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Date: November 30, 2001

Appendix RL-4

Reaction Loads – Cask Placement Sequence

This Appendix presents reaction loads of the model for eight Hosgri HE(1) Load Cases, aimed at 45 degrees around the compass.

The first part of the calculation computes the expected forces. Input values are from References 2 and 4. The sum of all applied loads are calculated followed by the sum of the forces at the pad/rock interface and the sum at the boundary of the rock. Since the rock is massless, the last two values are the same. These are presented in Tables 1 through 3, for the sets of analyses performed. The first set is for casks placed from number 1 through 1 to 6, Table 1 (42 Load Cases). The second set is for casks placed from 1 to 7 through 1 to 10, Table 2 (26 Load Cases), and the last set is for casks placed from 1 to 11 through 1 to 14, Table 3 (26 Load Cases). The forces computed and provided in the Tables are the applied forces, with sign.

Then the databases are scanned for the same data. The input and output files are provided in sequence.

The ANSYS program is providing the unbalanced forces that the elements are applying to the nodes. Thus, the values for the nodes where the loads are applied, are actually the reactions that the elements are applying to these nodes to maintain equilibrium. Hence, the values are the negative of the applied loads. On the boundary, the values are again the forces that the elements are applying to the nodes. Thus, they have the same sign as the applied loads calculated and provided in the Tables.

A comparison of the expected forces and the forces scanned from the soft rock analysis database shows that the values are the same. This indicates that the pad is in equilibrium and that, together with a review of the displacement plots, provides high confidence that the analyses are correct.

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Compute the various force components of the cask(s) and the pad at 45 degrees around the compass:

Hosgri (HE(1)) Force Components 100-40-40 rule:

Horizontal Force = 515000 per cask
Vertical Force = 267040 down per cask

Pad weight 68*105*7.5*150 = 8032500 pounds

Pad seismic horizontal force = 0.808*8032500 = 6490260
Pad seismic vertical force = 0.800*8032500 = 6426000

Components @ 45 degrees:

Horizontal Force = 0.707*515000 = 364160 per cask
Pad seismic horizontal force = 0.707*0.808*8032500 = 4586558 (where 0.707*0.808 = 0.571)

The tables were created simply by adding the applied cask load components to the applied ZPA pad seismic load component.

As an example:

Say 12 casks at N 45 W (See Table 3 (1 of 2)):

Horizontal:

Cask load = 12*364160 =	4369920
Pad load =	4586558
Total =	8956478

Vertical:

Cask load = 12*267040 =	3204480
Pad load =	6426000
Total =	9630480

All forces are computed in a similar manner.

Table 1 (1 of 2) – Reaction loads for Casks 1 through 1 to 6

Direction of Seismic Accel.	Forces	Number of Casks on Pad in Sequence					
		1	2	3	4	5	6
N Load Steps 1,9,17,25, 30 and 38	Cask Fx	0	0	0	0	0	0
	Fy	-267040	-534080	-801120	-1068160	-1335200	-1602240
	Fz	515000	1030000	1545000	2060000	2575000	3090000
	Rock Fx	0	0	0	0	0	0
	Fy	-6693040	-6960080	-7227120	-7494160	-7761200	-8028240
	Fz	7005260	7520260	8035260	8550260	9065260	9580260
N 45 W Load Steps 2,10,18, 26,31 and 39	Cask Fx	364160	728320	1092480	1456640	1820800	2184960
	Fy	-267040	-534080	-801120	-1068160	-1335200	-1602240
	Fz	364160	728320	1092480	1456640	1820800	2184960
	Rock Fx	4950717	5314877	5679037	6043197	6407357	6771517
	Fy	-6693040	-6960080	-7227120	-7494160	-7761200	-8028240
	Fz	4950717	5314877	5679037	6043197	6407357	6771517
W Load Steps 3,11,19, 27,32 and 40	Cask Fx	515000	1030000	1545000	2060000	2575000	3090000
	Fy	-267040	-534080	-801120	-1068160	-1335200	-1602240
	Fz	0	0	0	0	0	0
	Rock Fx	7005260	7520260	8035260	8550260	9065260	9580260
	Fy	-6693040	-6960080	-7227120	-7494160	-7761200	-8028240
	Fz	0	0	0	0	0	0
S 45 W Load Steps 4,12,20, 28,33 and 41	Cask Fx	364160	728320	1092480	1456640	1820800	2184960
	Fy	-267040	-534080	-801120	-1068160	-1335200	-1602240
	Fz	-364160	-728320	-1092480	-1456640	-1820800	-2184960
	Rock Fx	4950717	5314877	5679037	6043197	6407357	6771517
	Fy	-6693040	-6960080	-7227120	-7494160	-7761200	-8028240
	Fz	-4950717	-5314877	-5679037	-6043197	-6407357	-6771517

Table 1 (2 of 2) – Reaction loads for Casks 1 through 1 to 6

Direction of Seismic Accel.	Forces	Number of Casks on Pad in Sequence					
		1	2	3	4	5	6
S Load Steps 5,13,21, 29,34 and 42	Cask Fx	0	0	0	0	0	0
	Fy	-267040	-534080	-801120	-1068160	-1335200	-1602240
	Fz	-515000	-1030000	-1545000	-2060000	-2575000	-3090000
	Rock Fx	0	0	0	0	0	0
	Fy	-6693040	-6960080	-7227120	-7494160	-7761200	-8028240
	Fz	-7005260	-7520260	-8035260	-8550260	-9065260	-9580260
S 45 E Load Steps 6,14,22, and 35	Cask Fx	-364160	-728320	-1092480	SYM with S 45 W	-1820800	SYM with S 45 W
	Fy	-267040	-534080	-801120		-1335200	
	Fz	-364160	-728320	-1092480		-1820800	
	Rock Fx	-4950717	-5314877	-5679037		-6407357	
	Fy	-6693040	-6960080	-7227120		-7761200	
	Fz	-4950717	-5314877	-5679037		-6407357	
E Load Steps 7,15,23, and 36	Cask Fx	-515000	-1030000	-1545000	SYM with W	-2575000	SYM with W
	Fy	-267040	-534080	-801120		-1335200	
	Fz	0	0	0		0	
	Rock Fx	-7005260	-7520260	-8035260		-9065260	
	Fy	-6693040	-6960080	-7227120		-7761200	
	Fz	0	0	0		0	
N 45 E Load Steps 8,16,24, and 37	Cask Fx	-364160	-728320	-1092480	SYM with N 45 W	-1820800	SYM with N 45 W
	Fy	-267040	-534080	-801120		-1335200	
	Fz	364160	728320	1092480		1820800	
	Rock Fx	-4950717	-5314877	-5679037		-6407357	
	Fy	-6693040	-6960080	-7227120		-7761200	
	Fz	4950717	5314877	5679037		6407357	

Table 2 (1 of 2) – Reaction loads for Casks 1 to 7 through 1 to 10

Direction of Seismic Accel.	Forces	Number of Casks on Pad in Sequence			
		7	8	9	10
N Load Steps 1,9,14 and 22	Cask Fx	0	0	0	0
	Fy	-1869280	-2136320	-2403360	-2670400
	Fz	3605000	4120000	4635000	5150000
	Rock Fx	0	0	0	0
	Fy	-8295280	-8562320	-8829360	-9096400
	Fz	10095260	10610260	11125260	11640260
N 45 W Load Steps 2,10,15 and 23	Cask Fx	2549120	2913280	3277440	3641600
	Fy	-1869280	-2136320	-2403360	-2670400
	Fz	2549120	2913280	3277440	3641600
	Rock Fx	7135677	7499837	7863997	8228157
	Fy	-8295280	-8562320	-8829360	-9096400
	Fz	7135677	7499837	7863997	8228157
W Load Steps 3,11,16 and 24	Cask Fx	3605000	4120000	4635000	5150000
	Fy	-1869280	-2136320	-2403360	-2670400
	Fz	0	0	0	0
	Rock Fx	10095260	10610260	11125260	11640260
	Fy	-8295280	-8562320	-8829360	-9096400
	Fz	0	0	0	0
S 45 W Load Steps 4,12,17 and 25	Cask Fx	2549120	2913280	3277440	3641600
	Fy	-1869280	-2136320	-2403360	-2670400
	Fz	-2549120	-2913280	-3277440	-3641600
	Rock Fx	7135677	7499837	7863997	8228157
	Fy	-8295280	-8562320	-8829360	-9096400
	Fz	-7135677	-7499837	-7863997	-8228157

Table 2 (2 of 2) – Reaction loads for Casks 1 to 7 through 1 to 10

Direction of Seismic Accel.	Forces	Number of Casks on Pad in Sequence			
		7	8	9	10
S Load Steps 5,13,18 and 26	Cask Fx	0	0	0	0
	Fy	-1869280	-2136320	-2403360	-2670400
	Fz	-3605000	-4120000	-4635000	-5150000
	Rock Fx	0	0	0	0
	Fy	-8295280	-8562320	-8829360	-9096400
	Fz	-10095260	-10610260	-11125260	-11640260
S 45 E Load Steps 6 and 19	Cask Fx	-2549120	SYM with S 45 W	-3277440	SYM with S 45 W
	Fy	-1869280		-2403360	
	Fz	-2549120		-3277440	
	Rock Fx	-7135677		-7863997	
	Fy	-8295280		-8829360	
	Fz	-7135677		-7863997	
E Load Steps 7 and 20	Cask Fx	-3605000	SYM with W	-4635000	SYM with W
	Fy	-1869280		-2403360	
	Fz	0		0	
	Rock Fx	-10095260		-11125260	
	Fy	-8295280		-8829360	
	Fz	0		0	
N 45 E Load Steps 8 and 21	Cask Fx	-2549120	SYM with N 45 W	-3277440	SYM with N 45 W
	Fy	-1869280		-2403360	
	Fz	2549120		3277440	
	Rock Fx	-7135677		-7863997	
	Fy	-8295280		-8829360	
	Fz	7135677		7863997	

Table 3 (1 of 2) – Reaction loads for Casks 1 to 11 through 1 to 14

Direction of Seismic Accel.	Forces	Number of Casks on Pad in Sequence			
		11	12	13	14
N Load Steps 1,9,14 and 22	Cask Fx	0	0	0	0
	Fy	-2937440	-3204480	-3471520	-3738560
	Fz	5665000	6180000	6695000	7210000
	Rock Fx	0	0	0	0
	Fy	-9363440	-9630480	-9897520	-10164560
	Fz	12155260	12670260	13185260	13700260
N 45 W Load Steps 2,10,15 and 23	Cask Fx	4005760	4369920	4734080	5098240
	Fy	-2937440	-3204480	-3471520	-3738560
	Fz	4005760	4369920	4734080	5098240
	Rock Fx	8592317	8956477	9320637	9684797
	Fy	-9363440	-9630480	-9897520	-10164560
	Fz	8592317	8956477	9320637	9684797
W Load Steps 3,11,16 and 24	Cask Fx	5665000	6180000	6695000	7210000
	Fy	-2937440	-3204480	-3471520	-3738560
	Fz	0	0	0	0
	Rock Fx	12155260	12670260	13185260	13700260
	Fy	-9363440	-9630480	-9897520	-10164560
	Fz	0	0	0	0
S 45 W Load Steps 4,12,17 and 25	Cask Fx	4005760	4369920	4734080	5098240
	Fy	-2937440	-3204480	-3471520	-3738560
	Fz	-4005760	-4369920	-4734080	-5098240
	Rock Fx	8592317	8956477	9320637	9684797
	Fy	-9363440	-9630480	-9897520	-10164560
	Fz	-8592317	-8956477	-9320637	-9684797

Table 3 (2 of 2) – Reaction loads for Casks 1 to 11 through 1 to 14

Direction of Seismic Accel.	Forces	Number of Casks on Pad in Sequence			
		11	12	13	14
S Load Steps 5,13,18 and 26	Cask Fx	0	0	0	0
	Fy	-2937440	-3204480	-3471520	-3738560
	Fz	-5665000	-6180000	-6695000	-7210000
	Rock Fx	0	0	0	0
	Fy	-9363440	-9630480	-9897520	-10164560
	Fz	-12155260	-12670260	-13185260	-13700260
S 45 E Load Steps 6 and 19	Cask Fx	-4005760	SYM with S 45 W	-4734080	SYM with S 45 W
	Fy	-2937440		-3471520	
	Fz	-4005760		-4734080	
	Rock Fx	-8592317		-9320637	
	Fy	-9363440		-9897520	
	Fz	-8592317		-9320637	
E Load Steps 7 and 20	Cask Fx	-5665000	SYM with W	-6695000	SYM with W
	Fy	-2937440		-3471520	
	Fz	0		0	
	Rock Fx	-12155260		-13185260	
	Fy	-9363440		-9897520	
	Fz	0		0	
N 45 E Load Steps 8 and 21	Cask Fx	-4005760	SYM with N 45 W	-4734080	SYM with N 45 W
	Fy	-2937440		-3471520	
	Fz	4005760		4734080	
	Rock Fx	-8592317		-9320637	
	Fy	-9363440		-9897520	
	Fz	8592317		9320637	

ANSYS input file for processing reaction loads for casks 1 through 1 to 6:

```
/com,
/com, This routine processes load results data for the
/com,   evaluation of equilibrium.
/com
/com,   Soft Rock Load Step Results for Cask Load Sequence 1
/com, This is for load sequence for casks 1 through 6
/com
/output,padsoftreacseq1,out
/com
/com ***************************************************************************
/com ***************************************************************************
/com ***************************************************************************
/com ***************************************************************************
/com ***************************************************************************
/com ***************************************************************************
/com
/com ************************ Soft Rock Reactions ****************************
/com
/file,dcslabs7
resume
/post1
eall
nall
/com
/com ***************************************************************************
/com *************************  LOAD CASE 1 **********************************
set,1
eall
cmsel,s,cask
/com
/com ******** SUM OF LOADS APPLIED TO CASKS *******
fsum
esel,type,1
cmsel,s,base
/com
/com ******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
fsum
esel,type,2
cmsel,s,boundary
/com
/com ******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
fsum
/com
/com ***************************************************************************
/com *************************  LOAD CASE 2 **********************************
set,2
eall
cmsel,s,cask
/com
/com ******** SUM OF LOADS APPLIED TO CASKS *******
fsum
esel,type,1
cmsel,s,base
/com
```

```
/com ******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
fsum
esel,type,2
cmsel,s,boundary
/com
/com ******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
fsum
/com
/com ***************************************************************************
/com *************************  LOAD CASE 3 **********************************
set,3
eall
cmsel,s,cask
/com
/com ******** SUM OF LOADS APPLIED TO CASKS *******
fsum
esel,type,1
cmsel,s,base
/com
/com ******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
fsum
esel,type,2
cmsel,s,boundary
/com
/com ******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
fsum
/com
/com ***************************************************************************
/com *************************  LOAD CASE 4 **********************************
set,4
eall
cmsel,s,cask
/com
/com ******** SUM OF LOADS APPLIED TO CASKS *******
fsum
esel,type,1
cmsel,s,base
/com
/com ******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
fsum
esel,type,2
/com
cmsel,s,boundary
/com ******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
fsum
/com
/com ***************************************************************************
/com *************************  LOAD CASE 5 **********************************
set,5
eall
cmsel,s,cask
/com
/com ******** SUM OF LOADS APPLIED TO CASKS *******
fsum
esel,type,1
cmsel,s,base
/com
```

```
/com ******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
fsum
esel,type,2
cmsel,s,boundary
/com
/com ******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
fsum
/com
/com ***************************************************************************
/com *************************  LOAD CASE 6 ***********************************
set,6
eall
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/com
/com ******** SUM OF LOADS APPLIED TO CASKS *******
fsum
esel,type,1
cmsel,s,base
/com
/com ******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
fsum
esel,type,2
cmsel,s,boundary
/com
/com ******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
fsum
/com
/com ***************************************************************************
/com *************************  LOAD CASE 7 ***********************************
set,7
eall
cmsel,s,cask
/com
/com ******** SUM OF LOADS APPLIED TO CASKS *******
fsum
esel,type,1
cmsel,s,base
/com
/com ******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
fsum
esel,type,2
cmsel,s,boundary
/com
/com ******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
fsum
/com
/com ***************************************************************************
/com *************************  LOAD CASE 8 ***********************************
set,8
eall
cmsel,s,cask
/com
/com ******** SUM OF LOADS APPLIED TO CASKS *******
fsum
esel,type,1
cmsel,s,base
/com
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```
/com ******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
fsum
esel,type,2
cmsel,s,boundary
/com
/com ******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
fsum
/com
/com ***************************************************************************
/com *************************  LOAD CASE 9 **********************************
set,9
eall
cmsel,s,cask
/com
/com ******** SUM OF LOADS APPLIED TO CASKS *******
fsum
esel,type,1
cmsel,s,base
/com
/com ******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
fsum
esel,type,2
cmsel,s,boundary
/com
/com ******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
fsum
/com
/com ***************************************************************************
/com *************************  LOAD CASE 10 *********************************
set,10
eall
cmsel,s,cask
/com
/com ******** SUM OF LOADS APPLIED TO CASKS *******
fsum
esel,type,1
cmsel,s,base
/com
/com ******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
fsum
esel,type,2
cmsel,s,boundary
/com
/com ******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
fsum
/com
/com ***************************************************************************
/com *************************  LOAD CASE 11 *********************************
set,11
eall
cmsel,s,cask
/com
/com ******** SUM OF LOADS APPLIED TO CASKS *******
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esel,type,1
cmsel,s,base
/com
```

```
/com ******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
fsum
esel,type,2
cmsel,s,boundary
/com
/com ******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
fsum
/com
/com ************************************************************************
/com *************************  LOAD CASE 12 ********************************
set,12
eall
cmsel,s,cask
/com
/com ******** SUM OF LOADS APPLIED TO CASKS *******
fsum
esel,type,1
cmsel,s,base
/com
/com ******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
fsum
esel,type,2
cmsel,s,boundary
/com
/com ******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
fsum
/com
/com ************************************************************************
/com *************************  LOAD CASE 13 ********************************
set,13
eall
cmsel,s,cask
/com
/com ******** SUM OF LOADS APPLIED TO CASKS *******
fsum
esel,type,1
cmsel,s,base
/com
/com ******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
fsum
esel,type,2
cmsel,s,boundary
/com
/com ******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
fsum
/com
/com ************************************************************************
/com *************************  LOAD CASE 14 ********************************
set,14
eall
cmsel,s,cask
/com
/com ******** SUM OF LOADS APPLIED TO CASKS *******
fsum
esel,type,1
cmsel,s,base
/com
```

```
/com ******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
fsum
esel,type,2
cmsel,s,boundary
/com
/com ******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
fsum
/com
/com ***************************************************************************
/com *************************  LOAD CASE 15 ********************************
set,15
eall
cmsel,s,cask
/com
/com ******** SUM OF LOADS APPLIED TO CASKS *******
fsum
esel,type,1
cmsel,s,base
/com
/com ******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
fsum
esel,type,2
cmsel,s,boundary
/com
/com ******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
fsum
/com
/com ***************************************************************************
/com *************************  LOAD CASE 16 ********************************
set,16
eall
cmsel,s,cask
/com
/com ******** SUM OF LOADS APPLIED TO CASKS *******
fsum
esel,type,1
cmsel,s,base
/com
/com ******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
fsum
esel,type,2
cmsel,s,boundary
/com
/com ******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
fsum
/com
/com ***************************************************************************
/com *************************  LOAD CASE 17 ********************************
set,17
eall
cmsel,s,cask
/com
/com ******** SUM OF LOADS APPLIED TO CASKS *******
fsum
esel,type,1
cmsel,s,base
/com
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```
/com ******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
fsum
esel,type,2
cmsel,s,boundary
/com
/com ******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
fsum
/com
/com ***************************************************************************
/com *************************  LOAD CASE 18 *********************************
set,18
eall
cmsel,s,cask
/com
/com ******** SUM OF LOADS APPLIED TO CASKS *******
fsum
esel,type,1
cmsel,s,base
/com
/com ******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
fsum
esel,type,2
cmsel,s,boundary
/com
/com ******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
fsum
/com
/com ***************************************************************************
/com *************************  LOAD CASE 19 *********************************
set,19
eall
cmsel,s,cask
/com
/com ******** SUM OF LOADS APPLIED TO CASKS *******
fsum
esel,type,1
cmsel,s,base
/com
/com ******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
fsum
esel,type,2
cmsel,s,boundary
/com
/com ******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
fsum
/com
/com ***************************************************************************
/com *************************  LOAD CASE 20 *********************************
set,20
eall
cmsel,s,cask
/com
/com ******** SUM OF LOADS APPLIED TO CASKS *******
fsum
esel,type,1
cmsel,s,base
/com
```

```
/com ******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
fsum
esel,type,2
cmsel,s,boundary
/com
/com ******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
fsum
/com
/com ***************************************************************************
/com *************************  LOAD CASE 21 ********************************
set,21
eall
cmsel,s,cask
/com
/com ******** SUM OF LOADS APPLIED TO CASKS *******
fsum
esel,type,1
cmsel,s,base
/com
/com ******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
fsum
esel,type,2
cmsel,s,boundary
/com
/com ******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
fsum
/com
/com ***************************************************************************
/com *************************  LOAD CASE 22 ********************************
set,22
eall
cmsel,s,cask
/com
/com ******** SUM OF LOADS APPLIED TO CASKS *******
fsum
esel,type,1
cmsel,s,base
/com
/com ******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
fsum
esel,type,2
cmsel,s,boundary
/com
/com ******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
fsum
/com
/com ***************************************************************************
/com *************************  LOAD CASE 23 ********************************
set,23
eall
cmsel,s,cask
/com
/com ******** SUM OF LOADS APPLIED TO CASKS *******
fsum
esel,type,1
cmsel,s,base
/com
```

```
/com ******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
fsum
esel,type,2
/com
cmsel,s,boundary
/com ******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
fsum
/com
/com ***************************************************************************
/com *************************  LOAD CASE 24 ********************************
set,24
eall
cmsel,s,cask
/com
/com ******** SUM OF LOADS APPLIED TO CASKS *******
fsum
esel,type,1
cmsel,s,base
/com
/com ******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
fsum
esel,type,2
cmsel,s,boundary
/com
/com ******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
fsum
/com
/com ***************************************************************************
/com *************************  LOAD CASE 25 ********************************
set,25
eall
cmsel,s,cask
/com
/com ******** SUM OF LOADS APPLIED TO CASKS *******
fsum
esel,type,1
cmsel,s,base
/com
/com ******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
fsum
esel,type,2
cmsel,s,boundary
/com
/com ******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
fsum
/com
/com ***************************************************************************
/com *************************  LOAD CASE 26 ********************************
set,26
eall
cmsel,s,cask
/com
/com ******** SUM OF LOADS APPLIED TO CASKS *******
fsum
esel,type,1
cmsel,s,base
/com
```

```
/com ******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
fsum
esel,type,2
cmsel,s,boundary
/com
/com ******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
fsum
/com
/com ***************************************************************************
/com *************************  LOAD CASE 27 ********************************
set,27
eall
cmsel,s,cask
/com
/com ******** SUM OF LOADS APPLIED TO CASKS *******
fsum
esel,type,1
cmsel,s,base
/com
/com ******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
fsum
esel,type,2
cmsel,s,boundary
/com
/com ******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
fsum
/com
/com ***************************************************************************
/com *************************  LOAD CASE 28 ********************************
set,28
eall
cmsel,s,cask
/com
/com ******** SUM OF LOADS APPLIED TO CASKS *******
fsum
esel,type,1
cmsel,s,base
/com
/com ******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
fsum
esel,type,2
cmsel,s,boundary
/com
/com ******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
fsum
/com
/com ***************************************************************************
/com *************************  LOAD CASE 29 ********************************
set,29
eall
cmsel,s,cask
/com
/com ******** SUM OF LOADS APPLIED TO CASKS *******
fsum
esel,type,1
cmsel,s,base
/com
```

```
/com ******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
fsum
esel,type,2
cmsel,s,boundary
/com
/com ******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
fsum
/com
/com ***************************************************************************
/com *************************  LOAD CASE 30 ********************************
set,30
eall
cmsel,s,cask
/com
/com ******** SUM OF LOADS APPLIED TO CASKS *******
fsum
esel,type,1
cmsel,s,base
/com
/com ******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
fsum
esel,type,2
cmsel,s,boundary
/com
/com ******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
fsum
/com
/com ***************************************************************************
/com *************************  LOAD CASE 31 ********************************
set,31
eall
cmsel,s,cask
/com
/com ******** SUM OF LOADS APPLIED TO CASKS *******
fsum
esel,type,1
cmsel,s,base
/com
/com ******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
fsum
esel,type,2
cmsel,s,boundary
/com
/com ******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
fsum
/com
/com ***************************************************************************
/com *************************  LOAD CASE 32 ********************************
set,32
eall
cmsel,s,cask
/com
/com ******** SUM OF LOADS APPLIED TO CASKS *******
fsum
esel,type,1
cmsel,s,base
/com
```

```
/com ******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
fsum
esel,type,2
cmsel,s,boundary
/com
/com ******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
fsum
/com
/com ************************************************************************
/com *************************  LOAD CASE 33 ********************************
set,33
eall
cmsel,s,cask
/com
/com ******** SUM OF LOADS APPLIED TO CASKS *******
fsum
esel,type,1
cmsel,s,base
/com
/com ******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
fsum
esel,type,2
cmsel,s,boundary
/com
/com ******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
fsum
/com
/com ************************************************************************
/com *************************  LOAD CASE 34 ********************************
set,34
eall
cmsel,s,cask
/com
/com ******** SUM OF LOADS APPLIED TO CASKS *******
fsum
esel,type,1
cmsel,s,base
/com
/com ******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
fsum
esel,type,2
cmsel,s,boundary
/com
/com ******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
fsum
/com
/com ************************************************************************
/com *************************  LOAD CASE 35 ********************************
set,35
eall
cmsel,s,cask
/com
/com ******** SUM OF LOADS APPLIED TO CASKS *******
fsum
esel,type,1
cmsel,s,base
/com
```

```
/com ******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
fsum
esel,type,2
cmsel,s,boundary
/com
/com ******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
fsum
/com
/com ***************************************************************************
/com *************************  LOAD CASE 36 ********************************
set,36
eall
cmsel,s,cask
/com
/com ******** SUM OF LOADS APPLIED TO CASKS *******
fsum
esel,type,1
cmsel,s,base
/com
/com ******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
fsum
esel,type,2
cmsel,s,boundary
/com
/com ******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
fsum
/com
/com ***************************************************************************
/com *************************  LOAD CASE 37 ********************************
set,37
eall
cmsel,s,cask
/com
/com ******** SUM OF LOADS APPLIED TO CASKS *******
fsum
esel,type,1
cmsel,s,base
/com
/com ******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
fsum
esel,type,2
cmsel,s,boundary
/com
/com ******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
fsum
/com
/com ***************************************************************************
/com *************************  LOAD CASE 38 ********************************
set,38
eall
cmsel,s,cask
/com
/com ******** SUM OF LOADS APPLIED TO CASKS *******
fsum
esel,type,1
cmsel,s,base
/com
```

```
/com ******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
fsum
esel,type,2
cmsel,s,boundary
/com
/com ******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
fsum
/com
/com
/com ***************************************************************************
/com *************************  LOAD CASE 39 ********************************
set,39
eall
cmsel,s,cask
/com
/com ******** SUM OF LOADS APPLIED TO CASKS *******
fsum
esel,type,1
cmsel,s,base
/com
/com ******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
fsum
esel,type,2
cmsel,s,boundary
/com
/com ******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
fsum
/com
/com ***************************************************************************
/com *************************  LOAD CASE 40 ********************************
set,40
eall
cmsel,s,cask
/com
/com ******** SUM OF LOADS APPLIED TO CASKS *******
fsum
esel,type,1
cmsel,s,base
/com
/com ******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
fsum
esel,type,2
cmsel,s,boundary
/com
/com ******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
fsum
/com
/com ***************************************************************************
/com *************************  LOAD CASE 41 ********************************
set,41
eall
cmsel,s,cask
/com
/com ******** SUM OF LOADS APPLIED TO CASKS *******
fsum
esel,type,1
cmsel,s,base
```

```
/com
/com ******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
fsum
esel,type,2
cmsel,s,boundary
/com
/com ******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
fsum
/com
/com ***************************************************************************
/com *************************  LOAD CASE 42 ********************************
set,42
eall
cmsel,s,cask
/com
/com ******** SUM OF LOADS APPLIED TO CASKS *******
fsum
esel,type,1
cmsel,s,base
/com
/com ******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
fsum
esel,type,2
cmsel,s,boundary
/com
/com ******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
fsum
/com
/com
eall
nall
fini
/output
/exit
```

