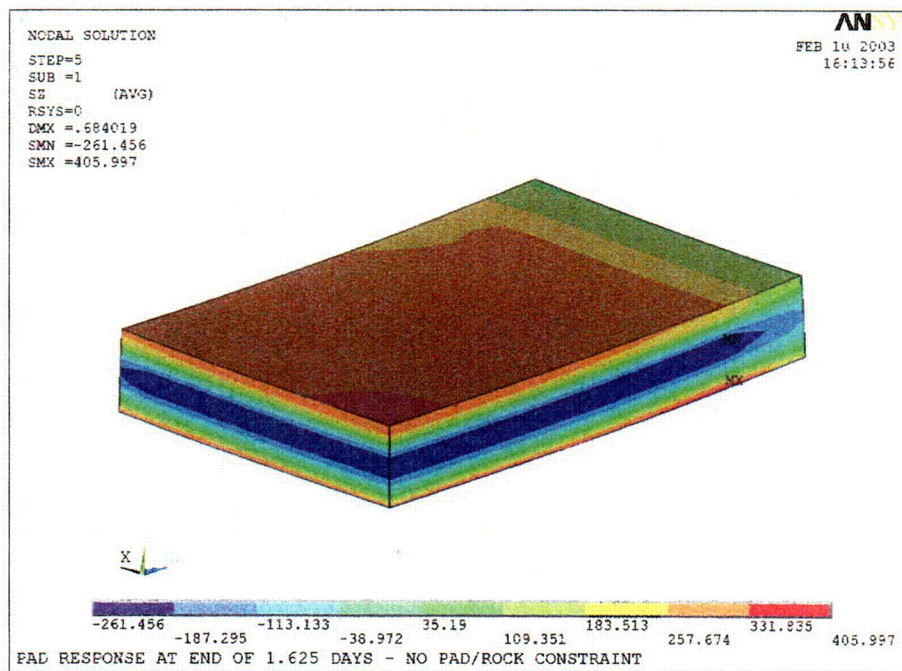


Figure STNC-10 – Sz at time 1.625 days

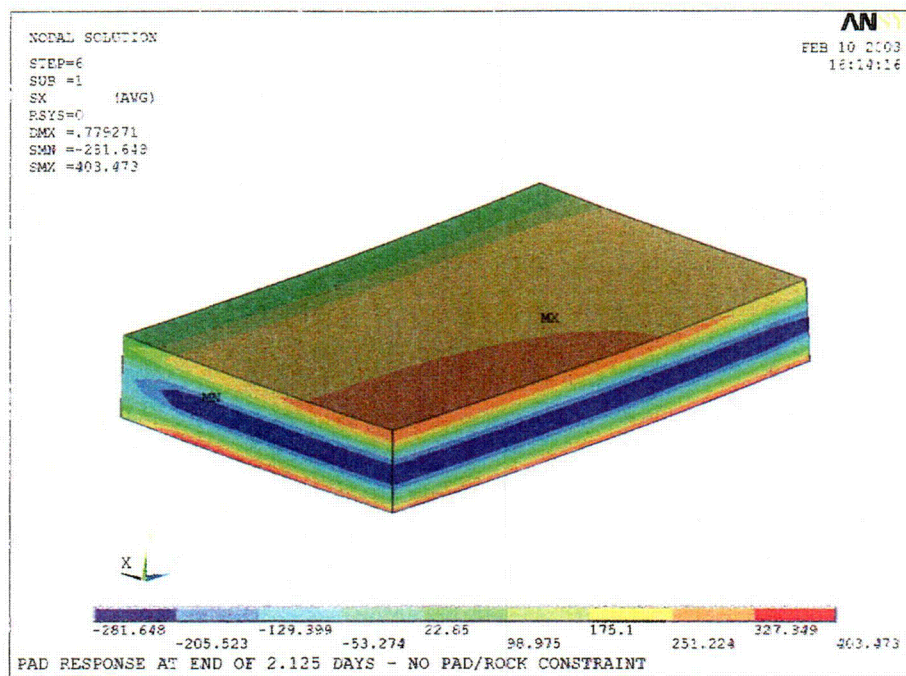
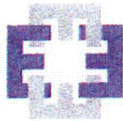


Figure STNC-11 – Sx at time 2.125 days

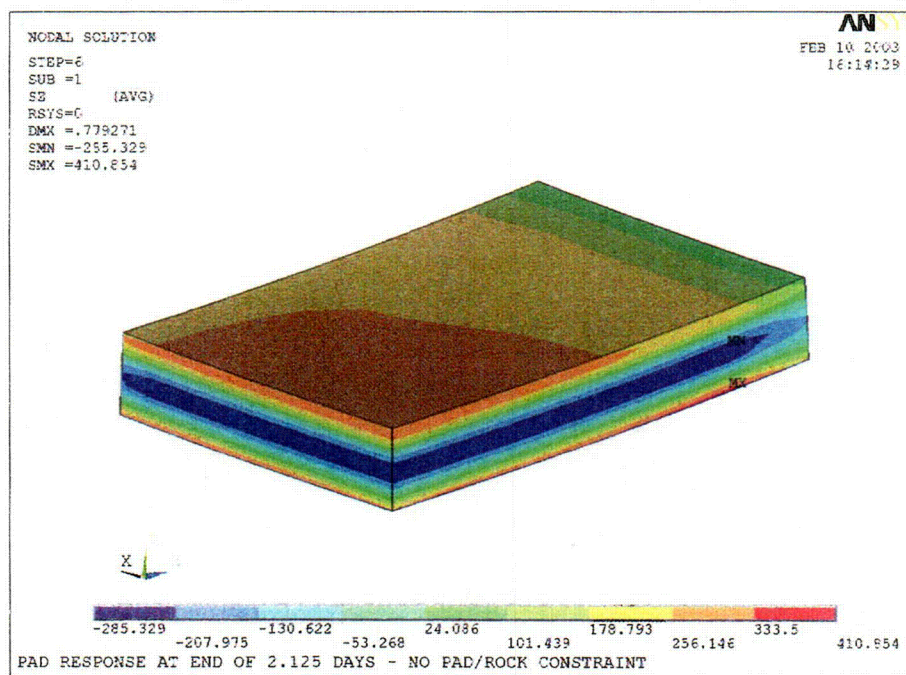


Figure STNC-12 – Sz at time 2.125 days

C12

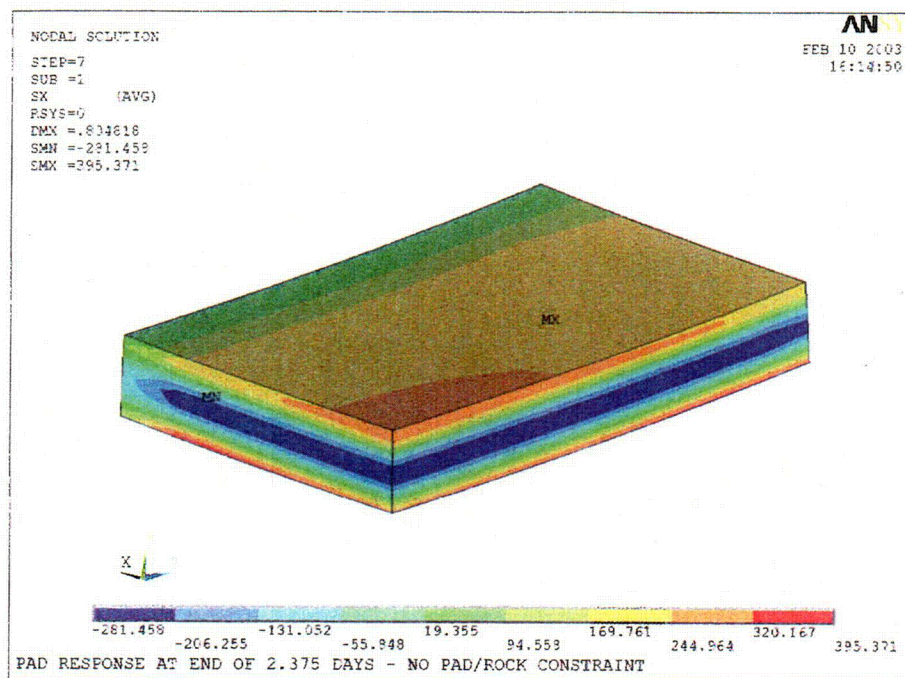
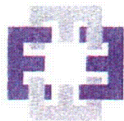


Figure STNC-13 – Sx at time 2.375 days

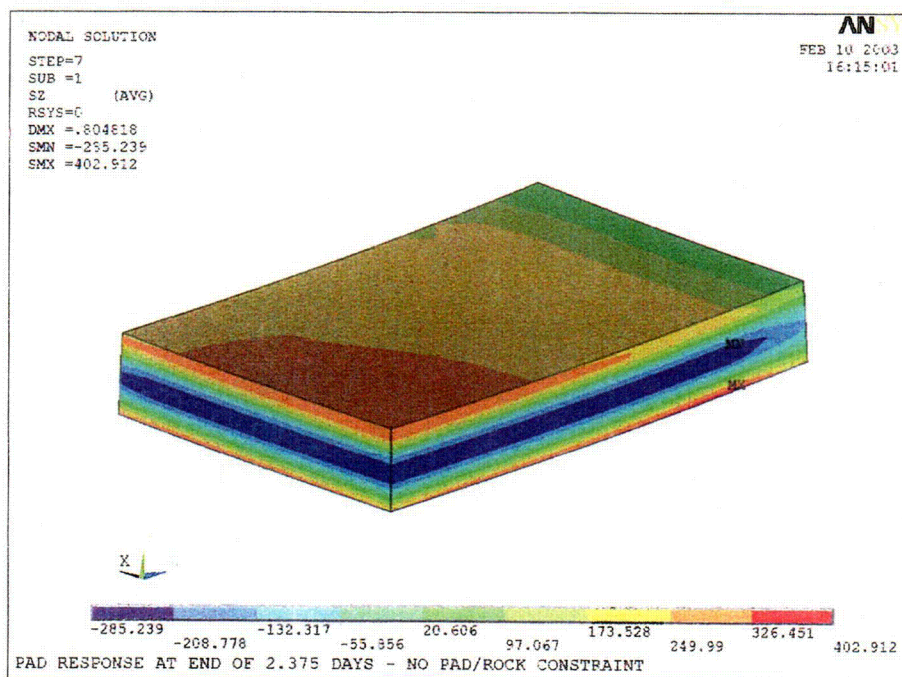


Figure STNC-14 – Sz at time 2.375 days



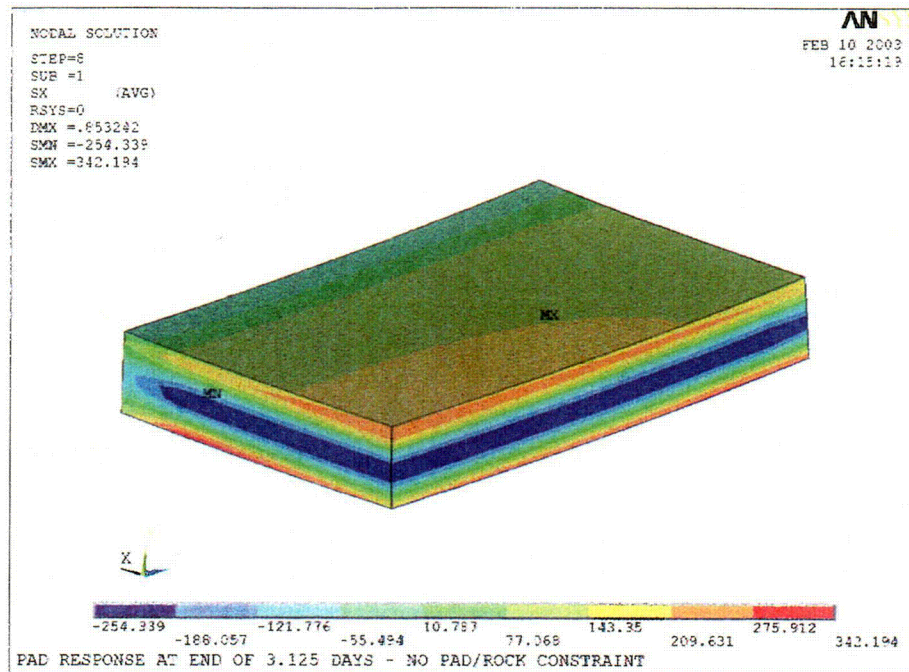
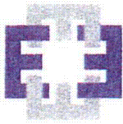


Figure STNC-15 – Sx at time 3.125 days

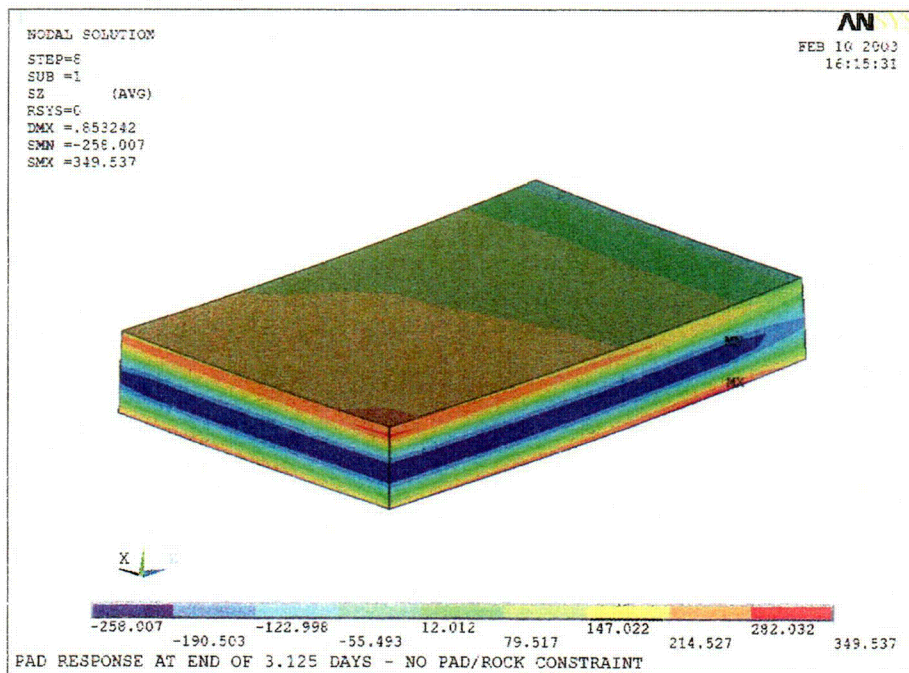


Figure STNC-16 – Sz at time 3.125 days



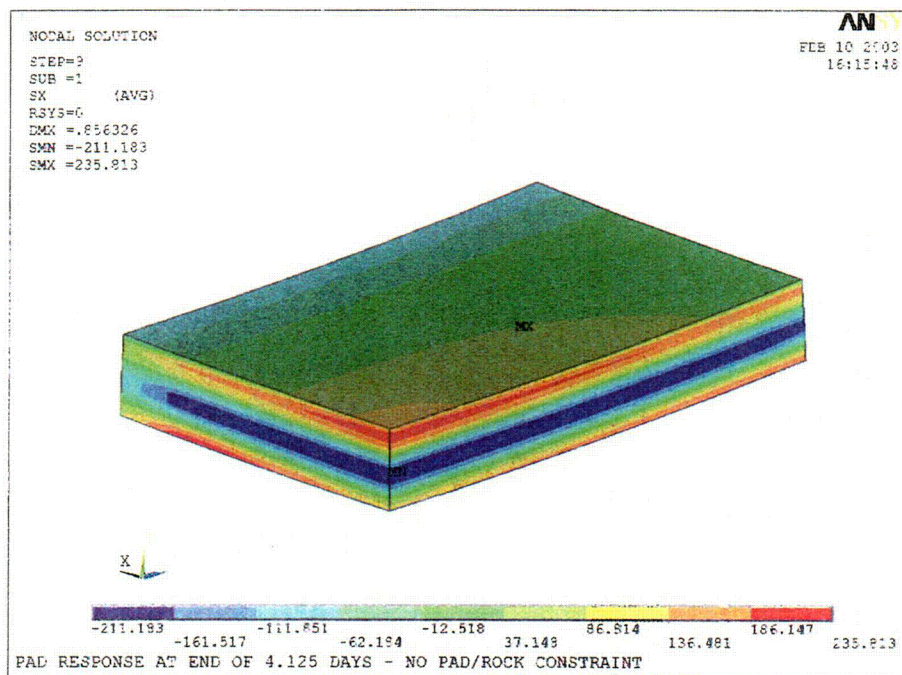
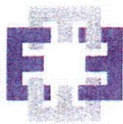


Figure STNC-17 – Sx at time 4.125 days

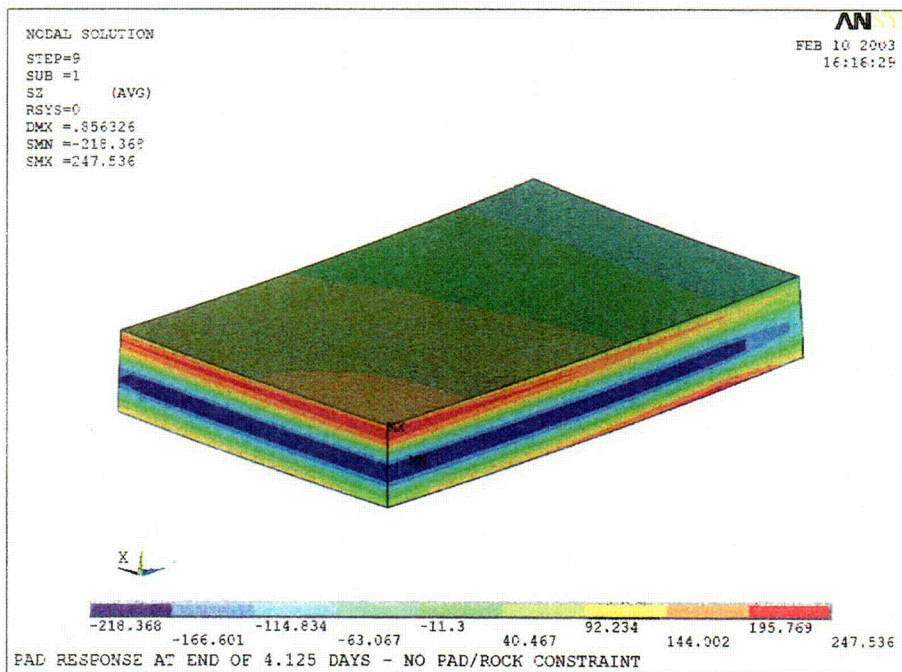
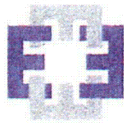


Figure STNC-18 – Sz at time 4.125 days



ENERCON  
SERVICES, INC.

Appendix STPadNC-TH to Calculation PGE-009-CALC-006

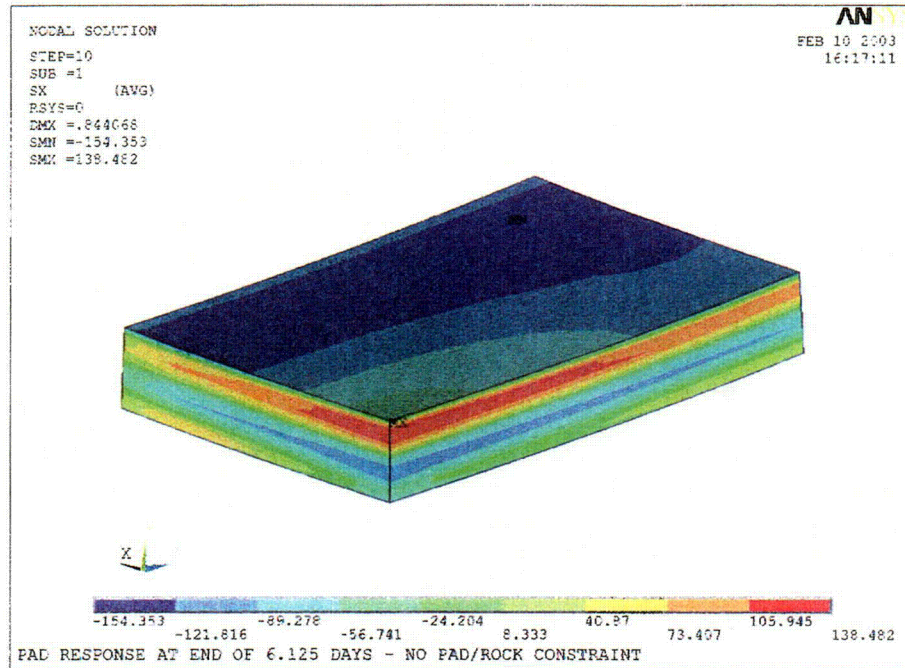


Figure STNC-19 – Sx at time 6.125 days

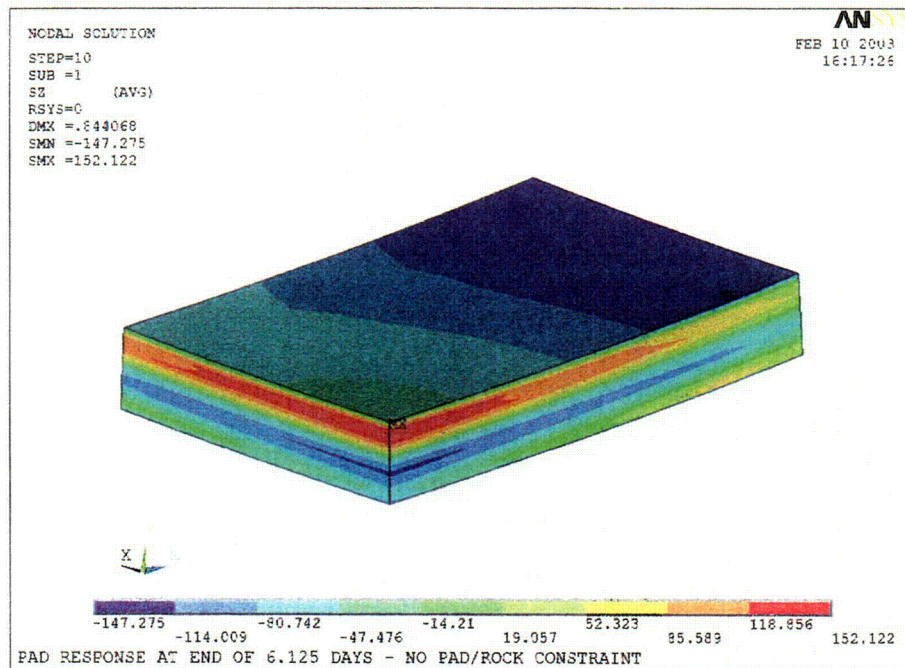


Figure STNC-20 – Sz at time 6.125 days

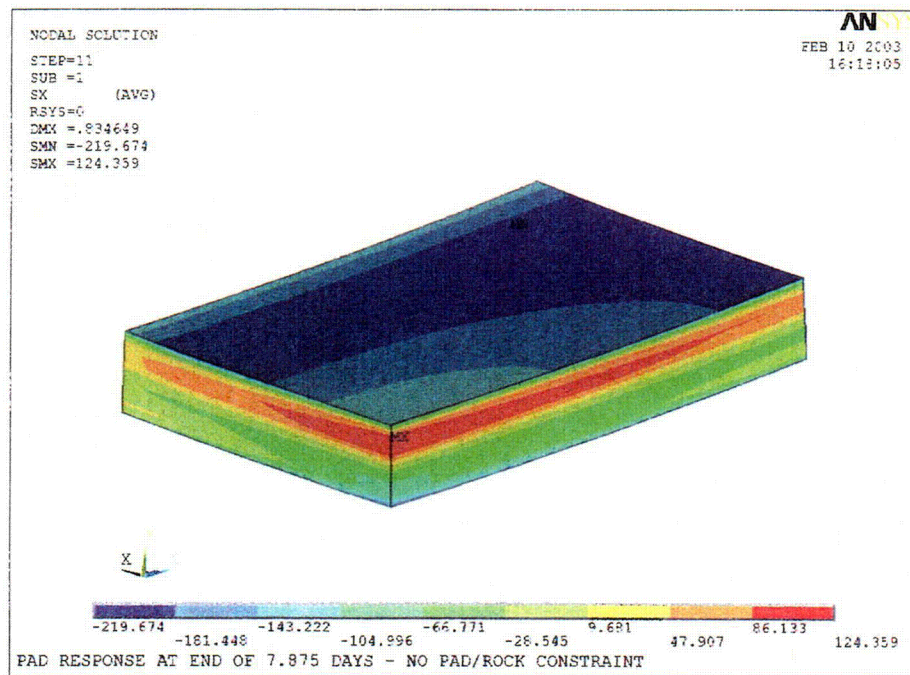
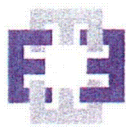