ANSYS output file for reaction loads for casks 1 through 1 to 6:

```
*****************************************************************************
*****************************************************************************
*****************************************************************************
*****************************************************************************
*****************************************************************************
*****************************************************************************

************************ Soft Rock Reactions ****************************


CURRENT JOBNAME REDEFINED AS dcslabs7

RESUME ANSYS DATA FROM FILE NAME=dcslabs7.db

*** ANSYS GLOBAL STATUS ***

TITLE = Pad, HE(1), Casks 1 to 6, 515 Kips South (-Z), Soft Rock
ANALYSIS TYPE =  STATIC (STEADY-STATE)
NUMBER OF ELEMENT TYPES =       6
   1728 ELEMENTS CURRENTLY SELECTED.  MAX ELEMENT NUMBER =    33177
    731 NODES CURRENTLY SELECTED.     MAX NODE NUMBER =       17051
    259 KEYPOINTS CURRENTLY SELECTED. MAX KEYPOINT NUMBER =     259
    250 LINES CURRENTLY SELECTED.     MAX LINE NUMBER =         396
    181 AREAS CURRENTLY SELECTED.     MAX AREA NUMBER =         295
     70 VOLUMES CURRENTLY SELECTED.   MAX VOL. NUMBER =          70
    25 COMPONENTS CURRENTLY DEFINED
MAXIMUM LINEAR PROPERTY NUMBER        =       5
MAXIMUM REAL CONSTANT SET NUMBER      =       6
ACTIVE COORDINATE SYSTEM              =       0  (CARTESIAN)
MAXIMUM CONSTRAINT EQUATION NUMBER    =    4620
NUMBER OF SPECIFIED CONSTRAINTS       =    2193
NUMBER OF NODAL LOADS                 =     648

INITIAL JOBNAME = dcslabs7
CURRENT JOBNAME = dcslabs7

***** ANSYS - ENGINEERING ANALYSIS SYSTEM  RELEASE 5.7     *****
ANSYS/Structural U
00150104          VERSION=INTEL NT      12:49:55  JUN 11, 2001 CP=      1.182

Pad, HE(1), Casks 1 to 6, 515 Kips South (-Z), Soft Rock


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

ENTER  /SHOW,DEVICE-NAME  TO ENABLE GRAPHIC DISPLAY
ENTER  FINISH             TO LEAVE POST1

*** NOTE ***                                CP=      1.182   TIME= 12:49:55
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).

   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

   17051  NODES (OF    17051  DEFINED) SELECTED BY NALL  COMMAND.

*************************************************************************
*************************  LOAD CASE 1 **********************************


USE LOAD STEP     1  SUBSTEP     0  FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP=     1  SUBSTEP=     1  CUMULATIVE ITERATION=     4
  TIME/FREQUENCY=  1.0000
TITLE= Pad, HE(1), Cask 1, 515 Kips North (Z), Soft Rock

   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

SELECT      COMPONENT CASK

******** SUM OF LOADS APPLIED TO CASKS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  = -0.3404712E-06
 FY  =   267040.0
 FZ  =  -515000.0
 MX  =  0.1568771E+09
 MY  =  0.1050600E+09
 MZ  =  0.5447616E+08

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     1 TO     1 BY    1

    9056  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BASE

******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  = -0.4548610E-05
 FY  =  -6693040.
 FZ  =   7005260.
 MX  = -0.3070747E+10
 MY  = -0.2091080E+10
 MZ  = -0.2020832E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     2 TO     2 BY    1

    1728  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BOUNDARY

******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
```

```
***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  = -0.9994679E-03
 FY  =  -6693040.
 FZ  =   7005260.
 MX  = -0.3070747E+10
 MY  = -0.2091080E+10
 MZ  = -0.2020832E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

*************************************************************************
*************************  LOAD CASE 2 ***********************************


USE LOAD STEP     2  SUBSTEP     0  FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP=     2  SUBSTEP=     1  CUMULATIVE ITERATION=     8
  TIME/FREQUENCY=  2.0000
TITLE= Pad, HE(1), Cask 1, 515 Kips N 45 W (Z,X), Soft Rock

   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

SELECT      COMPONENT CASK

******** SUM OF LOADS APPLIED TO CASKS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  -364160.0
 FY  =   267040.0
 FZ  =  -364160.0
 MX  =  0.1747517E+09
 MY  =  0.3714432E+09
 MZ  =  0.9762912E+08

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     1 TO     1 BY    1

    9056  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BASE

******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =   4950717.
 FY  =  -6693040.
 FZ  =   4950717.
 MX  = -0.3002955E+10
 MY  = -0.3646245E+10
 MZ  = -0.1857590E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     2 TO     2 BY    1
```

```
    1728  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BOUNDARY

******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =   4950717.
 FY  =  -6693040.
 FZ  =   4950717.
 MX  = -0.3002955E+10
 MY  = -0.3646245E+10
 MZ  = -0.1857590E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

*************************************************************************
*************************  LOAD CASE 3 **********************************


USE LOAD STEP     3  SUBSTEP     0  FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP=     3  SUBSTEP=     1  CUMULATIVE ITERATION=    13
  TIME/FREQUENCY=  3.0000
TITLE= Pad, HE(1), Cask 1, 515 Kips West (X), Soft Rock

   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

SELECT      COMPONENT CASK

******** SUM OF LOADS APPLIED TO CASKS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  -515000.0
 FY  =   267040.0
 FZ  = -0.1914207E-05
 MX  =  0.2179046E+09
 MY  =  0.4202400E+09
 MZ  =  0.1155037E+09

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     1 TO     1 BY    1

    9056  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BASE

******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =   7005260.
 FY  =  -6693040.
 FZ  = -0.5576921E-06
 MX  = -0.2839713E+10
 MY  = -0.3068266E+10
 MZ  = -0.1789798E+10
```

```
SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     2 TO     2 BY    1

    1728  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BOUNDARY

******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =   7005260.
 FY  =  -6693040.
 FZ  = -0.5525149E-03
 MX  = -0.2839713E+10
 MY  = -0.3068266E+10
 MZ  = -0.1789798E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

*************************************************************************
*************************  LOAD CASE 4 ***********************************


USE LOAD STEP     4  SUBSTEP     0  FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP=     4  SUBSTEP=     1  CUMULATIVE ITERATION=    18
  TIME/FREQUENCY=  4.0000
TITLE= Pad, HE(1), Cask 1, 515 Kips S 45 W (-Z,X), Soft Rock

   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

SELECT      COMPONENT CASK

******** SUM OF LOADS APPLIED TO CASKS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  -364160.0
 FY  =   267040.0
 FZ  =   364160.0
 MX  =  0.2610576E+09
 MY  =  0.2228659E+09
 MZ  =  0.9762912E+08

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     1 TO     1 BY    1

    9056  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BASE

******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =   4950717.
```

```
 FY  =  -6693040.
 FZ  =  -4950717.
 MX  = -0.2676471E+10
 MY  = -0.6906948E+09
 MZ  = -0.1857590E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     2 TO     2 BY    1

    1728  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.


SELECT      COMPONENT BOUNDARY
******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =   4950717.
 FY  =  -6693040.
 FZ  =  -4950717.
 MX  = -0.2676471E+10
 MY  = -0.6906948E+09
 MZ  = -0.1857590E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

*************************************************************************
*************************  LOAD CASE 5 **********************************


USE LOAD STEP     5  SUBSTEP     0  FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP=     5  SUBSTEP=     1  CUMULATIVE ITERATION=    21
  TIME/FREQUENCY=  5.0000
TITLE= Pad, HE(1), Cask 1, 515 Kips South (-Z), Soft Rock

   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

SELECT      COMPONENT CASK

******** SUM OF LOADS APPLIED TO CASKS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  0.1149842E-04
 FY  =   267040.0
 FZ  =   515000.0
 MX  =  0.2789321E+09
 MY  = -0.1050600E+09
 MZ  =  0.5447616E+08

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     1 TO     1 BY    1

    9056  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BASE
```

```
******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  0.8825099E-04
 FY  =  -6693040.
 FZ  =  -7005260.
 MX  = -0.2608678E+10
 MY  =  0.2091080E+10
 MZ  = -0.2020832E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     2 TO     2 BY    1

    1728  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BOUNDARY

******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  0.5599402E-03
 FY  =  -6693040.
 FZ  =  -7005260.
 MX  = -0.2608678E+10
 MY  =  0.2091080E+10
 MZ  = -0.2020832E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

*************************************************************************
*************************  LOAD CASE 6 ***********************************


USE LOAD STEP     6  SUBSTEP     0  FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP=     6  SUBSTEP=     1  CUMULATIVE ITERATION=    25
  TIME/FREQUENCY=  6.0000
TITLE= Pad, HE(1), Cask 1, 515 Kips S 45 E (-Z,-X), Soft Rock

   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

SELECT      COMPONENT CASK

******** SUM OF LOADS APPLIED TO CASKS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =   364160.0
 FY  =   267040.0
 FZ  =   364160.0
 MX  =  0.2610576E+09
 MY  = -0.3714432E+09
 MZ  =  0.1132320E+08

SUMMATION POINT=  0.0000      0.0000      0.0000
```

```
ESEL  FOR LABEL= TYPE  FROM     1 TO     1 BY    1

    9056  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BASE

******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  -4950717.
 FY  =  -6693040.
 FZ  =  -4950717.
 MX  = -0.2676471E+10
 MY  =  0.3646245E+10
 MZ  = -0.2184074E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     2 TO     2 BY    1

    1728  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BOUNDARY

******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  -4950717.
 FY  =  -6693040.
 FZ  =  -4950717.
 MX  = -0.2676471E+10
 MY  =  0.3646245E+10
 MZ  = -0.2184074E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

*************************************************************************
************************  LOAD CASE 7 ********************************


USE LOAD STEP     7  SUBSTEP     0  FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP=     7  SUBSTEP=     1  CUMULATIVE ITERATION=    29
  TIME/FREQUENCY=  7.0000
TITLE= Pad, HE(1), Cask 1, 515 Kips East (-x), Soft Rock

   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

SELECT      COMPONENT CASK

******** SUM OF LOADS APPLIED TO CASKS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =   515000.0
 FY  =   267040.0
 FZ  =  0.2208788E-05
 MX  =  0.2179046E+09
```

```
 MY  = -0.4202400E+09
 MZ  =  -6551340.

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     1 TO     1 BY    1

    9056  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BASE

******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  -7005260.
 FY  =  -6693040.
 FZ  =  0.1077171E-04
 MX  = -0.2839713E+10
 MY  =  0.3068266E+10
 MZ  = -0.2251866E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     2 TO     2 BY    1

    1728  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BOUNDARY

******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  -7005260.
 FY  =  -6693040.
 FZ  =  0.5919110E-03
 MX  = -0.2839713E+10
 MY  =  0.3068266E+10
 MZ  = -0.2251866E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

*************************************************************************
************************* LOAD CASE 8 ***********************************


USE LOAD STEP     8  SUBSTEP     0  FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP=     8  SUBSTEP=     1  CUMULATIVE ITERATION=    33
  TIME/FREQUENCY=  8.0000
TITLE= Pad, HE(1), Cask 1, 515 Kips N 45 E (Z,-X), Soft Rock

   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

SELECT      COMPONENT CASK

******** SUM OF LOADS APPLIED TO CASKS *******
```

```
***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =   364160.0
 FY  =   267040.0
 FZ  =  -364160.0
 MX  =  0.1747517E+09
 MY  = -0.2228659E+09
 MZ  =  0.1132320E+08

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     1 TO     1 BY    1

    9056  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BASE

******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  -4950717.
 FY  =  -6693040.
 FZ  =   4950717.
 MX  = -0.3002955E+10
 MY  =  0.6906948E+09
 MZ  = -0.2184074E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     2 TO     2 BY    1

    1728  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BOUNDARY

******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  -4950717.
 FY  =  -6693040.
 FZ  =   4950717.
 MX  = -0.3002955E+10
 MY  =  0.6906948E+09
 MZ  = -0.2184074E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

*************************************************************************
*************************  LOAD CASE 9 ***********************************


USE LOAD STEP     9  SUBSTEP     0  FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP=     9  SUBSTEP=     1  CUMULATIVE ITERATION=    37
  TIME/FREQUENCY=  9.0000
TITLE= Pad, HE(1), Casks 1 and 2, 515 Kips North (Z), Soft Rock

   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.
```

```
SELECT      COMPONENT CASK

******** SUM OF LOADS APPLIED TO CASKS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  0.3738950E-05
 FY  =   534080.0
 FZ  =  -1030000.
 MX  =  0.2592781E+09
 MY  =  0.2101200E+09
 MZ  =  0.1089523E+09

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     1 TO     1 BY    1

    9056  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BASE

******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  0.1265460E-04
 FY  =  -6960080.
 FZ  =   7520260.
 MX  = -0.3173148E+10
 MY  = -0.2196140E+10
 MZ  = -0.2075308E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     2 TO     2 BY    1

    1728  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BOUNDARY

******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  = -0.2443332E-02
 FY  =  -6960080.
 FZ  =   7520260.
 MX  = -0.3173148E+10
 MY  = -0.2196140E+10
 MZ  = -0.2075308E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

*************************************************************************
************************* LOAD CASE 10 ********************************

USE LOAD STEP    10  SUBSTEP     0  FOR LOAD CASE 0
```

```
SET COMMAND GOT LOAD STEP=    10  SUBSTEP=     1  CUMULATIVE ITERATION=    42
  TIME/FREQUENCY=  10.000
TITLE= Pad, HE(1), Casks 1 and 2, 515 Kips N 45 W (Z,X), Soft Rock

   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

SELECT      COMPONENT CASK

******** SUM OF LOADS APPLIED TO CASKS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  -728320.0
 FY  =   534080.0
 FZ  =  -728320.0
 MX  =  0.2950272E+09
 MY  =  0.6685978E+09
 MZ  =  0.1952582E+09

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     1 TO     1 BY    1

    9056  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BASE

******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =   5314877.
 FY  =  -6960080.
 FZ  =   5314877.
 MX  = -0.3123230E+10
 MY  = -0.3943400E+10
 MZ  = -0.1955219E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     2 TO     2 BY    1

    1728  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BOUNDARY

******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =   5314877.
 FY  =  -6960080.
 FZ  =   5314877.
 MX  = -0.3123230E+10
 MY  = -0.3943400E+10
 MZ  = -0.1955219E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

*************************************************************************
```

```
************************* LOAD CASE 11 ********************************

USE LOAD STEP    11  SUBSTEP     0  FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP=    11  SUBSTEP=     1  CUMULATIVE ITERATION=    47
  TIME/FREQUENCY=  11.000
TITLE= Pad, HE(1), Casks 1 and 2, 515 Kips West (X), Soft Rock

   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

SELECT      COMPONENT CASK

******** SUM OF LOADS APPLIED TO CASKS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  -1030000.
 FY  =   534080.0
 FZ  =  0.1299095E-05
 MX  =  0.3813331E+09
 MY  =  0.7354200E+09
 MZ  =  0.2310073E+09

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     1 TO     1 BY    1

    9056  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BASE

******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =   7520260.
 FY  =  -6960080.
 FZ  =  0.9063054E-05
 MX  = -0.3003141E+10
 MY  = -0.3383446E+10
 MZ  = -0.1905302E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     2 TO     2 BY    1

    1728  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BOUNDARY

******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =   7520260.
 FY  =  -6960080.
 FZ  = -0.2246422E-02
 MX  = -0.3003141E+10
 MY  = -0.3383446E+10
```

```
 MZ  = -0.1905302E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

*************************************************************************
*************************  LOAD CASE 12 ********************************


USE LOAD STEP    12  SUBSTEP     0  FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP=    12  SUBSTEP=     1  CUMULATIVE ITERATION=    52
  TIME/FREQUENCY=  12.000
TITLE= Pad, HE(1), Casks 1 and 2, 515 Kips S 45 W (-Z,X), Soft Rock

   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

SELECT      COMPONENT CASK

******** SUM OF LOADS APPLIED TO CASKS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  -728320.0
 FY  =   534080.0
 FZ  =   728320.0
 MX  =  0.4676390E+09
 MY  =  0.3714432E+09
 MZ  =  0.1952582E+09

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     1 TO     1 BY    1

    9056  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BASE

******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =   5314877.
 FY  =  -6960080.
 FZ  =  -5314877.
 MX  = -0.2883052E+10
 MY  = -0.8392721E+09
 MZ  = -0.1955219E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     2 TO     2 BY    1

    1728  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BOUNDARY

******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******

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

```
 FX  =   5314877.
 FY  =  -6960080.
 FZ  =  -5314877.
 MX  = -0.2883052E+10
 MY  = -0.8392721E+09
 MZ  = -0.1955219E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

*************************************************************************
*************************  LOAD CASE 13 *********************************


USE LOAD STEP    13  SUBSTEP     0  FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP=    13  SUBSTEP=     1  CUMULATIVE ITERATION=    56
  TIME/FREQUENCY=  13.000
TITLE= Pad, HE(1), Casks 1 and 2, 515 Kips South (-Z), Soft Rock

   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

SELECT      COMPONENT CASK

******** SUM OF LOADS APPLIED TO CASKS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  = -0.4849905E-05
 FY  =   534080.0
 FZ  =   1030000.
 MX  =  0.5033881E+09
 MY  = -0.2101200E+09
 MZ  =  0.1089523E+09

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     1 TO     1 BY    1

    9056  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BASE

******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  = -0.2228251E-05
 FY  =  -6960080.
 FZ  =  -7520260.
 MX  = -0.2833134E+10
 MY  =  0.2196140E+10
 MZ  = -0.2075308E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     2 TO     2 BY    1

    1728  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.
```

```
SELECT      COMPONENT BOUNDARY

******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  0.8035135E-03
 FY  =  -6960080.
 FZ  =  -7520260.
 MX  = -0.2833134E+10
 MY  =  0.2196140E+10
 MZ  = -0.2075308E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

*************************************************************************
*************************  LOAD CASE 14 ********************************


USE LOAD STEP    14  SUBSTEP     0  FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP=    14  SUBSTEP=     1  CUMULATIVE ITERATION=    60
  TIME/FREQUENCY=  14.000
TITLE= Pad, HE(1), Casks 1 and 2, 515 Kips S 45 E (-Z,-X), Soft Rock

   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

SELECT      COMPONENT CASK

******** SUM OF LOADS APPLIED TO CASKS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =   728320.0
 FY  =   534080.0
 FZ  =   728320.0
 MX  =  0.4676390E+09
 MY  = -0.6685978E+09
 MZ  =  0.2264640E+08

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     1 TO     1 BY    1

    9056  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BASE

******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  -5314877.
 FY  =  -6960080.
 FZ  =  -5314877.
 MX  = -0.2883052E+10
 MY  =  0.3943400E+10
 MZ  = -0.2195397E+10

SUMMATION POINT=  0.0000      0.0000      0.0000
```

```
ESEL  FOR LABEL= TYPE  FROM     2 TO     2 BY    1

    1728  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BOUNDARY

******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  -5314877.
 FY  =  -6960080.
 FZ  =  -5314877.
 MX  = -0.2883052E+10
 MY  =  0.3943400E+10
 MZ  = -0.2195397E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

*************************************************************************
*************************  LOAD CASE 15 ********************************


USE LOAD STEP    15  SUBSTEP     0  FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP=    15  SUBSTEP=     1  CUMULATIVE ITERATION=    64
  TIME/FREQUENCY=  15.000
TITLE= Pad, HE(1), Casks 1 and 2, 515 Kips East (-x), Soft Rock

   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

SELECT      COMPONENT CASK

******** SUM OF LOADS APPLIED TO CASKS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =   1030000.
 FY  =   534080.0
 FZ  =  0.5304349E-05
 MX  =  0.3813331E+09
 MY  = -0.7354200E+09
 MZ  = -0.1310268E+08

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     1 TO     1 BY    1

    9056  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BASE

******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  -7520260.
 FY  =  -6960080.
 FZ  = -0.3442952E-05
```

```
 MX  = -0.3003141E+10
 MY  =  0.3383446E+10
 MZ  = -0.2245315E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     2 TO     2 BY    1

    1728  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BOUNDARY

******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  -7520260.
 FY  =  -6960080.
 FZ  =  0.6077041E-03
 MX  = -0.3003141E+10
 MY  =  0.3383446E+10
 MZ  = -0.2245315E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

*************************************************************************
*************************** LOAD CASE 16 ********************************


USE LOAD STEP    16  SUBSTEP     0  FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP=    16  SUBSTEP=     1  CUMULATIVE ITERATION=    68
  TIME/FREQUENCY=  16.000
TITLE= Pad, HE(1), Casks 1 and 2, 515 Kips N 45 E (Z,-X), Soft Rock

   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

SELECT      COMPONENT CASK

******** SUM OF LOADS APPLIED TO CASKS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =   728320.0
 FY  =   534080.0
 FZ  =  -728320.0
 MX  =  0.2950272E+09
 MY  = -0.3714432E+09
 MZ  =  0.2264640E+08

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     1 TO     1 BY    1

    9056  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BASE

******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
```

```
***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  -5314877.
 FY  =  -6960080.
 FZ  =   5314877.
 MX  = -0.3123230E+10
 MY  =  0.8392721E+09
 MZ  = -0.2195397E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     2 TO     2 BY    1

    1728  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BOUNDARY

******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  -5314878.
 FY  =  -6960080.
 FZ  =   5314877.
 MX  = -0.3123230E+10
 MY  =  0.8392721E+09
 MZ  = -0.2195397E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

*************************************************************************
*************************  LOAD CASE 17 ********************************


USE LOAD STEP    17  SUBSTEP     0  FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP=    17  SUBSTEP=     1  CUMULATIVE ITERATION=    73
. TIME/FREQUENCY=  17.000
TITLE= Pad, HE(1), Casks 1 to 3, 515 Kips North (Z), Soft Rock

   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

SELECT      COMPONENT CASK

******** SUM OF LOADS APPLIED TO CASKS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  0.8738952E-06
 FY  =   801120.0
 FZ  =  -1545000.
 MX  =  0.4161553E+09
 MY  =  0.4202400E+09
 MZ  =  0.2179046E+09

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     1 TO     1 BY    1
```

```
    9056  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BASE

******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  = -0.1016409E-04
 FY  =  -7227120.
 FZ  =   8035260.
 MX  = -0.3330025E+10
 MY  = -0.2406260E+10
 MZ  = -0.2184261E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     2 TO     2 BY    1

    1728  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BOUNDARY

******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  = -0.1446143E-02
 FY  =  -7227120.
 FZ  =   8035260.
 MX  = -0.3330025E+10
 MY  = -0.2406260E+10
 MZ  = -0.2184261E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

*************************************************************************
************************* LOAD CASE 18 ********************************

USE LOAD STEP    18  SUBSTEP     0  FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP=    18  SUBSTEP=     1  CUMULATIVE ITERATION=    78
  TIME/FREQUENCY=  18.000
TITLE= Pad, HE(1), Casks 1 to 3, 515 Kips N 45 W (Z,X), Soft Rock

   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

SELECT      COMPONENT CASK

******** SUM OF LOADS APPLIED TO CASKS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  -1092480.
 FY  =   801120.0
 FZ  =  -1092480.
 MX  =  0.4697789E+09
 MY  =  0.1114330E+10
 MZ  =  0.3473635E+09
```

```
SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     1 TO     1 BY    1

    9056  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BASE

******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =   5679037.
 FY  =  -7227120.
 FZ  =   5679037.
 MX  = -0.3297982E+10
 MY  = -0.4389132E+10
 MZ  = -0.2107324E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     2 TO     2 BY    1

    1728  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BOUNDARY

******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =   5679037.
 FY  =  -7227120.
 FZ  =   5679037.
 MX  = -0.3297982E+10
 MY  = -0.4389132E+10
 MZ  = -0.2107324E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

*************************************************************************
*************************  LOAD CASE 19 *********************************


USE LOAD STEP    19  SUBSTEP     0  FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP=    19  SUBSTEP=     1  CUMULATIVE ITERATION=    83
  TIME/FREQUENCY=  19.000
TITLE= Pad, HE(1), Casks 1 to 3, 515 Kips West (X), Soft Rock

   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

SELECT      COMPONENT CASK

******** SUM OF LOADS APPLIED TO CASKS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  -1545000.
```

```
 FY  =   801120.0
 FZ  =  0.1073334E-05
 MX  =  0.5992378E+09
 MY  =  0.1155660E+10
 MZ  =  0.4009871E+09

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     1 TO     1 BY    1

    9056  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BASE

******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =   8035260.
 FY  =  -7227120.
 FZ  =  0.1352398E-04
 MX  = -0.3221046E+10
 MY  = -0.3803686E+10
 MZ  = -0.2075281E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     2 TO     2 BY    1

    1728  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BOUNDARY

******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =   8035260.
 FY  =  -7227120.
 FZ  = -0.1956761E-02
 MX  = -0.3221046E+10
 MY  = -0.3803686E+10
 MZ  = -0.2075281E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

*************************************************************************
*************************  LOAD CASE 20 *********************************


USE LOAD STEP    20  SUBSTEP     0  FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP=    20  SUBSTEP=     1  CUMULATIVE ITERATION=    88
  TIME/FREQUENCY=  20.000
TITLE= Pad, HE(1), Casks 1 to 3, 515 Kips S 45 W (-Z,X), Soft Rock

   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

SELECT      COMPONENT CASK
```

```
******** SUM OF LOADS APPLIED TO CASKS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  -1092480.
 FY  =   801120.0
 FZ  =   1092480.
 MX  =  0.7286966E+09
 MY  =  0.5200205E+09
 MZ  =  0.3473635E+09

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     1 TO     1 BY    1

    9056  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BASE

******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =   5679037.
 FY  =  -7227120.
 FZ  =  -5679037.
 MX  = -0.3144110E+10
 MY  = -0.9878493E+09
 MZ  = -0.2107324E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     2 TO     2 BY    1

    1728  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BOUNDARY

******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =   5679037.
 FY  =  -7227120.
 FZ  =  -5679037.
 MX  = -0.3144110E+10
 MY  = -0.9878493E+09
 MZ  = -0.2107324E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

*************************************************************************
************************* LOAD CASE 21 ********************************


USE LOAD STEP    21  SUBSTEP     0  FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP=    21  SUBSTEP=     1  CUMULATIVE ITERATION=    92
  TIME/FREQUENCY=  21.000
```

```
TITLE= Pad, HE(1), Casks 1 to 3, 515 Kips South (-Z), Soft Rock

   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

SELECT      COMPONENT CASK

******** SUM OF LOADS APPLIED TO CASKS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  0.2405465E-05
 FY  =   801120.0
 FZ  =   1545000.
 MX  =  0.7823203E+09
 MY  = -0.4202400E+09
 MZ  =  0.2179046E+09

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     1 TO     1 BY    1

    9056  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BASE

******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  0.1974613E-04
 FY  =  -7227120.
 FZ  =  -8035260.
 MX  = -0.3112067E+10
 MY  =  0.2406260E+10
 MZ  = -0.2184261E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     2 TO     2 BY    1

    1728  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BOUNDARY

******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  0.1588907E-03
 FY  =  -7227120.
 FZ  =  -8035260.
 MX  = -0.3112067E+10
 MY  =  0.2406260E+10
 MZ  = -0.2184261E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

*************************************************************************
************************  LOAD CASE 22 ********************************
```

```
USE LOAD STEP    22  SUBSTEP     0  FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP=    22  SUBSTEP=     1  CUMULATIVE ITERATION=    96
  TIME/FREQUENCY=  22.000
TITLE= Pad, HE(1), Casks 1 to 3, 515 Kips S 45 E (-Z,-X), Soft Rock

   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

SELECT      COMPONENT CASK

******** SUM OF LOADS APPLIED TO CASKS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =   1092480.
 FY  =   801120.0
 FZ  =   1092480.
 MX  =  0.7286966E+09
 MY  = -0.1114330E+10
 MZ  =  0.8844576E+08

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     1 TO     1 BY    1

    9056  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BASE

******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  -5679037.
 FY  =  -7227120.
 FZ  =  -5679037.
 MX  = -0.3144110E+10
 MY  =  0.4389132E+10
 MZ  = -0.2261197E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     2 TO     2 BY    1

    1728  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BOUNDARY

******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  -5679037.
 FY  =  -7227120.
 FZ  =  -5679037.
 MX  = -0.3144110E+10
 MY  =  0.4389132E+10
 MZ  = -0.2261197E+10
```

```
SUMMATION POINT=  0.0000      0.0000      0.0000

*************************************************************************
*************************  LOAD CASE 23 *********************************


USE LOAD STEP    23  SUBSTEP     0  FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP=    23  SUBSTEP=     1  CUMULATIVE ITERATION=   101
  TIME/FREQUENCY=  23.000
TITLE= Pad, HE(1), Casks 1 to 3, 515 Kips East (-x), Soft Rock

   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

SELECT      COMPONENT CASK

******** SUM OF LOADS APPLIED TO CASKS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =   1545000.
 FY  =   801120.0
 FZ  = -0.6804747E-05
 MX  =  0.5992378E+09
 MY  = -0.1155660E+10
 MZ  =  0.3482214E+08

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     1 TO     1 BY    1

    9056  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BASE

******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  -8035260.
 FY  =  -7227120.
 FZ  = -0.1158217E-05
 MX  = -0.3221046E+10
 MY  =  0.3803686E+10
 MZ  = -0.2293240E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     2 TO     2 BY    1

    1728  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.


SELECT      COMPONENT BOUNDARY
******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  -8035260.
 FY  =  -7227120.
```

```
 FZ  = -0.2711743E-03
 MX  = -0.3221046E+10
 MY  =  0.3803686E+10
 MZ  = -0.2293240E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

*************************************************************************
*************************  LOAD CASE 24 *********************************

USE LOAD STEP    24  SUBSTEP     0  FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP=    24  SUBSTEP=     1  CUMULATIVE ITERATION=   108
  TIME/FREQUENCY= . 24.000
TITLE= Pad, HE(1), Casks 1 to 3, 515 Kips N 45 E (Z,-X), Soft Rock

   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

SELECT      COMPONENT CASK

******** SUM OF LOADS APPLIED TO CASKS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =   1092480.
 FY  =   801120.0
 FZ  =  -1092480.
 MX  =  0.4697789E+09
 MY  = -0.5200205E+09
 MZ  =  0.8844576E+08

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     1 TO     1 BY    1

    9056  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BASE

******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  -5679037.
 FY  =  -7227120.
 FZ  =   5679037.
 MX  = -0.3297982E+10
 MY  =  0.9878493E+09
 MZ  = -0.2261197E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     2 TO     2 BY    1

    1728  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BOUNDARY
```

```
******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  -5679038.
 FY  =  -7227120.
 FZ  =   5679037.
 MX  = -0.3297982E+10
 MY  =  0.9878493E+09
 MZ  = -0.2261197E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

*************************************************************************
*************************  LOAD CASE 25 *********************************


USE LOAD STEP    25  SUBSTEP     0  FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP=    25  SUBSTEP=     1  CUMULATIVE ITERATION=   113
  TIME/FREQUENCY=  25.000
TITLE= Pad, HE(1), Casks 1 to 4, 515 Kips North (Z), Soft Rock

   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

SELECT      COMPONENT CASK

******** SUM OF LOADS APPLIED TO CASKS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  0.1583816E-04
 FY  =   1068160.
 FZ  =  -2060000.
 MX  =  0.5185562E+09
 MY  =  0.6303600E+09
 MZ  =  0.3268570E+09

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     1 TO     1 BY    1

    9056  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BASE

******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  0.2874678E-04
 FY  =  -7494160.
 FZ  =   8550260.
 MX  = -0.3432426E+10
 MY  = -0.2616380E+10
 MZ  = -0.2293213E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     2 TO     2 BY    1
```

```
    1728  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BOUNDARY

******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  = -0.2942764E-04
 FY  =  -7494160.
 FZ  =   8550260.
 MX  = -0.3432426E+10
 MY  = -0.2616380E+10
 MZ  = -0.2293213E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

*************************************************************************
************************* LOAD CASE 26 ********************************


USE LOAD STEP    26  SUBSTEP     0  FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP=    26  SUBSTEP=     1  CUMULATIVE ITERATION=   119
  TIME/FREQUENCY=  26.000
TITLE= Pad, HE(1), Casks 1 to 4, 515 Kips N 45 W (Z,X), Soft Rock

   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

SELECT      COMPONENT CASK

******** SUM OF LOADS APPLIED TO CASKS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  -1456640.
 FY  =   1068160.
 FZ  =  -1456640.
 MX  =  0.5900544E+09
 MY  =  0.1485773E+10
 MZ  =  0.4994688E+09

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     1 TO     1 BY    1

    9056  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BASE

******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =   6043197.
 FY  =  -7494160.
 FZ  =   6043197.
 MX  = -0.3418257E+10
 MY  = -0.4760575E+10
```

```
 MZ  = -0.2259430E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     2 TO     2 BY    1

    1728  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BOUNDARY

******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =   6043198.
 FY  =  -7494160.
 FZ  =   6043197.
 MX  = -0.3418257E+10
 MY  = -0.4760575E+10
 MZ  = -0.2259430E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

*************************************************************************
*************************  LOAD CASE 27 ********************************


USE LOAD STEP    27  SUBSTEP     0  FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP=    27  SUBSTEP=     1  CUMULATIVE ITERATION=   125
  TIME/FREQUENCY=  27.000
TITLE= Pad, HE(1), Casks 1 to 4, 515 Kips West (X), Soft Rock

   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

SELECT      COMPONENT CASK

******** SUM OF LOADS APPLIED TO CASKS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  -2060000.
 FY  =   1068160.
 FZ  =  0.9695931E-05
 MX  =  0.7626662E+09
 MY  =  0.1470840E+10
 MZ  =  0.5709670E+09