Figure STNC-21 – Sx at time 7.875 days

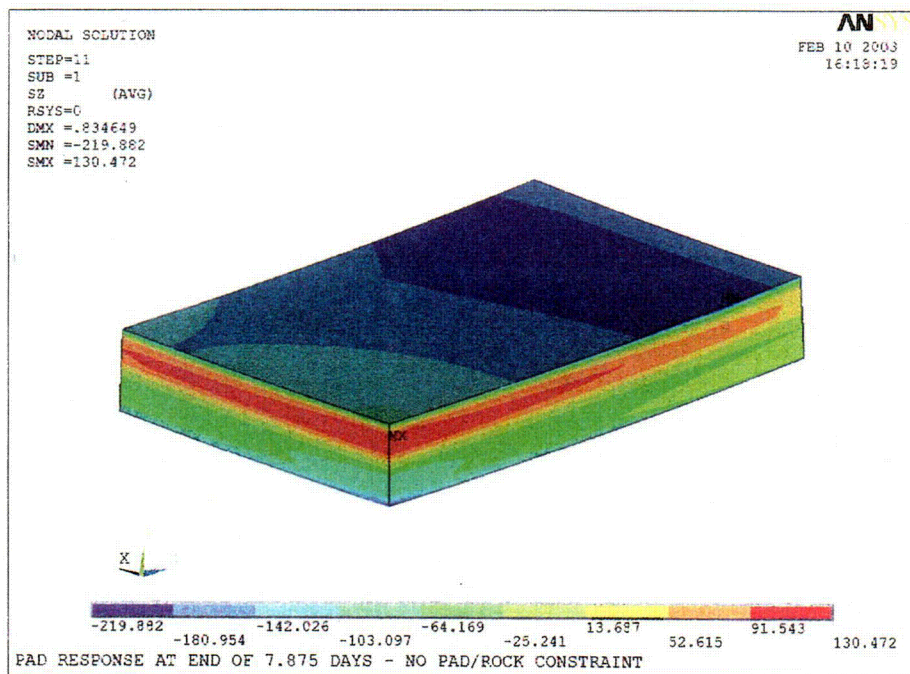
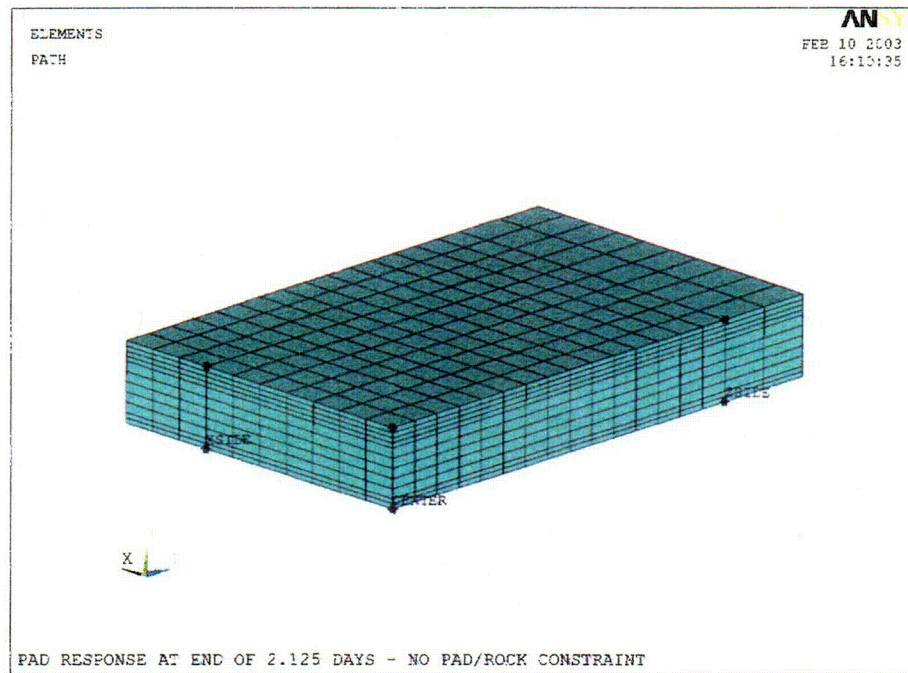
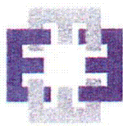


Figure STNC-22 – Sz at time 7.875 days





**Figure STNC-23 – Locations where stresses are plotted**

**X side where X is 285.6 in. and Z is 0.0**  
**Center where both X and Z are 0.0 and**  
**Z side where X is 0.0 and Z is 510.0 in.**



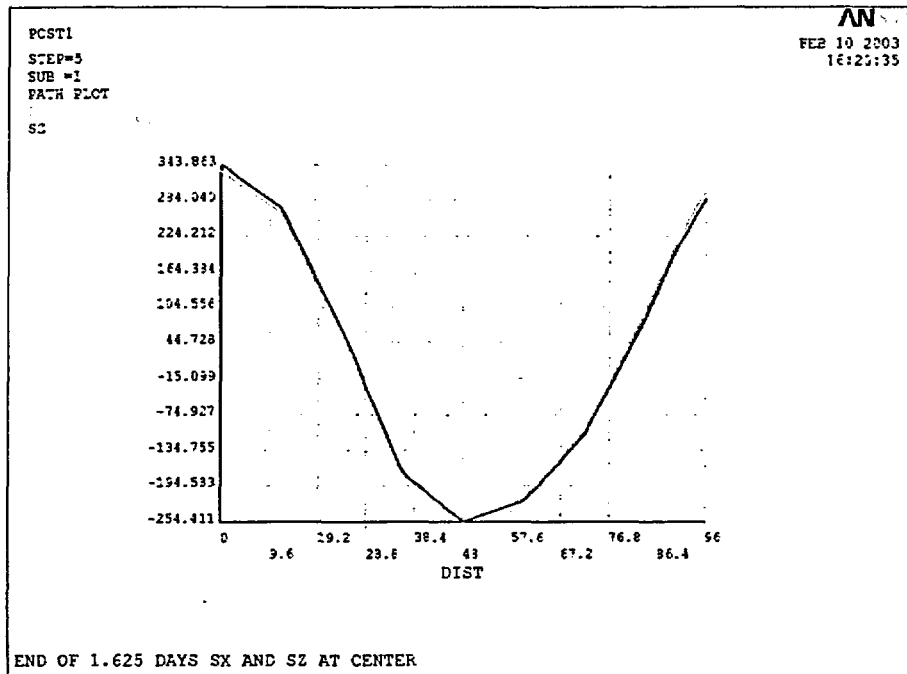


Figure STNC-24 – Sx and Sz at Center at time 1.625 days

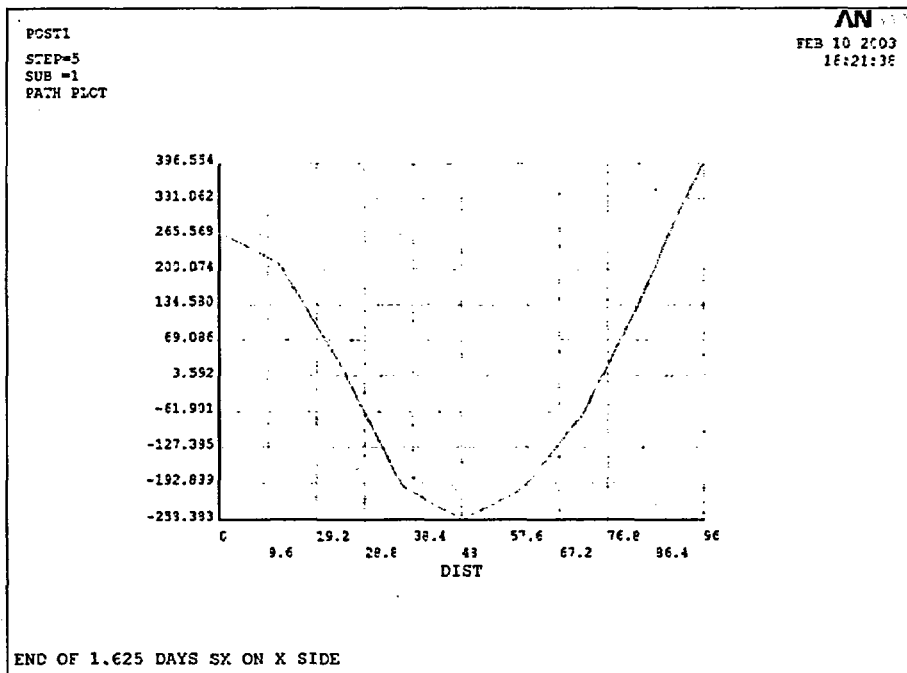


Figure STNC-25 – Sx at X side at time 1.625 days

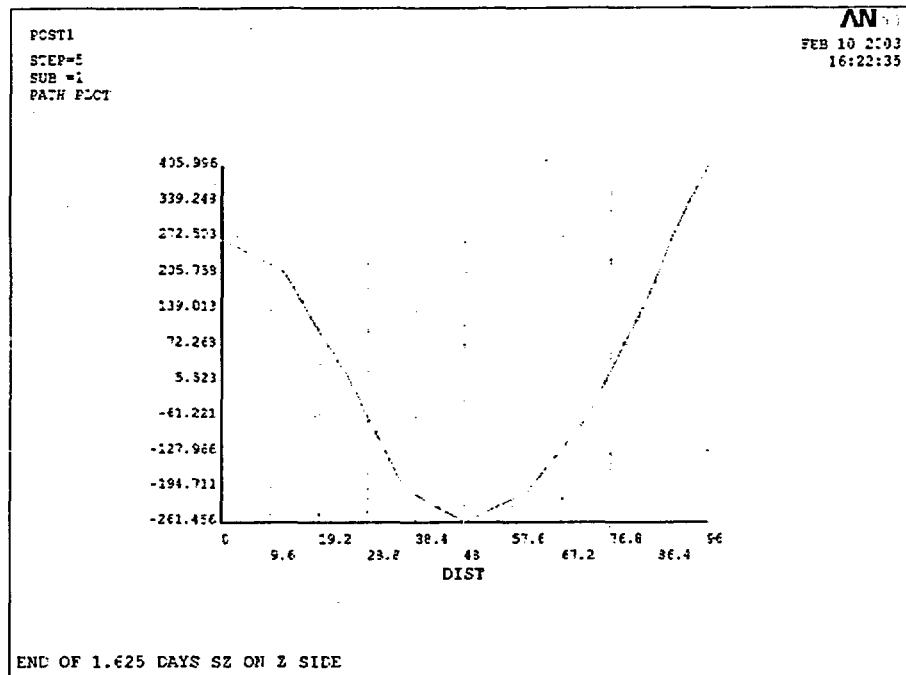


Figure STNC-26 – Sz at Z side at time 1.625 days

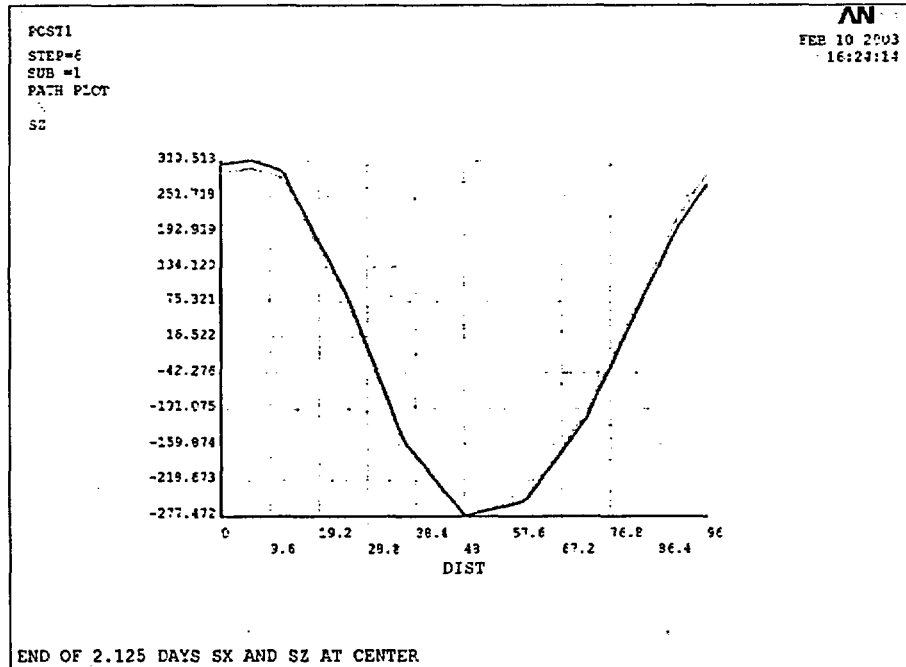


Figure STNC-27 – Sx and Sz at Center at time 2.125 days

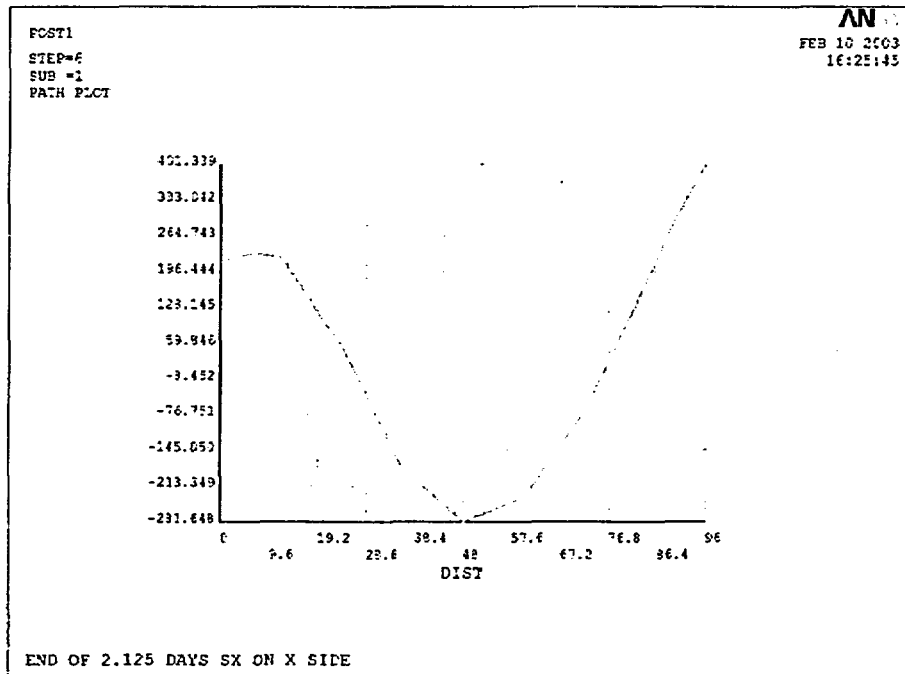


Figure STNC-28 – Sx at X side at time 2.125 days

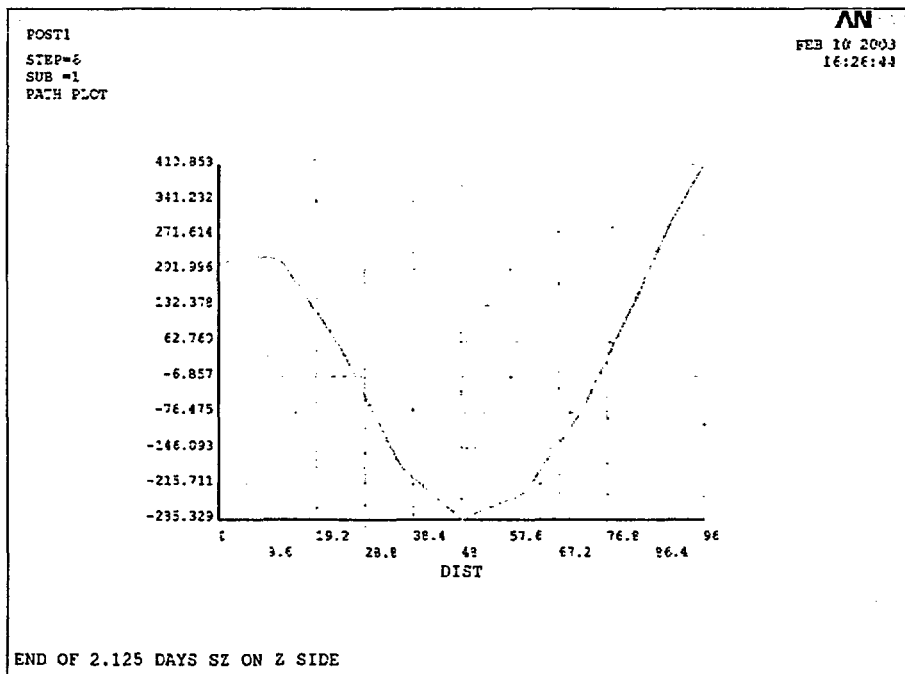


Figure STNC-29 – Sz at Z side at time 2.125 days





ENERCON  
SERVICES, INC.

Appendix STPadNC-TH to Calculation PGE-009-CALC-006

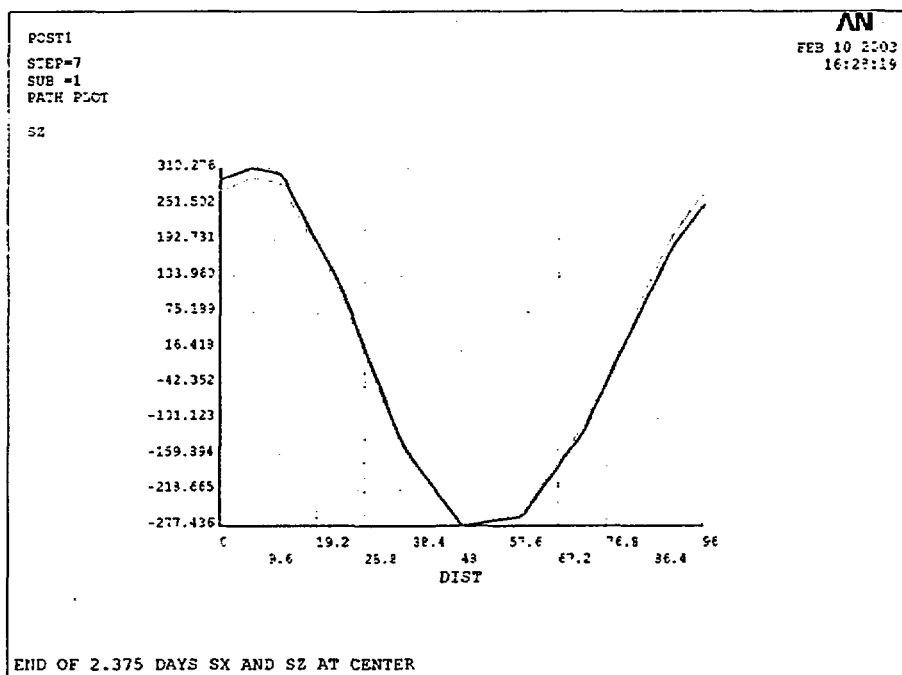


Figure STNC-30 – Sx and Sz at Center at time 2.375 days

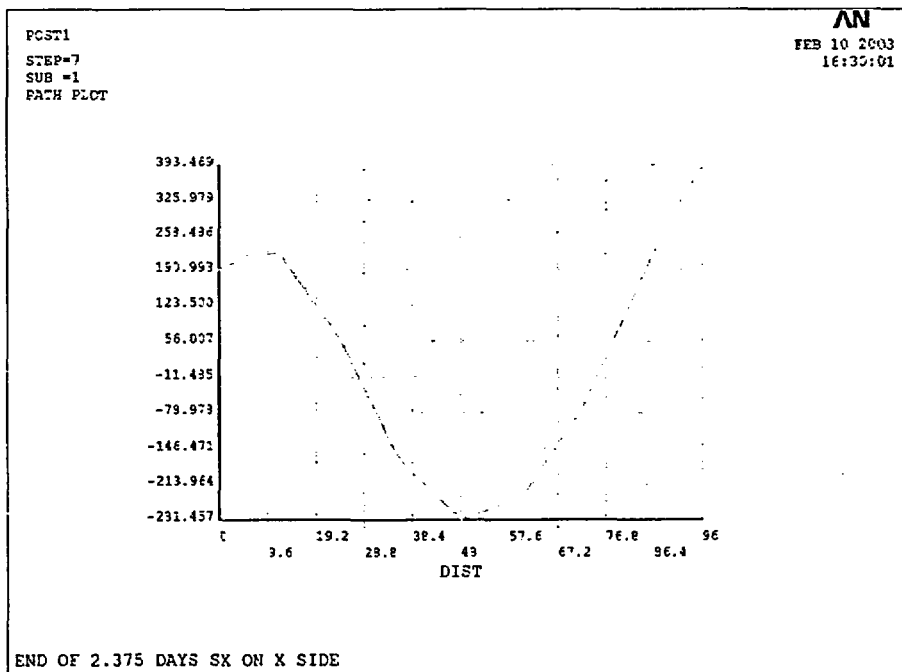


Figure STNC-31 – Sx at X side at time 2.375 days



ENERCON  
SERVICES, INC.

Appendix STPadNC-TH to Calculation PGE-009-CALC-006

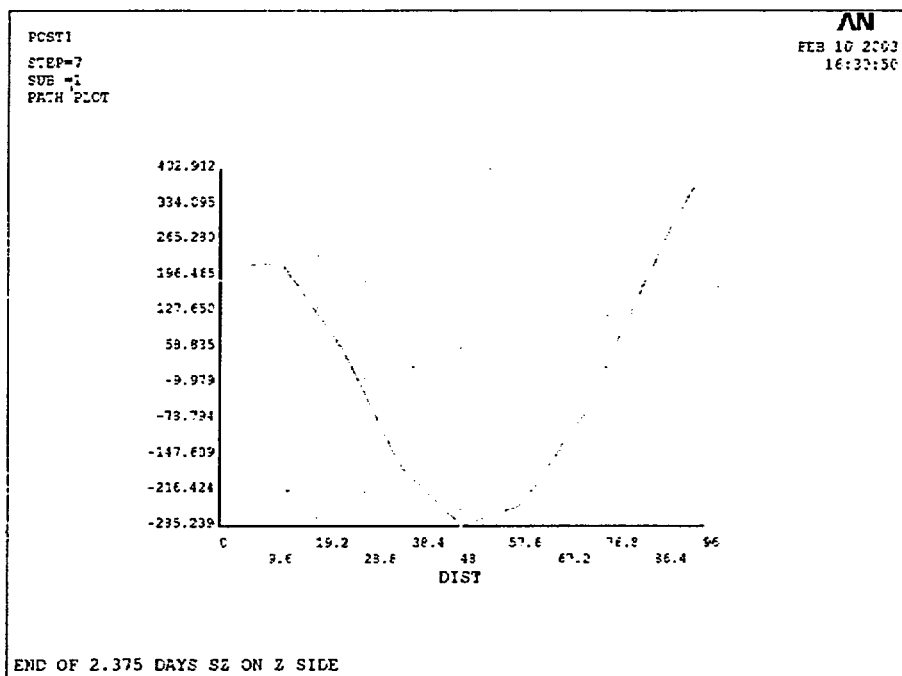


Figure STNC-32 – Sz at Z side at time 2.375 days



ENERCON  
SERVICES, INC.

Sheet 1 of 2

Appendix SH-Loads to Calculation PGE-009-CALC-006

Originator:

S. C. Tumminelli

Date:

September 20, 2002

Revised:

March 3, 2003

## Appendix SH-Loads

This Appendix presents the ANSYS file documenting the applied loads for the shrinkage stress analysis. |  
This analysis was performed using the constrained model.






```
/FILE, PadSh
RESUME
EALL
NALL
MPLI
CMLI
/PREP7
LSCLEAR,ALL
/title,Shrinkage at 117 days and Deadweight
/COM, BC'S ALL LOAD STEPS
D, SYMXY, UZ, 0.0
D, SYMYZ, UX, 0.0
D, XEDGE, UX, 0.0
D, XEDGE, UY, 0.0
D, XEDGE, UZ, 0.0
D, ZEDGE, UX, 0.0
D, ZEDGE, UY, 0.0
D, ZEDGE, UZ, 0.0
D, BOT, UX, 0.0
D, BOT, UY, 0.0
D, BOT, UZ, 0.0
ACEL, 0, 1, 0
BFUNIF, TEMP, 0.0
BF, CONC80, TEMP, -89.38
BF, CONC75, TEMP, -24.71
BF, CONC70, TEMP, -6.76
BF, CONC65, TEMP, -0.42
BF, CONC60, TEMP, 2.32
BF, CONC50, TEMP, 4.44
BF, CONC40, TEMP, 4.83
BF, CONC30, TEMP, 4.83
BF, CONC20, TEMP, 4.83
BF, CONC10, TEMP, 4.83
BF, CONC05, TEMP, 4.83
BF, CONC00, TEMP, 4.83
LSWRITE, 1
FINISH
SAVE
/EXIT
```



**ENERCON  
SERVICES, INC.**

**Sheet 1 of 11**

**Appendix RPad-SH to Calculation PGE-009-CALC-006**

Originator:  S. C. Tumminelli  
Date: September 20, 2002  
Revised: March 3, 2003

**Appendix RPad-SH**

This Appendix presents the ANSYS output file documenting the execution of the shrinkage stress analysis and the output temperatures for checking. This analysis was performed using the constrained model.



ANSYS/Mechanical U

```
*-----*
| W E L C O M E   T O   T H E   A N S Y S   P R O G R A M |
|-----|
*
```

```
*****
*                               ANSYS 6.0 NOTICES                               *
*****
*
* Copyright 2001 SAS IP, Inc. All rights reserved.
* Unpublished---rights reserved under the Copyright Laws of
* the United States.
*
*
* U.S. GOVERNMENT RIGHTS
*
* Use, duplication, or disclosure by the U.S. Government is
* subject to restrictions set forth in the ANSYS, Inc.
* license agreement and as provided in DFARS 227.7202-1(a)
* and 227.7202-3(a)(1995), DFARS 252.227-7013(c)(1)(ii) (OCT
* 1988), FAR 12.212(a)(1995), FAR 52.227-19, or FAR52.227-14
* (ALT III), as applicable. ANSYS, Inc.
*
* THIS SOFTWARE CONTAINS CONFIDENTIAL INFORMATION AND TRADE
* SECRETS OF SAS IP, INC. USE, DISCLOSURE, OR REPRODUCTION
* IS PROHIBITED WITHOUT THE PRIOR EXPRESS WRITTEN PERMISSION
* OF SAS IP, INC.
*****
```

```
*****
* The Program also contains the following licensed software: *
*****
* PCGLSS: Linear Equations Solver
*
* (C) Copyright 1992-1995 Computational Applications and
*                               System Integration Inc.
* All Rights Reserved.
*
* CA&SI, 2004 S. Wright Street, Urbana, IL 61821
* Ph (217)244-7875
* Fax (217)244-7874
*
* CA&SI DOES NOT GUARANTEE THE CORRECTNESS OR USEFULNESS OF
* THE RESULTS OBTAINED USING PCGLSS. CA&SI IS NOT LIABLE FOR
* ANY CONCLUSIONS OR ACTIONS BASED ON THE RESULTS. IT IS THE
* RESPONSIBILITY OF THE USER TO CONFIRM THE ACCURACY AND
* USEFULNESS OF THE RESULTS.
*****
```





Appendix RPad-SH to Calculation PGE-009-CALC-006

Completing ANSYS Load Process.

```
***** ANSYS COMMAND LINE ARGUMENTS *****
INITIAL JOBNAME           = PadSh
BATCH MODE REQUESTED      = LIST
MEMORY REQUESTED (MB)     = 520
DATABASE SIZE REQUESTED (MB) = 150

00150104          VERSION=INTEL NT          RELEASE= 6.0          UP20010919
CURRENT JOBNAME=PadSh 19:04:08 JAN 23, 2002 CP=          0.150
```

```
1 /file,PadSh
2 resume
3 nall
4 eall
5 mpli
6 /solu
7 /HEADER,ON,OFF,OFF,OFF,ON,OFF
8 elist,530
9 lssolve,1
10 finish
11 save
12 /com print the temperatures for checking
13 EALL
14 NALL
15 /POST1
16 /HEADER,ON,OFF,OFF,OFF,ON,OFF
17 NSEL,S,LOC,X,0.0
18 NSEL,R,LOC,Z,0.0
19 NSEL,R,LOC,Y,0.0,-145.0
20 NLIS
21 SET,1
22 NSORT,LOC,Y
23 PRNSOL,BFE
24 NUSORT
25 FINISH
26 eall
27 nall
28 SAVE
29 /EXIT
```

RUN SETUP PROCEDURE FROM FILE= C:\PROGRAM FILES\ANSYS  
INC\ANSYS60\docu\start60.ans

/INPUT FILE= C:\PROGRAM FILES\ANSYS INC\ANSYS60\docu\start60.ans LINE= 0

CURRENT JOBNAME REDEFINED AS PadSh

RESUME ANSYS DATA FROM FILE NAME=PadSh.db

\*\*\* ANSYS GLOBAL STATUS \*\*\*

TITLE = Shrinkage at 117 days and Deadweight  
NUMBER OF ELEMENT TYPES = 5



Appendix RPad-SH to Calculation PGE-009-CALC-006

8812 ELEMENTS CURRENTLY SELECTED. MAX ELEMENT NUMBER = 9341  
10212 NODES CURRENTLY SELECTED. MAX NODE NUMBER = 10212  
166 KEYPOINTS CURRENTLY SELECTED. MAX KEYPOINT NUMBER = 166  
339 LINES CURRENTLY SELECTED. MAX LINE NUMBER = 339  
2 AREAS CURRENTLY SELECTED. MAX AREA NUMBER = 224  
48 VOLUMES CURRENTLY SELECTED. MAX VOL. NUMBER = 48  
22 COMPONENTS CURRENTLY DEFINED  
MAXIMUM LINEAR PROPERTY NUMBER = 2  
MAXIMUM REAL CONSTANT SET NUMBER = 1  
ACTIVE COORDINATE SYSTEM = 0 (CARTESIAN)  
MAXIMUM COUPLED D.O.F. SET NUMBER = 367  
NUMBER OF SPECIFIED CONSTRAINTS = 4657

INITIAL JOBNAME = PadSh  
CURRENT JOBNAME = PadSh

10212 NODES (OF 10212 DEFINED) SELECTED BY NALL COMMAND.

8812 ELEMENTS (OF 8812 DEFINED) SELECTED BY EALL COMMAND.

LIST MATERIALS 1 TO 2 BY 1  
PROPERTY= ALL

PROPERTY TABLE EX MAT= 1 NUM. POINTS= 1  
TEMPERATURE DATA TEMPERATURE DATA TEMPERATURE DATA  
0.0000 0.20000E+07

PROPERTY TABLE NUXY MAT= 1 NUM. POINTS= 1  
TEMPERATURE DATA TEMPERATURE DATA TEMPERATURE DATA  
0.0000 0.24000

PROPERTY TABLE ALPX MAT= 1 NUM. POINTS= 1  
TEMPERATURE DATA TEMPERATURE DATA TEMPERATURE DATA  
0.0000 0.50000E-05

PROPERTY TABLE EX MAT= 2 NUM. POINTS= 1  
TEMPERATURE DATA TEMPERATURE DATA TEMPERATURE DATA  
0.0000 0.28440E+07

PROPERTY TABLE NUXY MAT= 2 NUM. POINTS= 1  
TEMPERATURE DATA TEMPERATURE DATA TEMPERATURE DATA  
0.0000 0.15000

PROPERTY TABLE ALPX MAT= 2 NUM. POINTS= 1  
TEMPERATURE DATA TEMPERATURE DATA TEMPERATURE DATA  
0.0000 0.51800E-05

PROPERTY TABLE DENS MAT= 2 NUM. POINTS= 1  
TEMPERATURE DATA TEMPERATURE DATA TEMPERATURE DATA  
0.0000 0.86800E-01

\*\*\*\*\* ANSYS SOLUTION ROUTINE \*\*\*\*\*

PRINT HEADER  
DO NOT PRINT SUBTITLE(S)  
DO NOT PRINT LOAD STEP ID



Appendix RPad-SH to Calculation PGE-009-CALC-006

DO NOT PRINT NOTE LINE(S)  
PRINT COLUMN HEADER LABELS  
DO NOT PRINT REPORT TOTALS

LIST ALL SELECTED ELEMENTS IN RANGE 530 TO 530 STEP 1  
1

\*\*\*\*\* ANSYS - ENGINEERING ANALYSIS SYSTEM RELEASE 6.0 \*\*\*\*\*  
ANSYS/Mechanical U  
00150104 VERSION=INTEL NT 19:04:08 JAN 23, 2002 CP= 0.561

Shrinkage at 117 days and Deadweight

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NODES
530	2	2	1	0	1		1 28 29 3 672 1050 1064 728
ANSYS RELEASE 6.0 UP20010919							19:02:58 01/23/2002

PRINTOUT RESUMED BY /GOP

Load step file number 1. Begin solution ...

\*\*\*\*\* ANSYS SOLVE COMMAND \*\*\*\*\*

\*\*\* NOTE \*\*\* CP= 1.893 TIME= 19:04:10  
Real constant 1 has been referenced by element types 4 and 5.  
We assume it identifies a contact pair.

1

\*\*\*\*\* ANSYS - ENGINEERING ANALYSIS SYSTEM RELEASE 6.0 \*\*\*\*\*  
ANSYS/Mechanical U  
00150104 VERSION=INTEL NT 19:04:10 JAN 23, 2002 CP= 2.213

Shrinkage at 117 days and Deadweight

SOLUTION OPTIONS

PROBLEM DIMENSIONALITY. . . . .3-D  
DEGREES OF FREEDOM. . . . . UX UY UZ  
ANALYSIS TYPE . . . . .STATIC (STEADY-STATE)  
NEWTON-RAPHSON OPTION . . . . .PROGRAM CHOSEN

\*\*\* NOTE \*\*\* CP= 2.293 TIME= 19:04:10  
Present time 0 is less than or equal to the previous time.  
Time will default to 1.

\*\*\* NOTE \*\*\* CP= 2.293 TIME= 19:04:10  
Nonlinear analysis, NROPT set to the FULL Newton-Raphson solution  
procedure for ALL DOFs.

SOLCONTROL,ON uses sparse matrix direct solver

\*\*\* NOTE \*\*\* CP= 2.293 TIME= 19:04:10  
The conditions for direct assembly have been met. No .emat or .erot  
files will be produced.



Appendix RPad-SH to Calculation PGE-009-CALC-006

\*\*\* WARNING \*\*\* CP= 2.293 TIME= 19:04:10  
The program chosen initial timestep/load-factor is arbitrary. It is necessary for the user to supply a suitable initial timestep/load-factor through the NSUB or DELTIM command for convergence and overall efficiency.

LOAD STEP OPTIONS

LOAD STEP NUMBER. . . . . 1  
TIME AT END OF THE LOAD STEP. . . . . 1.0000  
AUTOMATIC TIME STEPPING . . . . . ON  
INITIAL NUMBER OF SUBSTEPS . . . . . 1  
MAXIMUM NUMBER OF SUBSTEPS . . . . . 5000  
MINIMUM NUMBER OF SUBSTEPS . . . . . 1  
START WITH TIME STEP FROM PREVIOUS SUBSTEP . YES  
MAXIMUM NUMBER OF EQUILIBRIUM ITERATIONS. . . . 15  
STEP CHANGE BOUNDARY CONDITIONS . . . . . NO  
TERMINATE ANALYSIS IF NOT CONVERGED . . . . .YES (EXIT)  
CONVERGENCE CONTROLS. . . . .USE DEFAULTS  
INERTIA LOADS X Y Z  
ACEL . . . . . 0.0000 1.0000 0.0000  
PRINT OUTPUT CONTROLS . . . . .NO PRINTOUT  
DATABASE OUTPUT CONTROLS. . . . .ALL DATA WRITTEN  
FOR THE LAST SUBSTEP

NONLINEAR MONITORING INFO IS WRITTEN TO FILE= PadSh.mntr  
MAXIMUM NUMBER OF EQUILIBRIUM ITERATIONS HAS BEEN MODIFIED  
TO BE, NEQIT = 26, BY SOLUTION CONTROL LOGIC.

\*\*\* NOTE \*\*\* CP= 3.295 TIME= 19:04:11  
Deformable-deformable contact pair identified by real constant set 1  
has been set up.  
Default contact stiffness factor FKN 1.0000  
Default penetration tolerance factor FTOLN 0.10000  
Initial contact closure factor ICONT 0.10000E-05  
Default pinball region factor PINB 1.0000  
Default Max. friction stress TAUMAX 0.10000E+21  
Absolute tangent contact stiffness FKT 0.10000E-08  
Warning: Initial penetration is included.  
\*\*\*\*\*

\*\*\* NOTE \*\*\* CP= 3.345 TIME= 19:04:11  
Max. Initial penetration 1.421085472E-14 was detected between contact  
element 9172 and target element 9002 specified by real constant set 1.

ALL CURRENT ANSYS DATA WRITTEN TO FILE NAME= PadSh.rdb  
FOR POSSIBLE RESUME FROM THIS POINT

\*\*\*\*\* CENTROID, MASS, AND MASS MOMENTS OF INERTIA \*\*\*\*\*

CALCULATIONS ASSUME ELEMENT MASS AT ELEMENT CENTROID





Appendix RPad-SH to Calculation PGE-009-CALC-006

TOTAL MASS = 0.21419E+07

CENTROID	MOM. OF INERTIA ABOUT ORIGIN	MOM. OF INERTIA ABOUT CENTROID
XC = 204.00	IXX = 0.2896E+12	IXX = 0.7218E+11
YC = -48.000	IYY = 0.4016E+12	IYY = 0.9997E+11
ZC = 315.00	IZZ = 0.1251E+12	IZZ = 0.3104E+11
	IXY = 0.2097E+11	IXY = -0.7744E-03
	IYZ = 0.3238E+11	IYZ = -0.8354E-03
	IZX = -0.1376E+12	IZX = 0.4333E-02

\*\*\* MASS SUMMARY BY ELEMENT TYPE \*\*\*

TYPE	MASS
2	0.214186E+07

Range of element maximum matrix coefficients in global coordinates  
Maximum= 1.813333333E+09 at element 9327.  
Minimum= 4772865.79 at element 5330.

\*\*\* ELEMENT MATRIX FORMULATION TIMES

TYPE	NUMBER	ENAME	TOTAL CP	AVE CP
1	6602	SOLID45	4.346	0.000658
2	1870	SOLID45	1.272	0.000680
4	170	TARGE170	0.020	0.000118
5	170	CONTA174	0.371	0.002180

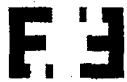
Time at end of element matrix formulation CP= 10.4049616.

FORCE CONVERGENCE VALUE = 0.2900E+08 CRITERION= 0.1479E+06

SPARSE MATRIX DIRECT SOLVER.

Number of equations = 25612, Maximum wavefront = 83  
Memory available for solver = 112.36 MB  
Memory required for in-core = 112.36 MB  
Optimal memory required for out-of-core = 20.68 MB  
Minimum memory required for out-of-core = 11.93 MB

EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.1716E-01  
LINE SEARCH PARAMETER = 1.000 SCALED MAX DOF INC = -0.1716E-01  
FORCE CONVERGENCE VALUE = 0.5212E+06 CRITERION= 5708.  
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.9238E-02  
LINE SEARCH PARAMETER = 1.000 SCALED MAX DOF INC = 0.9238E-02  
FORCE CONVERGENCE VALUE = 0.1418E+07 CRITERION= 5835.  
EQUIL ITER 3 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1040E-01  
LINE SEARCH PARAMETER = 1.000 SCALED MAX DOF INC = 0.1040E-01  
FORCE CONVERGENCE VALUE = 0.1213E+07 CRITERION= 5956.  
EQUIL ITER 4 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.7284E-02  
LINE SEARCH PARAMETER = 1.000 SCALED MAX DOF INC = 0.7284E-02  
FORCE CONVERGENCE VALUE = 0.1004E+07 CRITERION= 6091.  
EQUIL ITER 5 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1065E-01  
LINE SEARCH PARAMETER = 1.000 SCALED MAX DOF INC = 0.1065E-01  
FORCE CONVERGENCE VALUE = 0.7391E+06 CRITERION= 6225.  
EQUIL ITER 6 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.3583E-02  
LINE SEARCH PARAMETER = 1.000 SCALED MAX DOF INC = 0.3583E-02  
FORCE CONVERGENCE VALUE = 0.7726E+06 CRITERION= 6360.



Appendix RPad-SH to Calculation PGE-009-CALC-006

EQUIL ITER 7 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2614E-02  
LINE SEARCH PARAMETER = 1.000 SCALED MAX DOF INC = 0.2614E-02  
FORCE CONVERGENCE VALUE = 0.9198E+06 CRITERION= 6493.  
EQUIL ITER 8 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.3730E-02  
LINE SEARCH PARAMETER = 1.000 SCALED MAX DOF INC = 0.3730E-02  
FORCE CONVERGENCE VALUE = 0.2099E+06 CRITERION= 6632.  
EQUIL ITER 9 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2912E-02  
LINE SEARCH PARAMETER = 1.000 SCALED MAX DOF INC = 0.2912E-02  
FORCE CONVERGENCE VALUE = 0.4292E+06 CRITERION= 6770.  
EQUIL ITER 10 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1897E-02  
LINE SEARCH PARAMETER = 1.000 SCALED MAX DOF INC = 0.1897E-02  
FORCE CONVERGENCE VALUE = 0.1615E+06 CRITERION= 6910.  
EQUIL ITER 11 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.4059E-03  
LINE SEARCH PARAMETER = 1.000 SCALED MAX DOF INC = 0.4059E-03  
FORCE CONVERGENCE VALUE = 0.2171E+06 CRITERION= 7051.  
EQUIL ITER 12 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.7608E-03  
LINE SEARCH PARAMETER = 1.000 SCALED MAX DOF INC = 0.7608E-03  
FORCE CONVERGENCE VALUE = 0.1162E+06 CRITERION= 7194.  
EQUIL ITER 13 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1418E-03  
LINE SEARCH PARAMETER = 1.000 SCALED MAX DOF INC = 0.1418E-03  
FORCE CONVERGENCE VALUE = 0.5488E+05 CRITERION= 7341.  
EQUIL ITER 14 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.1960E-03  
LINE SEARCH PARAMETER = 1.000 SCALED MAX DOF INC = -0.1960E-03  
FORCE CONVERGENCE VALUE = 0.2739E+05 CRITERION= 7490.  
EQUIL ITER 15 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.8241E-04  
LINE SEARCH PARAMETER = 1.000 SCALED MAX DOF INC = 0.8241E-04  
FORCE CONVERGENCE VALUE = 0.1611E+05 CRITERION= 7643.  
EQUIL ITER 16 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.3239E-04  
LINE SEARCH PARAMETER = 1.000 SCALED MAX DOF INC = 0.3239E-04  
FORCE CONVERGENCE VALUE = 0.3615E-01 CRITERION= 7799. <<< CONVERGED  
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 16

\*\*\* ELEMENT RESULT CALCULATION TIMES

TYPE	NUMBER	ENAME	TOTAL CP	AVE CP
1	6602	SOLID45	3.295	0.000499
2	1870	SOLID45	1.002	0.000536
4	170	TARGE170	0.000	0.000000
5	170	CONTA174	0.090	0.000530

\*\*\* NODAL LOAD CALCULATION TIMES

TYPE	NUMBER	ENAME	TOTAL CP	AVE CP
1	6602	SOLID45	0.330	0.000050
2	1870	SOLID45	0.100	0.000054
4	170	TARGE170	0.020	0.000118
5	170	CONTA174	0.000	0.000000

\*\*\* LOAD STEP 1 SUBSTEP 1 COMPLETED. CUM ITER = 16  
\*\*\* TIME = 1.00000 TIME INC = 1.00000

\*\*\* ANSYS BINARY FILE STATISTICS

BUFFER SIZE USED= 16384  
44.938 MB WRITTEN ON ELEMENT SAVED DATA FILE: PadSh.esav  
8.188 MB WRITTEN ON ASSEMBLED MATRIX FILE: PadSh.full  
19.188 MB WRITTEN ON RESULTS FILE: PadSh.rst



Appendix RPad-SH to Calculation PGE-009-CALC-006

FINISH SOLUTION PROCESSING

\*\*\*\*\* ROUTINE COMPLETED \*\*\*\*\* CP = 806.710

ALL CURRENT ANSYS DATA WRITTEN TO FILE NAME= PadSh.db  
FOR POSSIBLE RESUME FROM THIS POINT  
print the temperatures for checking

8812 ELEMENTS (OF 8812 DEFINED) SELECTED BY EALL COMMAND.

10212 NODES (OF 10212 DEFINED) SELECTED BY NALL COMMAND.

1

\*\*\*\*\* ANSYS - ENGINEERING ANALYSIS SYSTEM RELEASE 6.0 \*\*\*\*\*  
ANSYS/Mechanical U  
00150104 VERSION=INTEL NT 19:18:22 JAN 23, 2002 CP= 807.852

Shrinkage at 117 days and Deadweight

\*\*\*\*\* ANSYS RESULTS INTERPRETATION (POST1) \*\*\*\*\*

\*\*\* NOTE \*\*\* CP= 807.852 TIME= 19:18:22  
Reading results into the database (SET command) will update the current  
displacement and force boundary conditions in the database with the  
values from the results file for that load set. Note that any  
subsequent solutions will use these values unless action is taken to  
either SAVE the current values or not overwrite them (/EXIT,NOSAVE).