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     1 TO     1 BY    1

    9056  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BASE

******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******

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

```
 FX  =    8550260.
 FY  =   -7494160.
 FZ  = -0.8574152E-05
 MX  = -0.3384474E+10
 MY  = -0.4118866E+10
 MZ  = -0.2245261E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     2 TO     2 BY    1

    1728  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BOUNDARY

******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =    8550260.
 FY  =   -7494160.
 FZ  = -0.1889136E-02
 MX  = -0.3384474E+10
 MY  = -0.4118866E+10
 MZ  = -0.2245261E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

*************************************************************************
*************************  LOAD CASE 28 *********************************


USE LOAD STEP    28  SUBSTEP     0  FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP=    28  SUBSTEP=     1  CUMULATIVE ITERATION=   130
  TIME/FREQUENCY=  28.000
TITLE= Pad, HE(1), Casks 1 to 4, 515 Kips S 45 W (-Z,X), Soft Rock

   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

SELECT      COMPONENT CASK

******** SUM OF LOADS APPLIED TO CASKS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =   -1456640.
 FY  =    1068160.
 FZ  =    1456640.
 MX  =  0.9352781E+09
 MY  =  0.5943091E+09
 MZ  =  0.4994688E+09

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     1 TO     1 BY    1

    9056  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.
```

```
SELECT      COMPONENT BASE

******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =   6043197.
 FY  =  -7494160.
 FZ  =  -6043197.
 MX  = -0.3350691E+10
 MY  = -0.1062138E+10
 MZ  = -0.2259430E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     2 TO     2 BY    1

    1728  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BOUNDARY

******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =   6043198.
 FY  =  -7494160.
 FZ  =  -6043197.
 MX  = -0.3350691E+10
 MY  = -0.1062138E+10
 MZ  = -0.2259430E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

*************************************************************************
************************* LOAD CASE 29 ********************************


.USE LOAD STEP    29  SUBSTEP     0  FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP=    29  SUBSTEP=     1  CUMULATIVE ITERATION=   134
  TIME/FREQUENCY=  29.000
TITLE= Pad, HE(1), Casks 1 to 4, 515 Kips South (-Z), Soft Rock

   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

SELECT      COMPONENT CASK

******** SUM OF LOADS APPLIED TO CASKS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  0.1133959E-04
 FY  =   1068160.
 FZ  =   2060000.
 MX  =  0.1006776E+10
 MY  = -0.6303600E+09
 MZ  =  0.3268570E+09

SUMMATION POINT=  0.0000      0.0000      0.0000
```

```
ESEL  FOR LABEL= TYPE  FROM     1 TO     1 BY    1

    9056  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BASE

******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  0.4349726E-04
 FY  =  -7494160.
 FZ  =  -8550260.
 MX  = -0.3336523E+10
 MY  =  0.2616380E+10
 MZ  = -0.2293213E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     2 TO     2 BY    1

    1728  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BOUNDARY

******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  = -0.7684545E-05
 FY  =  -7494160.
 FZ  =  -8550260.
 MX  = -0.3336523E+10
 MY  =  0.2616380E+10
 MZ  = -0.2293213E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

*************************************************************************
*************************  LOAD CASE 30 ********************************


USE LOAD STEP    30  SUBSTEP     0  FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP=    30  SUBSTEP=     1  CUMULATIVE ITERATION=   144
  TIME/FREQUENCY=  30.000
TITLE= Pad, HE(1), Casks 1 to 5, 515 Kips North (Z), Soft Rock

   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

SELECT      COMPONENT CASK

******** SUM OF LOADS APPLIED TO CASKS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  = -0.7514946E-06
 FY  =   1335200.
 FZ  =  -2575000.
```

```
 MX  =  0.6754334E+09
 MY  =  0.6303600E+09
 MZ  =  0.3268570E+09

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     1 TO     1 BY    1

    9056  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BASE

******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  0.1435080E-04
 FY  =  -7761200.
 FZ  =   9065260.
 MX  = -0.3589303E+10
 MY  = -0.2616380E+10
 MZ  = -0.2293213E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     2 TO     2 BY    1

    1728  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BOUNDARY

******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  = -0.3242998E-03
 FY  =  -7761200.
 FZ  =   9065260.
 MX  = -0.3589303E+10
 MY  = -0.2616380E+10
 MZ  = -0.2293213E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

*************************************************************************
*************************  LOAD CASE 31 *********************************


USE LOAD STEP    31  SUBSTEP     0  FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP=    31  SUBSTEP=     1  CUMULATIVE ITERATION=   151
  TIME/FREQUENCY=  31.000
TITLE= Pad, HE(1), Casks 1 to 5, 515 Kips N 45 W (Z,X), Soft Rock

   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

SELECT      COMPONENT CASK

******** SUM OF LOADS APPLIED TO CASKS *******
```

```
***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  -1820800.
 FY  =   1335200.
 FZ  =  -1820800.
 MX  =  0.7648061E+09
 MY  =  0.1782927E+10
 MZ  =  0.5426218E+09

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     1 TO     1 BY    1

    9056  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BASE

******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =   6407357.
 FY  =  -7761200.
 FZ  =   6407357.
 MX  = -0.3593009E+10
 MY  = -0.5057729E+10
 MZ  = -0.2302583E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     2 TO     2 BY    1

    1728  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BOUNDARY

******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =   6407357.
 FY  =  -7761200.
 FZ  =   6407357.
 MX  = -0.3593009E+10
 MY  = -0.5057729E+10
 MZ  = -0.2302583E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

*************************************************************************
*************************  LOAD CASE 32 ********************************


USE LOAD STEP    32  SUBSTEP     0  FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP=    32  SUBSTEP=     1  CUMULATIVE ITERATION=   156
  TIME/FREQUENCY=  32.000
TITLE= Pad, HE(1), Casks 1 to 5, 515 Kips West (X), Soft Rock
```

```
   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

SELECT      COMPONENT CASK

******** SUM OF LOADS APPLIED TO CASKS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  -2575000.
 FY  =   1335200.
 FZ  =  0.3504371E-04
 MX  =  0.9805709E+09
 MY  =  0.1891080E+10
 MZ  =  0.6319945E+09

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     1 TO     1 BY    1

    9056  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BASE

******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =   9065260.
 FY  =  -7761200.
 FZ  =  0.2893927E-04
 MX  = -0.3602379E+10
 MY  = -0.4539106E+10
 MZ  = -0.2306289E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     2 TO     2 BY    1

    1728  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BOUNDARY

******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =   9065260.
 FY  =  -7761200.
 FZ  = -0.2676164E-02
 MX  = -0.3602379E+10
 MY  = -0.4539106E+10
 MZ  = -0.2306289E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

*************************************************************************
************************  LOAD CASE 33 ********************************


USE LOAD STEP    33  SUBSTEP     0  FOR LOAD CASE 0
```

```
SET COMMAND GOT LOAD STEP=     33  SUBSTEP=      1  CUMULATIVE ITERATION=    161
  TIME/FREQUENCY=  33.000
TITLE= Pad, HE(1), Casks 1 to 5, 515 Kips S 45 W (-Z,X), Soft Rock

   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

SELECT      COMPONENT CASK

******** SUM OF LOADS APPLIED TO CASKS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  -1820800.
 FY  =   1335200.
 FZ  =   1820800.
 MX  =  0.1196336E+10
 MY  =  0.8914637E+09
 MZ  =  0.5426218E+09

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     1 TO     1 BY    1

    9056  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BASE

******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =   6407357.
 FY  =  -7761200.
 FZ  =  -6407357.
 MX  = -0.3611749E+10
 MY  = -0.1359293E+10
 MZ  = -0.2302583E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     2 TO     2 BY    1

    1728  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BOUNDARY

******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =   6407358.
 FY  =  -7761200.
 FZ  =  -6407357.
 MX  = -0.3611749E+10
 MY  = -0.1359293E+10
 MZ  = -0.2302583E+10

SUMMATION POINT=  0.0000      0.0000      0.0000
```

```
*************************************************************************
*************************  LOAD CASE 34 ********************************

USE LOAD STEP    34  SUBSTEP     0  FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP=    34  SUBSTEP=     1  CUMULATIVE ITERATION=   165
  TIME/FREQUENCY=  34.000
TITLE= Pad, HE(1), Casks 1 to 5, 515 Kips South (-Z), Soft Rock

   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

SELECT      COMPONENT CASK

******** SUM OF LOADS APPLIED TO CASKS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  0.1983018E-05
 FY  =   1335200.
 FZ  =   2575000.
 MX  =  0.1285708E+10
 MY  = -0.6303600E+09
 MZ  =  0.3268570E+09

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     1 TO     1 BY    1

    9056  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BASE

******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  = -0.1630182E-04
 FY  =  -7761200.
 FZ  =  -9065260.
 MX  = -0.3615455E+10
 MY  =  0.2616380E+10
 MZ  = -0.2293213E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     2 TO     2 BY    1

    1728  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BOUNDARY

******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  0.1241767E-02
 FY  =  -7761200.
 FZ  =  -9065260.
 MX  = -0.3615455E+10
```

```
 MY  =  0.2616380E+10
 MZ  = -0.2293213E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

*************************************************************************
*************************  LOAD CASE 35 *********************************


USE LOAD STEP    35  SUBSTEP     0  FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP=    35  SUBSTEP=     1  CUMULATIVE ITERATION=   169
  TIME/FREQUENCY=  35.000
TITLE= Pad, HE(1), Casks 1 to 5, 515 Kips S 45 E (-Z,-X), Soft Rock

   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

SELECT      COMPONENT CASK

******** SUM OF LOADS APPLIED TO CASKS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =   1820800.
 FY  =   1335200.
 FZ  =   1820800.
 MX  =  0.1196336E+10
 MY  = -0.1782927E+10
 MZ  =  0.1110922E+09

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     1 TO     1 BY    1

    9056  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BASE

******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  -6407357.
 FY  =  -7761200.
 FZ  =  -6407357.
 MX  = -0.3611749E+10
 MY  =  0.5057729E+10
 MZ  = -0.2283843E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     2 TO     2 BY    1

    1728  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BOUNDARY

******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
```

```
***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  -6407357.
 FY  =  -7761200.
 FZ  =  -6407357.
 MX  = -0.3611749E+10
 MY  =  0.5057729E+10
 MZ  = -0.2283843E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

*************************************************************************
*************************  LOAD CASE 36 ********************************


USE LOAD STEP    36  SUBSTEP     0  FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP=    36  SUBSTEP=     1  CUMULATIVE ITERATION=   175
  TIME/FREQUENCY=  36.000
TITLE= Pad, HE(1), Casks 1 to 5, 515 Kips East (-x), Soft Rock

   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

SELECT      COMPONENT CASK

******** SUM OF LOADS APPLIED TO CASKS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =   2575000.
 FY  =   1335200.
 FZ  = -0.4613663E-05
 MX  =  0.9805709E+09
 MY  = -0.1891080E+10
 MZ  =  0.2171946E+08

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     1 TO     1 BY    1

    9056  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BASE

******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  -9065260.
 FY  =  -7761200.
 FZ  =  0.1298883E-04
 MX  = -0.3602379E+10
 MY  =  0.4539106E+10
 MZ  = -0.2280137E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     2 TO     2 BY    1

    1728  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.
```

```
SELECT      COMPONENT BOUNDARY

******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  -9065260.
 FY  =  -7761200.
 FZ  = -0.1181374E-02
 MX  = -0.3602379E+10
 MY  =  0.4539106E+10
 MZ  = -0.2280137E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

*************************************************************************
*************************  LOAD CASE 37 ********************************


USE LOAD STEP    37  SUBSTEP     0  FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP=    37  SUBSTEP=     1  CUMULATIVE ITERATION=   183
  TIME/FREQUENCY=  37.000
TITLE= Pad, HE(1), Casks 1 to 5, 515 Kips N 45 E (Z,-X), Soft Rock

   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

SELECT      COMPONENT CASK

******** SUM OF LOADS APPLIED TO CASKS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =   1820800.
 FY  =   1335200.
 FZ  =  -1820800.
 MX  =  0.7648061E+09
 MY  = -0.8914637E+09
 MZ  =  0.1110922E+09

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     1 TO     1 BY    1

    9056  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BASE

******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  -6407357.
 FY  =  -7761200.
 FZ  =   6407357.
 MX  = -0.3593009E+10
 MY  =  0.1359293E+10
 MZ  = -0.2283843E+10
```

```
SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     2 TO     2 BY    1

    1728  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BOUNDARY

******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  -6407357.
 FY  =  -7761200.
 FZ  =   6407357.
 MX  = -0.3593009E+10
 MY  =  0.1359293E+10
 MZ  = -0.2283843E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

*************************************************************************
*************************  LOAD CASE 38 ********************************


USE LOAD STEP    38  SUBSTEP     0  FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP=    38  SUBSTEP=     1  CUMULATIVE ITERATION=   190
  TIME/FREQUENCY=  38.000
TITLE= Pad, HE(1), Casks 1 to 6, 515 Kips North (Z), Soft Rock

   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

SELECT      COMPONENT CASK

******** SUM OF LOADS APPLIED TO CASKS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  0.1122735E-06
 FY  =   1602240.
 FZ  =  -3090000.
 MX  =  0.8323105E+09
 MY  =  0.9455400E+09
 MZ  =  0.4902854E+09

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     1 TO     1 BY    1

    9056  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BASE

******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  0.1336810E-04
 FY  =  -8028240.
```

```
 FZ  =    9580260.
 MX  = -0.3746180E+10
 MY  = -0.2931560E+10
 MZ  = -0.2456641E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     2 TO     2 BY    1

    1728  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BOUNDARY

******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  = -0.2585423E-05
 FY  =  -8028240.
 FZ  =    9580260.
 MX  = -0.3746180E+10
 MY  = -0.2931560E+10
 MZ  = -0.2456641E+10

SUMMATION POINT=  0.0000      0.0000      0.0000


*************************************************************************
*************************  LOAD CASE 39 ********************************


USE LOAD STEP    39  SUBSTEP     0  FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP=    39  SUBSTEP=     1  CUMULATIVE ITERATION=   197
  TIME/FREQUENCY=  39.000
TITLE= Pad, HE(1), Casks 1 to 6, 515 Kips N 45 W (Z,X), Soft Rock

   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

SELECT      COMPONENT CASK

******** SUM OF LOADS APPLIED TO CASKS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  -2184960.
 FY  =   1602240.
 FZ  =  -2184960.
 MX  =  0.9395578E+09
 MY  =  0.2302948E+10
 MZ  =  0.7492032E+09

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     1 TO     1 BY    1

    9056  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BASE
```

```
******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =   6771517.
 FY  =  -8028240.
 FZ  =   6771517.
 MX  = -0.3767761E+10
 MY  = -0.5577750E+10
 MZ  = -0.2509164E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     2 TO     2 BY    1

    1728  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BOUNDARY

******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =   6771517.
 FY  =  -8028240.
 FZ  =   6771517.
 MX  = -0.3767761E+10
 MY  = -0.5577750E+10
 MZ  = -0.2509164E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

*************************************************************************
************************** LOAD CASE 40 ********************************


USE LOAD STEP    40  SUBSTEP     0  FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP=    40  SUBSTEP=     1  CUMULATIVE ITERATION=   203
  TIME/FREQUENCY=  40.000
TITLE= Pad, HE(1), Casks 1 to 6, 515 Kips West (X), Soft Rock

   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

SELECT      COMPONENT CASK

******** SUM OF LOADS APPLIED TO CASKS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  -3090000.
 FY  =   1602240.
 FZ  =  0.7267194E-05
 MX  =  0.1198476E+10
 MY  =  0.2311320E+10
 MZ  =  0.8564504E+09

SUMMATION POINT=  0.0000      0.0000      0.0000
```

```
ESEL  FOR LABEL= TYPE  FROM     1 TO     1 BY    1

    9056  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BASE

******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =   9580260.
 FY  =  -8028240.
 FZ  =  0.9570563E-05
 MX  = -0.3820284E+10
 MY  = -0.4959346E+10
 MZ  = -0.2530745E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     2 TO     2 BY    1

    1728  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BOUNDARY

******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =   9580260.
 FY  =  -8028240.
 FZ  = -0.2004258E-02
 MX  = -0.3820284E+10
 MY  = -0.4959346E+10
 MZ  = -0.2530745E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

*************************************************************************
************************* LOAD CASE 41 ********************************


USE LOAD STEP    41  SUBSTEP     0  FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP=    41  SUBSTEP=     1  CUMULATIVE ITERATION=   208
  TIME/FREQUENCY=  41.000
TITLE= Pad, HE(1), Casks 1 to 6, 515 Kips S 45 W (-Z,X), Soft Rock

   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

SELECT      COMPONENT CASK

******** SUM OF LOADS APPLIED TO CASKS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  -2184960.
 FY  =   1602240.
 FZ  =   2184960.
 MX  =  0.1457393E+10
```

```
 MY  =  0.9657523E+09
 MZ  =  0.7492032E+09

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     1 TO     1 BY    1

    9056  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BASE

******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =   6771517.
 FY  =  -8028240.
 FZ  =  -6771517.
 MX  = -0.3872806E+10
 MY  = -0.1433581E+10
 MZ  = -0.2509164E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     2 TO     2 BY    1

    1728  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BOUNDARY

******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =   6771517.
 FY  =  -8028240.
 FZ  =  -6771517.
 MX  = -0.3872806E+10
 MY  = -0.1433581E+10
 MZ  = -0.2509164E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

*************************************************************************
************************* LOAD CASE 42 ********************************


USE LOAD STEP    42  SUBSTEP     0  FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP=    42  SUBSTEP=     1  CUMULATIVE ITERATION=   213
  TIME/FREQUENCY=  42.000
TITLE= Pad, HE(1), Casks 1 to 6, 515 Kips South (-Z), Soft Rock

   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

SELECT      COMPONENT CASK

******** SUM OF LOADS APPLIED TO CASKS *******
```

```
***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  = -0.9941150E-06
 FY  =   1602240.
 FZ  =   3090000.
 MX  =  0.1564641E+10
 MY  = -0.9455400E+09
 MZ  =  0.4902854E+09

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     1 TO     1 BY    1

    9056  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BASE

******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  0.2742890E-04
 FY  =  -8028240.
 FZ  =  -9580260.
 MX  = -0.3894387E+10
 MY  =  0.2931560E+10
 MZ  = -0.2456641E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     2 TO     2 BY    1

    1728  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BOUNDARY

******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  0.5174761E-05
 FY  =  -8028240.
 FZ  =  -9580260.
 MX  = -0.3894387E+10
 MY  =  0.2931560E+10
 MZ  = -0.2456641E+10

SUMMATION POINT=  0.0000      0.0000      0.0000


   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

   17051  NODES (OF    17051  DEFINED) SELECTED BY NALL  COMMAND.

EXIT THE ANSYS POST1 DATABASE PROCESSOR


***** ROUTINE COMPLETED *****  CP =       126.021
```

```
*** NOTE ***                                CP=    126.021   TIME= 12:52:41
A total of 1 warnings and errors written to dcslabs7.err.
```

ANSYS input file for processing reaction loads for casks 1 to 7 through 1 to 10:

```
/com,
/com, This routine processes load results data for the
/com,   evaluation of equilibrium.
/com
/com,   Soft Rock Load Step Results for Cask Load Sequence 2
/com, This is for load sequence for casks 7 through 10
/com
/output,padsoftreacseq2,out
/com
/com ***************************************************************************
/com ***************************************************************************
/com ***************************************************************************
/com ***************************************************************************
/com ***************************************************************************
/com ***************************************************************************
/com
/com ************************ Soft Rock Reactions ****************************
/com
/file,dcslabs7
resume
/post1
eall
nall
/com
/com ***************************************************************************
/com *************************  LOAD CASE 1 ***********************************
set,1
eall
cmsel,s,cask
/com
/com ******** SUM OF LOADS APPLIED TO CASKS *******
fsum
esel,type,1
cmsel,s,base
/com
/com ******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
fsum
esel,type,2
cmsel,s,boundary
/com
/com ******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
fsum
/com
/com ***************************************************************************
/com *************************  LOAD CASE 2 ***********************************
set,2
eall
cmsel,s,cask
/com
/com ******** SUM OF LOADS APPLIED TO CASKS *******
fsum
esel,type,1
cmsel,s,base
/com
```

```
/com ******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
fsum
esel,type,2
cmsel,s,boundary
/com
/com ******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
fsum
/com
/com ***************************************************************************
/com *************************  LOAD CASE 3 ***********************************
set,3
eall
cmsel,s,cask
/com
/com ******** SUM OF LOADS APPLIED TO CASKS *******
fsum
esel,type,1
cmsel,s,base
/com
/com ******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
fsum
esel,type,2
cmsel,s,boundary
/com
/com ******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
fsum
/com
/com ***************************************************************************
/com *************************  LOAD CASE 4 ***********************************
set,4
eall
cmsel,s,cask
/com
/com ******** SUM OF LOADS APPLIED TO CASKS *******
fsum
esel,type,1
cmsel,s,base
/com
/com ******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
fsum
esel,type,2
/com
cmsel,s,boundary
/com ******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
fsum
/com
/com ***************************************************************************
/com *************************  LOAD CASE 5 ***********************************
set,5
eall
cmsel,s,cask
/com
/com ******** SUM OF LOADS APPLIED TO CASKS *******
fsum
esel,type,1
cmsel,s,base
/com
```

```
/com ******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
fsum
esel,type,2
cmsel,s,boundary
/com
/com ******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
fsum
/com
/com ***************************************************************************
/com *************************  LOAD CASE 6 **********************************
set,6
eall
cmsel,s,cask
/com
/com ******** SUM OF LOADS APPLIED TO CASKS *******
fsum
esel,type,1
cmsel,s,base
/com
/com ******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
fsum
esel,type,2
cmsel,s,boundary
/com
/com ******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
fsum
/com
/com ***************************************************************************
/com *************************  LOAD CASE 7 **********************************
set,7
eall
cmsel,s,cask
/com
/com ******** SUM OF LOADS APPLIED TO CASKS *******
fsum
esel,type,1
cmsel,s,base
/com
/com ******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
fsum
esel,type,2
cmsel,s,boundary
/com
/com ******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
fsum
/com
/com ***************************************************************************
/com *************************  LOAD CASE 8 **********************************
set,8
eall
cmsel,s,cask
/com
/com ******** SUM OF LOADS APPLIED TO CASKS *******
fsum
esel,type,1
cmsel,s,base
/com
```

```
/com ******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
fsum
esel,type,2
cmsel,s,boundary
/com
/com ******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
fsum
/com
/com ***************************************************************************
/com *************************  LOAD CASE 9 ***********************************
set,9
eall
cmsel,s,cask
/com
/com ******** SUM OF LOADS APPLIED TO CASKS *******
fsum
esel,type,1
cmsel,s,base
/com
/com ******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
fsum
esel,type,2
cmsel,s,boundary
/com
/com ******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
fsum
/com
/com ***************************************************************************
/com *************************  LOAD CASE 10 **********************************
set,10
eall
cmsel,s,cask
/com
/com ******** SUM OF LOADS APPLIED TO CASKS *******
fsum
esel,type,1
cmsel,s,base
/com
/com ******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
fsum
esel,type,2
cmsel,s,boundary
/com
/com ******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
fsum
/com
/com ***************************************************************************
/com *************************  LOAD CASE 11 **********************************
set,11
eall
cmsel,s,cask
/com
/com ******** SUM OF LOADS APPLIED TO CASKS *******
fsum
esel,type,1
cmsel,s,base
/com
```

```
/com ******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
fsum
esel,type,2
cmsel,s,boundary
/com
/com ******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
fsum
/com
/com ***************************************************************************
/com *************************  LOAD CASE 12 ********************************
set,12
eall
cmsel,s,cask
/com
/com ******** SUM OF LOADS APPLIED TO CASKS *******
fsum
esel,type,1
cmsel,s,base
/com
/com ******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
fsum
esel,type,2
cmsel,s,boundary
/com
/com ******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
fsum
/com
/com ***************************************************************************
/com *************************  LOAD CASE 13 ********************************
set,13
eall
cmsel,s,cask
/com
/com ******** SUM OF LOADS APPLIED TO CASKS *******
fsum
esel,type,1
cmsel,s,base
/com
/com ******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
fsum
esel,type,2
cmsel,s,boundary
/com
/com ******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
fsum
/com
/com ***************************************************************************
/com *************************  LOAD CASE 14 ********************************
set,14
eall
cmsel,s,cask
/com
/com ******** SUM OF LOADS APPLIED TO CASKS *******
fsum
esel,type,1
cmsel,s,base
/com
```

```
/com ******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
fsum
esel,type,2
cmsel,s,boundary
/com
/com ******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
fsum
/com
/com ***************************************************************************
/com *************************  LOAD CASE 15 ********************************
set,15
eall
cmsel,s,cask
/com
/com ******** SUM OF LOADS APPLIED TO CASKS *******
fsum
esel,type,1
cmsel,s,base
/com
/com ******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
fsum
esel,type,2
cmsel,s,boundary
/com
/com ******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
fsum
/com
/com ***************************************************************************
/com *************************  LOAD CASE 16 ********************************
set,16
eall
cmsel,s,cask
/com
/com ******** SUM OF LOADS APPLIED TO CASKS *******
fsum
esel,type,1
cmsel,s,base
/com
/com ******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
fsum
esel,type,2
cmsel,s,boundary
/com
/com ******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
fsum
/com
/com ***************************************************************************
/com *************************  LOAD CASE 17 ********************************
set,17
eall
cmsel,s,cask
/com
/com ******** SUM OF LOADS APPLIED TO CASKS *******
fsum
esel,type,1
cmsel,s,base
/com
```

```
/com ******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
fsum
esel,type,2
cmsel,s,boundary
/com
/com ******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
fsum
/com
/com ***************************************************************************
/com *************************  LOAD CASE 18 ********************************
set,18
eall
cmsel,s,cask
/com
/com ******** SUM OF LOADS APPLIED TO CASKS *******
fsum
esel,type,1
cmsel,s,base
/com
/com ******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
fsum
esel,type,2
cmsel,s,boundary
/com
/com ******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
fsum
/com
/com ***************************************************************************
/com *************************  LOAD CASE 19 ********************************
set,19
eall
cmsel,s,cask
/com
/com ******** SUM OF LOADS APPLIED TO CASKS *******
fsum
esel,type,1
cmsel,s,base
/com
/com ******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
fsum
esel,type,2
cmsel,s,boundary
/com
/com ******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
fsum
/com
/com ***************************************************************************
/com *************************  LOAD CASE 20 ********************************
set,20
eall
cmsel,s,cask
/com
/com ******** SUM OF LOADS APPLIED TO CASKS *******
fsum
esel,type,1
cmsel,s,base
/com
```

```
/com ******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
fsum
esel,type,2
cmsel,s,boundary
/com
/com ******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
fsum
/com
/com ***************************************************************************
/com *************************  LOAD CASE 21 ********************************
set,21
eall
cmsel,s,cask
/com
/com ******** SUM OF LOADS APPLIED TO CASKS *******
fsum
esel,type,1
cmsel,s,base
/com
/com ******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
fsum
esel,type,2
cmsel,s,boundary
/com
/com ******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
fsum
/com
/com ***************************************************************************
/com *************************  LOAD CASE 22 ********************************
set,22
eall
cmsel,s,cask
/com
/com ******** SUM OF LOADS APPLIED TO CASKS *******
fsum
esel,type,1
cmsel,s,base
/com
/com ******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
fsum
esel,type,2
cmsel,s,boundary
/com
/com ******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
fsum
/com
/com ***************************************************************************
/com *************************  LOAD CASE 23 ********************************
set,23
eall
cmsel,s,cask
/com
/com ******** SUM OF LOADS APPLIED TO CASKS *******
fsum
esel,type,1
cmsel,s,base
/com
```

```
/com ******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
fsum
esel,type,2
/com
cmsel,s,boundary
/com ******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
fsum
/com
/com ************************************************************************
/com *************************  LOAD CASE 24 ********************************
set,24
eall
cmsel,s,cask
/com
/com ******** SUM OF LOADS APPLIED TO CASKS *******
fsum
esel,type,1
cmsel,s,base
/com
/com ******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
fsum
esel,type,2
cmsel,s,boundary
/com
/com ******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
fsum
/com
/com ************************************************************************
/com *************************  LOAD CASE 25 ********************************
set,25
eall
cmsel,s,cask
/com
/com ******** SUM OF LOADS APPLIED TO CASKS *******
fsum
esel,type,1
cmsel,s,base
/com
/com ******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
fsum
esel,type,2
cmsel,s,boundary
/com
/com ******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
fsum
/com
/com ************************************************************************
/com *************************  LOAD CASE 26 ********************************
set,26
eall
cmsel,s,cask
/com
/com ******** SUM OF LOADS APPLIED TO CASKS *******
fsum
esel,type,1
cmsel,s,base
/com
```

```
/com ******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
fsum
esel,type,2
cmsel,s,boundary
/com
/com ******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
fsum
/com
/com
eall
nall
fini
/output
/exit
```