PRINT HEADER  
DO NOT PRINT SUBTITLE(S)  
DO NOT PRINT LOAD STEP ID  
DO NOT PRINT NOTE LINE(S)  
PRINT COLUMN HEADER LABELS  
DO NOT PRINT REPORT TOTALS

SELECT FOR ITEM=LOC COMPONENT=X BETWEEN 0.0000 AND 0.0000  
KABS= 0. TOLERANCE= 0.100000E-05

626 NODES (OF 10212 DEFINED) SELECTED BY NSEL COMMAND.

RESELECT FOR ITEM=LOC COMPONENT=Z BETWEEN 0.0000 AND 0.0000  
KABS= 0. TOLERANCE= 0.100000E-05

26 NODES (OF 10212 DEFINED) SELECTED BY NSEL COMMAND.

RESELECT FOR ITEM=LOC COMPONENT=Y BETWEEN -145.00 AND 0.0000  
KABS= 0. TOLERANCE= 0.145000E-05

18 NODES (OF 10212 DEFINED) SELECTED BY NSEL COMMAND.

LIST ALL SELECTED NODES. DSYS= 0

1



Appendix RPad-SH to Calculation PGE-009-CALC-006

\*\*\*\*\* ANSYS - ENGINEERING ANALYSIS SYSTEM RELEASE 6.0 \*\*\*\*\*  
ANSYS/Mechanical U  
00150104 VERSION=INTEL NT 19:18:22 JAN 23, 2002 CP= 807.872

Shrinkage at 117 days and Deadweight

NODE	X	Y	Z	THXY	THYZ	THZX
1	0.0000	0.0000	0.0000	0.00	0.00	0.00
16	0.0000	-24.000	0.0000	0.00	0.00	0.00
26	0.0000	-18.000	0.0000	0.00	0.00	0.00
27	0.0000	-12.000	0.0000	0.00	0.00	0.00
28	0.0000	-6.0000	0.0000	0.00	0.00	0.00
61	0.0000	-84.000	0.0000	0.00	0.00	0.00
71	0.0000	-72.000	0.0000	0.00	0.00	0.00
72	0.0000	-60.000	0.0000	0.00	0.00	0.00
73	0.0000	-48.000	0.0000	0.00	0.00	0.00
74	0.0000	-36.000	0.0000	0.00	0.00	0.00
113	0.0000	-96.000	0.0000	0.00	0.00	0.00
123	0.0000	-90.000	0.0000	0.00	0.00	0.00
133	0.0000	-96.000	0.0000	0.00	0.00	0.00
146	0.0000	-108.00	0.0000	0.00	0.00	0.00
156	0.0000	-102.00	0.0000	0.00	0.00	0.00
169	0.0000	-144.00	0.0000	0.00	0.00	0.00
179	0.0000	-132.00	0.0000	0.00	0.00	0.00
180	0.0000	-120.00	0.0000	0.00	0.00	0.00

USE LOAD STEP 1 SUBSTEP 0 FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP= 1 SUBSTEP= 1 CUMULATIVE ITERATION= 16  
TIME/FREQUENCY= 1.0000  
TITLE= Shrinkage at 117 days and Deadweight

SORT ON ITEM=LOC COMPONENT=Y ORDER= 0 KABS= 0 NMAX= 10212

SORT COMPLETED FOR 18 VALUES.

PRINT BFE NODAL SOLUTION PER NODE

1

\*\*\*\*\* ANSYS - ENGINEERING ANALYSIS SYSTEM RELEASE 6.0 \*\*\*\*\*  
ANSYS/Mechanical U  
00150104 VERSION=INTEL NT 19:18:24 JAN 23, 2002 CP= 809.414

Shrinkage at 117 days and Deadweight

NODE	BFETEMP
1	-89.380
28	-24.710
27	-6.7600
26	-0.42000
16	2.3200
74	4.4400
73	4.8300





Appendix RPad-SH to Calculation PGE-009-CALC-006

72	4.8300
71	4.8300
61	4.8300
123	4.8300
113	4.8300
133	4.8300
156	0.0000
146	0.0000
180	0.0000
179	0.0000
169	0.0000

NODE SORT REMOVED

EXIT THE ANSYS POST1 DATABASE PROCESSOR

\*\*\*\*\* ROUTINE COMPLETED \*\*\*\*\* CP = 809.424

8812 ELEMENTS (OF 8812 DEFINED) SELECTED BY EALL COMMAND.

10212 NODES (OF 10212 DEFINED) SELECTED BY NALL COMMAND.

ALL CURRENT ANSYS DATA WRITTEN TO FILE NAME= PadSh.db  
FOR POSSIBLE RESUME FROM THIS POINT

PURGE ALL SOLUTION AND POST DATA  
SAVE ALL MODEL DATA

ALL CURRENT ANSYS DATA WRITTEN TO FILE NAME= PadSh.db  
FOR POSSIBLE RESUME FROM THIS POINT

NUMBER OF WARNING MESSAGES ENCOUNTERED=	1
NUMBER OF ERROR MESSAGES ENCOUNTERED=	0


ANSYS RUN COMPLETED			
Release 6.0	UP20010919	INTEL NT	
Maximum Scratch Memory Used	=	36154348 Words	137.918 MB
CP Time (sec) =	811.066	Time =	19:18:27
Elapsed Time (sec) =	861.000	Date =	01/23/2002



**ENERCON  
SERVICES, INC.**

Sheet 1 of 6

**Appendix EPad-SH to Calculation PGE-009-CALC-006**

Originator:  S. C. Tumminelli  
Date: September 20, 2002  
Revised: March 3, 2003

## **Appendix EPad-SH**

This Appendix presents the ANSYS output file documenting the equilibrium check for the shrinkage stress analysis. This analysis was performed using the constrained model.



ANSYS/Mechanical U

```
*-----*
| W E L C O M E   T O   T H E   A N S Y S   P R O G R A M |
|-----|
*-----*
```

```
*****
*                               ANSYS 6.0 NOTICES                               *
*****
*
* Copyright 2001 SAS IP, Inc. All rights reserved.
* Unpublished---rights reserved under the Copyright Laws of
* the United States.
*
*
* U.S. GOVERNMENT RIGHTS
*
* Use, duplication, or disclosure by the U.S. Government is
* subject to restrictions set forth in the ANSYS, Inc.
* license agreement and as provided in DFARS 227.7202-1(a)
* and 227.7202-3(a)(1995), DFARS 252.227-7013(c)(1)(ii) (OCT
* 1988), FAR 12.212(a)(1995), FAR 52.227-19, or FAR52.227-14
* (ALT III), as applicable. ANSYS, Inc.
*
* THIS SOFTWARE CONTAINS CONFIDENTIAL INFORMATION AND TRADE
* SECRETS OF SAS IP, INC. USE, DISCLOSURE, OR REPRODUCTION
* IS PROHIBITED WITHOUT THE PRIOR EXPRESS WRITTEN PERMISSION
* OF SAS IP, INC.
*****
```

```
*****
* The Program also contains the following licensed software: *
*****
* PCGLSS: Linear Equations Solver
*
* (C) Copyright 1992-1995 Computational Applications and
*                               System Integration Inc.
* All Rights Reserved.
*
* CA&SI, 2004 S. Wright Street, Urbana, IL 61821
* Ph (217)244-7875
* Fax (217)244-7874
*
* CA&SI DOES NOT GUARANTEE THE CORRECTNESS OR USEFULNESS OF
* THE RESULTS OBTAINED USING PCGLSS. CA&SI IS NOT LIABLE FOR
* ANY CONCLUSIONS OR ACTIONS BASED ON THE RESULTS. IT IS THE
* RESPONSIBILITY OF THE USER TO CONFIRM THE ACCURACY AND
* USEFULNESS OF THE RESULTS.
*****
```



Completing ANSYS Load Process.

```
***** ANSYS COMMAND LINE ARGUMENTS *****
INITIAL JOBNAME           = PadSh
BATCH MODE REQUESTED      = LIST
MEMORY REQUESTED (MB)     = 520
DATABASE SIZE REQUESTED (MB) = 150

00150104          VERSION=INTEL NT          RELEASE= 6.0          UP20010919
CURRENT JOBNAME=PadSh 19:32:16 JAN 23, 2002 CP=          0.150

1  /com,
2  /com,      This routine processes load results data for the
3  /com,      evaluation of equilibrium.
4  /com
5  /com,      Results
6  /com
7  /com
8  /com *****
9  /com *****
10 /com
11 /com ***** Reactions *****
12 /com
13 /file,PadSh
14 resume
15 /header,on,on,on
16 /post1
17 spoint,,0,0,0
18 /com
19 /com *****
20 /com ***** SET 1 *****
21 SET,1
22 eall
23 cmsel,s,bot
24 cmsel,a,symxy
25 cmsel,a,symyz
26 cmsel,a,xedge
27 cmsel,a,zedge
28 fsum
29 /com
30 /com *****
31 /com *****
32 /com
33 fini
34 /exit
35
36
37
38
39
40
41
```





Appendix EPad-SH to Calculation PGE-009-CALC-006

RUN SETUP PROCEDURE FROM FILE= C:\PROGRAM FILES\ANSYS  
INC\ANSYS60\docu\start60.ans

/INPUT FILE= C:\PROGRAM FILES\ANSYS INC\ANSYS60\docu\start60.ans LINE= 0

This routine processes load results data for the  
evaluation of equilibrium.

Results

\*\*\*\*\*  
\*\*\*\*\*

\*\*\*\*\* Reactions \*\*\*\*\*

CURRENT JOBNAME REDEFINED AS PadSh

RESUME ANSYS DATA FROM FILE NAME=PadSh.db

\*\*\* ANSYS GLOBAL STATUS \*\*\*

TITLE = Shrinkage at 117 days and Deadweight

ANALYSIS TYPE = STATIC (STEADY-STATE)

NUMBER OF ELEMENT TYPES = 5

8812 ELEMENTS CURRENTLY SELECTED. MAX ELEMENT NUMBER = 9341

10212 NODES CURRENTLY SELECTED. MAX NODE NUMBER = 10212

166 KEYPOINTS CURRENTLY SELECTED. MAX KEYPOINT NUMBER = 166

339 LINES CURRENTLY SELECTED. MAX LINE NUMBER = 339

2 AREAS CURRENTLY SELECTED. MAX AREA NUMBER = 224

48 VOLUMES CURRENTLY SELECTED. MAX VOL. NUMBER = 48

22 COMPONENTS CURRENTLY DEFINED

MAXIMUM LINEAR PROPERTY NUMBER = 2

MAXIMUM REAL CONSTANT SET NUMBER = 1

ACTIVE COORDINATE SYSTEM = 0 (CARTESIAN)

MAXIMUM COUPLED D.O.F. SET NUMBER = 367

NUMBER OF SPECIFIED CONSTRAINTS = 4657

INITIAL JOBNAME = PadSh

CURRENT JOBNAME = PadSh

PRINT HEADER

PRINT SUBTITLE(S)

PRINT LOAD STEP ID

DO NOT PRINT NOTE LINE(S)

PRINT COLUMN HEADER LABELS

DO NOT PRINT REPORT TOTALS

1

\*\*\*\*\* ANSYS - ENGINEERING ANALYSIS SYSTEM RELEASE 6.0 \*\*\*\*\*

ANSYS/Mechanical U

00150104

VERSION=INTEL NT

19:32:16 JAN 23, 2002 CP=

0.571

Shrinkage at 117 days and Deadweight



Appendix EPad-SH to Calculation PGE-009-CALC-006

\*\*\*\*\* ANSYS RESULTS INTERPRETATION (POST1) \*\*\*\*\*

\*\*\* NOTE \*\*\* CP= 0.571 TIME= 19:32:16  
Reading results into the database (SET command) will update the current displacement and force boundary conditions in the database with the values from the results file for that load set. Note that any subsequent solutions will use these values unless action is taken to either SAVE the current values or not overwrite them (/EXIT,NOSAVE).

\*\*\* NOTE \*\*\* CP= 0.571 TIME= 19:32:16  
The force summations will be in global cartesian when the summation point is at the origin.

NODE FOR MOMENT SUMMATION= 0  
MOMENT SUMMATION LOCATION= 0.00000 0.00000 0.00000

\*\*\*\*\*  
\*\*\*\*\* SET 1 \*\*\*\*\*

USE LOAD STEP 1 SUBSTEP 0 FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP= 1 SUBSTEP= 1 CUMULATIVE ITERATION= 16  
TIME/FREQUENCY= 1.0000  
TITLE= Shrinkage at 117 days and Deadweight

8812 ELEMENTS (OF 8812 DEFINED) SELECTED BY EALL COMMAND.

SELECT COMPONENT BOT

ALSO SELECT COMPONENT SYMXY

ALSO SELECT COMPONENT SYMYZ

ALSO SELECT COMPONENT XEDGE

ALSO SELECT COMPONENT ZEDGE

\*\*\*\*\* SUMMATION OF TOTAL FORCES AND MOMENTS IN GLOBAL COORDINATES \*\*\*\*\*  
FX = -0.1363716E-08  
FY = -2141863.  
FZ = -0.9923781E-08  
MX = 0.6746868E+09  
MY = 0.2521556E-06  
MZ = -0.4369400E+09

SUMMATION POINT= 0.0000 0.0000 0.0000

\*\*\*\*\*  
\*\*\*\*\*

EXIT THE ANSYS POST1 DATABASE PROCESSOR

\*\*\*\*\* ROUTINE COMPLETED \*\*\*\*\* CP = 2.033



Appendix EPad-SH to Calculation PGE-009-CALC-006

PURGE ALL SOLUTION AND POST DATA  
SAVE ALL MODEL DATA

ALL CURRENT ANSYS DATA WRITTEN TO FILE NAME= PadSh.db  
FOR POSSIBLE RESUME FROM THIS POINT

NUMBER OF WARNING MESSAGES ENCOUNTERED= 0  
NUMBER OF ERROR MESSAGES ENCOUNTERED= 0

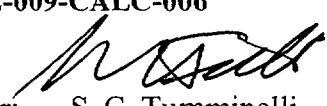
ANSYS RUN COMPLETED			
Release 6.0	UP20010919	INTEL NT	
Maximum Scratch Memory Used	=	1034776 Words	3.947 MB
CP Time (sec) =	2.514	Time =	19:32:19
Elapsed Time (sec) =	5.000	Date =	01/23/2002



**ENERCON  
SERVICES, INC.**

Sheet 1 of 7

**Appendix DPad-SH to Calculation PGE-009-CALC-006**

  
Originator: S. C. Tumminelli  
Date: September 20, 2002  
Revised: March 3, 2003

## **Appendix DPad-SH**

This Appendix presents the ANSYS output file documenting the pad vertical displacements for the shrinkage stress analysis. This analysis was performed using the constrained model.



ANSYS/Mechanical U

```
*-----*
| W E L C O M E   T O   T H E   A N S Y S   P R O G R A M |
|-----|
*-----*
```

```
*****
*                               ANSYS 6.0 NOTICES                               *
*****
*
* Copyright 2001 SAS IP, Inc. All rights reserved.
* Unpublished---rights reserved under the Copyright Laws of
* the United States.
*
*
* U.S. GOVERNMENT RIGHTS
*
* Use, duplication, or disclosure by the U.S. Government is
* subject to restrictions set forth in the ANSYS, Inc.
* license agreement and as provided in DFARS 227.7202-1(a)
* and 227.7202-3(a)(1995), DFARS 252.227-7013(c)(1)(ii) (OCT
* 1988), FAR 12.212(a)(1995), FAR 52.227-19, or FAR52.227-14
* (ALT III), as applicable. ANSYS, Inc.
*
* THIS SOFTWARE CONTAINS CONFIDENTIAL INFORMATION AND TRADE
* SECRETS OF SAS IP, INC. USE, DISCLOSURE, OR REPRODUCTION
* IS PROHIBITED WITHOUT THE PRIOR EXPRESS WRITTEN PERMISSION
* OF SAS IP, INC.
*****
```

```
*****
* The Program also contains the following licensed software: *
*****
* PCGLSS: Linear Equations Solver
*
* (C) Copyright 1992-1995 Computational Applications and
*                               System Integration Inc.
* All Rights Reserved.
*
* CA&SI, 2004 S. Wright Street, Urbana, IL 61821
* Ph (217)244-7875
* Fax (217)244-7874
*
* CA&SI DOES NOT GUARANTEE THE CORRECTNESS OR USEFULNESS OF
* THE RESULTS OBTAINED USING PCGLSS. CA&SI IS NOT LIABLE FOR
* ANY CONCLUSIONS OR ACTIONS BASED ON THE RESULTS. IT IS THE
* RESPONSIBILITY OF THE USER TO CONFIRM THE ACCURACY AND
* USEFULNESS OF THE RESULTS.
*****
```





Completing ANSYS Load Process.

```
***** ANSYS COMMAND LINE ARGUMENTS *****
INITIAL JOBNAME           = PadSh
BATCH MODE REQUESTED      = LIST
MEMORY REQUESTED (MB)     = 520
DATABASE SIZE REQUESTED (MB) = 150

00150104          VERSION=INTEL NT          RELEASE= 6.0          UP20010919
CURRENT JOBNAME=PadSh 19:35:13 JAN 23, 2002 CP=          0.140

1  /com
2  /COM      DISPLACEMENT DATA SORTED AND PRINTED
3  /COM
4  /FILE,PadSh
5  RESUME
6  /header,on,off,off,off,on,off
7  /POST1
8  /COM
9  /COM
10 EALL
11 NALL
12 /COM
13 /COM

=====
14 /COM ===== SET 1
=====
15 /COM
16 SET,1
17 ESEL,TYPE,2
18 NELEM
19 /COM
20 /COM

=====
21 /COM ===== MAXIMUM VALUES OF Uy
=====
22 /COM
23 NSORT,U,Y,0,0,2,SEL
24 PRNSOL,U
25 NUSORT
26 /COM
27 /COM
28 /COM

=====
29 /COM ===== MINIMUM VALUES OF Uy
=====
30 /COM
31 NSORT,U,Y,1,0,2,SEL
32 PRNSOL,U
33 NUSORT
34 /COM
35 /COM

=====
36 /COM
```



Appendix DPad-SH to Calculation PGE-009-CALC-006

37 FINI  
38 /EXIT  
39  
40

RUN SETUP PROCEDURE FROM FILE= C:\PROGRAM FILES\ANSYS  
INC\ANSYS60\docu\start60.ans

/INPUT FILE= C:\PROGRAM FILES\ANSYS INC\ANSYS60\docu\start60.ans LINE= 0

DISPLACEMENT DATA SORTED AND PRINTED

CURRENT JOBNAME REDEFINED AS PadSh

RESUME ANSYS DATA FROM FILE NAME=PadSh.db

\*\*\* ANSYS GLOBAL STATUS \*\*\*

TITLE = Shrinkage at 117 days and Deadweight

ANALYSIS TYPE = STATIC (STEADY-STATE)

NUMBER OF ELEMENT TYPES = 5

8812 ELEMENTS CURRENTLY SELECTED. MAX ELEMENT NUMBER = 9341

2164 NODES CURRENTLY SELECTED. MAX NODE NUMBER = 10212

166 KEYPOINTS CURRENTLY SELECTED. MAX KEYPOINT NUMBER = 166

339 LINES CURRENTLY SELECTED. MAX LINE NUMBER = 339

2 AREAS CURRENTLY SELECTED. MAX AREA NUMBER = 224

48 VOLUMES CURRENTLY SELECTED. MAX VOL. NUMBER = 48

22 COMPONENTS CURRENTLY DEFINED

MAXIMUM LINEAR PROPERTY NUMBER = 2

MAXIMUM REAL CONSTANT SET NUMBER = 1

ACTIVE COORDINATE SYSTEM = 0 (CARTESIAN)

MAXIMUM COUPLED D.O.F. SET NUMBER = 367

NUMBER OF SPECIFIED CONSTRAINTS = 4657

INITIAL JOBNAME = PadSh

CURRENT JOBNAME = PadSh

PRINT HEADER

DO NOT PRINT SUBTITLE(S)

DO NOT PRINT LOAD STEP ID

DO NOT PRINT NOTE LINE(S)

PRINT COLUMN HEADER LABELS

DO NOT PRINT REPORT TOTALS

1

\*\*\*\*\* ANSYS - ENGINEERING ANALYSIS SYSTEM RELEASE 6.0 \*\*\*\*\*

ANSYS/Mechanical U

00150104 VERSION=INTEL NT 19:35:13 JAN 23, 2002 CP= 0.591

Shrinkage at 117 days and Deadweight

\*\*\*\*\* ANSYS RESULTS INTERPRETATION (POST1) \*\*\*\*\*

\*\*\* NOTE \*\*\*

CP= 0.591 TIME= 19:35:13



Appendix DPad-SH to Calculation PGE-009-CALC-006

Reading results into the database (SET command) will update the current displacement and force boundary conditions in the database with the values from the results file for that load set. Note that any subsequent solutions will use these values unless action is taken to either SAVE the current values or not overwrite them (/EXIT,NOSAVE).

8812 ELEMENTS (OF 8812 DEFINED) SELECTED BY EALL COMMAND.

10212 NODES (OF 10212 DEFINED) SELECTED BY NALL COMMAND.

=====

USE LOAD STEP 1 SUBSTEP 0 FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP= 1 SUBSTEP= 1 CUMULATIVE ITERATION= 16  
TIME/FREQUENCY= 1.0000  
TITLE= Shrinkage at 117 days and Deadweight

ESEL FOR LABEL= TYPE FROM 2 TO 2 BY 1

1870 ELEMENTS (OF 8812 DEFINED) SELECTED BY ESEL COMMAND.

SELECT ALL NODES HAVING ANY ELEMENT IN ELEMENT SET.

2376 NODES (OF 10212 DEFINED) SELECTED FROM  
1870 SELECTED ELEMENTS BY NELE COMMAND.

=====

SORT ON ITEM=U COMPONENT=Y ORDER= 0 KABS= 0 NMAX= 2

SORT COMPLETED FOR 2 VALUES.

PRINT U NODAL SOLUTION PER NODE

1

\*\*\*\*\* ANSYS - ENGINEERING ANALYSIS SYSTEM RELEASE 6.0 \*\*\*\*\*  
ANSYS/Mechanical U  
00150104 VERSION=INTEL NT 19:35:14 JAN 23, 2002 CP= 1.793

Shrinkage at 117 days and Deadweight

NODE	UX	UY	UZ	USUM
2610	-0.16566E-01	0.58279E-01	-0.16965E-01	0.62918E-01
2609	-0.20151E-01	0.58119E-01	-0.20370E-01	0.64798E-01

NODE SORT REMOVED



Appendix DPad-SH to Calculation PGE-009-CALC-006

=====

===== MINIMUM VALUES OF Uy =====

=====

SORT ON ITEM=U COMPONENT=Y ORDER= 1 KABS= 0 NMAX= 2

SORT COMPLETED FOR 2 VALUES.

PRINT U NODAL SOLUTION PER NODE

1

\*\*\*\*\* ANSYS - ENGINEERING ANALYSIS SYSTEM RELEASE 6.0 \*\*\*\*\*

ANSYS/Mechanical U

00150104 VERSION=INTEL NT 19:35:14 JAN 23, 2002 CP= 1.813

Shrinkage at 117 days and Deadweight

NODE	UX	UY	UZ	USUM
1	0.0000	-0.49676E-02	0.0000	0.49676E-02
672	0.0000	-0.49664E-02	-0.21869E-03	0.49712E-02

NODE SORT REMOVED

=====

EXIT THE ANSYS POST1 DATABASE PROCESSOR

\*\*\*\*\* ROUTINE COMPLETED \*\*\*\*\* CP = 1.813

PURGE ALL SOLUTION AND POST DATA

SAVE ALL MODEL DATA

ALL CURRENT ANSYS DATA WRITTEN TO FILE NAME= PadSh.db

FOR POSSIBLE RESUME FROM THIS POINT

NUMBER OF WARNING MESSAGES ENCOUNTERED= 0

NUMBER OF ERROR MESSAGES ENCOUNTERED= 0

\*-----\*

ANSYS RUN COMPLETED			
-----			
Release 6.0	UP20010919	INTEL NT	
-----			
Maximum Scratch Memory Used	=	1034776 Words	3.947 MB

\*-----\*



ENERCON  
SERVICES, INC.

Appendix DPad-SH to Calculation PGE-009-CALC-006


CP Time	(sec) =	2.303	Time =	19:35:15
Elapsed Time	(sec) =	5.000	Date =	01/23/2002



**ENERCON  
SERVICES, INC.**

Sheet 1 of 9

**Appendix SPad-SH to Calculation PGE-009-CALC-006**

Originator:  S. C. Tumminelli  
Date: September 20, 2002  
Revised: March 3, 2003

**Appendix SPad-SH**

This Appendix presents the ANSYS output file documenting the pad stress response for the shrinkage stress analysis. This analysis was performed using the constrained model.





ANSYS/Mechanical U

```
*-----*
| W E L C O M E   T O   T H E   A N S Y S   P R O G R A M |
|-----|
*-----*
```

```
*****
*                               ANSYS 6.0 NOTICES                               *
*****
*
* Copyright 2001 SAS IP, Inc. All rights reserved.
* Unpublished---rights reserved under the Copyright Laws of
* the United States.
*
*
* U.S. GOVERNMENT RIGHTS
*
* Use, duplication, or disclosure by the U.S. Government is
* subject to restrictions set forth in the ANSYS, Inc.
* license agreement and as provided in DFARS 227.7202-1(a)
* and 227.7202-3(a)(1995), DFARS 252.227-7013(c)(1)(ii) (OCT
* 1988), FAR 12.212(a)(1995), FAR 52.227-19, or FAR52.227-14
* (ALT III), as applicable. ANSYS, Inc.
*
* THIS SOFTWARE CONTAINS CONFIDENTIAL INFORMATION AND TRADE
* SECRETS OF SAS IP, INC. USE, DISCLOSURE, OR REPRODUCTION
* IS PROHIBITED WITHOUT THE PRIOR EXPRESS WRITTEN PERMISSION
* OF SAS IP, INC.
*****
```

```
*****
* The Program also contains the following licensed software: *
*****
* PCGLSS: Linear Equations Solver
*
* (C) Copyright 1992-1995 Computational Applications and
*                               System Integration Inc.
* All Rights Reserved.
*
* CA&SI, 2004 S. Wright Street, Urbana, IL 61821
* Ph (217)244-7875
* Fax (217)244-7874
*
* CA&SI DOES NOT GUARANTEE THE CORRECTNESS OR USEFULNESS OF
* THE RESULTS OBTAINED USING PCGLSS. CA&SI IS NOT LIABLE FOR
* ANY CONCLUSIONS OR ACTIONS BASED ON THE RESULTS. IT IS THE
* RESPONSIBILITY OF THE USER TO CONFIRM THE ACCURACY AND
* USEFULNESS OF THE RESULTS.
*****
```



Completing ANSYS Load Process.

```
***** ANSYS COMMAND LINE ARGUMENTS *****
INITIAL JOBNAME           = PadSh
BATCH MODE REQUESTED      = LIST
MEMORY REQUESTED (MB)     = 520
DATABASE SIZE REQUESTED (MB) = 150

00150104          VERSION=INTEL NT          RELEASE= 6.0          UP20010919
CURRENT JOBNAME=PadSh 19:38:14 JAN 23, 2002 CP=          0.150

1 /COM
2 /COM
3 /COM          STRESS DATA SORTED AND PRINTED BY LOAD CASE
4 /COM
5 /COM
6 /COM
7 /COM          THIS ROUTINE SORTS AND PRINTS STRESS DATA BY LOAD CASE
8 /COM          FIRST SX, SZ, S1 (MAX) AND S3 (MIN)
9 /COM
10 /COM
11 /file,PadSh
12 resume
13 /header,on,off,off,off,off,on,off
14 /post1
15 /COM
16 EALL
17 NALL
18 /COM
19 /COM =====
20 /COM =====
21 /COM =====
22 /COM ===== SET 1 =====
23 /COM
24 SET,1
25 ESEL,TYPE,2
26 NELEM
27 /COM
28 /COM =====
29 /COM ===== MAXIMUM VALUES OF SX =====
30 /COM
31 NSORT,S,X,0,0,2,SEL
32 PRNSOL,S
33 NUSORT
34 /COM
35 /COM =====
36 /COM ===== MINIMUM VALUES OF SX =====
37 /COM
38 NSORT,S,X,1,0,2,SEL
39 PRNSOL,S
40 NUSORT
41 /COM
42 /COM =====
43 /COM ===== MAXIMUM VALUES OF SZ =====
```



```
44 /COM
45 NSORT,S,Z,0,0,2,SEL
46 PRNSOL,S
47 NUSORT
48 /COM
49 /COM =====
50 /COM ===== MINIMUM VALUES OF SZ =====
51 /COM
52 NSORT,S,Z,1,0,2,SEL
53 PRNSOL,S
54 /COM
55 /COM
56 /COM =====
57 /COM ===== MAXIMUM VALUES OF S1 =====
58 /COM
59 NSORT,S,1,0,0,2,SEL
60 PRNSOL,S,PRIN
61 NUSORT
62 /COM
63 /COM =====
64 /COM ===== MINIMUM VALUES OF S3 =====
65 /COM
66 NSORT,S,3,1,0,2,SEL
67 PRNSOL,S,PRIN
68 NUSORT
69 /COM
70 /COM =====
71 /COM =====
72 /COM =====
73 /COM =====
74 /COM
75 EALL
76 NALL
77 FINI
78 /EXIT
```

RUN SETUP PROCEDURE FROM FILE= C:\PROGRAM FILES\ANSYS  
INC\ANSYS60\docu\start60.ans

/INPUT FILE= C:\PROGRAM FILES\ANSYS INC\ANSYS60\docu\start60.ans LINE= 0

STRESS DATA SORTED AND PRINTED BY LOAD CASE

THIS ROUTINE SORTS AND PRINTS STRESS DATA BY LOAD CASE  
FIRST SX, SZ, S1 (MAX) AND S3 (MIN)

CURRENT JOBNAME REDEFINED AS PadSh

RESUME ANSYS DATA FROM FILE NAME=PadSh.db

\*\*\* ANSYS GLOBAL STATUS \*\*\*



Appendix SPad-SH to Calculation PGE-009-CALC-006

TITLE = Shrinkage at 117 days and Deadweight

ANALYSIS TYPE = STATIC (STEADY-STATE)

NUMBER OF ELEMENT TYPES = 5

1870 ELEMENTS CURRENTLY SELECTED. MAX ELEMENT NUMBER = 9341

2376 NODES CURRENTLY SELECTED. MAX NODE NUMBER = 10212

166 KEYPOINTS CURRENTLY SELECTED. MAX KEYPOINT NUMBER = 166

339 LINES CURRENTLY SELECTED. MAX LINE NUMBER = 339

2 AREAS CURRENTLY SELECTED. MAX AREA NUMBER = 224

48 VOLUMES CURRENTLY SELECTED. MAX VOL. NUMBER = 48

22 COMPONENTS CURRENTLY DEFINED

MAXIMUM LINEAR PROPERTY NUMBER = 2

MAXIMUM REAL CONSTANT SET NUMBER = 1

ACTIVE COORDINATE SYSTEM = 0 (CARTESIAN)

MAXIMUM COUPLED D.O.F. SET NUMBER = 367

NUMBER OF SPECIFIED CONSTRAINTS = 4657

INITIAL JOBNAME = PadSh

CURRENT JOBNAME = PadSh

PRINT HEADER

DO NOT PRINT SUBTITLE(S)

DO NOT PRINT LOAD STEP ID

DO NOT PRINT NOTE LINE(S)

PRINT COLUMN HEADER LABELS

DO NOT PRINT REPORT TOTALS

1

\*\*\*\*\* ANSYS - ENGINEERING ANALYSIS SYSTEM RELEASE 6.0 \*\*\*\*\*

ANSYS/Mechanical U

00150104 VERSION=INTEL NT 19:38:14 JAN 23, 2002 CP= 0.631

Shrinkage at 117 days and Deadweight

\*\*\*\*\* ANSYS RESULTS INTERPRETATION (POST1) \*\*\*\*\*

\*\*\* NOTE \*\*\* CP= 0.631 TIME= 19:38:14

Reading results into the database (SET command) will update the current displacement and force boundary conditions in the database with the values from the results file for that load set. Note that any subsequent solutions will use these values unless action is taken to either SAVE the current values or not overwrite them (/EXIT,NOSAVE).

8812 ELEMENTS (OF 8812 DEFINED) SELECTED BY EALL COMMAND.

10212 NODES (OF 10212 DEFINED) SELECTED BY NALL COMMAND.

=====  
=====  
=====  
===== SET 1 =====

USE LOAD STEP 1 SUBSTEP 0 FOR LOAD CASE 0



Appendix SPad-SH to Calculation PGE-009-CALC-006

SET COMMAND GOT LOAD STEP= 1 SUBSTEP= 1 CUMULATIVE ITERATION= 16  
TIME/FREQUENCY= 1.0000  
TITLE= Shrinkage at 117 days and Deadweight

ESEL FOR LABEL= TYPE FROM 2 TO 2 BY 1

1870 ELEMENTS (OF 8812 DEFINED) SELECTED BY ESEL COMMAND.

SELECT ALL NODES HAVING ANY ELEMENT IN ELEMENT SET.

2376 NODES (OF 10212 DEFINED) SELECTED FROM  
1870 SELECTED ELEMENTS BY NELE COMMAND.

=====

===== MAXIMUM VALUES OF SX =====

=====

SORT ON ITEM=S COMPONENT=X ORDER= 0 KABS= 0 NMAX= 2

SORT COMPLETED FOR 2 VALUES.

PRINT S NODAL SOLUTION PER NODE  
1

\*\*\*\*\* ANSYS - ENGINEERING ANALYSIS SYSTEM RELEASE 6.0 \*\*\*\*\*  
ANSYS/Mechanical U  
00150104 VERSION=INTEL NT 19:38:16 JAN 23, 2002 CP= 2.063

Shrinkage at 117 days and Deadweight

NODE	SX	SY	SZ	SXY	SYZ	SXZ
1	1506.0	0.16308	1524.4	1.2072	-0.94098E-01	-0.82939E-02
672	1506.0	0.25421	1524.3	1.2070	-0.25594E-01	-0.17400E-01

NODE SORT REMOVED

=====

===== MINIMUM VALUES OF SX =====

=====

SORT ON ITEM=S COMPONENT=X ORDER= 1 KABS= 0 NMAX= 2

SORT COMPLETED FOR 2 VALUES.

PRINT S NODAL SOLUTION PER NODE  
1

\*\*\*\*\* ANSYS - ENGINEERING ANALYSIS SYSTEM RELEASE 6.0 \*\*\*\*\*  
ANSYS/Mechanical U  
00150104 VERSION=INTEL NT 19:38:16 JAN 23, 2002 CP= 2.083

Shrinkage at 117 days and Deadweight

NODE	SX	SY	SZ	SXY	SYZ	SXZ
------	----	----	----	-----	-----	-----



Appendix SPad-SH to Calculation PGE-009-CALC-006

2669	-189.40	-76.758	-150.06	-25.371	-33.582	-3.0037
923	-181.78	-3.1022	-150.32	-28.174	-0.65449	-6.2950

NODE SORT REMOVED

=====

===== MAXIMUM VALUES OF SZ =====

=====

SORT ON ITEM=S COMPONENT=Z ORDER= 0 KABS= 0 NMAX= 2

SORT COMPLETED FOR 2 VALUES.

PRINT S NODAL SOLUTION PER NODE

1

\*\*\*\*\* ANSYS - ENGINEERING ANALYSIS SYSTEM RELEASE 6.0 \*\*\*\*\*

ANSYS/Mechanical U

00150104 VERSION=INTEL NT 19:38:16 JAN 23, 2002 CP= 2.113

Shrinkage at 117 days and Deadweight

NODE	SX	SY	SZ	SXY	SYZ	SXZ
1	1506.0	0.16308	1524.4	1.2072	-0.94098E-01	-0.82939E-02
672	1506.0	0.25421	1524.3	1.2070	-0.25594E-01	-0.17400E-01

NODE SORT REMOVED

=====

===== MINIMUM VALUES OF SZ =====

=====

SORT ON ITEM=S COMPONENT=Z ORDER= 1 KABS= 0 NMAX= 2

SORT COMPLETED FOR 2 VALUES.

PRINT S NODAL SOLUTION PER NODE

1

\*\*\*\*\* ANSYS - ENGINEERING ANALYSIS SYSTEM RELEASE 6.0 \*\*\*\*\*

ANSYS/Mechanical U

00150104 VERSION=INTEL NT 19:38:16 JAN 23, 2002 CP= 2.143

Shrinkage at 117 days and Deadweight

NODE	SX	SY	SZ	SXY	SYZ	SXZ
633	-131.20	-68.140	-183.07	-43.181	-9.3680	-2.4794
635	-163.77	27.224	-175.24	-6.1373	-10.706	-7.1740

=====

===== MAXIMUM VALUES OF S1 =====

=====

SORT ON ITEM=S COMPONENT=1 ORDER= 0 KABS= 0 NMAX= 2





## Appendix SPad-SH to Calculation PGE-009-CALC-006

SORT COMPLETED FOR 2 VALUES.

PRINT S NODAL SOLUTION PER NODE

1

\*\*\*\*\* ANSYS - ENGINEERING ANALYSIS SYSTEM RELEASE 6.0 \*\*\*\*\*  
 ANSYS/Mechanical U  
 00150104 VERSION=INTEL NT 19:38:16 JAN 23, 2002 CP= 2.173

Shrinkage at 117 days and Deadweight

NODE	S1	S2	S3	SINT	SEQV
1	1524.4	1506.0	0.16211	1524.2	1515.1
672	1524.3	1506.0	0.25324	1524.1	1515.0

NODE SORT REMOVED

=====

===== MINIMUM VALUES OF S3 =====

SORT ON ITEM=S COMPONENT=3 ORDER= 1 KABS= 0 NMAX= 2

SORT COMPLETED FOR 2 VALUES.

PRINT S NODAL SOLUTION PER NODE

1

\*\*\*\*\* ANSYS - ENGINEERING ANALYSIS SYSTEM RELEASE 6.0 \*\*\*\*\*  
 ANSYS/Mechanical U  
 00150104 VERSION=INTEL NT 19:38:16 JAN 23, 2002 CP= 2.203

Shrinkage at 117 days and Deadweight

NODE	S1	S2	S3	SINT	SEQV
2706	-93.475	-156.53	-229.57	136.10	117.97
2668	-110.01	-149.85	-215.79	105.77	92.529

NODE SORT REMOVED

=====

=====

=====

=====

8812 ELEMENTS (OF 8812 DEFINED) SELECTED BY EALL COMMAND.

10212 NODES (OF 10212 DEFINED) SELECTED BY NALL COMMAND.

EXIT THE ANSYS POST1 DATABASE PROCESSOR

\*\*\*\*\* ROUTINE COMPLETED \*\*\*\*\* CP = 2.203



PURGE ALL SOLUTION AND POST DATA  
SAVE ALL MODEL DATA

ALL CURRENT ANSYS DATA WRITTEN TO FILE NAME= PadSh.db  
FOR POSSIBLE RESUME FROM THIS POINT


NUMBER OF WARNING MESSAGES ENCOUNTERED= 0  
NUMBER OF ERROR MESSAGES ENCOUNTERED= 0

ANSYS RUN COMPLETED			
Release 6.0	UP20010919	INTEL NT	
Maximum Scratch Memory Used	=	1034776 Words	3.947 MB
CP Time (sec) =	2.704	Time =	19:38:17
Elapsed Time (sec) =	5.000	Date =	01/23/2002



**ENERCON  
SERVICES, INC.**

**Appendix FPad-SH to Calculation PGE-009-CALC-006**

Originator:  S. C. Tumminelli  
Date: September 20, 2002  
Revised: March 3, 2003

## **Appendix FPad-SH**

This Appendix presents the ANSYS output file documenting the pad internal forces for the shrinkage stress analysis. This analysis was performed using the constrained model.



ANSYS/Mechanical U

```
*-----*
| W E L C O M E   T O   T H E   A N S Y S   P R O G R A M |
*-----*
```

```
*****
*                               ANSYS 6.0 NOTICES                               *
*****
*
* Copyright 2001 SAS IP, Inc. All rights reserved.
* Unpublished---rights reserved under the Copyright Laws of
* the United States.
*
*
* U.S. GOVERNMENT RIGHTS
*
* Use, duplication, or disclosure by the U.S. Government is
* subject to restrictions set forth in the ANSYS, Inc.
* license agreement and as provided in DFARS 227.7202-1(a)
* and 227.7202-3(a)(1995), DFARS 252.227-7013(c)(1)(ii) (OCT
* 1988), FAR 12.212(a)(1995), FAR 52.227-19, or FAR52.227-14
* (ALT III), as applicable. ANSYS, Inc.
*
* THIS SOFTWARE CONTAINS CONFIDENTIAL INFORMATION AND TRADE
* SECRETS OF SAS IP, INC. USE, DISCLOSURE, OR REPRODUCTION
* IS PROHIBITED WITHOUT THE PRIOR EXPRESS WRITTEN PERMISSION
* OF SAS IP, INC.
*****
```

```
*****
* The Program also contains the following licensed software:
*****
* PCGLSS: Linear Equations Solver
*
* (C) Copyright 1992-1995 Computational Applications and
*                               System Integration Inc.
* All Rights Reserved.
*
* CA&SI, 2004 S. Wright Street, Urbana, IL 61821
* Ph (217)244-7875
* Fax (217)244-7874
*
* CA&SI DOES NOT GUARANTEE THE CORRECTNESS OR USEFULNESS OF
* THE RESULTS OBTAINED USING PCGLSS. CA&SI IS NOT LIABLE FOR
* ANY CONCLUSIONS OR ACTIONS BASED ON THE RESULTS. IT IS THE
* RESPONSIBILITY OF THE USER TO CONFIRM THE ACCURACY AND
* USEFULNESS OF THE RESULTS.
*****
```



Completing ANSYS Load Process.

```
***** ANSYS COMMAND LINE ARGUMENTS *****
INITIAL JOBNAME           = PadSh
BATCH MODE REQUESTED      = LIST
MEMORY REQUESTED (MB)     = 520
DATABASE SIZE REQUESTED (MB) = 150

00150104          VERSION=INTEL NT          RELEASE= 6.0          UP20010919
CURRENT JOBNAME=PadSh 19:40:55 JAN 23, 2002 CP=          0.160

1  /com,
2  /COM
3  /com
4  /com,          This routine processes load results data for the
5  /com,          evaluation of pad internal forces and moments
6  /com
7  /com *****
8  /com *****
9  /com
10 /file,PadSh
11 resume
12 /HEADER,ON,OFF,OFF,OFF,ON,OFF
13 /post1
14 eall
15 nall
16 /com
17 /com *****
18 /com ***** SET 1 *****
19 SET,1
20 /COM
21 /COM          SECTION THE PAD IN TO 2 NORTH-SOUTH Z-DIRECTION STRIPS
22 /com
23 /com          Select all nodes in pad only
24 /com
25 esel,type,2
26 nelem
27 /com
28 /com          select strip Z direction x = 0 to 204 Lines C to D
29 /com
30 nsel,r,loc,x,-0.1,204.1
31 enode,1
32 /com
33 /com          internal forces at Z = 0.0          LINE 5 1/2
34 /com
35 nsel,r,loc,z,-0.1,0.1
36 spoint,,102,-48.0,0.0
37 fsum
38 /com          next strip x = 204 to 408 Lines D to E
39 /com
40 /com          Select all nodes in pad only
41 /com
42 esel,type,2
43 nelem
```