ANSYS output file for reaction loads for casks 1 to 7 through 1 to 10:

```
*************************************************************************
*************************************************************************
*************************************************************************
*************************************************************************
*************************************************************************
*************************************************************************

************************* Soft Rock Reactions ****************************


CURRENT JOBNAME REDEFINED AS dcslabs7

RESUME ANSYS DATA FROM FILE NAME=dcslabs7.db

*** ANSYS GLOBAL STATUS ***

TITLE = Pad, HE(1), Casks 1 to 10, 515 Kips South (-Z), Soft Rock
ANALYSIS TYPE =  STATIC (STEADY-STATE)
NUMBER OF ELEMENT TYPES =       6
  15348 ELEMENTS CURRENTLY SELECTED.  MAX ELEMENT NUMBER =    33177
  17051 NODES CURRENTLY SELECTED.     MAX NODE NUMBER =       17051
    259 KEYPOINTS CURRENTLY SELECTED. MAX KEYPOINT NUMBER =     259
    250 LINES CURRENTLY SELECTED.     MAX LINE NUMBER =         396
    181 AREAS CURRENTLY SELECTED.     MAX AREA NUMBER =         295
     70 VOLUMES CURRENTLY SELECTED.   MAX VOL. NUMBER =          70
    25 COMPONENTS CURRENTLY DEFINED
MAXIMUM LINEAR PROPERTY NUMBER        =       5
MAXIMUM REAL CONSTANT SET NUMBER      =       6
ACTIVE COORDINATE SYSTEM              =       0  (CARTESIAN)
MAXIMUM CONSTRAINT EQUATION NUMBER    =    4620
NUMBER OF SPECIFIED CONSTRAINTS       =    2193
NUMBER OF NODAL LOADS                 =    1080

INITIAL JOBNAME = dcslabs7
CURRENT JOBNAME = dcslabs7

***** ANSYS - ENGINEERING ANALYSIS SYSTEM  RELEASE 5.7     *****
ANSYS/Structural U
00150104          VERSION=INTEL NT      09:17:29  JUN 19, 2001 CP=      1.222

Pad, HE(1), Casks 1 to 10, 515 Kips South (-Z), Soft Rock


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

ENTER  /SHOW,DEVICE-NAME  TO ENABLE GRAPHIC DISPLAY
ENTER  FINISH             TO LEAVE POST1

*** NOTE ***                            CP=      1.222   TIME= 09:17:29
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).
```

```
   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

   17051  NODES (OF    17051  DEFINED) SELECTED BY NALL  COMMAND.

*************************************************************************
*************************  LOAD CASE 1 **********************************


USE LOAD STEP     1  SUBSTEP     0  FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP=     1  SUBSTEP=     1  CUMULATIVE ITERATION=     9
  TIME/FREQUENCY=  1.0000
TITLE= Pad, HE(1), Casks 1 to 7, 515 Kips North (Z), Soft Rock

   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

SELECT      COMPONENT CASK

******** SUM OF LOADS APPLIED TO CASKS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  0.5621790E-05
 FY  =   1869280.
 FZ  =  -3605000.
 MX  =  0.8802353E+09
 MY  =  0.1050600E+10
 MZ  =  0.5447616E+09

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     1 TO     1 BY    1

    9056  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BASE

******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  = -0.1179353E-04
 FY  =  -8295280.
 FZ  =  0.1009526E+08
 MX  = -0.3794105E+10
 MY  = -0.3036620E+10
 MZ  = -0.2511118E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     2 TO     2 BY    1

    1728  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BOUNDARY

******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
```

```
***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  = -0.1022989E-02
 FY  =  -8295280.
 FZ  =  0.1009526E+08
 MX  = -0.3794105E+10
 MY  = -0.3036620E+10
 MZ  = -0.2511118E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

*************************************************************************
*************************  LOAD CASE 2 ***********************************


USE LOAD STEP     2  SUBSTEP     0  FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP=     2  SUBSTEP=     1  CUMULATIVE ITERATION=    16
  TIME/FREQUENCY=  2.0000
TITLE= Pad, HE(1), Casks 1 to 7, 515 Kips N 45 W (Z,X), Soft Rock

   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

SELECT      COMPONENT CASK

******** SUM OF LOADS APPLIED TO CASKS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  -2549120.
 FY  =   1869280.
 FZ  =  -2549120.
 MX  =  0.1005357E+10
 MY  =  0.2525814E+10
 MZ  =  0.8468323E+09

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     1 TO     1 BY    1

    9056  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BASE

******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =   7135677.
 FY  =  -8295280.
 FZ  =   7135677.
 MX  = -0.3833560E+10
 MY  = -0.5800616E+10
 MZ  = -0.2606793E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     2 TO     2 BY    1

    1728  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.
```

```
SELECT      COMPONENT BOUNDARY

******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =   7135677.
 FY  =  -8295280.
 FZ  =   7135677.
 MX  = -0.3833560E+10
 MY  = -0.5800616E+10
 MZ  = -0.2606793E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

*************************************************************************
*************************  LOAD CASE 3 **********************************


USE LOAD STEP     3  SUBSTEP     0  FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP=     3  SUBSTEP=     1  CUMULATIVE ITERATION=    22
  TIME/FREQUENCY=  3.0000
TITLE= Pad, HE(1), Casks 1 to 7, 515 Kips West (X), Soft Rock

   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

SELECT      COMPONENT CASK

******** SUM OF LOADS APPLIED TO CASKS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  -3605000.
 FY  =   1869280.
 FZ  =  0.2085733E-04
 MX  =  0.1307428E+10
 MY  =  0.2521440E+10
 MZ  =  0.9719541E+09

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     1 TO     1 BY    1

    9056  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BASE

******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  0.1009526E+08
 FY  =  -8295280.
 FZ  = -0.9199044E-05
 MX  = -0.3929236E+10
 MY  = -0.5169466E+10
 MZ  = -0.2646248E+10
```

```
SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     2 TO     2 BY    1

    1728  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BOUNDARY

******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  0.1009526E+08
 FY  =  -8295280.
 FZ  = -0.2103961E-02
 MX  = -0.3929236E+10
 MY  = -0.5169466E+10
 MZ  = -0.2646248E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

*************************************************************************
*************************  LOAD CASE 4 ***********************************


USE LOAD STEP     4  SUBSTEP     0  FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP=     4  SUBSTEP=     1  CUMULATIVE ITERATION=    27
  TIME/FREQUENCY=  4.0000
TITLE= Pad, HE(1), Casks 1 to 7, 515 Kips S 45 W (-Z,X), Soft Rock

   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

SELECT      COMPONENT CASK

******** SUM OF LOADS APPLIED TO CASKS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  -2549120.
 FY  =   1869280.
 FZ  =   2549120.
 MX  =  0.1609499E+10
 MY  =  0.1040041E+10
 MZ  =  0.8468323E+09

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     1 TO     1 BY    1

    9056  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BASE

******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =   7135677.
 FY  =  -8295280.
```

```
 FZ  =  -7135677.
 MX  = -0.4024911E+10
 MY  = -0.1507870E+10
 MZ  = -0.2606793E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     2 TO     2 BY    1

    1728  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.


SELECT      COMPONENT BOUNDARY
******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =   7135677.
 FY  =  -8295280.
 FZ  =  -7135677.
 MX  = -0.4024911E+10
 MY  = -0.1507870E+10
 MZ  = -0.2606793E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

*************************************************************************
*************************  LOAD CASE 5 **********************************


USE LOAD STEP     5  SUBSTEP     0  FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP=     5  SUBSTEP=     1  CUMULATIVE ITERATION=    31
  TIME/FREQUENCY=  5.0000
TITLE= Pad, HE(1), Casks 1 to 7, 515 Kips South (-Z), Soft Rock

   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

SELECT      COMPONENT CASK

******** SUM OF LOADS APPLIED TO CASKS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  = -0.1443982E-05
 FY  =   1869280.
 FZ  =   3605000.
 MX  =  0.1734620E+10
 MY  = -0.1050600E+10
 MZ  =  0.5447616E+09

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     1 TO     1 BY    1

    9056  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BASE
```

```
******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  = -0.1194444E-04
 FY  =  -8295280.
 FZ  = -0.1009526E+08
 MX  = -0.4064367E+10
 MY  =  0.3036620E+10
 MZ  = -0.2511118E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     2 TO     2 BY    1

    1728  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BOUNDARY

******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  = -0.6266482E-03
 FY  =  -8295280.
 FZ  = -0.1009526E+08
 MX  = -0.4064367E+10
 MY  =  0.3036620E+10
 MZ  = -0.2511118E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

*************************************************************************
*************************  LOAD CASE 6 ***********************************


USE LOAD STEP     6  SUBSTEP     0  FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP=     6  SUBSTEP=     1  CUMULATIVE ITERATION=    38
  TIME/FREQUENCY=  6.0000
TITLE= Pad, HE(1), Casks 1 to 7, 515 Kips S 45 E (-Z,-X), Soft Rock

   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

SELECT      COMPONENT CASK

******** SUM OF LOADS APPLIED TO CASKS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =   2549120.
 FY  =   1869280.
 FZ  =   2549120.
 MX  =  0.1609499E+10
 MY  = -0.2525814E+10
 MZ  =  0.2426909E+09

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     1 TO     1 BY    1
```

```
    9056  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BASE

******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  -7135677.
 FY  =  -8295280.
 FZ  =  -7135677.
 MX  = -0.4024911E+10
 MY  =  0.5800616E+10
 MZ  = -0.2415442E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     2 TO     2 BY    1

    1728  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BOUNDARY

******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  -7135678.
 FY  =  -8295280.
 FZ  =  -7135677.
 MX  = -0.4024911E+10
 MY  =  0.5800616E+10
 MZ  = -0.2415442E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

*************************************************************************
************************* LOAD CASE 7 ***********************************


USE LOAD STEP     7  SUBSTEP     0  FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP=     7  SUBSTEP=     1  CUMULATIVE ITERATION=    46
  TIME/FREQUENCY=  7.0000
TITLE= Pad, HE(1), Casks 1 to 7, 515 Kips East (-x), Soft Rock

   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

SELECT      COMPONENT CASK

******** SUM OF LOADS APPLIED TO CASKS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =   3605000.
 FY  =   1869280.
 FZ  = -0.1290711E-04
 MX  =  0.1307428E+10
 MY  = -0.2521440E+10
```

```
 MZ  =  0.1175691E+09

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     1 TO     1 BY    1

    9056  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BASE

******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  = -0.1009526E+08
 FY  =  -8295280.
 FZ  = -0.3556770E-04
 MX  = -0.3929236E+10
 MY  =  0.5169466E+10
 MZ  = -0.2375987E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     2 TO     2 BY    1

    1728  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BOUNDARY

******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  = -0.1009526E+08
 FY  =  -8295280.
 FZ  = -0.1595002E-02
 MX  = -0.3929236E+10
 MY  =  0.5169466E+10
 MZ  = -0.2375987E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

*************************************************************************
************************* LOAD CASE 8 ***********************************


USE LOAD STEP     8  SUBSTEP     0  FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP=     8  SUBSTEP=     1  CUMULATIVE ITERATION=    55
  TIME/FREQUENCY=  8.0000
TITLE= Pad, HE(1), Casks 1 to 7, 515 Kips N 45 E (Z,-X), Soft Rock

   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

SELECT      COMPONENT CASK

******** SUM OF LOADS APPLIED TO CASKS *******

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

```
 FX  =   2549120.
 FY  =   1869280.
 FZ  =  -2549120.
 MX  =  0.1005357E+10
 MY  = -0.1040041E+10
 MZ  =  0.2426909E+09

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     1 TO     1 BY    1

    9056  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BASE

******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  -7135677.
 FY  =  -8295280.
 FZ  =   7135677.
 MX  = -0.3833560E+10
 MY  =  0.1507870E+10
 MZ  = -0.2415442E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     2 TO     2 BY    1

    1728  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BOUNDARY

******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  -7135678.
 FY  =  -8295280.
 FZ  =   7135677.
 MX  = -0.3833560E+10
 MY  =  0.1507870E+10
 MZ  = -0.2415442E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

*************************************************************************
************************* LOAD CASE 9 ***********************************


USE LOAD STEP     9  SUBSTEP     0  FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP=     9  SUBSTEP=     1  CUMULATIVE ITERATION=    62
  TIME/FREQUENCY=  9.0000
TITLE= Pad, HE(1), Casks 1 to 8, 515 Kips North (Z), Soft Rock

   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.
```

```
SELECT      COMPONENT CASK

******** SUM OF LOADS APPLIED TO CASKS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  0.1088402E-04
 FY  =   2136320.
 FZ  =  -4120000.
 MX  =  0.9281602E+09
 MY  =  0.1260720E+10
 MZ  =  0.6537139E+09

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     1 TO     1 BY    1

    9056  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BASE

******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  = -0.1485564E-04
 FY  =  -8562320.
 FZ  =  0.1061026E+08
 MX  = -0.3842030E+10
 MY  = -0.3246740E+10
 MZ  = -0.2620070E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     2 TO     2 BY    1

    1728  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BOUNDARY

******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  = -0.8980486E-05
 FY  =  -8562320.
 FZ  =  0.1061026E+08
 MX  = -0.3842030E+10
 MY  = -0.3246740E+10
 MZ  = -0.2620070E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

*************************************************************************
************************* LOAD CASE 10 ********************************


USE LOAD STEP    10  SUBSTEP     0  FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP=    10  SUBSTEP=     1  CUMULATIVE ITERATION=    69
```

```
  TIME/FREQUENCY=  10.000
TITLE= Pad, HE(1), Casks 1 to 8, 515 Kips N 45 W (Z,X), Soft Rock

   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

SELECT      COMPONENT CASK

******** SUM OF LOADS APPLIED TO CASKS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  -2913280.
 FY  =   2136320.
 FZ  =  -2913280.
 MX  =  0.1071156E+10
 MY  =  0.2822968E+10
 MZ  =  0.9989376E+09

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     1 TO     1 BY    1

    9056  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BASE

******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =   7499837.
 FY  =  -8562320.
 FZ  =   7499837.
 MX  = -0.3899360E+10
 MY  = -0.6097770E+10
 MZ  = -0.2758899E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     2 TO     2 BY    1

    1728  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BOUNDARY

******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =   7499838.
 FY  =  -8562320.
 FZ  =   7499837.
 MX  = -0.3899360E+10
 MY  = -0.6097770E+10
 MZ  = -0.2758899E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

*************************************************************************
************************  LOAD CASE 11 ********************************
```

```
USE LOAD STEP    11  SUBSTEP     0  FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP=    11  SUBSTEP=     1  CUMULATIVE ITERATION=    75
  TIME/FREQUENCY=  11.000
TITLE= Pad, HE(1), Casks 1 to 8, 515 Kips West (X), Soft Rock

   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

SELECT      COMPONENT CASK

******** SUM OF LOADS APPLIED TO CASKS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  -4120000.
 FY  =   2136320.
 FZ  =  0.3337948E-04
 MX  =  0.1416380E+10
 MY  =  0.2731560E+10
 MZ  =  0.1141934E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     1 TO     1 BY    1

    9056  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BASE

******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  0.1061026E+08
 FY  =  -8562320.
 FZ  =  0.1314772E-04
 MX  = -0.4038188E+10
 MY  = -0.5379586E+10
 MZ  = -0.2816228E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     2 TO     2 BY    1

    1728  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BOUNDARY

******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  0.1061026E+08
 FY  =  -8562320.
 FZ  = -0.1673062E-02
 MX  = -0.4038188E+10
 MY  = -0.5379586E+10
 MZ  = -0.2816228E+10
```

```
SUMMATION POINT=  0.0000      0.0000      0.0000

*************************************************************************
*************************  LOAD CASE 12 ********************************


USE LOAD STEP    12  SUBSTEP     0  FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP=    12  SUBSTEP=     1  CUMULATIVE ITERATION=    80
  TIME/FREQUENCY=  12.000
TITLE= Pad, HE(1), Casks 1 to 8, 515 Kips S 45 W (-Z,X), Soft Rock

   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

SELECT      COMPONENT CASK

******** SUM OF LOADS APPLIED TO CASKS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  -2913280.
 FY  =   2136320.
 FZ  =   2913280.
 MX  =  0.1761604E+10
 MY  =  0.1040041E+10
 MZ  =  0.9989376E+09

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     1 TO     1 BY    1

    9056  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BASE

******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =   7499837.
 FY  =  -8562320.
 FZ  =  -7499837.
 MX  = -0.4177017E+10
 MY  = -0.1507870E+10
 MZ  = -0.2758899E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     2 TO     2 BY    1

    1728  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BOUNDARY

******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =   7499838.
```

```
 FY  =  -8562320.
 FZ  =  -7499837.
 MX  = -0.4177017E+10
 MY  = -0.1507870E+10
 MZ  = -0.2758899E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

*************************************************************************
*************************  LOAD CASE 13 *********************************


USE LOAD STEP    13  SUBSTEP     0  FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP=    13  SUBSTEP=     1  CUMULATIVE ITERATION=    84
  TIME/FREQUENCY=  13.000
TITLE= Pad, HE(1), Casks 1 to 8, 515 Kips South (-Z), Soft Rock

   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

SELECT      COMPONENT CASK

******** SUM OF LOADS APPLIED TO CASKS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  0.1246286E-05
 FY  =   2136320.
 FZ  =   4120000.
 MX  =  0.1904600E+10
 MY  = -0.1260720E+10
 MZ  =  0.6537139E+09

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     1 TO     1 BY    1

    9056  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BASE

******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  0.5025056E-04
 FY  =  -8562320.
 FZ  = -0.1061026E+08
 MX  = -0.4234346E+10
 MY  =  0.3246740E+10
 MZ  = -0.2620070E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     2 TO     2 BY    1

    1728  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BOUNDARY
```

```
******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  0.1214107E-04
 FY  =  -8562320.
 FZ  = -0.1061026E+08
 MX  = -0.4234346E+10
 MY  =  0.3246740E+10
 MZ  = -0.2620070E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

*************************************************************************
*************************  LOAD CASE 14 ********************************


USE LOAD STEP    14  SUBSTEP     0  FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP=    14  SUBSTEP=     1  CUMULATIVE ITERATION=    94
  TIME/FREQUENCY=  14.000
TITLE= Pad, HE(1), Casks 1 to 9, 515 Kips North (Z), Soft Rock

   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

SELECT      COMPONENT CASK

******** SUM OF LOADS APPLIED TO CASKS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  = -0.3853758E-05
 FY  =   2403360.
 FZ  =  -4635000.
 MX  =  0.1030561E+10
 MY  =  0.1260720E+10
 MZ  =  0.6537139E+09

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     1 TO     1 BY    1

    9056  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BASE

******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  0.9745712E-05
 FY  =  -8829360.
 FZ  =  0.1112526E+08
 MX  = -0.3944431E+10
 MY  = -0.3246740E+10
 MZ  = -0.2620070E+10

SUMMATION POINT=  0.0000      0.0000      0.0000
```

```
ESEL  FOR LABEL= TYPE  FROM     2 TO     2 BY    1

    1728  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BOUNDARY

******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  = -0.1856031E-02
 FY  =  -8829360.
 FZ  =  0.1112526E+08
 MX  = -0.3944431E+10
 MY  = -0.3246740E+10
 MZ  = -0.2620070E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

*************************************************************************
*************************  LOAD CASE 15 ********************************


USE LOAD STEP    15  SUBSTEP     0  FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP=    15  SUBSTEP=     1  CUMULATIVE ITERATION=   102
  TIME/FREQUENCY=  15.000
TITLE= Pad, HE(1), Casks 1 to 9, 515 Kips N 45 W (Z,X), Soft Rock

   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

SELECT      COMPONENT CASK

******** SUM OF LOADS APPLIED TO CASKS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  -3277440.
 FY  =   2403360.
 FZ  =  -3277440.
 MX  =  0.1191432E+10
 MY  =  0.3045834E+10
 MZ  =  0.1042091E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     1 TO     1 BY    1

    9056  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BASE

******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =   7863997.
 FY  =  -8829360.
 FZ  =   7863997.
 MX  = -0.4019635E+10
```

```
 MY  = -0.6320636E+10
 MZ  = -0.2802051E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     2 TO     2 BY    1

    1728  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BOUNDARY

******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =   7863997.
 FY  =  -8829360.
 FZ  =   7863997.
 MX  = -0.4019635E+10
 MY  = -0.6320636E+10
 MZ  = -0.2802051E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

*************************************************************************
*************************  LOAD CASE 16 *********************************


USE LOAD STEP    16  SUBSTEP     0  FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP=    16  SUBSTEP=     1  CUMULATIVE ITERATION=   109
  TIME/FREQUENCY=  16.000
TITLE= Pad, HE(1), Casks 1 to 9, 515 Kips West (X), Soft Rock

   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

SELECT      COMPONENT CASK

******** SUM OF LOADS APPLIED TO CASKS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  -4635000.
 FY  =   2403360.
 FZ  =  0.1003488E-04
 MX  =  0.1579809E+10
 MY  =  0.3046740E+10
 MZ  =  0.1202961E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     1 TO     1 BY    1

    9056  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BASE

******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
```

```
***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  0.1112526E+08
 FY  =  -8829360.
 FZ  =  0.8847758E-05
 MX  = -0.4201617E+10
 MY  = -0.5694766E+10
 MZ  = -0.2877256E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     2 TO     2 BY    1

    1728  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BOUNDARY

******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  0.1112526E+08
 FY  =  -8829360.
 FZ  = -0.4772679E-02
 MX  = -0.4201617E+10
 MY  = -0.5694766E+10
 MZ  = -0.2877256E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

*************************************************************************
*************************  LOAD CASE 17 *********************************


USE LOAD STEP    17  SUBSTEP     0  FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP=    17  SUBSTEP=     1  CUMULATIVE ITERATION=   114
  TIME/FREQUENCY=  17.000
TITLE= Pad, HE(1), Casks 1 to 9, 515 Kips S 45 W (-Z,X), Soft Rock

   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

SELECT      COMPONENT CASK

******** SUM OF LOADS APPLIED TO CASKS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  -3277440.
 FY  =   2403360.
 FZ  =   3277440.
 MX  =  0.1968185E+10
 MY  =  0.1262907E+10
 MZ  =  0.1042091E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     1 TO     1 BY    1

    9056  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.
```

```
SELECT      COMPONENT BASE

******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =   7863997.
 FY  =  -8829360.
 FZ  =  -7863997.
 MX  = -0.4383598E+10
 MY  = -0.1730736E+10
 MZ  = -0.2802051E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     2 TO     2 BY    1

    1728  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BOUNDARY

******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =   7863998.
 FY  =  -8829360.
 FZ  =  -7863997.
 MX  = -0.4383598E+10
 MY  = -0.1730736E+10
 MZ  = -0.2802051E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

*************************************************************************
*************************  LOAD CASE 18 ********************************


USE LOAD STEP    18  SUBSTEP     0  FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP=    18  SUBSTEP=     1  CUMULATIVE ITERATION=   119
  TIME/FREQUENCY=  18.000
TITLE= Pad, HE(1), Casks 1 to 9, 515 Kips South (-Z), Soft Rock

   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

SELECT      COMPONENT CASK

******** SUM OF LOADS APPLIED TO CASKS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  0.2623387E-05
 FY  =   2403360.
 FZ  =   4635000.
 MX  =  0.2129056E+10
 MY  = -0.1260720E+10
 MZ  =  0.6537139E+09
```

```
SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     1 TO     1 BY    1

    9056  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BASE

******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  0.1635327E-04
 FY  =  -8829360.
 FZ  = -0.1112526E+08
 MX  = -0.4458802E+10
 MY  =  0.3246740E+10
 MZ  = -0.2620070E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     2 TO     2 BY    1

    1728  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BOUNDARY

******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  0.1271337E-02
 FY  =  -8829360.
 FZ  = -0.1112526E+08
 MX  = -0.4458802E+10
 MY  =  0.3246740E+10
 MZ  = -0.2620070E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

*************************************************************************
*************************  LOAD CASE 19 *********************************


USE LOAD STEP    19  SUBSTEP     0  FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP=    19  SUBSTEP=     1  CUMULATIVE ITERATION=   126
  TIME/FREQUENCY=  19.000
TITLE= Pad, HE(1), Casks 1 to 9, 515 Kips S 45 E (-Z,-X), Soft Rock

   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

SELECT      COMPONENT CASK

******** SUM OF LOADS APPLIED TO CASKS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =   3277440.
 FY  =   2403360.
```

```
 FZ  =   3277440.
 MX  =  0.1968185E+10
 MY  = -0.3045834E+10
 MZ  =  0.2653373E+09

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     1 TO     1 BY    1

    9056  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BASE

******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  -7863997.
 FY  =  -8829360.
 FZ  =  -7863997.
 MX  = -0.4383598E+10
 MY  =  0.6320636E+10
 MZ  = -0.2438088E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     2 TO     2 BY    1

    1728  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BOUNDARY

******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  -7863998.
 FY  =  -8829360.
 FZ  =  -7863997.
 MX  = -0.4383598E+10
 MY  =  0.6320636E+10
 MZ  = -0.2438088E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

*************************************************************************
************************* LOAD CASE 20 ********************************


USE LOAD STEP    20  SUBSTEP     0  FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP=    20  SUBSTEP=     1  CUMULATIVE ITERATION=   133
  TIME/FREQUENCY=  20.000
TITLE= Pad, HE(1), Casks 1 to 9, 515 Kips East (-x), Soft Rock

   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

SELECT      COMPONENT CASK
```

```
******** SUM OF LOADS APPLIED TO CASKS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =   4635000.
 FY  =   2403360.
 FZ  = -0.5047132E-05
 MX  =  0.1579809E+10
 MY  = -0.3046740E+10
 MZ  =  0.1044664E+09

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     1 TO     1 BY    1

    9056  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BASE

******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  = -0.1112526E+08
 FY  =  -8829360.
 FZ  =  0.8746337E-04
 MX  = -0.4201617E+10
 MY  =  0.5694766E+10
 MZ  = -0.2362884E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     2 TO     2 BY    1

    1728  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BOUNDARY

******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  = -0.1112526E+08
 FY  =  -8829360.
 FZ  =  0.5153256E-03
 MX  = -0.4201617E+10
 MY  =  0.5694766E+10
 MZ  = -0.2362884E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

*************************************************************************
*************************  LOAD CASE 21 ********************************


USE LOAD STEP    21  SUBSTEP     0  FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP=    21  SUBSTEP=     1  CUMULATIVE ITERATION=   143
  TIME/FREQUENCY=  21.000
TITLE= Pad, HE(1), Casks 1 to 9, 515 Kips N 45 E (Z,-X), Soft Rock
```

```
   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

SELECT      COMPONENT CASK

******** SUM OF LOADS APPLIED TO CASKS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =   3277440.
 FY  =   2403360.
 FZ  =  -3277440.
 MX  =  0.1191432E+10
 MY  = -0.1262907E+10
 MZ  =  0.2653373E+09

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     1 TO     1 BY    1

    9056  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BASE

******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  -7863997.
 FY  =  -8829360.
 FZ  =   7863997.
 MX  = -0.4019635E+10
 MY  =  0.1730736E+10
 MZ  = -0.2438088E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     2 TO     2 BY    1

    1728  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BOUNDARY

******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  -7863998.
 FY  =  -8829360.
 FZ  =   7863997.
 MX  = -0.4019635E+10
 MY  =  0.1730736E+10
 MZ  = -0.2438088E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

*************************************************************************
*************************  LOAD CASE 22  ********************************
```

```
USE LOAD STEP    22  SUBSTEP     0  FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP=    22  SUBSTEP=     1  CUMULATIVE ITERATION=   150
  TIME/FREQUENCY=  22.000
TITLE= Pad, HE(1), Casks 1 to 10, 515 Kips North (Z), Soft Rock

   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

SELECT      COMPONENT CASK

******** SUM OF LOADS APPLIED TO CASKS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  0.1946680E-04
 FY  =   2670400.
 FZ  =  -5150000.
 MX  =  0.1132962E+10
 MY  =  0.1575900E+10
 MZ  =  0.8171424E+09

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     1 TO     1 BY    1

    9056  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BASE

******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  0.1001725E-04
 FY  =  -9096400.
 FZ  =  0.1164026E+08
 MX  = -0.4046832E+10
 MY  = -0.3561920E+10
 MZ  = -0.2783498E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     2 TO     2 BY    1

    1728  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BOUNDARY

******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  = -0.3276465E-05
 FY  =  -9096400.
 FZ  =  0.1164026E+08
 MX  = -0.4046832E+10
 MY  = -0.3561920E+10
 MZ  = -0.2783498E+10

SUMMATION POINT=  0.0000      0.0000      0.0000
```

```
*************************************************************************
*************************  LOAD CASE 23 *********************************

USE LOAD STEP    23  SUBSTEP     0  FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP=    23  SUBSTEP=     1  CUMULATIVE ITERATION=   158
  TIME/FREQUENCY=  23.000
TITLE= Pad, HE(1), Casks 1 to 10, 515 Kips N 45 W (Z,X), Soft Rock

   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

SELECT      COMPONENT CASK

******** SUM OF LOADS APPLIED TO CASKS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  -3641600.
 FY  =   2670400.
 FZ  =  -3641600.
 MX  =  0.1311708E+10
 MY  =  0.3491566E+10
 MZ  =  0.1248672E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     1 TO     1 BY    1

    9056  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BASE

******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =   8228157.
 FY  =  -9096400.
 FZ  =   8228157.
 MX  = -0.4139911E+10
 MY  = -0.6766368E+10
 MZ  = -0.3008633E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     2 TO     2 BY    1

    1728  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.


SELECT      COMPONENT BOUNDARY
******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =   8228157.
 FY  =  -9096400.
 FZ  =   8228157.
```

```
 MX  = -0.4139911E+10
 MY  = -0.6766368E+10
 MZ  = -0.3008633E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

*************************************************************************
************************** LOAD CASE 24 ********************************


USE LOAD STEP    24  SUBSTEP     0  FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP=    24  SUBSTEP=     1  CUMULATIVE ITERATION=   165
  TIME/FREQUENCY=  24.000
TITLE= Pad, HE(1), Casks 1 to 10, 515 Kips West (X), Soft Rock

   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

SELECT      COMPONENT CASK

******** SUM OF LOADS APPLIED TO CASKS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  -5150000.
 FY  =   2670400.
 FZ  =  0.1063272E-04
 MX  =  0.1743237E+10
 MY  =  0.3361920E+10
 MZ  =  0.1427417E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     1 TO     1 BY    1

    9056  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BASE

******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  0.1164026E+08
 FY  =  -9096400.
 FZ  = -0.3396336E-04
 MX  = -0.4365045E+10
 MY  = -0.6009946E+10
 MZ  = -0.3101712E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     2 TO     2 BY    1

    1728  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BOUNDARY

******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
```

```
***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  0.1164026E+08
 FY  =  -9096400.
 FZ  = -0.2576979E-02
 MX  = -0.4365045E+10
 MY  = -0.6009946E+10
 MZ  = -0.3101712E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

*************************************************************************
*************************  LOAD CASE 25 ********************************


USE LOAD STEP    25  SUBSTEP     0  FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP=    25  SUBSTEP=     1  CUMULATIVE ITERATION=   170
  TIME/FREQUENCY=  25.000
TITLE= Pad, HE(1), Casks 1 to 10, 515 Kips S 45 W (-Z,X), Soft Rock

   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

SELECT      COMPONENT CASK

******** SUM OF LOADS APPLIED TO CASKS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  -3641600.
 FY  =   2670400.
 FZ  =   3641600.
 MX  =  0.2174767E+10
 MY  =  0.1262907E+10
 MZ  =  0.1248672E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     1 TO     1 BY    1

    9056  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BASE

******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =   8228157.
 FY  =  -9096400.
 FZ  =  -8228157.
 MX  = -0.4590180E+10
 MY  = -0.1730736E+10
 MZ  = -0.3008633E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     2 TO     2 BY    1
```

```
    1728  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BOUNDARY

******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =   8228157.
 FY  =  -9096400.
 FZ  =  -8228157.
 MX  = -0.4590180E+10
 MY  = -0.1730736E+10
 MZ  = -0.3008633E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

*************************************************************************
*************************  LOAD CASE 26 ********************************


USE LOAD STEP    26  SUBSTEP     0  FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP=    26  SUBSTEP=     1  CUMULATIVE ITERATION=   175
  TIME/FREQUENCY=  26.000
TITLE= Pad, HE(1), Casks 1 to 10, 515 Kips South (-Z), Soft Rock

   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

SELECT      COMPONENT CASK

******** SUM OF LOADS APPLIED TO CASKS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  0.5976699E-06
 FY  =   2670400.
 FZ  =   5150000.
 MX  =  0.2353512E+10
 MY  = -0.1575900E+10
 MZ  =  0.8171424E+09

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     1 TO     1 BY    1

    9056  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BASE

******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  0.8624582E-05
 FY  =  -9096400.
 FZ  = -0.1164026E+08
 MX  = -0.4683258E+10
 MY  =  0.3561920E+10
 MZ  = -0.2783498E+10
```

```
SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     2 TO     2 BY    1

    1728  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BOUNDARY

******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  0.2333496E-05
 FY  =  -9096400.
 FZ  = -0.1164026E+08
 MX  = -0.4683258E+10
 MY  =  0.3561920E+10
 MZ  = -0.2783498E+10

SUMMATION POINT=  0.0000      0.0000      0.0000


   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

   17051  NODES (OF    17051  DEFINED) SELECTED BY NALL  COMMAND.

EXIT THE ANSYS POST1 DATABASE PROCESSOR


***** ROUTINE COMPLETED *****  CP =        78.323


*** NOTE ***                            CP=     78.323   TIME= 09:19:10
A total of 1 warnings and errors written to dcslabs7.err.
```

ANSYS input file for processing reaction loads for casks 1 to 11 through 1 to 14:

```
/com,
/com, This routine processes load results data for the
/com,   evaluation of equilibrium.
/com
/com,   Soft Rock Load Step Results for Cask Load Sequence 2
/com, This is for load sequence for casks 11 through 14
/com
/output,padsoftreacseq3,out
/com
/com ***************************************************************************
/com ***************************************************************************
/com ***************************************************************************
/com ***************************************************************************
/com ***************************************************************************
/com ***************************************************************************
/com
/com ************************ Soft Rock Reactions ****************************
/com
/file,dcslabs7
resume
/post1
eall
nall
/com
/com ***************************************************************************
/com *************************  LOAD CASE 1 ***********************************
set,1
eall
cmsel,s,cask
/com
/com ******** SUM OF LOADS APPLIED TO CASKS *******
fsum
esel,type,1
cmsel,s,base
/com
/com ******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
fsum
esel,type,2
cmsel,s,boundary
/com
/com ******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
fsum
/com
/com ***************************************************************************
/com *************************  LOAD CASE 2 ***********************************
set,2
eall
cmsel,s,cask
/com
/com ******** SUM OF LOADS APPLIED TO CASKS *******
fsum
esel,type,1
cmsel,s,base
/com
```

```
/com ******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
fsum
esel,type,2
cmsel,s,boundary
/com
/com ******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
fsum
/com
/com ************************************************************************
/com *************************  LOAD CASE 3 ***********************************
set,3
eall
cmsel,s,cask
/com
/com ******** SUM OF LOADS APPLIED TO CASKS *******
fsum
esel,type,1
cmsel,s,base
/com
/com ******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
fsum
esel,type,2
cmsel,s,boundary
/com
/com ******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
fsum
/com
/com ************************************************************************
/com *************************  LOAD CASE 4 ***********************************
set,4
eall
cmsel,s,cask
/com
/com ******** SUM OF LOADS APPLIED TO CASKS *******
fsum
esel,type,1
cmsel,s,base
/com
/com ******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
fsum
esel,type,2
/com
cmsel,s,boundary
/com ******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
fsum
/com
/com ************************************************************************
/com *************************  LOAD CASE 5 ***********************************
set,5
eall
cmsel,s,cask
/com
/com ******** SUM OF LOADS APPLIED TO CASKS *******
fsum
esel,type,1
cmsel,s,base
/com
```

```
/com ******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
fsum
esel,type,2
cmsel,s,boundary
/com
/com ******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
fsum
/com
/com ***************************************************************************
/com *************************  LOAD CASE 6 ***********************************
set,6
eall
cmsel,s,cask
/com
/com ******** SUM OF LOADS APPLIED TO CASKS *******
fsum
esel,type,1
cmsel,s,base
/com
/com ******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
fsum
esel,type,2
cmsel,s,boundary
/com
/com ******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
fsum
/com
/com ***************************************************************************
/com *************************  LOAD CASE 7 ***********************************
set,7
eall
cmsel,s,cask
/com
/com ******** SUM OF LOADS APPLIED TO CASKS *******
fsum
esel,type,1
cmsel,s,base
/com
/com ******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
fsum
esel,type,2
cmsel,s,boundary
/com
/com ******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
fsum
/com
/com ***************************************************************************
/com *************************  LOAD CASE 8 ***********************************
set,8
eall
cmsel,s,cask
/com
/com ******** SUM OF LOADS APPLIED TO CASKS *******
fsum
esel,type,1
cmsel,s,base
/com
```

```
/com ******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
fsum
esel,type,2
cmsel,s,boundary
/com
/com ******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
fsum
/com
/com ***************************************************************************
/com *************************  LOAD CASE 9 ***********************************
set,9
eall
cmsel,s,cask
/com
/com ******** SUM OF LOADS APPLIED TO CASKS *******
fsum
esel,type,1
cmsel,s,base
/com
/com ******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
fsum
esel,type,2
cmsel,s,boundary
/com
/com ******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
fsum
/com
/com ***************************************************************************
/com *************************  LOAD CASE 10 **********************************
set,10
eall
cmsel,s,cask
/com
/com ******** SUM OF LOADS APPLIED TO CASKS *******
fsum
esel,type,1
cmsel,s,base
/com
/com ******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
fsum
esel,type,2
cmsel,s,boundary
/com
/com ******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
fsum
/com
/com ***************************************************************************
/com *************************  LOAD CASE 11 **********************************
set,11
eall
cmsel,s,cask
/com
/com ******** SUM OF LOADS APPLIED TO CASKS *******
fsum
esel,type,1
cmsel,s,base
/com
```

```
/com ******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
fsum
esel,type,2
cmsel,s,boundary
/com
/com ******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
fsum
/com
/com ***************************************************************************
/com *************************  LOAD CASE 12 ********************************
set,12
eall
cmsel,s,cask
/com
/com ******** SUM OF LOADS APPLIED TO CASKS *******
fsum
esel,type,1
cmsel,s,base
/com
/com ******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
fsum
esel,type,2
cmsel,s,boundary
/com
/com ******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
fsum
/com
/com ***************************************************************************
/com *************************  LOAD CASE 13 ********************************
set,13
eall
cmsel,s,cask
/com
/com ******** SUM OF LOADS APPLIED TO CASKS *******
fsum
esel,type,1
cmsel,s,base
/com
/com ******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
fsum
esel,type,2
cmsel,s,boundary
/com
/com ******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
fsum
/com
/com ***************************************************************************
/com *************************  LOAD CASE 14 ********************************
set,14
eall
cmsel,s,cask
/com
/com ******** SUM OF LOADS APPLIED TO CASKS *******
fsum
esel,type,1
cmsel,s,base
/com
```

```
/com ******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
fsum
esel,type,2
cmsel,s,boundary
/com
/com ******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
fsum
/com
/com ***************************************************************************
/com *************************  LOAD CASE 15 ********************************
set,15
eall
cmsel,s,cask
/com
/com ******** SUM OF LOADS APPLIED TO CASKS *******
fsum
esel,type,1
cmsel,s,base
/com
/com ******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
fsum
esel,type,2
cmsel,s,boundary
/com
/com ******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
fsum
/com
/com ***************************************************************************
/com *************************  LOAD CASE 16 ********************************
set,16
eall
cmsel,s,cask
/com
/com ******** SUM OF LOADS APPLIED TO CASKS *******
fsum
esel,type,1
cmsel,s,base
/com
/com ******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
fsum
esel,type,2
cmsel,s,boundary
/com
/com ******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
fsum
/com
/com ***************************************************************************
/com *************************  LOAD CASE 17 ********************************
set,17
eall
cmsel,s,cask
/com
/com ******** SUM OF LOADS APPLIED TO CASKS *******
fsum
esel,type,1
cmsel,s,base
/com
```

```
/com ******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
fsum
esel,type,2
cmsel,s,boundary
/com
/com ******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
fsum
/com
/com ***************************************************************************
/com *************************  LOAD CASE 18 ********************************
set,18
eall
cmsel,s,cask
/com
/com ******** SUM OF LOADS APPLIED TO CASKS *******
fsum
esel,type,1
cmsel,s,base
/com
/com ******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
fsum
esel,type,2
cmsel,s,boundary
/com
/com ******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
fsum
/com
/com ***************************************************************************
/com *************************  LOAD CASE 19 ********************************
set,19
eall
cmsel,s,cask
/com
/com ******** SUM OF LOADS APPLIED TO CASKS *******
fsum
esel,type,1
cmsel,s,base
/com
/com ******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
fsum
esel,type,2
cmsel,s,boundary
/com
/com ******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
fsum
/com
/com ***************************************************************************
/com *************************  LOAD CASE 20 ********************************
set,20
eall
cmsel,s,cask
/com
/com ******** SUM OF LOADS APPLIED TO CASKS *******
fsum
esel,type,1
cmsel,s,base
/com
```

```
/com ******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
fsum
esel,type,2
cmsel,s,boundary
/com
/com ******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
fsum
/com
/com ***************************************************************************
/com *************************  LOAD CASE 21 ********************************
set,21
eall
cmsel,s,cask
/com
/com ******** SUM OF LOADS APPLIED TO CASKS *******
fsum
esel,type,1
cmsel,s,base
/com
/com ******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
fsum
esel,type,2
cmsel,s,boundary
/com
/com ******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
fsum
/com
/com ***************************************************************************
/com *************************  LOAD CASE 22 ********************************
set,22
eall
cmsel,s,cask
/com
/com ******** SUM OF LOADS APPLIED TO CASKS *******
fsum
esel,type,1
cmsel,s,base
/com
/com ******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
fsum
esel,type,2
cmsel,s,boundary
/com
/com ******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
fsum
/com
/com ***************************************************************************
/com *************************  LOAD CASE 23 ********************************
set,23
eall
cmsel,s,cask
/com
/com ******** SUM OF LOADS APPLIED TO CASKS *******
fsum
esel,type,1
cmsel,s,base
/com
```

```
/com ******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
fsum
esel,type,2
/com
cmsel,s,boundary
/com ******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
fsum
/com
/com ***************************************************************************
/com *************************  LOAD CASE 24 ********************************
set,24
eall
cmsel,s,cask
/com
/com ******** SUM OF LOADS APPLIED TO CASKS *******
fsum
esel,type,1
cmsel,s,base
/com
/com ******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
fsum
esel,type,2
cmsel,s,boundary
/com
/com ******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
fsum
/com
/com ***************************************************************************
/com *************************  LOAD CASE 25 ********************************
set,25
eall
cmsel,s,cask
/com
/com ******** SUM OF LOADS APPLIED TO CASKS *******
fsum
esel,type,1
cmsel,s,base
/com
/com ******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
fsum
esel,type,2
cmsel,s,boundary
/com
/com ******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
fsum
/com
/com ***************************************************************************
/com *************************  LOAD CASE 26 ********************************
set,26
eall
cmsel,s,cask
/com
/com ******** SUM OF LOADS APPLIED TO CASKS *******
fsum
esel,type,1
cmsel,s,base
/com
```

```
/com ******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
fsum
esel,type,2
cmsel,s,boundary
/com
/com ******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
fsum
/com
/com
eall
nall
fini
/output
/exit
```

ANSYS output file for reaction loads for casks 1 to 11 through 1 to 14:

```
*****************************************************************************
*****************************************************************************
*****************************************************************************
*****************************************************************************
*****************************************************************************
*****************************************************************************

************************* Soft Rock Reactions ****************************


CURRENT JOBNAME REDEFINED AS dcslabs7

RESUME ANSYS DATA FROM FILE NAME=dcslabs7.db

*** ANSYS GLOBAL STATUS ***

TITLE = Pad, HE(1), Casks 1 to 11, 515 Kips North (Z), Soft Rock
ANALYSIS TYPE =  STATIC (STEADY-STATE)
NUMBER OF ELEMENT TYPES =       6
   9056 ELEMENTS CURRENTLY SELECTED.  MAX ELEMENT NUMBER =    33177
  11550 NODES CURRENTLY SELECTED.     MAX NODE NUMBER =       17051
    259 KEYPOINTS CURRENTLY SELECTED. MAX KEYPOINT NUMBER =     259
    250 LINES CURRENTLY SELECTED.     MAX LINE NUMBER =         396
    181 AREAS CURRENTLY SELECTED.     MAX AREA NUMBER =         295
     70 VOLUMES CURRENTLY SELECTED.   MAX VOL. NUMBER =          70
    25 COMPONENTS CURRENTLY DEFINED
MAXIMUM LINEAR PROPERTY NUMBER        =       5
MAXIMUM REAL CONSTANT SET NUMBER      =       6
ACTIVE COORDINATE SYSTEM              =       0  (CARTESIAN)
MAXIMUM CONSTRAINT EQUATION NUMBER    =    4620
NUMBER OF SPECIFIED CONSTRAINTS       =    2193
NUMBER OF NODAL LOADS                 =    2268

INITIAL JOBNAME = dcslabs7
CURRENT JOBNAME = dcslabs7

***** ANSYS - ENGINEERING ANALYSIS SYSTEM  RELEASE 5.7     *****
ANSYS/Structural U
00150104          VERSION=INTEL NT      16:30:36  JUN 20, 2001 CP=      2.774

Pad, HE(1), Casks 1 to 11, 515 Kips North (Z), Soft Rock


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

ENTER  /SHOW,DEVICE-NAME  TO ENABLE GRAPHIC DISPLAY
ENTER  FINISH             TO LEAVE POST1

*** NOTE ***                                CP=      2.774   TIME= 16:30:36
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).

   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

   17051  NODES (OF    17051  DEFINED) SELECTED BY NALL  COMMAND.

*************************************************************************
*************************  LOAD CASE 1 **********************************


USE LOAD STEP     1  SUBSTEP     0  FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP=     1  SUBSTEP=     1  CUMULATIVE ITERATION=    11
  TIME/FREQUENCY=  1.0000
TITLE= Pad, HE(1), Casks 1 to 11, 515 Kips North (Z), Soft Rock

   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

SELECT      COMPONENT CASK

******** SUM OF LOADS APPLIED TO CASKS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  0.5038988E-05
 FY  =   2937440.
 FZ  =  -5665000.
 MX  =  0.1126411E+10
 MY  =  0.1680960E+10
 MZ  =  0.8716186E+09

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     1 TO     1 BY    1

    9056  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BASE

******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  0.5348968E-04
 FY  =  -9363440.
 FZ  =  0.1215526E+08
 MX  = -0.4040280E+10
 MY  = -0.3666980E+10
 MZ  = -0.2837975E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     2 TO     2 BY    1

    1728  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BOUNDARY

******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
```

```
***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  = -0.6567931E-03
 FY  =  -9363440.
 FZ  =  0.1215526E+08
 MX  = -0.4040280E+10
 MY  = -0.3666980E+10
 MZ  = -0.2837975E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

*************************************************************************
*************************  LOAD CASE 2 **********************************


USE LOAD STEP     2  SUBSTEP     0  FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP=     2  SUBSTEP=     1  CUMULATIVE ITERATION=    20
  TIME/FREQUENCY=  2.0000
TITLE= Pad, HE(1), Casks 1 to 11, 515 Kips N 45 W (Z,X), Soft Rock

   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

SELECT      COMPONENT CASK

******** SUM OF LOADS APPLIED TO CASKS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  -4005760.
 FY  =   2937440.
 FZ  =  -4005760.
 MX  =  0.1323031E+10
 MY  =  0.3640143E+10
 MZ  =  0.1346301E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     1 TO     1 BY    1

    9056  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BASE

******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =   8592317.
 FY  =  -9363440.
 FZ  =   8592317.
 MX  = -0.4151234E+10
 MY  = -0.6914945E+10
 MZ  = -0.3106262E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     2 TO     2 BY    1
```

```
    1728  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BOUNDARY

******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =   8592317.
 FY  =  -9363440.
 FZ  =   8592317.
 MX  = -0.4151234E+10
 MY  = -0.6914945E+10
 MZ  = -0.3106262E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

*************************************************************************
************************* LOAD CASE 3 ***********************************


USE LOAD STEP     3  SUBSTEP     0  FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP=     3  SUBSTEP=     1  CUMULATIVE ITERATION=    27
  TIME/FREQUENCY=  3.0000
TITLE= Pad, HE(1), Casks 1 to 11, 515 Kips West (X), Soft Rock

   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

SELECT      COMPONENT CASK

******** SUM OF LOADS APPLIED TO CASKS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  -5665000.
 FY  =   2937440.
 FZ  =  0.1156800E-04
 MX  =  0.1797713E+10
 MY  =  0.3466980E+10
 MZ  =  0.1542921E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     1 TO     1 BY    1

    9056  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BASE

******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  0.1215526E+08
 FY  =  -9363440.
 FZ  =  0.1824518E-05
 MX  = -0.4419521E+10
 MY  = -0.6115006E+10
 MZ  = -0.3217215E+10
```

```
SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     2 TO     2 BY    1

    1728  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BOUNDARY

******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  0.1215526E+08
 FY  =  -9363440.
 FZ  = -0.2625384E-02
 MX  = -0.4419521E+10
 MY  = -0.6115006E+10
 MZ  = -0.3217215E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

*************************************************************************
*************************  LOAD CASE 4 ***********************************


USE LOAD STEP     4  SUBSTEP     0  FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP=     4  SUBSTEP=     1  CUMULATIVE ITERATION=    33
  TIME/FREQUENCY=  4.0000
TITLE= Pad, HE(1), Casks 1 to 11, 515 Kips S 45 W (-Z,X), Soft Rock

   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

SELECT      COMPONENT CASK

******** SUM OF LOADS APPLIED TO CASKS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  -4005760.
 FY  =   2937440.
 FZ  =   4005760.
 MX  =  0.2272396E+10
 MY  =  0.1262907E+10
 MZ  =  0.1346301E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     1 TO     1 BY    1

    9056  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BASE

******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =   8592317.
```

```
 FY  =  -9363440.
 FZ  =  -8592317.
 MX  = -0.4687809E+10
 MY  = -0.1730736E+10
 MZ  = -0.3106262E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     2 TO     2 BY    1

    1728  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.