Appendix FPad-SH to Calculation PGE-009-CALC-006

```
44 /com
45 /com      select strip Z direction
46 /com
47 nsel,r,loc,x,203.9,408.1
48 enode,1
49 /com
50 /com      internal forces at Z = 0.0      LINE 5 1/2
51 /com
52 nsel,r,loc,z,-0.1,0.1
53 spoint,,306,-48.0,0.0
54 fsum
55 /com *****
56 /com *****
57 /com
58 /COM      SECTION THE PAD IN TO 4 EAST-WEST X-DIRECTION STRIPS
59 /COM
60 /com      Select all nodes in pad only
61 /com
62 esel,type,2
63 nelem
64 /com
65 /com      select strip x direction z = 0.0 to 102 Lines 5 1/2 to 6
66 /com
67 nsel,r,loc,z,-0.1,102.1
68 enode,1
69 /com
70 /com      internal forces at x = 0.0      LINE C
71 /com
72 nsel,r,loc,x,-0.1,0.1
73 spoint,,0.0,-48.0,51.0
74 fsum
75 nelem
76 /com
77 /com      next strip z = 102 to 306 Lines 6 to 7
78 /com
79 /com
80 /com      Select all nodes in pad only
81 /com
82 esel,type,2
83 nelem
84 /com
85 /com      select strip x direction z = 102 to 306
86 /com
87 nsel,r,loc,z,101.9,306.1
88 enode,1
89 /com
90 /com      internal forces at x = 0.0      LINE C
91 /com
92 nsel,r,loc,x,-0.1,0.1
93 spoint,,0.0,-48.0,204.0
94 fsum
95 nelem
96 /com
97 /com      next strip z = 306 to 510 Lines 7 to 8
98 /com
99 /com
100 /com      Select all nodes in pad only
```





```
101 /com
102 esel,type,2
103 nelem
104 /com
105 /com      select strip x direction z = 306 to 510
106 /com
107 nsel,r,loc,z,305.9,510.1
108 enode,1
109 /com
110 /com      internal forces at x = 0.0      LINE C
111 /com
112 nsel,r,loc,x,-0.1,0.1
113 spoint,,0.0,-48.0,408.0
114 fsum
115 nelem
116 /com
117 /com      next strip z = 510 to 630 Lines 8 to 10
118 /com
119 /com
120 /com      Select all nodes in pad only
121 /com
122 esel,type,2
123 nelem
124 /com
125 /com      select strip x direction z = 510 to 630
126 /com
127 nsel,r,loc,z,509.9,630.1
128 enode,1
129 /com
130 /com      internal forces at x = 0.0      LINE C
131 /com
132 nsel,r,loc,x,-0.1,0.1
133 spoint,,0.0,-48.0,570.0
134 fsum
135 eall
136 nall
137 /com
138 /com *****
139 /com *****
140 fini
141 /exit
142
143
144
145
146
```

RUN SETUP PROCEDURE FROM FILE= C:\PROGRAM FILES\ANSYS  
INC\ANSYS60\docu\start60.ans

/INPUT FILE= C:\PROGRAM FILES\ANSYS INC\ANSYS60\docu\start60.ans LINE=

0

This routine processes load results data for the  
evaluation of pad internal forces and moments



Appendix FPad-SH to Calculation PGE-009-CALC-006

\*\*\*\*\*  
\*\*\*\*\*

CURRENT JOBNAME REDEFINED AS PadSh

RESUME ANSYS DATA FROM FILE NAME=PadSh.db

\*\*\* ANSYS GLOBAL STATUS \*\*\*

TITLE = Shrinkage at 117 days and Deadweight

ANALYSIS TYPE = STATIC (STEADY-STATE)

NUMBER OF ELEMENT TYPES = 5

8812 ELEMENTS CURRENTLY SELECTED. MAX ELEMENT NUMBER = 9341

10212 NODES CURRENTLY SELECTED. MAX NODE NUMBER = 10212

166 KEYPOINTS CURRENTLY SELECTED. MAX KEYPOINT NUMBER = 166

339 LINES CURRENTLY SELECTED. MAX LINE NUMBER = 339

2 AREAS CURRENTLY SELECTED. MAX AREA NUMBER = 224

48 VOLUMES CURRENTLY SELECTED. MAX VOL. NUMBER = 48

22 COMPONENTS CURRENTLY DEFINED

MAXIMUM LINEAR PROPERTY NUMBER = 2

MAXIMUM REAL CONSTANT SET NUMBER = 1

ACTIVE COORDINATE SYSTEM = 0 (CARTESIAN)

MAXIMUM COUPLED D.O.F. SET NUMBER = 367

NUMBER OF SPECIFIED CONSTRAINTS = 4657

INITIAL JOBNAME = PadSh

CURRENT JOBNAME = PadSh

PRINT HEADER

DO NOT PRINT SUBTITLE(S)

DO NOT PRINT LOAD STEP ID

DO NOT PRINT NOTE LINE(S)

PRINT COLUMN HEADER LABELS

DO NOT PRINT REPORT TOTALS

1

\*\*\*\*\* ANSYS - ENGINEERING ANALYSIS SYSTEM RELEASE 6.0 \*\*\*\*\*

ANSYS/Mechanical U

00150104 VERSION=INTEL NT 19:40:56 JAN 23, 2002 CP= 0.611

Shrinkage at 117 days and Deadweight

\*\*\*\*\* ANSYS RESULTS INTERPRETATION (POST1) \*\*\*\*\*

\*\*\* NOTE \*\*\*

CP= 0.611 TIME= 19:40:56

Reading results into the database (SET command) will update the current displacement and force boundary conditions in the database with the values from the results file for that load set. Note that any subsequent solutions will use these values unless action is taken to either SAVE the current values or not overwrite them (/EXIT,NOSAVE).

8812 ELEMENTS (OF 8812 DEFINED) SELECTED BY EALL COMMAND.

10212 NODES (OF 10212 DEFINED) SELECTED BY NALL COMMAND.



Appendix FPad-SH to Calculation PGE-009-CALC-006

\*\*\*\*\*  
\*\*\*\*\* SET 1 \*\*\*\*\*

USE LOAD STEP 1 SUBSTEP 0 FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP= 1 SUBSTEP= 1 CUMULATIVE ITERATION= 16  
TIME/FREQUENCY= 1.0000  
TITLE= Shrinkage at 117 days and Deadweight

SECTION THE PAD IN TO 2 NORTH-SOUTH Z-DIRECTION STRIPS

Select all nodes in pad only

ESEL FOR LABEL= TYPE FROM 2 TO 2 BY 1

1870 ELEMENTS (OF 8812 DEFINED) SELECTED BY ESEL COMMAND.

SELECT ALL NODES HAVING ANY ELEMENT IN ELEMENT SET.

2376 NODES (OF 10212 DEFINED) SELECTED FROM  
1870 SELECTED ELEMENTS BY NELE COMMAND.

select strip Z direction x = 0 to 204 Lines C to D

RESELECT FOR ITEM=LOC COMPONENT=X BETWEEN-0.10000 AND 204.10  
KABS= 0. TOLERANCE= 0.204200E-05

1296 NODES (OF 10212 DEFINED) SELECTED BY NSEL COMMAND.

SELECT ONLY ELEMENTS COMPLETELY CONTAINED WITHIN NODE SET.

1020 ELEMENTS (OF 8812 DEFINED) SELECTED FROM  
1296 SELECTED NODES BY ENOD COMMAND.

internal forces at Z = 0.0 LINE 5 1/2

RESELECT FOR ITEM=LOC COMPONENT=Z BETWEEN-0.10000 AND 0.10000  
KABS= 0. TOLERANCE= 0.200000E-08

72 NODES (OF 10212 DEFINED) SELECTED BY NSEL COMMAND.

NODE FOR MOMENT SUMMATION= 0  
MOMENT SUMMATION LOCATION= 102.000 -48.0000 0.00000

\*\*\*\*\* SUMMATION OF TOTAL FORCES AND MOMENTS IN GLOBAL COORDINATES \*\*\*\*\*  
FX = -392.5554  
FY = -33078.24  
FZ = -39019.69  
MX = 0.8543538E+08  
MY = 733309.1  
MZ = -7319.217



Appendix FPad-SH to Calculation PGE-009-CALC-006

SUMMATION POINT= 102.00 -48.000 0.0000  
next strip x = 204 to 408 Lines D to E

Select all nodes in pad only

ESEL FOR LABEL= TYPE FROM 2 TO 2 BY 1

1870 ELEMENTS (OF 8812 DEFINED) SELECTED BY ESEL COMMAND.

SELECT ALL NODES HAVING ANY ELEMENT IN ELEMENT SET.

2376 NODES (OF 10212 DEFINED) SELECTED FROM  
1870 SELECTED ELEMENTS BY NELE COMMAND.

select strip Z direction

RESELECT FOR ITEM=LOC COMPONENT=X BETWEEN 203.90 AND 408.10  
KABS= 0. TOLERANCE= 0.204200E-05

1296 NODES (OF 10212 DEFINED) SELECTED BY NSEL COMMAND.

SELECT ONLY ELEMENTS COMPLETELY CONTAINED WITHIN NODE SET.

1020 ELEMENTS (OF 8812 DEFINED) SELECTED FROM  
1296 SELECTED NODES BY ENOD COMMAND.

internal forces at Z = 0.0 LINE 5 1/2

RESELECT FOR ITEM=LOC COMPONENT=Z BETWEEN-0.10000 AND 0.10000  
KABS= 0. TOLERANCE= 0.200000E-08

72 NODES (OF 10212 DEFINED) SELECTED BY NSEL COMMAND.

NODE FOR MOMENT SUMMATION= 0  
MOMENT SUMMATION LOCATION= 306.000 -48.0000 0.00000

\*\*\*\*\* SUMMATION OF TOTAL FORCES AND MOMENTS IN GLOBAL COORDINATES \*\*\*\*\*  
FX = 923.6247  
FY = -35415.40  
FZ = -18571.40  
MX = 0.7921937E+08  
MY = -3314747.  
MZ = -63787.28

SUMMATION POINT= 306.00 -48.000 0.0000  
\*\*\*\*\*  
\*\*\*\*\*

SECTION THE PAD IN TO 4 EAST-WEST X-DIRECTION STRIPS

Select all nodes in pad only

ESEL FOR LABEL= TYPE FROM 2 TO 2 BY 1



Appendix FPad-SH to Calculation PGE-009-CALC-006

```
1870 ELEMENTS (OF      8812 DEFINED) SELECTED BY ESEL COMMAND.

SELECT      ALL NODES HAVING ANY ELEMENT IN ELEMENT SET.

2376 NODES (OF      10212 DEFINED) SELECTED FROM
1870 SELECTED ELEMENTS BY NELE COMMAND.

select strip x direction z = 0.0 to 102 Lines 5 1/2 to 6

RESELECT    FOR ITEM=LOC COMPONENT=Z      BETWEEN-0.10000      AND      102.10
KABS= 0.  TOLERANCE= 0.102200E-05

528 NODES (OF      10212 DEFINED) SELECTED BY NSEL COMMAND.

SELECT      ONLY ELEMENTS COMPLETELY CONTAINED WITHIN NODE SET.

360 ELEMENTS (OF      8812 DEFINED) SELECTED FROM
528 SELECTED NODES BY ENOD COMMAND.

internal forces at x = 0.0 LINE C

RESELECT    FOR ITEM=LOC COMPONENT=X      BETWEEN-0.10000      AND      0.10000
KABS= 0.  TOLERANCE= 0.200000E-08

48 NODES (OF      10212 DEFINED) SELECTED BY NSEL COMMAND.

NODE FOR MOMENT SUMMATION=      0
MOMENT SUMMATION LOCATION= 0.00000      -48.0000      51.0000

***** SUMMATION OF TOTAL FORCES AND MOMENTS IN GLOBAL COORDINATES *****
FX = -137829.5
FY = -28244.29
FZ = -191.3393
MX = -777.7775
MY = -30379.50
MZ = -0.4204211E+08

SUMMATION POINT= 0.0000      -48.000      51.000

SELECT      ALL NODES HAVING ANY ELEMENT IN ELEMENT SET.

528 NODES (OF      10212 DEFINED) SELECTED FROM
360 SELECTED ELEMENTS BY NELE COMMAND.

next strip z = 102 to 306 Lines 6 to 7

Select all nodes in pad only

ESEL FOR LABEL= TYPE FROM      2 TO      2 BY      1

1870 ELEMENTS (OF      8812 DEFINED) SELECTED BY ESEL COMMAND.
```



Appendix FPad-SH to Calculation PGE-009-CALC-006

SELECT ALL NODES HAVING ANY ELEMENT IN ELEMENT SET.

2376 NODES (OF 10212 DEFINED) SELECTED FROM  
1870 SELECTED ELEMENTS BY NELE COMMAND.

select strip x direction z = 102 to 306

RESELECT FOR ITEM=LOC COMPONENT=Z BETWEEN 101.90 AND 306.10  
KABS= 0. TOLERANCE= 0.204200E-05

924 NODES (OF 10212 DEFINED) SELECTED BY NSEL COMMAND.

SELECT ONLY ELEMENTS COMPLETELY CONTAINED WITHIN NODE SET.

720 ELEMENTS (OF 8812 DEFINED) SELECTED FROM  
924 SELECTED NODES BY ENOD COMMAND.

internal forces at x = 0.0 LINE C

RESELECT FOR ITEM=LOC COMPONENT=X BETWEEN-0.10000 AND 0.10000  
KABS= 0. TOLERANCE= 0.200000E-08

84 NODES (OF 10212 DEFINED) SELECTED BY NSEL COMMAND.

NODE FOR MOMENT SUMMATION= 0  
MOMENT SUMMATION LOCATION= 0.00000 -48.0000 204.000

\*\*\*\*\* SUMMATION OF TOTAL FORCES AND MOMENTS IN GLOBAL COORDINATES \*\*\*\*\*

FX = -314889.8  
FY = -57891.24  
FZ = -2604.722  
MX = 8196.450  
MY = -1373514.  
MZ = -0.8378861E+08

SUMMATION POINT= 0.0000 -48.000 204.00

SELECT ALL NODES HAVING ANY ELEMENT IN ELEMENT SET.

924 NODES (OF 10212 DEFINED) SELECTED FROM  
720 SELECTED ELEMENTS BY NELE COMMAND.

next strip z = 306 to 510 Lines 7 to 8

Select all nodes in pad only

ESEL FOR LABEL= TYPE FROM 2 TO 2 BY 1

1870 ELEMENTS (OF 8812 DEFINED) SELECTED BY ESEL COMMAND.

SELECT ALL NODES HAVING ANY ELEMENT IN ELEMENT SET.

2376 NODES (OF 10212 DEFINED) SELECTED FROM



Appendix FPad-SH to Calculation PGE-009-CALC-006

1870 SELECTED ELEMENTS BY NELE COMMAND.

select strip x direction z = 306 to 510

RESELECT FOR ITEM=LOC COMPONENT=Z BETWEEN 305.90 AND 510.10  
KABS= 0. TOLERANCE= 0.204200E-05

924 NODES (OF 10212 DEFINED) SELECTED BY NSEL COMMAND.

SELECT ONLY ELEMENTS COMPLETELY CONTAINED WITHIN NODE SET.

720 ELEMENTS (OF 8812 DEFINED) SELECTED FROM  
924 SELECTED NODES BY ENOD COMMAND.

internal forces at x = 0.0 LINE C

RESELECT FOR ITEM=LOC COMPONENT=X BETWEEN-0.10000 AND 0.10000  
KABS= 0. TOLERANCE= 0.200000E-08

84 NODES (OF 10212 DEFINED) SELECTED BY NSEL COMMAND.

NODE FOR MOMENT SUMMATION= 0  
MOMENT SUMMATION LOCATION= 0.00000 -48.0000 408.000

\*\*\*\*\* SUMMATION OF TOTAL FORCES AND MOMENTS IN GLOBAL COORDINATES \*\*\*\*\*

FX = -448136.0  
FY = -63084.03  
FZ = -8405.768  
MX = -305907.0  
MY = -2127001.  
MZ = -0.7960841E+08

SUMMATION POINT= 0.0000 -48.000 408.00

SELECT ALL NODES HAVING ANY ELEMENT IN ELEMENT SET.

924 NODES (OF 10212 DEFINED) SELECTED FROM  
720 SELECTED ELEMENTS BY NELE COMMAND.

next strip z = 510 to 630 Lines 8 to 10

Select all nodes in pad only

ESEL FOR LABEL= TYPE FROM 2 TO 2 BY 1

1870 ELEMENTS (OF 8812 DEFINED) SELECTED BY ESEL COMMAND.

SELECT ALL NODES HAVING ANY ELEMENT IN ELEMENT SET.

2376 NODES (OF 10212 DEFINED) SELECTED FROM  
1870 SELECTED ELEMENTS BY NELE COMMAND.

select strip x direction z = 510 to 630





Appendix FPad-SH to Calculation PGE-009-CALC-006

RESELECT FOR ITEM=LOC COMPONENT=Z BETWEEN 509.90 AND 630.10  
KABS= 0. TOLERANCE= 0.120200E-05

396 NODES (OF 10212 DEFINED) SELECTED BY NSEL COMMAND.

SELECT ONLY ELEMENTS COMPLETELY CONTAINED WITHIN NODE SET.

240 ELEMENTS (OF 8812 DEFINED) SELECTED FROM  
396 SELECTED NODES BY ENOD COMMAND.

internal forces at x = 0.0 LINE C

RESELECT FOR ITEM=LOC COMPONENT=X BETWEEN -0.10000 AND 0.10000  
KABS= 0. TOLERANCE= 0.200000E-08

36 NODES (OF 10212 DEFINED) SELECTED BY NSEL COMMAND.

NODE FOR MOMENT SUMMATION= 0  
MOMENT SUMMATION LOCATION= 0.00000 -48.0000 570.000

\*\*\*\*\* SUMMATION OF TOTAL FORCES AND MOMENTS IN GLOBAL COORDINATES \*\*\*\*\*

FX = -288218.4  
FY = -31288.21  
FZ = -3202.622  
MX = -332202.2  
MY = 1880875.  
MZ = -0.4046600E+08

SUMMATION POINT= 0.0000 -48.000 570.00

8812 ELEMENTS (OF 8812 DEFINED) SELECTED BY EALL COMMAND.

10212 NODES (OF 10212 DEFINED) SELECTED BY NALL COMMAND.

\*\*\*\*\*  
\*\*\*\*\*

EXIT THE ANSYS POST1 DATABASE PROCESSOR

\*\*\*\*\* ROUTINE COMPLETED \*\*\*\*\* CP = 2.213

PURGE ALL SOLUTION AND POST DATA  
SAVE ALL MODEL DATA

ALL CURRENT ANSYS DATA WRITTEN TO FILE NAME= PadSh.db  
FOR POSSIBLE RESUME FROM THIS POINT

NUMBER OF WARNING MESSAGES ENCOUNTERED= 0  
NUMBER OF ERROR MESSAGES ENCOUNTERED= 0



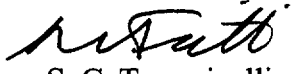
*-----*			
ANSYS RUN COMPLETED			
-----			
Release 6.0	UP20010919	INTEL NT	
-----			
Maximum Scratch Memory Used	=	1034776 Words	3.947 MB
-----			
CP Time	(sec) =	2.714	Time = 19:40:58
Elapsed Time	(sec) =	5.000	Date = 01/23/2002
*-----*			



**ENERCON  
SERVICES, INC.**

Sheet 1 of 25

**Appendix FTPad-SH to Calculation PGE-009-CALC-006**

  
Originator: S. C. Tumminelli  
Date: September 20, 2002  
Revised: March 3, 2003

**Appendix FTPad-SH**

This Appendix presents the ANSYS output file for the pad internal forces for the top 12 and top 6 inches for the shrinkage stress analysis. This analysis was performed using the constrained model.



**ANSYS file for the top 12 inches:**

ANSYS/Mechanical U

```
*-----*
| W E L C O M E   T O   T H E   A N S Y S   P R O G R A M |
|-----|
*-----*
```

```
*****
*                               ANSYS 6.0 NOTICES                               *
*****
*
* Copyright 2001 SAS IP, Inc. All rights reserved.
* Unpublished---rights reserved under the Copyright Laws of
* the United States.
*
*
* U.S. GOVERNMENT RIGHTS
*
* Use, duplication, or disclosure by the U.S. Government is
* subject to restrictions set forth in the ANSYS, Inc.
* license agreement and as provided in DFARS 227.7202-1(a)
* and 227.7202-3(a)(1995), DFARS 252.227-7013(c)(1)(ii) (OCT
* 1988), FAR 12.212(a)(1995), FAR 52.227-19, or FAR52.227-14
* (ALT III), as applicable. ANSYS, Inc.
*
* THIS SOFTWARE CONTAINS CONFIDENTIAL INFORMATION AND TRADE
* SECRETS OF SAS IP, INC. USE, DISCLOSURE, OR REPRODUCTION
* IS PROHIBITED WITHOUT THE PRIOR EXPRESS WRITTEN PERMISSION
* OF SAS IP, INC.
*****
```

```
*****
* The Program also contains the following licensed software: *
*****
* PCGLSS: Linear Equations Solver
*
* (C) Copyright 1992-1995 Computational Applications and
*                               System Integration Inc.
* All Rights Reserved.
*
* CA&SI, 2004 S. Wright Street, Urbana, IL 61821
* Ph (217)244-7875
* Fax (217)244-7874
*
* CA&SI DOES NOT GUARANTEE THE CORRECTNESS OR USEFULNESS OF
* THE RESULTS OBTAINED USING PCGLSS. CA&SI IS NOT LIABLE FOR
* ANY CONCLUSIONS OR ACTIONS BASED ON THE RESULTS. IT IS THE
```



Appendix FTPad-SH to Calculation PGE-009-CALC-006

\* RESPONSIBILITY OF THE USER TO CONFIRM THE ACCURACY AND \*  
\* USEFULNESS OF THE RESULTS. \*  
\*\*\*\*\*

Completing ANSYS Load Process.

\*\*\*\*\* ANSYS COMMAND LINE ARGUMENTS \*\*\*\*\*

INITIAL JOBNAME = PadSh  
BATCH MODE REQUESTED = LIST  
MEMORY REQUESTED (MB) = 520  
DATABASE SIZE REQUESTED (MB) = 150

00150104 VERSION=INTEL NT RELEASE= 6.0 UP20010919  
CURRENT JOBNAME=PadSh 10:56:03 JAN 28, 2002 CP= 0.140

```
1 /com,
2 /COM
3 /com
4 /com, This routine processes load results data for the
5 /com, evaluation of pad internal forces and moments
6 /com, for the top 12 inches of the pad
7 /com
8 /com *****
9 /com *****
10 /com
11 /file,PadSh
12 resume
13 /HEADER,ON,OFF,OFF,OFF,ON,OFF
14 /post1
15 eall
16 nall
17 /com
18 /com *****
19 /com ***** SET 1 *****
20 SET,1
21 /COM
22 /COM SECTION THE PAD IN TO 2 NORTH-SOUTH Z-DIRECTION STRIPS
23 /com
24 /com Select all nodes in pad only
25 /com
26 esel,type,2
27 nelem
28 /com
29 /com select strip Z direction x = 0 to 204 Lines C to D
30 /com
31 nsel,r,loc,x,-0.1,204.1
32 enode,1
33 /com
34 /com internal forces at Z = 0.0 LINE 5 1/2
35 /com
36 nsel,r,loc,z,-0.1,0.1
37 nsel,r,loc,y,0.1,-12.1
38 spoint,,102,-6.0,0.0
39 fsum
40 /com next strip x = 204 to 408 Lines D to E
```



```
41 /com
42 /com      Select all nodes in pad only
43 /com
44 esel,type,2
45 nelem
46 /com
47 /com      select strip Z direction
48 /com
49 nsel,r,loc,x,203.9,408.1
50 nsel,r,loc,y,0.1,-12.1
51 enode,1
52 /com
53 /com      internal forces at Z = 0.0      LINE 5 1/2
54 /com
55 nsel,r,loc,z,-0.1,0.1
56 spoint,,306,-6.0,0.0
57 fsum
58 /com *****
59 /com *****
60 /com
61 /COM      SECTION THE PAD IN TO 4 EAST-WEST X-DIRECTION STRIPS
62 /COM
63 /com      Select all nodes in pad only
64 /com
65 esel,type,2
66 nelem
67 /com
68 /com      select strip x direction z = 0.0 to 102 Lines 5 1/2 to 6
69 /com
70 nsel,r,loc,z,-0.1,102.1
71 nsel,r,loc,y,0.1,-12.1
72 enode,1
73 /com
74 /com      internal forces at x = 0.0      LINE C
75 /com
76 nsel,r,loc,x,-0.1,0.1
77 spoint,,0.0,-6.0,51.0
78 fsum
79 nelem
80 /com
81 /com      next strip z = 102 to 306 Lines 6 to 7
82 /com
83 /com
84 /com      Select all nodes in pad only
85 /com
86 esel,type,2
87 nelem
88 /com
89 /com      select strip x direction z = 102 to 306
90 /com
91 nsel,r,loc,z,101.9,306.1
92 nsel,r,loc,y,0.1,-12.1
93 enode,1
94 /com
95 /com      internal forces at x = 0.0      LINE C
96 /com
97 nsel,r,loc,x,-0.1,0.1
```



```
98  spoint,,0.0,-6.0,204.0
99  fsum
100 nelem
101 /com
102 /com      next strip z = 306 to 510 Lines 7 to 8
103 /com
104 /com
105 /com      Select all nodes in pad only
106 /com
107 esel,type,2
108 nelem
109 /com
110 /com      select strip x direction z = 306 to 510
111 /com
112 nsel,r,loc,z,305.9,510.1
113 nsel,r,loc,y,0.1,-12.1
114 enode,1
115 /com
116 /com      internal forces at x = 0.0      LINE C
117 /com
118 nsel,r,loc,x,-0.1,0.1
119 spoint,,0.0,-6.0,408.0
120 fsum
121 nelem
122 /com
123 /com      next strip z = 510 to 630 Lines 8 to 10
124 /com
125 /com
126 /com      Select all nodes in pad only
127 /com
128 esel,type,2
129 nelem
130 /com
131 /com      select strip x direction z = 510 to 630
132 /com
133 nsel,r,loc,z,509.9,630.1
134 nsel,r,loc,y,0.1,-12.1
135 enode,1
136 /com
137 /com      internal forces at x = 0.0      LINE C
138 /com
139 nsel,r,loc,x,-0.1,0.1
140 spoint,,0.0,-6.0,570.0
141 fsum
142 eall
143 nall
144 /com
145 /com *****
146 /com *****
147 fini
148 /exit
```

RUN SETUP PROCEDURE FROM FILE= C:\PROGRAM FILES\ANSYS  
INC\ANSYS60\docu\start60.ans

/INPUT FILE= C:\PROGRAM FILES\ANSYS INC\ANSYS60\docu\start60.ans LINE=

0



Appendix FTPad-SH to Calculation PGE-009-CALC-006

This routine processes load results data for the  
evaluation of pad internal forces and moments  
for the top 12 inches of the pad

\*\*\*\*\*  
\*\*\*\*\*

CURRENT JOBNAME REDEFINED AS PadSh

RESUME ANSYS DATA FROM FILE NAME=PadSh.db

\*\*\* ANSYS GLOBAL STATUS \*\*\*

TITLE = Shrinkage at 117 days and Deadweight

ANALYSIS TYPE = STATIC (STEADY-STATE)

NUMBER OF ELEMENT TYPES = 5

8812 ELEMENTS CURRENTLY SELECTED. MAX ELEMENT NUMBER = 9341

10212 NODES CURRENTLY SELECTED. MAX NODE NUMBER = 10212

166 KEYPOINTS CURRENTLY SELECTED. MAX KEYPOINT NUMBER = 166

339 LINES CURRENTLY SELECTED. MAX LINE NUMBER = 339

2 AREAS CURRENTLY SELECTED. MAX AREA NUMBER = 224

48 VOLUMES CURRENTLY SELECTED. MAX VOL. NUMBER = 48

22 COMPONENTS CURRENTLY DEFINED

MAXIMUM LINEAR PROPERTY NUMBER = 2

MAXIMUM REAL CONSTANT SET NUMBER = 1

ACTIVE COORDINATE SYSTEM = 0 (CARTESIAN)

MAXIMUM COUPLED D.O.F. SET NUMBER = 367

NUMBER OF SPECIFIED CONSTRAINTS = 4657

INITIAL JOBNAME = PadSh

CURRENT JOBNAME = PadSh

PRINT HEADER

DO NOT PRINT SUBTITLE(S)

DO NOT PRINT LOAD STEP ID

DO NOT PRINT NOTE LINE(S)

PRINT COLUMN HEADER LABELS

DO NOT PRINT REPORT TOTALS

1

\*\*\*\*\* ANSYS - ENGINEERING ANALYSIS SYSTEM RELEASE 6.0 \*\*\*\*\*

ANSYS/Mechanical U

00150104 VERSION=INTEL NT 10:56:03 JAN 28, 2002 CP= 0.561

Shrinkage at 117 days and Deadweight

\*\*\*\*\* ANSYS RESULTS INTERPRETATION (POST1) \*\*\*\*\*

\*\*\* NOTE \*\*\* CP= 0.561 TIME= 10:56:03

Reading results into the database (SET command) will update the current  
displacement and force boundary conditions in the database with the  
values from the results file for that load set. Note that any





Appendix FTPad-SH to Calculation PGE-009-CALC-006

subsequent solutions will use these values unless action is taken to either SAVE the current values or not overwrite them (/EXIT,NOSAVE).

8812 ELEMENTS (OF 8812 DEFINED) SELECTED BY EALL COMMAND.

10212 NODES (OF 10212 DEFINED) SELECTED BY NALL COMMAND.

\*\*\*\*\*  
\*\*\*\*\* SET 1 \*\*\*\*\*

USE LOAD STEP 1 SUBSTEP 0 FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP= 1 SUBSTEP= 1 CUMULATIVE ITERATION= 16  
TIME/FREQUENCY= 1.0000  
TITLE= Shrinkage at 117 days and Deadweight

SECTION THE PAD IN TO 2 NORTH-SOUTH Z-DIRECTION STRIPS

Select all nodes in pad only

ESEL FOR LABEL= TYPE FROM 2 TO 2 BY 1

1870 ELEMENTS (OF 8812 DEFINED) SELECTED BY ESEL COMMAND.

SELECT ALL NODES HAVING ANY ELEMENT IN ELEMENT SET.

2376 NODES (OF 10212 DEFINED) SELECTED FROM  
1870 SELECTED ELEMENTS BY NELE COMMAND.

select strip Z direction x = 0 to 204 Lines C to D

RESELECT FOR ITEM=LOC COMPONENT=X BETWEEN-0.10000 AND 204.10  
KABS= 0. TOLERANCE= 0.204200E-05

1296 NODES (OF 10212 DEFINED) SELECTED BY NSEL COMMAND.

SELECT ONLY ELEMENTS COMPLETELY CONTAINED WITHIN NODE SET.

1020 ELEMENTS (OF 8812 DEFINED) SELECTED FROM  
1296 SELECTED NODES BY ENOD COMMAND.

internal forces at Z = 0.0 LINE 5 1/2

RESELECT FOR ITEM=LOC COMPONENT=Z BETWEEN-0.10000 AND 0.10000  
KABS= 0. TOLERANCE= 0.200000E-08

72 NODES (OF 10212 DEFINED) SELECTED BY NSEL COMMAND.

RESELECT FOR ITEM=LOC COMPONENT=Y BETWEEN -12.100 AND 0.10000  
KABS= 0. TOLERANCE= 0.122000E-06

18 NODES (OF 10212 DEFINED) SELECTED BY NSEL COMMAND.



Appendix FTPad-SH to Calculation PGE-009-CALC-006

NODE FOR MOMENT SUMMATION= 0  
MOMENT SUMMATION LOCATION= 102.000 -6.00000 0.00000

\*\*\*\*\* SUMMATION OF TOTAL FORCES AND MOMENTS IN GLOBAL COORDINATES \*\*\*\*\*

FX = 14891.89  
FY = 1462.558  
FZ = 1510694.  
MX = 3306212.  
MY = 387291.4  
MZ = 170310.3

SUMMATION POINT= 102.00 -6.0000 0.0000  
next strip x = 204 to 408 Lines D to E

Select all nodes in pad only

ESEL FOR LABEL= TYPE FROM 2 TO 2 BY 1

1870 ELEMENTS (OF 8812 DEFINED) SELECTED BY ESEL COMMAND.

SELECT ALL NODES HAVING ANY ELEMENT IN ELEMENT SET.

2376 NODES (OF 10212 DEFINED) SELECTED FROM  
1870 SELECTED ELEMENTS BY NELE COMMAND.

select strip Z direction

RESELECT FOR ITEM=LOC COMPONENT=X BETWEEN 203.90 AND 408.10  
KABS= 0. TOLERANCE= 0.204200E-05

1296 NODES (OF 10212 DEFINED) SELECTED BY NSEL COMMAND.

RESELECT FOR ITEM=LOC COMPONENT=Y BETWEEN -12.100 AND 0.10000  
KABS= 0. TOLERANCE= 0.122000E-06

324 NODES (OF 10212 DEFINED) SELECTED BY NSEL COMMAND.

SELECT ONLY ELEMENTS COMPLETELY CONTAINED WITHIN NODE SET.

170 ELEMENTS (OF 8812 DEFINED) SELECTED FROM  
324 SELECTED NODES BY ENOD COMMAND.

internal forces at Z = 0.0 LINE 5 1/2

RESELECT FOR ITEM=LOC COMPONENT=Z BETWEEN -0.10000 AND 0.10000  
KABS= 0. TOLERANCE= 0.200000E-08

18 NODES (OF 10212 DEFINED) SELECTED BY NSEL COMMAND.

NODE FOR MOMENT SUMMATION= 0  
MOMENT SUMMATION LOCATION= 306.000 -6.00000 0.00000

\*\*\*\*\* SUMMATION OF TOTAL FORCES AND MOMENTS IN GLOBAL COORDINATES \*\*\*\*\*

FX = 21.61996



Appendix FTPad-SH to Calculation PGE-009-CALC-006

FY = -3748.838  
FZ = 1419874.  
MX = 3467140.  
MY = 2185203.  
MZ = -1841.302

SUMMATION POINT= 306.00 -6.0000 0.0000  
\*\*\*\*\*  
\*\*\*\*\*

SECTION THE PAD IN TO 4 EAST-WEST X-DIRECTION STRIPS

Select all nodes in pad only

ESEL FOR LABEL= TYPE FROM 2 TO 2 BY 1

1870 ELEMENTS (OF 8812 DEFINED) SELECTED BY ESEL COMMAND.

SELECT ALL NODES HAVING ANY ELEMENT IN ELEMENT SET.

2376 NODES (OF 10212 DEFINED) SELECTED FROM  
1870 SELECTED ELEMENTS BY NELE COMMAND.

select strip x direction z = 0.0 to 102 Lines 5 1/2 to 6

RESELECT FOR ITEM=LOC COMPONENT=Z BETWEEN-0.10000 AND 102.10  
KABS= 0. TOLERANCE= 0.102200E-05

528 NODES (OF 10212 DEFINED) SELECTED BY NSEL COMMAND.

RESELECT FOR ITEM=LOC COMPONENT=Y BETWEEN -12.100 AND 0.10000  
KABS= 0. TOLERANCE= 0.122000E-06

132 NODES (OF 10212 DEFINED) SELECTED BY NSEL COMMAND.

SELECT ONLY ELEMENTS COMPLETELY CONTAINED WITHIN NODE SET.

60 ELEMENTS (OF 8812 DEFINED) SELECTED FROM  
132 SELECTED NODES BY ENOD COMMAND.

internal forces at x = 0.0 LINE C

RESELECT FOR ITEM=LOC COMPONENT=X BETWEEN-0.10000 AND 0.10000  
KABS= 0. TOLERANCE= 0.200000E-08

12 NODES (OF 10212 DEFINED) SELECTED BY NSEL COMMAND.

NODE FOR MOMENT SUMMATION= 0  
MOMENT SUMMATION LOCATION= 0.00000 -6.00000 51.0000

\*\*\*\*\* SUMMATION OF TOTAL FORCES AND MOMENTS IN GLOBAL COORDINATES \*\*\*\*\*  
FX = 718834.5  
FY = -2272.945  
FZ = -34.26578



MX = 26.58270  
MY = -4395.688  
MZ = -1754228.

SUMMATION POINT= 0.0000 -6.0000 51.000

SELECT ALL NODES HAVING ANY ELEMENT IN ELEMENT SET.

132 NODES (OF 10212 DEFINED) SELECTED FROM  
60 SELECTED ELEMENTS BY NELE COMMAND.

next strip z = 102 to 306 Lines 6 to 7

Select all nodes in pad only

ESEL FOR LABEL= TYPE FROM 2 TO 2 BY 1

1870 ELEMENTS (OF 8812 DEFINED) SELECTED BY ESEL COMMAND.

SELECT ALL NODES HAVING ANY ELEMENT IN ELEMENT SET.

2376 NODES (OF 10212 DEFINED) SELECTED FROM  
1870 SELECTED ELEMENTS BY NELE COMMAND.

select strip x direction z = 102 to 306

RESELECT FOR ITEM=LOC COMPONENT=Z BETWEEN 101.90 AND 306.10  
KABS= 0. TOLERANCE= 0.204200E-05

924 NODES (OF 10212 DEFINED) SELECTED BY NSEL COMMAND.

RESELECT FOR ITEM=LOC COMPONENT=Y BETWEEN -12.100 AND 0.10000  
KABS= 0. TOLERANCE= 0.122000E-06

231 NODES (OF 10212 DEFINED) SELECTED BY NSEL COMMAND.

SELECT ONLY ELEMENTS COMPLETELY CONTAINED WITHIN NODE SET.

120 ELEMENTS (OF 8812 DEFINED) SELECTED FROM  
231 SELECTED NODES BY ENOD COMMAND.

internal forces at x = 0.0 LINE C

RESELECT FOR ITEM=LOC COMPONENT=X BETWEEN -0.10000 AND 0.10000  
KABS= 0. TOLERANCE= 0.200000E-08

21 NODES (OF 10212 DEFINED) SELECTED BY NSEL COMMAND.

NODE FOR MOMENT SUMMATION= 0  
MOMENT SUMMATION LOCATION= 0.00000 -6.00000 204.000

\*\*\*\*\* SUMMATION OF TOTAL FORCES AND MOMENTS IN GLOBAL COORDINATES \*\*\*\*\*  
FX = 1430751.



FY = -4590.278  
FZ = -630.8487  
MX = 1875.998  
MY = -257829.3  
MZ = -3508909.

SUMMATION POINT= 0.0000 -6.0000 204.00

SELECT ALL NODES HAVING ANY ELEMENT IN ELEMENT SET.

231 NODES (OF 10212 DEFINED) SELECTED FROM  
120 SELECTED ELEMENTS BY NELE COMMAND.

next strip z = 306 to 510 Lines 7 to 8

Select all nodes in pad only

ESEL FOR LABEL= TYPE FROM 2 TO 2 BY 1

1870 ELEMENTS (OF 8812 DEFINED) SELECTED BY ESEL COMMAND.

SELECT ALL NODES HAVING ANY ELEMENT IN ELEMENT SET.

2376 NODES (OF 10212 DEFINED) SELECTED FROM  
1870 SELECTED ELEMENTS BY NELE COMMAND.

select strip x direction z = 306 to 510

RESELECT FOR ITEM=LOC COMPONENT=Z BETWEEN 305.90 AND 510.10  
KABS= 0. TOLERANCE= 0.204200E-05

924 NODES (OF 10212 DEFINED) SELECTED BY NSEL COMMAND.

RESELECT FOR ITEM=LOC COMPONENT=Y BETWEEN -12.100 AND 0.10000  
KABS= 0. TOLERANCE= 0.122000E-06

231 NODES (OF 10212 DEFINED) SELECTED BY NSEL COMMAND.

SELECT ONLY ELEMENTS COMPLETELY CONTAINED WITHIN NODE SET.

120 ELEMENTS (OF 8812 DEFINED) SELECTED FROM  
231 SELECTED NODES BY ENOD COMMAND.

internal forces at x = 0.0 LINE C

RESELECT FOR ITEM=LOC COMPONENT=X BETWEEN -0.10000 AND 0.10000  
KABS= 0. TOLERANCE= 0.200000E-08

21 NODES (OF 10212 DEFINED) SELECTED BY NSEL COMMAND.

NODE FOR MOMENT SUMMATION= 0  
MOMENT SUMMATION LOCATION= 0.00000 -6.00000 408.000



Appendix FTPad-SH to Calculation PGE-009-CALC-006

\*\*\*\*\* SUMMATION OF TOTAL FORCES AND MOMENTS IN GLOBAL COORDINATES \*\*\*\*\*

FX = 1384017.  
FY = -4848.322  
FZ = -3569.679  
MX = 3766.729  
MY = -1422260.  
MZ = -3500475.

SUMMATION POINT= 0.0000 -6.0000 408.00

SELECT ALL NODES HAVING ANY ELEMENT IN ELEMENT SET.

231 NODES (OF 10212 DEFINED) SELECTED FROM  
120 SELECTED ELEMENTS BY NELE COMMAND.

next strip z = 510 to 630 Lines 8 to 10

Select all nodes in pad only

ESEL FOR LABEL= TYPE FROM 2 TO 2 BY 1

1870 ELEMENTS (OF 8812 DEFINED) SELECTED BY ESEL COMMAND.

SELECT ALL NODES HAVING ANY ELEMENT IN ELEMENT SET.

2376 NODES (OF 10212 DEFINED) SELECTED FROM  
1870 SELECTED ELEMENTS BY NELE COMMAND.

select strip x direction z = 510 to 630

RESELECT FOR ITEM=LOC COMPONENT=Z BETWEEN 509.90 AND 630.10  
KABS= 0. TOLERANCE= 0.120200E-05

396 NODES (OF 10212 DEFINED) SELECTED BY NSEL COMMAND.

RESELECT FOR ITEM=LOC COMPONENT=Y BETWEEN -12.100 AND 0.10000  
KABS= 0. TOLERANCE= 0.122000E-06

99 NODES (OF 10212 DEFINED) SELECTED BY NSEL COMMAND.

SELECT ONLY ELEMENTS COMPLETELY CONTAINED WITHIN NODE SET.

40 ELEMENTS (OF 8812 DEFINED) SELECTED FROM  
99 SELECTED NODES BY ENOD COMMAND.

internal forces at x = 0.0 LINE C

RESELECT FOR ITEM=LOC COMPONENT=X BETWEEN -0.10000 AND 0.10000  
KABS= 0. TOLERANCE= 0.200000E-08

9 NODES (OF 10212 DEFINED) SELECTED BY NSEL COMMAND.

NODE FOR MOMENT SUMMATION= 0



Appendix FTPad-SH to Calculation PGE-009-CALC-006

MOMENT SUMMATION LOCATION= 0.00000 -6.00000 570.000

\*\*\*\*\* SUMMATION OF TOTAL FORCES AND MOMENTS IN GLOBAL COORDINATES \*\*\*\*\*

FX = 752669.1  
FY = -2670.776  
FZ = -2149.334  
MX = -4752.461  
MY = -789838.4  
MZ = -2027422.

SUMMATION POINT= 0.0000 -6.0000 570.00

8812 ELEMENTS (OF 8812 DEFINED) SELECTED BY EALL COMMAND.

10212 NODES (OF 10212 DEFINED) SELECTED BY NALL COMMAND.

\*\*\*\*\*  
\*\*\*\*\*

EXIT THE ANSYS POST1 DATABASE PROCESSOR

\*\*\*\*\* ROUTINE COMPLETED \*\*\*\*\* CP = 2.063

PURGE ALL SOLUTION AND POST DATA  
SAVE ALL MODEL DATA

ALL CURRENT ANSYS DATA WRITTEN TO FILE NAME= PadSh.db  
FOR POSSIBLE RESUME FROM THIS POINT

NUMBER OF WARNING MESSAGES ENCOUNTERED= 0  
NUMBER OF ERROR MESSAGES ENCOUNTERED= 0

```
*-----*
|                                     |
|               ANSYS RUN COMPLETED               |
|-----|
|               Release 6.0               UP20010919               INTEL NT               |
|-----|
| Maximum Scratch Memory Used           =           1034776 Words           3.947 MB           |
|-----|
|               CP Time      (sec) =           2.524           Time = 10:56:06           |
|               Elapsed Time (sec) =           6.000           Date  = 01/28/2002           |
|-----|
*-----*
```



**ANSYS file for the top 6 inches:**

ANSYS/Mechanical U

```
*-----*
| W E L C O M E   T O   T H E   A N S Y S   P R O G R A M |
|-----|
*-----*
```

```
*****
*                               ANSYS 6.0 NOTICES                               *
*****
*
* Copyright 2001 SAS IP, Inc. All rights reserved.
* Unpublished---rights reserved under the Copyright Laws of
* the United States.
*
*
* U.S. GOVERNMENT RIGHTS
*
* Use, duplication, or disclosure by the U.S. Government is
* subject to restrictions set forth in the ANSYS, Inc.
* license agreement and as provided in DFARS 227.7202-1(a)
* and 227.7202-3(a)(1995), DFARS 252.227-7013(c)(1)(ii) (OCT
* 1988), FAR 12.212(a)(1995), FAR 52.227-19, or FAR52.227-14
* (ALT III), as applicable. ANSYS, Inc.
*
* THIS SOFTWARE CONTAINS CONFIDENTIAL INFORMATION AND TRADE
* SECRETS OF SAS IP, INC. USE, DISCLOSURE, OR REPRODUCTION
* IS PROHIBITED WITHOUT THE PRIOR EXPRESS WRITTEN PERMISSION
* OF SAS IP, INC.
*****
```

```
*****
* The Program also contains the following licensed software: *
*****
* PCGLSS: Linear Equations Solver
*
* (C) Copyright 1992-1995 Computational Applications and
*                               System Integration Inc.
* All Rights Reserved.
*
* CA&SI, 2004 S. Wright Street, Urbana, IL 61821
* Ph (217)244-7875
* Fax (217)244-7874
*
* CA&SI DOES NOT GUARANTEE THE CORRECTNESS OR USEFULNESS OF
* THE RESULTS OBTAINED USING PCGLSS. CA&SI IS NOT LIABLE FOR
* ANY CONCLUSIONS OR ACTIONS BASED ON THE RESULTS. IT IS THE
```





Appendix FTPad-SH to Calculation PGE-009-CALC-006

\* RESPONSIBILITY OF THE USER TO CONFIRM THE ACCURACY AND \*  
\* USEFULNESS OF THE RESULTS. \*  
\*\*\*\*\*

Completing ANSYS Load Process.