SELECT      COMPONENT BOUNDARY
******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =   8592317.
 FY  =  -9363440.
 FZ  =  -8592317.
 MX  = -0.4687809E+10
 MY  = -0.1730736E+10
 MZ  = -0.3106262E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

*************************************************************************
*************************  LOAD CASE 5 **********************************


USE LOAD STEP     5  SUBSTEP     0  FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP=     5  SUBSTEP=     1  CUMULATIVE ITERATION=    38
  TIME/FREQUENCY=  5.0000
TITLE= Pad, HE(1), Casks 1 to 11, 515 Kips South (-Z), Soft Rock

   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

SELECT      COMPONENT CASK

******** SUM OF LOADS APPLIED TO CASKS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  0.1094125E-04
 FY  =   2937440.
 FZ  =   5665000.
 MX  =  0.2469016E+10
 MY  = -0.1680960E+10
 MZ  =  0.8716186E+09

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     1 TO     1 BY    1

    9056  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BASE
```

```
******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  0.2032347E-04
 FY  =  -9363440.
 FZ  = -0.1215526E+08
 MX  = -0.4798762E+10
 MY  =  0.3666980E+10
 MZ  = -0.2837975E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     2 TO     2 BY    1

    1728  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BOUNDARY

******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  = -0.1006073E-02
 FY  =  -9363440.
 FZ  = -0.1215526E+08
 MX  = -0.4798762E+10
 MY  =  0.3666980E+10
 MZ  = -0.2837975E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

*************************************************************************
************************* LOAD CASE 6 ***********************************

USE LOAD STEP     6  SUBSTEP     0  FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP=     6  SUBSTEP=     1  CUMULATIVE ITERATION=    46
  TIME/FREQUENCY=  6.0000
TITLE= Pad, HE(1), Casks 1 to 11, 515 Kips S 45 E (-Z,-X), Soft Rock

   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

SELECT      COMPONENT CASK

******** SUM OF LOADS APPLIED TO CASKS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =   4005760.
 FY  =   2937440.
 FZ  =   4005760.
 MX  =  0.2272396E+10
 MY  = -0.3640143E+10
 MZ  =  0.3969360E+09

SUMMATION POINT=  0.0000      0.0000      0.0000
```

```
ESEL  FOR LABEL= TYPE  FROM     1 TO     1 BY    1

    9056  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BASE

******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  -8592317.
 FY  =  -9363440.
 FZ  =  -8592317.
 MX  = -0.4687809E+10
 MY  =  0.6914945E+10
 MZ  = -0.2569687E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     2 TO     2 BY    1

    1728  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BOUNDARY

******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  -8592318.
 FY  =  -9363440.
 FZ  =  -8592317.
 MX  = -0.4687809E+10
 MY  =  0.6914945E+10
 MZ  = -0.2569687E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

*************************************************************************
************************** LOAD CASE 7 ***********************************


USE LOAD STEP     7  SUBSTEP     0  FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP=     7  SUBSTEP=     1  CUMULATIVE ITERATION=    53
  TIME/FREQUENCY=  7.0000
TITLE= Pad, HE(1), Casks 1 to 11, 515 Kips East (-x), Soft Rock

   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

SELECT      COMPONENT CASK

******** SUM OF LOADS APPLIED TO CASKS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =   5665000.
 FY  =   2937440.
 FZ  = -0.2925970E-04
 MX  =  0.1797713E+10
```

```
 MY  = -0.3466980E+10
 MZ  =  0.2003161E+09

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     1 TO     1 BY    1

    9056  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BASE

******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  = -0.1215526E+08
 FY  =  -9363440.
 FZ  = -0.4036787E-05
 MX  = -0.4419521E+10
 MY  =  0.6115006E+10
 MZ  = -0.2458734E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     2 TO     2 BY    1

    1728  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BOUNDARY

******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  = -0.1215526E+08
 FY  =  -9363440.
 FZ  = -0.2493784E-02
 MX  = -0.4419521E+10
 MY  =  0.6115006E+10
 MZ  = -0.2458734E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

*************************************************************************
*************************  LOAD CASE 8  ********************************


USE LOAD STEP     8  SUBSTEP     0  FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP=     8  SUBSTEP=     1  CUMULATIVE ITERATION=    63
  TIME/FREQUENCY=  8.0000
TITLE= Pad, HE(1), Casks 1 to 11, 515 Kips N 45 E (Z,-X), Soft Rock

   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

SELECT      COMPONENT CASK

******** SUM OF LOADS APPLIED TO CASKS *******
```

```
***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =   4005760.
 FY  =   2937440.
 FZ  =  -4005760.
 MX  =  0.1323031E+10
 MY  = -0.1262907E+10
 MZ  =  0.3969360E+09

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     1 TO     1 BY    1

    9056  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BASE

******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  -8592317.
 FY  =  -9363440.
 FZ  =   8592317.
 MX  = -0.4151234E+10
 MY  =  0.1730736E+10
 MZ  = -0.2569687E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     2 TO     2 BY    1

    1728  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BOUNDARY

******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  -8592318.
 FY  =  -9363440.
 FZ  =   8592317.
 MX  = -0.4151234E+10
 MY  =  0.1730736E+10
 MZ  = -0.2569687E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

*************************************************************************
*************************  LOAD CASE 9 ***********************************


USE LOAD STEP     9  SUBSTEP     0  FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP=     9  SUBSTEP=     1  CUMULATIVE ITERATION=    71
  TIME/FREQUENCY=  9.0000
TITLE= Pad, HE(1), Casks 1 to 12, 515 Kips North (Z), Soft Rock

   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.
```

```
SELECT      COMPONENT CASK

******** SUM OF LOADS APPLIED TO CASKS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  0.1910777E-05
 FY  =   3204480.
 FZ  =  -6180000.
 MX  =  0.1119859E+10
 MY  =  0.1891080E+10
 MZ  =  0.9805709E+09

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     1 TO     1 BY    1

    9056  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BASE

******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  = -0.1338014E-05
 FY  =  -9630480.
 FZ  =  0.1267026E+08
 MX  = -0.4033729E+10
 MY  = -0.3877100E+10
 MZ  = -0.2946927E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     2 TO     2 BY    1

    1728  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BOUNDARY

******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  = -0.4630728E-05
 FY  =  -9630480.
 FZ  =  0.1267026E+08
 MX  = -0.4033729E+10
 MY  = -0.3877100E+10
 MZ  = -0.2946927E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

*************************************************************************
************************* LOAD CASE 10 ********************************

USE LOAD STEP    10  SUBSTEP     0  FOR LOAD CASE 0
```

```
SET COMMAND GOT LOAD STEP=     10  SUBSTEP=      1  CUMULATIVE ITERATION=     80
  TIME/FREQUENCY=  10.000
TITLE= Pad, HE(1), Casks 1 to 12, 515 Kips N 45 W (Z,X), Soft Rock

   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

SELECT      COMPONENT CASK

******** SUM OF LOADS APPLIED TO CASKS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  -4369920.
 FY  =   3204480.
 FZ  =  -4369920.
 MX  =  0.1334354E+10
 MY  =  0.3863009E+10
 MZ  =  0.1498406E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     1 TO     1 BY    1

    9056  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BASE

******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =   8956477.
 FY  =  -9630480.
 FZ  =   8956477.
 MX  = -0.4162557E+10
 MY  = -0.7137811E+10
 MZ  = -0.3258367E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     2 TO     2 BY    1

    1728  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BOUNDARY

******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =   8956478.
 FY  =  -9630480.
 FZ  =   8956477.
 MX  = -0.4162557E+10
 MY  = -0.7137811E+10
 MZ  = -0.3258367E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

*************************************************************************
```

```
************************* LOAD CASE 11 ********************************

USE LOAD STEP    11  SUBSTEP     0  FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP=    11  SUBSTEP=     1  CUMULATIVE ITERATION=    88
  TIME/FREQUENCY=  11.000
TITLE= Pad, HE(1), Casks 1 to 12, 515 Kips West (X), Soft Rock

   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

SELECT      COMPONENT CASK

******** SUM OF LOADS APPLIED TO CASKS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  -6180000.
 FY  =   3204480.
 FZ  =  0.9212859E-05
 MX  =  0.1852189E+10
 MY  =  0.3572040E+10
 MZ  =  0.1712901E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     1 TO     1 BY    1

    9056  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BASE

******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  0.1267026E+08
 FY  =  -9630480.
 FZ  = -0.2736841E-04
 MX  = -0.4473997E+10
 MY  = -0.6220066E+10
 MZ  = -0.3387195E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     2 TO     2 BY    1

    1728  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BOUNDARY

******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  0.1267026E+08
 FY  =  -9630480.
 FZ  = -0.2529359E-02
 MX  = -0.4473997E+10
 MY  = -0.6220066E+10
```

```
 MZ  = -0.3387195E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

*************************************************************************
*************************  LOAD CASE 12 ********************************


USE LOAD STEP    12  SUBSTEP     0  FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP=    12  SUBSTEP=     1  CUMULATIVE ITERATION=    93
  TIME/FREQUENCY=  12.000
TITLE= Pad, HE(1), Casks 1 to 12, 515 Kips S 45 W (-Z,X), Soft Rock

   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

SELECT      COMPONENT CASK

******** SUM OF LOADS APPLIED TO CASKS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  -4369920.
 FY  =   3204480.
 FZ  =   4369920.
 MX  =  0.2370025E+10
 MY  =  0.1188618E+10
 MZ  =  0.1498406E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     1 TO     1 BY    1

    9056  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BASE

******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =   8956477.
 FY  =  -9630480.
 FZ  =  -8956477.
 MX  = -0.4785438E+10
 MY  = -0.1656447E+10
 MZ  = -0.3258367E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     2 TO     2 BY    1

    1728  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BOUNDARY

******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******

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

```
 FX  =   8956478.
 FY  =  -9630480.
 FZ  =  -8956477.
 MX  = -0.4785438E+10
 MY  = -0.1656447E+10
 MZ  = -0.3258367E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

*************************************************************************
*************************  LOAD CASE 13 *********************************


USE LOAD STEP    13  SUBSTEP     0  FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP=    13  SUBSTEP=     1  CUMULATIVE ITERATION=    99
  TIME/FREQUENCY=  13.000
TITLE= Pad, HE(1), Casks 1 to 12, 515 Kips South (-Z), Soft Rock

   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

SELECT      COMPONENT CASK

******** SUM OF LOADS APPLIED TO CASKS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  = -0.3392453E-05
 FY  =   3204480.
 FZ  =   6180000.
 MX  =  0.2584519E+10
 MY  = -0.1891080E+10
 MZ  =  0.9805709E+09

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     1 TO     1 BY    1

    9056  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BASE

******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  = -0.2596076E-05
 FY  =  -9630480.
 FZ  = -0.1267026E+08
 MX  = -0.4914266E+10
 MY  =  0.3877100E+10
 MZ  = -0.2946927E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     2 TO     2 BY    1

    1728  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.
```

```
SELECT      COMPONENT BOUNDARY

******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  0.5608468E-05
 FY  =  -9630480.
 FZ  = -0.1267026E+08
 MX  = -0.4914266E+10
 MY  =  0.3877100E+10
 MZ  = -0.2946927E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

*****************************************************************************
*************************  LOAD CASE 14 ********************************


USE LOAD STEP    14  SUBSTEP     0  FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP=    14  SUBSTEP=     1  CUMULATIVE ITERATION=   111
  TIME/FREQUENCY=  14.000
TITLE= Pad, HE(1), Casks 1 to 13, 515 Kips North (Z), Soft Rock

   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

SELECT      COMPONENT CASK

******** SUM OF LOADS APPLIED TO CASKS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  0.7657772E-05
 FY  =   3471520.
 FZ  =  -6695000.
 MX  =  0.1167784E+10
 MY  =  0.1891080E+10
 MZ  =  0.9805709E+09

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     1 TO     1 BY    1

    9056  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BASE

******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  0.1573579E-04
 FY  =  -9897520.
 FZ  =  0.1318526E+08
 MX  = -0.4081654E+10
 MY  = -0.3877100E+10
 MZ  = -0.2946927E+10

SUMMATION POINT=  0.0000      0.0000      0.0000
```

```
ESEL  FOR LABEL= TYPE  FROM     2 TO     2 BY    1

    1728  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BOUNDARY

******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  = -0.5856292E-03
 FY  =  -9897520.
 FZ  =  0.1318526E+08
 MX  = -0.4081654E+10
 MY  = -0.3877100E+10
 MZ  = -0.2946927E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

*************************************************************************
*************************  LOAD CASE 15 ********************************


USE LOAD STEP    15  SUBSTEP     0  FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP=    15  SUBSTEP=     1  CUMULATIVE ITERATION=   120
  TIME/FREQUENCY=  15.000
TITLE= Pad, HE(1), Casks 1 to 13, 515 Kips N 45 W (Z,X), Soft Rock

   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

SELECT      COMPONENT CASK

******** SUM OF LOADS APPLIED TO CASKS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  -4734080.
 FY  =   3471520.
 FZ  =  -4734080.
 MX  =  0.1400153E+10
 MY  =  0.4011587E+10
 MZ  =  0.1541559E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     1 TO     1 BY    1

    9056  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BASE

******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =   9320637.
 FY  =  -9897520.
 FZ  =   9320637.
```

```
 MX  = -0.4228356E+10
 MY  = -0.7286389E+10
 MZ  = -0.3301520E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     2 TO     2 BY    1

    1728  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BOUNDARY

******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =   9320637.
 FY  =  -9897520.
 FZ  =   9320637.
 MX  = -0.4228356E+10
 MY  = -0.7286389E+10
 MZ  = -0.3301520E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

*************************************************************************
*************************  LOAD CASE 16 *********************************


USE LOAD STEP    16  SUBSTEP     0  FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP=    16  SUBSTEP=     1  CUMULATIVE ITERATION=   127
  TIME/FREQUENCY=  16.000
TITLE= Pad, HE(1), Casks 1 to 13, 515 Kips West (X), Soft Rock

   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

SELECT      COMPONENT CASK

******** SUM OF LOADS APPLIED TO CASKS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  -6695000.
 FY  =   3471520.
 FZ  =  0.1903945E-04
 MX  =  0.1961142E+10
 MY  =  0.3782160E+10
 MZ  =  0.1773928E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     1 TO     1 BY    1

    9056  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BASE

******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
```

```
***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  0.1318526E+08
 FY  =  -9897520.
 FZ  =  0.2044401E-04
 MX  = -0.4582950E+10
 MY  = -0.6430186E+10
 MZ  = -0.3448223E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     2 TO     2 BY    1

    1728  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BOUNDARY

******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  0.1318526E+08
 FY  =  -9897520.
 FZ  = -0.3252108E-02
 MX  = -0.4582950E+10
 MY  = -0.6430186E+10
 MZ  = -0.3448223E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

*************************************************************************
************************* LOAD CASE 17 ********************************


USE LOAD STEP    17  SUBSTEP     0  FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP=    17  SUBSTEP=     1  CUMULATIVE ITERATION=   133
  TIME/FREQUENCY=  17.000
TITLE= Pad, HE(1), Casks 1 to 13, 515 Kips S 45 W (-Z,X), Soft Rock

   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

SELECT      COMPONENT CASK

******** SUM OF LOADS APPLIED TO CASKS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  -4734080.
 FY  =   3471520.
 FZ  =   4734080.
 MX  =  0.2522130E+10
 MY  =  0.1337196E+10
 MZ  =  0.1541559E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     1 TO     1 BY    1
```

```
    9056  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BASE

******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =   9320637.
 FY  =  -9897520.
 FZ  =  -9320637.
 MX  = -0.4937543E+10
 MY  = -0.1805024E+10
 MZ  = -0.3301520E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     2 TO     2 BY    1

    1728  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BOUNDARY

******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =   9320637.
 FY  =  -9897520.
 FZ  =  -9320637.
 MX  = -0.4937543E+10
 MY  = -0.1805024E+10
 MZ  = -0.3301520E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

*************************************************************************
*************************  LOAD CASE 18 *********************************

USE LOAD STEP    18  SUBSTEP     0  FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP=    18  SUBSTEP=     1  CUMULATIVE ITERATION=   138
  TIME/FREQUENCY=  18.000
TITLE= Pad, HE(1), Casks 1 to 13, 515 Kips South (-Z), Soft Rock

   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

SELECT      COMPONENT CASK

******** SUM OF LOADS APPLIED TO CASKS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  = -0.3773001E-05
 FY  =   3471520.
 FZ  =   6695000.
 MX  =  0.2754499E+10
 MY  = -0.1891080E+10
 MZ  =  0.9805709E+09
```

```
SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     1 TO     1 BY    1

    9056  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BASE

******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  = -0.1841914E-04
 FY  =  -9897520.
 FZ  = -0.1318526E+08
 MX  = -0.5084246E+10
 MY  =  0.3877100E+10
 MZ  = -0.2946927E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     2 TO     2 BY    1

    1728  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BOUNDARY

******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  = -0.4982649E-03
 FY  =  -9897520.
 FZ  = -0.1318526E+08
 MX  = -0.5084246E+10
 MY  =  0.3877100E+10
 MZ  = -0.2946927E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

*****************************************************************************
************************** LOAD CASE 19 ********************************


USE LOAD STEP    19  SUBSTEP     0  FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP=    19  SUBSTEP=     1  CUMULATIVE ITERATION=   146
  TIME/FREQUENCY=  19.000
TITLE= Pad, HE(1), Casks 1 to 13, 515 Kips S 45 E (-Z,-X), Soft Rock

   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

SELECT      COMPONENT CASK

******** SUM OF LOADS APPLIED TO CASKS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =   4734080.
```

```
 FY  =   3471520.
 FZ  =   4734080.
 MX  =  0.2522130E+10
 MY  = -0.4011587E+10
 MZ  =  0.4195824E+09

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     1 TO     1 BY    1

    9056  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BASE

******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  -9320637.
 FY  =  -9897520.
 FZ  =  -9320637.
 MX  = -0.4937543E+10
 MY  =  0.7286389E+10
 MZ  = -0.2592333E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     2 TO     2 BY    1

    1728  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BOUNDARY

******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  -9320637.
 FY  =  -9897520.
 FZ  =  -9320637.
 MX  = -0.4937543E+10
 MY  =  0.7286389E+10
 MZ  = -0.2592333E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

*************************************************************************
************************* LOAD CASE 20 ********************************


USE LOAD STEP    20  SUBSTEP     0  FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP=    20  SUBSTEP=     1  CUMULATIVE ITERATION=   154
  TIME/FREQUENCY=  20.000
TITLE= Pad, HE(1), Casks 1 to 13, 515 Kips East (-x), Soft Rock

   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

SELECT      COMPONENT CASK
```

```
******** SUM OF LOADS APPLIED TO CASKS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =    6695000.
 FY  =    3471520.
 FZ  = -0.2131277E-04
 MX  =  0.1961142E+10
 MY  = -0.3782160E+10
 MZ  =  0.1872134E+09

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     1 TO     1 BY    1

    9056  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BASE

******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  = -0.1318526E+08
 FY  =   -9897520.
 FZ  =  0.2011867E-04
 MX  = -0.4582950E+10
 MY  =  0.6430186E+10
 MZ  = -0.2445631E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     2 TO     2 BY    1

    1728  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BOUNDARY

******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  = -0.1318526E+08
 FY  =   -9897520.
 FZ  = -0.1905545E-02
 MX  = -0.4582950E+10
 MY  =  0.6430186E+10
 MZ  = -0.2445631E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

*************************************************************************
************************* LOAD CASE 21 ********************************

USE LOAD STEP    21  SUBSTEP     0  FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP=    21  SUBSTEP=     1  CUMULATIVE ITERATION=   164
  TIME/FREQUENCY=  21.000
```

```
TITLE= Pad, HE(1), Casks 1 to 13, 515 Kips N 45 E (Z,-X), Soft Rock

   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

SELECT      COMPONENT CASK

******** SUM OF LOADS APPLIED TO CASKS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =   4734080.
 FY  =   3471520.
 FZ  =  -4734080.
 MX  =  0.1400153E+10
 MY  = -0.1337196E+10
 MZ  =  0.4195824E+09

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     1 TO     1 BY    1

    9056  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BASE

******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  -9320637.
 FY  =  -9897520.
 FZ  =   9320637.
 MX  = -0.4228356E+10
 MY  =  0.1805024E+10
 MZ  = -0.2592333E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     2 TO     2 BY    1

    1728  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BOUNDARY

******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  -9320637.
 FY  =  -9897520.
 FZ  =   9320637.
 MX  = -0.4228356E+10
 MY  =  0.1805024E+10
 MZ  = -0.2592333E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

*************************************************************************
************************* LOAD CASE 22 ********************************
```

```
USE LOAD STEP     22  SUBSTEP      0  FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP=     22  SUBSTEP=      1  CUMULATIVE ITERATION=    172
  TIME/FREQUENCY=  22.000
TITLE= Pad, HE(1), Casks 1 to 14, 515 Kips North (Z), Soft Rock

   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

SELECT      COMPONENT CASK

******** SUM OF LOADS APPLIED TO CASKS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  0.2229153E-04
 FY  =   3738560.
 FZ  =  -7210000.
 MX  =  0.1215709E+10
 MY  =  0.2206260E+10
 MZ  =  0.1143999E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     1 TO     1 BY    1

    9056  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BASE

******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  0.9400639E-05
 FY  = -0.1016456E+08
 FZ  =  0.1370026E+08
 MX  = -0.4129579E+10
 MY  = -0.4192280E+10
 MZ  = -0.3110355E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     2 TO     2 BY    1

    1728  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BOUNDARY

******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  0.7400165E-05
 FY  = -0.1016456E+08
 FZ  =  0.1370026E+08
 MX  = -0.4129579E+10
 MY  = -0.4192280E+10
 MZ  = -0.3110355E+10
```

```
SUMMATION POINT=  0.0000      0.0000      0.0000

*************************************************************************
*************************  LOAD CASE 23 ********************************


USE LOAD STEP    23  SUBSTEP     0  FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP=    23  SUBSTEP=     1  CUMULATIVE ITERATION=   181
  TIME/FREQUENCY=  23.000
TITLE= Pad, HE(1), Casks 1 to 14, 515 Kips N 45 W (Z,X), Soft Rock

   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

SELECT      COMPONENT CASK

******** SUM OF LOADS APPLIED TO CASKS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  -5098240.
 FY  =   3738560.
 FZ  =  -5098240.
 MX  =  0.1465953E+10
 MY  =  0.4383030E+10
 MZ  =  0.1748141E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     1 TO     1 BY    1

    9056  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BASE

******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =   9684797.
 FY  = -0.1016456E+08
 FZ  =   9684797.
 MX  = -0.4294156E+10
 MY  = -0.7657832E+10
 MZ  = -0.3508102E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     2 TO     2 BY    1

    1728  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.


SELECT      COMPONENT BOUNDARY
******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =   9684797.
 FY  = -0.1016456E+08
```

```
 FZ  =   9684797.
 MX  = -0.4294156E+10
 MY  = -0.7657832E+10
 MZ  = -0.3508102E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

*************************************************************************
*************************  LOAD CASE 24 *********************************


USE LOAD STEP    24  SUBSTEP     0  FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP=    24  SUBSTEP=     1  CUMULATIVE ITERATION=   188
  TIME/FREQUENCY=  24.000
TITLE= Pad, HE(1), Casks 1 to 14, 515 Kips West (X), Soft Rock

   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

SELECT      COMPONENT CASK

******** SUM OF LOADS APPLIED TO CASKS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  -7210000.
 FY  =   3738560.
 FZ  =  0.5044745E-05
 MX  =  0.2070094E+10
 MY  =  0.3992280E+10
 MZ  =  0.1998384E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     1 TO     1 BY    1

    9056  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BASE

******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  0.1370026E+08
 FY  = -0.1016456E+08
 FZ  = -0.3978522E-04
 MX  = -0.4691902E+10
 MY  = -0.6640306E+10
 MZ  = -0.3672679E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     2 TO     2 BY    1

    1728  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BOUNDARY
```

```
******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  0.1370026E+08
 FY  = -0.1016456E+08
 FZ  = -0.2669406E-02
 MX  = -0.4691902E+10
 MY  = -0.6640306E+10
 MZ  = -0.3672679E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

*************************************************************************
*************************  LOAD CASE 25 ********************************


USE LOAD STEP    25  SUBSTEP     0  FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP=    25  SUBSTEP=     1  CUMULATIVE ITERATION=   194
  TIME/FREQUENCY=  25.000
TITLE= Pad, HE(1), Casks 1 to 14, 515 Kips S 45 W (-Z,X), Soft Rock

   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

SELECT      COMPONENT CASK

******** SUM OF LOADS APPLIED TO CASKS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  -5098240.
 FY  =   3738560.
 FZ  =   5098240.
 MX  =  0.2674236E+10
 MY  =  0.1262907E+10
 MZ  =  0.1748141E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     1 TO     1 BY    1

    9056  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BASE

******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =   9684797.
 FY  = -0.1016456E+08
 FZ  =  -9684797.
 MX  = -0.5089648E+10
 MY  = -0.1730736E+10
 MZ  = -0.3508102E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     2 TO     2 BY    1
```

```
    1728  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BOUNDARY

******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =   9684797.
 FY  = -0.1016456E+08
 FZ  =  -9684797.
 MX  = -0.5089648E+10
 MY  = -0.1730736E+10
 MZ  = -0.3508102E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

*************************************************************************
*************************  LOAD CASE 26 ********************************


USE LOAD STEP    26  SUBSTEP     0  FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP=    26  SUBSTEP=     1  CUMULATIVE ITERATION=   199
  TIME/FREQUENCY=  26.000
TITLE= Pad, HE(1), Casks 1 to 14, 515 Kips South (-Z), Soft Rock

   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

SELECT      COMPONENT CASK

******** SUM OF LOADS APPLIED TO CASKS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  0.8825056E-05
 FY  =   3738560.
 FZ  =   7210000.
 MX  =  0.2924479E+10
 MY  = -0.2206260E+10
 MZ  =  0.1143999E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     1 TO     1 BY    1

    9056  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BASE

******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  0.9578402E-05
 FY  = -0.1016456E+08
 FZ  = -0.1370026E+08
 MX  = -0.5254225E+10
 MY  =  0.4192280E+10
```

```
 MZ  = -0.3110355E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     2 TO     2 BY    1

    1728  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BOUNDARY

******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  0.1347436E-05
 FY  = -0.1016456E+08
 FZ  = -0.1370026E+08
 MX  = -0.5254225E+10
 MY  =  0.4192280E+10
 MZ  = -0.3110355E+10

SUMMATION POINT=  0.0000      0.0000      0.0000


   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

   17051  NODES (OF    17051  DEFINED) SELECTED BY NALL  COMMAND.

EXIT THE ANSYS POST1 DATABASE PROCESSOR


***** ROUTINE COMPLETED *****  CP =        80.396


*** NOTE ***                            CP=     80.396   TIME= 16:32:21
A total of 1 warnings and errors written to dcslabs7.err.
```

Originator: S. C. Tumminelli
Date: November 30, 2001

Appendix RL-5

Reaction Loads – Cask Extraction

This Appendix presents reaction loads of the model for eight Hosgri HE(1) Load Cases, aimed at 45 degrees around the compass for the Cask Extraction configuration which is for 17 casks on the pad.