\*\*\*\*\* ANSYS COMMAND LINE ARGUMENTS \*\*\*\*\*  
INITIAL JOBNAME = PadSh  
BATCH MODE REQUESTED = LIST  
MEMORY REQUESTED (MB) = 520  
DATABASE SIZE REQUESTED (MB) = 150

00150104 VERSION=INTEL NT RELEASE= 6.0 UP20010919  
CURRENT JOBNAME=PadSh 10:59:54 JAN 28, 2002 CP= 0.140

```
1 /com,
2 /COM
3 /com
4 /com,      This routine processes load results data for the
5 /com,      evaluation of pad internal forces and moments
6 /com,      for the top 6 inches of the pad
7 /com
8 /com *****
9 /com *****
10 /com
11 /file,PadSh
12 resume
13 /HEADER,ON,OFF,OFF,OFF,ON,OFF
14 /post1
15 e
16 nall
17 /com
18 /com *****
19 /com ***** SET 1 *****
20 SET,1
21 /COM
22 /COM      SECTION THE PAD IN TO 2 NORTH-SOUTH Z-DIRECTION STRIPS
23 /com
24 /com      Select all nodes in pad only
25 /com
26 esel,type,2
27 nelem
28 /com
29 /com      select strip Z direction x = 0 to 204 Lines C to D
30 /com
31 nsel,r,loc,x,-0.1,204.1
32 enode,1
33 /com
34 /com      internal forces at Z = 0.0      LINE 5 1/2
35 /com
36 nsel,r,loc,z,-0.1,0.1
37 nsel,r,loc,y,0.1,-6.1
38 spoint,,102,-3.0,0.0
39 fsum
40 /com      next strip x = 204 to 408 Lines D to E
```



```
41 /com
42 /com      Select all nodes in pad only
43 /com
44 esel,type,2
45 nelem
46 /com
47 /com      select strip Z direction
48 /com
49 nsel,r,loc,x,203.9,408.1
50 nsel,r,loc,y,0.1,-6.1
51 enode,1
52 /com
53 /com      internal forces at Z = 0.0      LINE 5 1/2
54 /com
55 nsel,r,loc,z,-0.1,0.1
56 spoint,,306,-3.0,0.0
57 fsum
58 /com *****
59 /com *****
60 /com
61 /COM      SECTION THE PAD IN TO 4 EAST-WEST X-DIRECTION STRIPS
62 /COM
63 /com      Select all nodes in pad only
64 /com
65 esel,type,2
66 nelem
67 /com
68 /com      select strip x direction z = 0.0 to 102 Lines 5 1/2 to 6
69 /com
70 nsel,r,loc,z,-0.1,102.1
71 nsel,r,loc,y,0.1,-6.1
72 enode,1
73 /com
74 /com      internal forces at x = 0.0      LINE C
75 /com
76 nsel,r,loc,x,-0.1,0.1
77 spoint,,0.0,-3.0,51.0
78 fsum
79 nelem
80 /com
81 /com      next strip z = 102 to 306 Lines 6 to 7
82 /com
83 /com
84 /com      Select all nodes in pad only
85 /com
86 esel,type,2
87 nelem
88 /com
89 /com      select strip x direction z = 102 to 306
90 /com
91 nsel,r,loc,z,101.9,306.1
92 nsel,r,loc,y,0.1,-6.1
93 enode,1
94 /com
95 /com      internal forces at x = 0.0      LINE C
96 /com
97 nsel,r,loc,x,-0.1,0.1
```



```
98  spoint,,0.0,-3.0,204.0
99  fsum
100 nelem
101 /com
102 /com      next strip z = 306 to 510 Lines 7 to 8
103 /com
104 /com
105 /com      Select all nodes in pad only
106 /com
107 esel,type,2
108 nelem
109 /com
110 /com      select strip x direction z = 306 to 510
111 /com
112 nsel,r,loc,z,305.9,510.1
113 nsel,r,loc,y,0.1,-6.1
114 enode,1
115 /com
116 /com      internal forces at x = 0.0      LINE C
117 /com
118 nsel,r,loc,x,-0.1,0.1
119 spoint,,0.0,-3.0,408.0
120 fsum
121 nelem
122 /com
123 /com      next strip z = 510 to 630 Lines 8 to 10
124 /com
125 /com
126 /com      Select all nodes in pad only
127 /com
128 esel,type,2
129 nelem
130 /com
131 /com      select strip x direction z = 510 to 630
132 /com
133 nsel,r,loc,z,509.9,630.1
134 nsel,r,loc,y,0.1,-6.1
135 enode,1
136 /com
137 /com      internal forces at x = 0.0      LINE C
138 /com
139 nsel,r,loc,x,-0.1,0.1
140 spoint,,0.0,-3.0,570.0
141 fsum
142 eall
143 nall
144 /com
145 /com *****
146 /com *****
147 fini
148 /exit
```

RUN SETUP PROCEDURE FROM FILE= C:\PROGRAM FILES\ANSYS  
INC\ANSYS60\docu\start60.ans

/INPUT FILE= C:\PROGRAM FILES\ANSYS INC\ANSYS60\docu\start60.ans LINE=

0



This routine processes load results data for the  
evaluation of pad internal forces and moments  
for the top 6 inches of the pad

\*\*\*\*\*  
\*\*\*\*\*

CURRENT JOBNAME REDEFINED AS PadSh

RESUME ANSYS DATA FROM FILE NAME=PadSh.db

\*\*\* ANSYS GLOBAL STATUS \*\*\*

TITLE = Shrinkage at 117 days and Deadweight

ANALYSIS TYPE = STATIC (STEADY-STATE)

NUMBER OF ELEMENT TYPES = 5

8812 ELEMENTS CURRENTLY SELECTED. MAX ELEMENT NUMBER = 9341

10212 NODES CURRENTLY SELECTED. MAX NODE NUMBER = 10212

166 KEYPOINTS CURRENTLY SELECTED. MAX KEYPOINT NUMBER = 166

339 LINES CURRENTLY SELECTED. MAX LINE NUMBER = 339

2 AREAS CURRENTLY SELECTED. MAX AREA NUMBER = 224

48 VOLUMES CURRENTLY SELECTED. MAX VOL. NUMBER = 48

22 COMPONENTS CURRENTLY DEFINED

MAXIMUM LINEAR PROPERTY NUMBER = 2

MAXIMUM REAL CONSTANT SET NUMBER = 1

ACTIVE COORDINATE SYSTEM = 0 (CARTESIAN)

MAXIMUM COUPLED D.O.F. SET NUMBER = 367

NUMBER OF SPECIFIED CONSTRAINTS = 4657

INITIAL JOBNAME = PadSh

CURRENT JOBNAME = PadSh

PRINT HEADER

DO NOT PRINT SUBTITLE(S)

DO NOT PRINT LOAD STEP ID

DO NOT PRINT NOTE LINE(S)

PRINT COLUMN HEADER LABELS

DO NOT PRINT REPORT TOTALS

1

\*\*\*\*\* ANSYS - ENGINEERING ANALYSIS SYSTEM RELEASE 6.0 \*\*\*\*\*

ANSYS/Mechanical U

00150104 VERSION=INTEL NT 10:59:54 JAN 28, 2002 CP= 0.601

Shrinkage at 117 days and Deadweight

\*\*\*\*\* ANSYS RESULTS INTERPRETATION (POST1) \*\*\*\*\*

\*\*\* NOTE \*\*\* CP= 0.601 TIME= 10:59:54

Reading results into the database (SET command) will update the current  
displacement and force boundary conditions in the database with the  
values from the results file for that load set. Note that any



Appendix FTPad-SH to Calculation PGE-009-CALC-006

subsequent solutions will use these values unless action is taken to either SAVE the current values or not overwrite them (/EXIT,NOSAVE).

\*\*\* WARNING \*\*\* CP= 0.601 TIME= 10:59:54  
E is not a recognized POST1 command, abbreviation, or macro.  
This command will be ignored.

10212 NODES (OF 10212 DEFINED) SELECTED BY NALL COMMAND.

\*\*\*\*\*  
\*\*\*\*\* SET 1 \*\*\*\*\*

USE LOAD STEP 1 SUBSTEP 0 FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP= 1 SUBSTEP= 1 CUMULATIVE ITERATION= 16  
TIME/FREQUENCY= 1.0000  
TITLE= Shrinkage at 117 days and Deadweight

SECTION THE PAD IN TO 2 NORTH-SOUTH Z-DIRECTION STRIPS

Select all nodes in pad only

ESEL FOR LABEL= TYPE FROM 2 TO 2 BY 1

1870 ELEMENTS (OF 8812 DEFINED) SELECTED BY ESEL COMMAND.

SELECT ALL NODES HAVING ANY ELEMENT IN ELEMENT SET.

2376 NODES (OF 10212 DEFINED) SELECTED FROM  
1870 SELECTED ELEMENTS BY NELE COMMAND.

select strip Z direction x = 0 to 204 Lines C to D

RESELECT FOR ITEM=LOC COMPONENT=X BETWEEN-0.10000 AND 204.10  
KABS= 0. TOLERANCE= 0.204200E-05

1296 NODES (OF 10212 DEFINED) SELECTED BY NSEL COMMAND.

SELECT ONLY ELEMENTS COMPLETELY CONTAINED WITHIN NODE SET.

1020 ELEMENTS (OF 8812 DEFINED) SELECTED FROM  
1296 SELECTED NODES BY ENOD COMMAND.

internal forces at Z = 0.0 LINE 5 1/2

RESELECT FOR ITEM=LOC COMPONENT=Z BETWEEN-0.10000 AND 0.10000  
KABS= 0. TOLERANCE= 0.200000E-08

72 NODES (OF 10212 DEFINED) SELECTED BY NSEL COMMAND.

RESELECT FOR ITEM=LOC COMPONENT=Y BETWEEN -6.1000 AND 0.10000  
KABS= 0. TOLERANCE= 0.620000E-07



Appendix FTPad-SH to Calculation PGE-009-CALC-006

12 NODES (OF 10212 DEFINED) SELECTED BY NSEL COMMAND.

NODE FOR MOMENT SUMMATION= 0  
MOMENT SUMMATION LOCATION= 102.000 -3.00000 0.00000

\*\*\*\*\* SUMMATION OF TOTAL FORCES AND MOMENTS IN GLOBAL COORDINATES \*\*\*\*\*

FX = 10063.85  
FY = 905.7373  
FZ = 1358678.  
MX = 142270.0  
MY = 242030.3  
MZ = 114737.9

SUMMATION POINT= 102.00 -3.0000 0.0000  
next strip x = 204 to 408 Lines D to E

Select all nodes in pad only

ESEL FOR LABEL= TYPE FROM 2 TO 2 BY 1

1870 ELEMENTS (OF 8812 DEFINED) SELECTED BY ESEL COMMAND.

SELECT ALL NODES HAVING ANY ELEMENT IN ELEMENT SET.

2376 NODES (OF 10212 DEFINED) SELECTED FROM  
1870 SELECTED ELEMENTS BY NELE COMMAND.

select strip Z direction

RESELECT FOR ITEM=LOC COMPONENT=X BETWEEN 203.90 AND 408.10  
KABS= 0. TOLERANCE= 0.204200E-05

1296 NODES (OF 10212 DEFINED) SELECTED BY NSEL COMMAND.

RESELECT FOR ITEM=LOC COMPONENT=Y BETWEEN -6.1000 AND 0.10000  
KABS= 0. TOLERANCE= 0.620000E-07

216 NODES (OF 10212 DEFINED) SELECTED BY NSEL COMMAND.

SELECT ONLY ELEMENTS COMPLETELY CONTAINED WITHIN NODE SET.

85 ELEMENTS (OF 8812 DEFINED) SELECTED FROM  
216 SELECTED NODES BY ENOD COMMAND.

internal forces at Z = 0.0 LINE 5 1/2

RESELECT FOR ITEM=LOC COMPONENT=Z BETWEEN -0.10000 AND 0.10000  
KABS= 0. TOLERANCE= 0.200000E-08

12 NODES (OF 10212 DEFINED) SELECTED BY NSEL COMMAND.

NODE FOR MOMENT SUMMATION= 0  
MOMENT SUMMATION LOCATION= 306.000 -3.00000 0.00000



Appendix FTPad-SH to Calculation PGE-009-CALC-006

\*\*\*\*\* SUMMATION OF TOTAL FORCES AND MOMENTS IN GLOBAL COORDINATES \*\*\*\*\*

FX = 11.28684  
FY = -1940.346  
FZ = 1143045.  
MX = 682629.4  
MY = 1430087.  
MZ = -475.4506

SUMMATION POINT= 306.00 -3.0000 0.0000

\*\*\*\*\*  
\*\*\*\*\*

SECTION THE PAD IN TO 4 EAST-WEST X-DIRECTION STRIPS

Select all nodes in pad only

ESEL FOR LABEL= TYPE FROM 2 TO 2 BY 1

1870 ELEMENTS (OF 8812 DEFINED) SELECTED BY ESEL COMMAND.

SELECT ALL NODES HAVING ANY ELEMENT IN ELEMENT SET.

2376 NODES (OF 10212 DEFINED) SELECTED FROM  
1870 SELECTED ELEMENTS BY NELE COMMAND.

select strip x direction z = 0.0 to 102 Lines 5 1/2 to 6

RESELECT FOR ITEM=LOC COMPONENT=Z BETWEEN-0.10000 AND 102.10  
KABS= 0. TOLERANCE= 0.102200E-05

528 NODES (OF 10212 DEFINED) SELECTED BY NSEL COMMAND.

RESELECT FOR ITEM=LOC COMPONENT=Y BETWEEN -6.1000 AND 0.10000  
KABS= 0. TOLERANCE= 0.620000E-07

88 NODES (OF 10212 DEFINED) SELECTED BY NSEL COMMAND.

SELECT ONLY ELEMENTS COMPLETELY CONTAINED WITHIN NODE SET.

30 ELEMENTS (OF 8812 DEFINED) SELECTED FROM  
88 SELECTED NODES BY ENOD COMMAND.

internal forces at x = 0.0 LINE C

RESELECT FOR ITEM=LOC COMPONENT=X BETWEEN-0.10000 AND 0.10000  
KABS= 0. TOLERANCE= 0.200000E-08

8 NODES (OF 10212 DEFINED) SELECTED BY NSEL COMMAND.

NODE FOR MOMENT SUMMATION= 0  
MOMENT SUMMATION LOCATION= 0.00000 -3.00000 51.0000

\*\*\*\*\* SUMMATION OF TOTAL FORCES AND MOMENTS IN GLOBAL COORDINATES \*\*\*\*\*

FX = 578435.6



FY = -345.1804  
FZ = -17.22419  
MX = 7.100706  
MY = -2237.241  
MZ = -328085.0

SUMMATION POINT= 0.0000 -3.0000 51.000

SELECT ALL NODES HAVING ANY ELEMENT IN ELEMENT SET.

88 NODES (OF 10212 DEFINED) SELECTED FROM  
30 SELECTED ELEMENTS BY NELE COMMAND.

next strip z = 102 to 306 Lines 6 to 7

Select all nodes in pad only

ESEL FOR LABEL= TYPE FROM 2 TO 2 BY 1

1870 ELEMENTS (OF 8812 DEFINED) SELECTED BY ESEL COMMAND.

SELECT ALL NODES HAVING ANY ELEMENT IN ELEMENT SET.

2376 NODES (OF 10212 DEFINED) SELECTED FROM  
1870 SELECTED ELEMENTS BY NELE COMMAND.

select strip x direction z = 102 to 306

RESELECT FOR ITEM=LOC COMPONENT=Z BETWEEN 101.90 AND 306.10  
KABS= 0. TOLERANCE= 0.204200E-05

924 NODES (OF 10212 DEFINED) SELECTED BY NSEL COMMAND.

RESELECT FOR ITEM=LOC COMPONENT=Y BETWEEN -6.1000 AND 0.10000  
KABS= 0. TOLERANCE= 0.620000E-07

154 NODES (OF 10212 DEFINED) SELECTED BY NSEL COMMAND.

SELECT ONLY ELEMENTS COMPLETELY CONTAINED WITHIN NODE SET.

60 ELEMENTS (OF 8812 DEFINED) SELECTED FROM  
154 SELECTED NODES BY ENOD COMMAND.

internal forces at x = 0.0 LINE C

RESELECT FOR ITEM=LOC COMPONENT=X BETWEEN -0.10000 AND 0.10000  
KABS= 0. TOLERANCE= 0.200000E-08

14 NODES (OF 10212 DEFINED) SELECTED BY NSEL COMMAND.

NODE FOR MOMENT SUMMATION= 0  
MOMENT SUMMATION LOCATION= 0.00000 -3.00000 204.000





Appendix FTPad-SH to Calculation PGE-009-CALC-006

\*\*\*\*\* SUMMATION OF TOTAL FORCES AND MOMENTS IN GLOBAL COORDINATES \*\*\*\*\*

FX = 1153356.  
FY = -701.8030  
FZ = -322.0606  
MX = 489.7172  
MY = -132416.4  
MZ = -656324.3

SUMMATION POINT= 0.0000 -3.0000 204.00

SELECT ALL NODES HAVING ANY ELEMENT IN ELEMENT SET.

154 NODES (OF 10212 DEFINED) SELECTED FROM  
60 SELECTED ELEMENTS BY NELE COMMAND.

next strip z = 306 to 510 Lines 7 to 8

Select all nodes in pad only

ESEL FOR LABEL= TYPE FROM 2 TO 2 BY 1

1870 ELEMENTS (OF 8812 DEFINED) SELECTED BY ESEL COMMAND.

SELECT ALL NODES HAVING ANY ELEMENT IN ELEMENT SET.

2376 NODES (OF 10212 DEFINED) SELECTED FROM  
1870 SELECTED ELEMENTS BY NELE COMMAND.

select strip x direction z = 306 to 510

RESELECT FOR ITEM=LOC COMPONENT=Z BETWEEN 305.90 AND 510.10  
KABS= 0. TOLERANCE= 0.204200E-05

924 NODES (OF 10212 DEFINED) SELECTED BY NSEL COMMAND.

RESELECT FOR ITEM=LOC COMPONENT=Y BETWEEN -6.1000 AND 0.10000  
KABS= 0. TOLERANCE= 0.620000E-07

154 NODES (OF 10212 DEFINED) SELECTED BY NSEL COMMAND.

SELECT ONLY ELEMENTS COMPLETELY CONTAINED WITHIN NODE SET.

60 ELEMENTS (OF 8812 DEFINED) SELECTED FROM  
154 SELECTED NODES BY ENOD COMMAND.

internal forces at x = 0.0 LINE C

RESELECT FOR ITEM=LOC COMPONENT=X BETWEEN -0.10000 AND 0.10000  
KABS= 0. TOLERANCE= 0.200000E-08

14 NODES (OF 10212 DEFINED) SELECTED BY NSEL COMMAND.

NODE FOR MOMENT SUMMATION= 0



Appendix FTPad-SH to Calculation PGE-009-CALC-006

MOMENT SUMMATION LOCATION= 0.00000 -3.00000 408.000

\*\*\*\*\* SUMMATION OF TOTAL FORCES AND MOMENTS IN GLOBAL COORDINATES \*\*\*\*\*

FX = 1128242.  
FY = -771.5669  
FZ = -1875.964  
MX = 1218.623  
MY = -829028.4  
MZ = -655829.1

SUMMATION POINT= 0.0000 -3.0000 408.00

SELECT ALL NODES HAVING ANY ELEMENT IN ELEMENT SET.

154 NODES (OF 10212 DEFINED) SELECTED FROM  
60 SELECTED ELEMENTS BY NELE COMMAND.

next strip z = 510 to 630 Lines 8 to 10

Select all nodes in pad only

ESEL FOR LABEL= TYPE FROM 2 TO 2 BY 1

1870 ELEMENTS (OF 8812 DEFINED) SELECTED BY ESEL COMMAND.

SELECT ALL NODES HAVING ANY ELEMENT IN ELEMENT SET.

2376 NODES (OF 10212 DEFINED) SELECTED FROM  
1870 SELECTED ELEMENTS BY NELE COMMAND.

select strip x direction z = 510 to 630

RESELECT FOR ITEM=LOC COMPONENT=Z BETWEEN 509.90 AND 630.10  
KABS= 0. TOLERANCE= 0.120200E-05

396 NODES (OF 10212 DEFINED) SELECTED BY NSEL COMMAND.

RESELECT FOR ITEM=LOC COMPONENT=Y BETWEEN -6.1000 AND 0.10000  
KABS= 0. TOLERANCE= 0.620000E-07

66 NODES (OF 10212 DEFINED) SELECTED BY NSEL COMMAND.

SELECT ONLY ELEMENTS COMPLETELY CONTAINED WITHIN NODE SET.

20 ELEMENTS (OF 8812 DEFINED) SELECTED FROM  
66 SELECTED NODES BY ENOD COMMAND.

internal forces at x = 0.0 LINE C

RESELECT FOR ITEM=LOC COMPONENT=X BETWEEN -0.10000 AND 0.10000  
KABS= 0. TOLERANCE= 0.200000E-08

6 NODES (OF 10212 DEFINED) SELECTED BY NSEL COMMAND.



Appendix FTPad-SH to Calculation PGE-009-CALC-006

NODE FOR MOMENT SUMMATION= 0  
MOMENT SUMMATION LOCATION= 0.00000 -3.00000 570.000

\*\*\*\*\* SUMMATION OF TOTAL FORCES AND MOMENTS IN GLOBAL COORDINATES \*\*\*\*\*  
FX = 629499.1  
FY = -408.0320  
FZ = -1151.391  
MX = -1187.422  
MY = -612623.5  
MZ = -381482.6

SUMMATION POINT= 0.0000 -3.0000 570.00

8812 ELEMENTS (OF 8812 DEFINED) SELECTED BY EALL COMMAND.

10212 NODES (OF 10212 DEFINED) SELECTED BY NALL COMMAND.

\*\*\*\*\*  
\*\*\*\*\*

EXIT THE ANSYS POST1 DATABASE PROCESSOR

\*\*\*\*\* ROUTINE COMPLETED \*\*\*\*\* CP = 2.103

PURGE ALL SOLUTION AND POST DATA  
SAVE ALL MODEL DATA

ALL CURRENT ANSYS DATA WRITTEN TO FILE NAME= PadSh.db  
FOR POSSIBLE RESUME FROM THIS POINT

NUMBER OF WARNING MESSAGES ENCOUNTERED= 1  
NUMBER OF ERROR MESSAGES ENCOUNTERED= 0

```
*-----*
|                                     |
|               ANSYS RUN COMPLETED |
|                                     |
|-----|
|               Release 6.0          |               UP20010919          |               INTEL NT          |
|-----|
|               Maximum Scratch Memory Used          |               =          1034776 Words          |               3.947 MB          |
|-----|
|               CP Time      (sec) =          2.584          |               Time =          10:59:56          |
|               Elapsed Time (sec) =          5.000          |               Date  =          01/28/2002          |
|-----|
*-----*
```