The first part of the calculation computes the expected forces. Input values are from References 2 and 4. The sum of all applied loads are calculated followed by the sum of the forces at the pad/rock interface and the sum at the boundary of the rock. Since the rock is massless, the last two values are the same. These are presented in the Table below. The methodology is described in Appendix RL-4. The forces computed and provided in the Table are the applied forces, with sign.

Then the database is scanned for the same data. The input and output files are provided in sequence.

The ANSYS program is providing the unbalanced forces that the elements are applying to the nodes. Thus, the values for the nodes where the loads are applied, are actually the reactions that the elements are applying to these nodes to maintain equilibrium. Hence, the values are the negative of the applied loads. On the boundary, the values are again the forces that the elements are applying to the nodes. Thus, they have the same sign as the applied loads calculated and provided in the Table.

A comparison of the expected forces and the forces scanned from the soft rock analysis database shows that the values are the same. This indicates that the pad is in equilibrium and that, together with a review of the displacement plots, provides high confidence that the analyses are correct.

Appendix Contents

Manual reaction calculations sheet 2
ANSYS input file for reactions sheet 3
ANSYS output file for reactions sheet 7

Table of Applied forces for 17 Casks on the Pad

Direction of Seismic Accel.	Forces	Number of Casks on Pad	Direction of Seismic Accel.	Forces	Number of Casks on Pad
		17			17
N Load Step 1	Cask Fx	0	S Load Step 5	Cask Fx	0
	Fy	-4539680		Fy	-4539680
	Fz	8755000		Fz	-8755000
	Rock Fx	0		Rock Fx	0
	Fy	-10965680		Fy	-10965680
	Fz	15245260		Fz	-15245260
N 45 W Load Step 2	Cask Fx	6190720	S 45 E Load Step 6	Cask Fx	-6190720
	Fy	-4539680		Fy	-4539680
	Fz	6190720		Fz	-6190720
	Rock Fx	10777278		Rock Fx	-10777278
	Fy	-10965680		Fy	-10965680
	Fz	10777278		Fz	-10777278
W Load Step 3	Cask Fx	8755000	E Load Step 7	Cask Fx	-8755000
	Fy	-4539680		Fy	-4539680
	Fz	0		Fz	0
	Rock Fx	15245260		Rock Fx	-15245260
	Fy	-10965680		Fy	-10965680
	Fz	0		Fz	0
S 45 W Load Step 4	Cask Fx	6190720	N 45 E Load Step 8	Cask Fx	-6190720
	Fy	-4539680		Fy	-4539680
	Fz	-6190720		Fz	6190720
	Rock Fx	10777278		Rock Fx	-10777278
	Fy	-10965680		Fy	-10965680
	Fz	-10777278		Fz	10777278

ANSYS input file for processing reaction loads:

```
/com,
/com, This routine processes load results data for the
/com,   evaluation of equilibrium.
/com
/com,   Soft Rock Load Step Results
/com
/output,padsoftreacS8,out
/com
/com ***************************************************************************
/com ***************************************************************************
/com ***************************************************************************
/com ***************************************************************************
/com ***************************************************************************
/com ***************************************************************************
/com
/com ************************ Soft Rock Reactions ****************************
/com
/file,dcslabs8
resume
/post1
/com
/com ***************************************************************************
/com ***************************************************************************
/com *************************  LOAD CASE 1 ***********************************
set,1
eall
cmsel,s,cask
/com
/com ******** SUM OF LOADS APPLIED TO CASKS *******
fsum
esel,type,1
cmsel,s,base
/com
/com ******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
fsum
esel,type,2
cmsel,s,boundary
/com
/com ******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
fsum
/com
/com
/com ****************************************************************************
/com ****************************************************************************
/com *************************  LOAD CASE 2 ***********************************
set,2
eall
cmsel,s,cask
/com
/com ******** SUM OF LOADS APPLIED TO CASKS *******
fsum
esel,type,1
cmsel,s,base
/com
```

```
/com ******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
fsum
esel,type,2
cmsel,s,boundary
/com
/com ******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
fsum
/com
/com
/com ***************************************************************************
/com ***************************************************************************
/com *************************  LOAD CASE 3 ***********************************
set,3
eall
cmsel,s,cask
/com
/com ******** SUM OF LOADS APPLIED TO CASKS *******
fsum
esel,type,1
cmsel,s,base
/com
/com ******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
fsum
esel,type,2
cmsel,s,boundary
/com
/com ******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
fsum
/com
/com
/com ***************************************************************************
/com ***************************************************************************
/com *************************  LOAD CASE 4 ***********************************
set,4
eall
cmsel,s,cask
/com
/com ******** SUM OF LOADS APPLIED TO CASKS *******
fsum
esel,type,1
cmsel,s,base
/com
/com ******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
fsum
esel,type,2
/com
cmsel,s,boundary
/com ******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
fsum
/com
/com
/com ***************************************************************************
/com ***************************************************************************
/com *************************  LOAD CASE 5 ***********************************
set,5
eall
cmsel,s,cask
```

```
/com
/com ******** SUM OF LOADS APPLIED TO CASKS *******
fsum
esel,type,1
cmsel,s,base
/com
/com ******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
fsum
esel,type,2
cmsel,s,boundary
/com
/com ******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
fsum
/com
/com
/com ************************************************************************
/com ************************************************************************
/com *************************  LOAD CASE 6 ***********************************
set,6
eall
cmsel,s,cask
/com
/com ******** SUM OF LOADS APPLIED TO CASKS *******
fsum
esel,type,1
cmsel,s,base
/com
/com ******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
fsum
esel,type,2
cmsel,s,boundary
/com
/com ******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
fsum
/com
/com
/com ************************************************************************
/com ************************************************************************
/com *************************  LOAD CASE 7 ***********************************
set,7
eall
cmsel,s,cask
/com
/com ******** SUM OF LOADS APPLIED TO CASKS *******
fsum
esel,type,1
cmsel,s,base
/com
/com ******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
fsum
esel,type,2
cmsel,s,boundary
/com
/com ******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
fsum
/com
/com
```

```
/com ***************************************************************************
/com ***************************************************************************
/com *************************  LOAD CASE 8 ***********************************
set,8
eall
cmsel,s,cask
/com
/com ******** SUM OF LOADS APPLIED TO CASKS *******
fsum
esel,type,1
cmsel,s,base
/com
/com ******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
fsum
esel,type,2
cmsel,s,boundary
/com
/com ******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
fsum
/com
/com
/com ***************************************************************************
/com ***************************************************************************
finish
/output
/exit
```

ANSYS output file for reaction loads:

```
*************************************************************************
*************************************************************************
*************************************************************************
*************************************************************************
*************************************************************************
*************************************************************************

************************ Soft Rock Reactions ****************************


CURRENT JOBNAME REDEFINED AS dcslabs8

RESUME ANSYS DATA FROM FILE NAME=dcslabs8.db

*** ANSYS GLOBAL STATUS ***

TITLE = Pad, HE(1), Cask Extraction, 17 Casks, 515 Kips N 45 E (Z,-X), Soft Ro
ANALYSIS TYPE =  STATIC (STEADY-STATE)
NUMBER OF ELEMENT TYPES =       6
  15348 ELEMENTS CURRENTLY SELECTED.  MAX ELEMENT NUMBER =    33177
  17051 NODES CURRENTLY SELECTED.     MAX NODE NUMBER =       17051
    259 KEYPOINTS CURRENTLY SELECTED. MAX KEYPOINT NUMBER =     259
      0 LINES CURRENTLY SELECTED.     MAX LINE NUMBER =         396
    181 AREAS CURRENTLY SELECTED.     MAX AREA NUMBER =         295
     70 VOLUMES CURRENTLY SELECTED.   MAX VOL. NUMBER =          70
    26 COMPONENTS CURRENTLY DEFINED
MAXIMUM LINEAR PROPERTY NUMBER        =       5
MAXIMUM REAL CONSTANT SET NUMBER      =       6
ACTIVE COORDINATE SYSTEM              =       0  (CARTESIAN)
MAXIMUM CONSTRAINT EQUATION NUMBER    =    4620
NUMBER OF SPECIFIED CONSTRAINTS       =    2193
NUMBER OF NODAL LOADS                 =    2754

INITIAL JOBNAME = dcslabs8
CURRENT JOBNAME = dcslabs8

***** ANSYS - ENGINEERING ANALYSIS SYSTEM  RELEASE 5.7     *****
ANSYS/Structural U
00150104          VERSION=INTEL NT      08:03:43  JUN 29, 2001 CP=      1.202

Pad, HE(1), Cask Extraction, 17 Casks, 515 Kips N 45 E (Z,-X), Soft Rock


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

ENTER  /SHOW,DEVICE-NAME  TO ENABLE GRAPHIC DISPLAY
ENTER  FINISH             TO LEAVE POST1

*** NOTE ***                            CP=      1.202   TIME= 08:03:43
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).
```

```
*************************************************************************
*************************************************************************
*************************  LOAD CASE 1 **********************************

USE LOAD STEP     1  SUBSTEP     0  FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP=     1  SUBSTEP=     1  CUMULATIVE ITERATION=    11
  TIME/FREQUENCY=  1.0000
TITLE= Pad, HE(1), Cask Extraction, 17 Casks, 515 Kips North (Z), Soft Rock

   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

SELECT      COMPONENT CASK

******** SUM OF LOADS APPLIED TO CASKS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  0.1762666E-04
 FY  =   4539680.
 FZ  =  -8755000.
 MX  =  0.6512935E+09
 MY  =  0.2836620E+10
 MZ  =  0.1470856E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     1 TO     1 BY    1

    9056  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BASE

******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  = -0.3665291E-04
 FY  = -0.1096568E+08
 FZ  =  0.1524526E+08
 MX  = -0.3565163E+10
 MY  = -0.4822640E+10
 MZ  = -0.3437212E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     2 TO     2 BY    1

    1728  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BOUNDARY

******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  0.3530628E-02
 FY  = -0.1096568E+08
```

```
 FZ  =  0.1524526E+08
 MX  = -0.3565163E+10
 MY  = -0.4822640E+10
 MZ  = -0.3437212E+10

SUMMATION POINT=  0.0000      0.0000      0.0000


*************************************************************************
*************************************************************************
*************************  LOAD CASE 2 **********************************


USE LOAD STEP     2  SUBSTEP     0  FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP=     2  SUBSTEP=     1  CUMULATIVE ITERATION=    20
  TIME/FREQUENCY=  2.0000
TITLE= Pad, HE(1), Cask Extraction, 17 Casks, 515 Kips N 45 W (Z,X), Soft Rock

   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

SELECT      COMPONENT CASK

******** SUM OF LOADS APPLIED TO CASKS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  -6190720.
 FY  =   4539680.
 FZ  =  -6190720.
 MX  =  0.9551606E+09
 MY  =  0.4308741E+10
 MZ  =  0.2204457E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     1 TO     1 BY    1

    9056  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BASE

******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  0.1077728E+08
 FY  = -0.1096568E+08
 FZ  =  0.1077728E+08
 MX  = -0.3783364E+10
 MY  = -0.7583543E+10
 MZ  = -0.3964418E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     2 TO     2 BY    1

    1728  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.
```

```
SELECT      COMPONENT BOUNDARY

******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  0.1077728E+08
 FY  = -0.1096568E+08
 FZ  =  0.1077728E+08
 MX  = -0.3783364E+10
 MY  = -0.7583543E+10
 MZ  = -0.3964418E+10

SUMMATION POINT=  0.0000      0.0000      0.0000


*************************************************************************
*************************************************************************
*************************  LOAD CASE 3 ***********************************


USE LOAD STEP     3  SUBSTEP     0  FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP=     3  SUBSTEP=     1  CUMULATIVE ITERATION=    29
  TIME/FREQUENCY=  3.0000
TITLE= Pad, HE(1), Cask Extraction, 17 Casks, 515 Kips West (X), Soft Rock

   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

SELECT      COMPONENT CASK

******** SUM OF LOADS APPLIED TO CASKS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  -8755000.
 FY  =   4539680.
 FZ  = -0.2150458E-04
 MX  =  0.1688761E+10
 MY  =  0.3256860E+10
 MZ  =  0.2508324E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     1 TO     1 BY    1

    9056  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BASE

******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  0.1524526E+08
 FY  = -0.1096568E+08
 FZ  = -0.5007636E-05
 MX  = -0.4310569E+10
 MY  = -0.5904886E+10
 MZ  = -0.4182618E+10
```

```
SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     2 TO     2 BY    1

    1728  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BOUNDARY

******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  0.1524526E+08
 FY  = -0.1096568E+08
 FZ  =  0.2788214E-02
 MX  = -0.4310569E+10
 MY  = -0.5904886E+10
 MZ  = -0.4182618E+10

SUMMATION POINT=  0.0000      0.0000      0.0000


*************************************************************************
*************************************************************************
*************************  LOAD CASE 4 ***********************************


USE LOAD STEP     4  SUBSTEP     0  FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP=     4  SUBSTEP=     1  CUMULATIVE ITERATION=    39
  TIME/FREQUENCY=  4.0000
TITLE= Pad, HE(1), Cask Extraction, 17 Casks, 515 Kips S 45 W (-Z,X), Soft Rock

   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

SELECT      COMPONENT CASK

******** SUM OF LOADS APPLIED TO CASKS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  -6190720.
 FY  =   4539680.
 FZ  =   6190720.
 MX  =  0.2422361E+10
 MY  =  0.2971546E+09
 MZ  =  0.2204457E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     1 TO     1 BY    1

    9056  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BASE

******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
```

```
***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  0.1077728E+08
 FY  = -0.1096568E+08
 FZ  = -0.1077728E+08
 MX  = -0.4837774E+10
 MY  = -0.7649834E+09
 MZ  = -0.3964418E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     2 TO     2 BY    1

    1728  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.


SELECT      COMPONENT BOUNDARY
******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  0.1077728E+08
 FY  = -0.1096568E+08
 FZ  = -0.1077728E+08
 MX  = -0.4837774E+10
 MY  = -0.7649834E+09
 MZ  = -0.3964418E+10

SUMMATION POINT=  0.0000      0.0000      0.0000


*************************************************************************
*************************************************************************
************************** LOAD CASE 5 **********************************


USE LOAD STEP     5  SUBSTEP     0  FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP=     5  SUBSTEP=     1  CUMULATIVE ITERATION=    47
  TIME/FREQUENCY=  5.0000
TITLE= Pad, HE(1), Cask Extraction, 17 Casks, 515 Kips South (-Z), Soft Rock

   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

SELECT      COMPONENT CASK

******** SUM OF LOADS APPLIED TO CASKS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  0.4336677E-04
 FY  =   4539680.
 FZ  =   8755000.
 MX  =  0.2726228E+10
 MY  = -0.2836620E+10
 MZ  =  0.1470856E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     1 TO     1 BY    1
```

```
    9056  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BASE

******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  = -0.3408351E-04
 FY  = -0.1096568E+08
 FZ  = -0.1524526E+08
 MX  = -0.5055975E+10
 MY  =  0.4822640E+10
 MZ  = -0.3437212E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     2 TO     2 BY    1

    1728  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BOUNDARY

******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  = -0.1035929E-03
 FY  = -0.1096568E+08
 FZ  = -0.1524526E+08
 MX  = -0.5055975E+10
 MY  =  0.4822640E+10
 MZ  = -0.3437212E+10

SUMMATION POINT=  0.0000      0.0000      0.0000


*************************************************************************
*************************************************************************
*************************  LOAD CASE 6 ***********************************


USE LOAD STEP     6  SUBSTEP     0  FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP=     6  SUBSTEP=     1  CUMULATIVE ITERATION=    56
  TIME/FREQUENCY=  6.0000
TITLE= Pad, HE(1), Cask Extraction, 17 Casks, 515 Kips S 45 E (-Z,-X), Soft Roc

   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

SELECT      COMPONENT CASK

******** SUM OF LOADS APPLIED TO CASKS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =   6190720.
 FY  =   4539680.
 FZ  =   6190720.
```

```
 MX  =  0.2422361E+10
 MY  = -0.4308741E+10
 MZ  =  0.7372560E+09

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     1 TO     1 BY    1

    9056  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BASE

******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  = -0.1077728E+08
 FY  = -0.1096568E+08
 FZ  = -0.1077728E+08
 MX  = -0.4837774E+10
 MY  =  0.7583543E+10
 MZ  = -0.2910007E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     2 TO     2 BY    1

    1728  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BOUNDARY

******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  = -0.1077728E+08
 FY  = -0.1096568E+08
 FZ  = -0.1077728E+08
 MX  = -0.4837774E+10
 MY  =  0.7583543E+10
 MZ  = -0.2910007E+10

SUMMATION POINT=  0.0000      0.0000      0.0000


*************************************************************************
*************************************************************************
*************************  LOAD CASE 7 ***********************************


USE LOAD STEP     7  SUBSTEP     0  FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP=     7  SUBSTEP=     1  CUMULATIVE ITERATION=    64
  TIME/FREQUENCY=  7.0000
TITLE= Pad, HE(1), Cask Extraction, 17 Casks, 515 Kips East (-x), Soft Rock

   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

SELECT      COMPONENT CASK
```

```
******** SUM OF LOADS APPLIED TO CASKS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =   8755000.
 FY  =   4539680.
 FZ  = -0.2248750E-04
 MX  =  0.1688761E+10
 MY  = -0.3256860E+10
 MZ  =  0.4333888E+09

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     1 TO     1 BY    1

    9056  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BASE

******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  = -0.1524526E+08
 FY  = -0.1096568E+08
 FZ  =  0.1691222E-04
 MX  = -0.4310569E+10
 MY  =  0.5904886E+10
 MZ  = -0.2691807E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     2 TO     2 BY    1

    1728  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BOUNDARY

******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  = -0.1524526E+08
 FY  = -0.1096568E+08
 FZ  = -0.9676202E-03
 MX  = -0.4310569E+10
 MY  =  0.5904886E+10
 MZ  = -0.2691806E+10

SUMMATION POINT=  0.0000      0.0000      0.0000


*************************************************************************
*************************************************************************
************************  LOAD CASE 8 ***********************************


USE LOAD STEP     8  SUBSTEP     0  FOR LOAD CASE 0
```

```
SET COMMAND GOT LOAD STEP=      8  SUBSTEP=      1  CUMULATIVE ITERATION=     73
  TIME/FREQUENCY=  8.0000
TITLE= Pad, HE(1), Cask Extraction, 17 Casks, 515 Kips N 45 E (Z,-X), Soft Rock

   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

SELECT      COMPONENT CASK

******** SUM OF LOADS APPLIED TO CASKS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =   6190720.
 FY  =   4539680.
 FZ  =  -6190720.
 MX  =  0.9551606E+09
 MY  = -0.2971546E+09
 MZ  =  0.7372560E+09

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     1 TO     1 BY    1

    9056  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BASE

******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  = -0.1077728E+08
 FY  = -0.1096568E+08
 FZ  =  0.1077728E+08
 MX  = -0.3783364E+10
 MY  =  0.7649834E+09
 MZ  = -0.2910007E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     2 TO     2 BY    1

    1728  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BOUNDARY

******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  = -0.1077728E+08
 FY  = -0.1096568E+08
 FZ  =  0.1077728E+08
 MX  = -0.3783364E+10
 MY  =  0.7649834E+09
 MZ  = -0.2910007E+10

SUMMATION POINT=  0.0000      0.0000      0.0000
```

```
***************************************************************************
***************************************************************************

EXIT THE ANSYS POST1 DATABASE PROCESSOR

***** ROUTINE COMPLETED *****  CP =        25.026


*** NOTE ***                            CP=     25.026   TIME= 08:04:17
A total of 1 warnings and errors written to dcslabs8.err.
```

Originator: S. C. Tumminelli
Date: November 30, 2001

Appendix RL-6

Reaction Loads – Soft Rock with Nu = 0.23

This Appendix presents reaction loads of the soft rock model for three Hosgri HE (1) Load Cases and three LTSP (2) Load Cases aimed at N, N45W and W with Poisson's ratio set to 0.23.

The ANSYS input file is followed by the output file.

A comparison of the expected forces taken from Appendix RL-1 (compare LS 2, 4, 6, 11, 13, 15 in RL-1 to LS 1 to 6), and the forces scanned from the soft rock analysis database, shows that the values are the same. This indicates that the pad is in equilibrium and that, together with a review of the displacement plots, provides high confidence that the analyses are correct.

Appendix Contents

ANSYS input file for reactions sheet 2
ANSYS output file for reactions sheet 5

ANSYS input file for processing reaction loads:

```
/com,
/com, This routine processes load results data for the
/com,   evaluation of equilibrium.
/com
/com,   Soft Rock Load Step Results
/com
/output,padsoftreacs9,out
/com
/com ***************************************************************************
/com ***************************************************************************
/com ***************************************************************************
/com ***************************************************************************
/com ***************************************************************************
/com ***************************************************************************
/com
/com ************************ Soft Rock Reactions ****************************
/com
/file,dcslabs9
resume
/post1
/com
/com ***************************************************************************
/com ***************************************************************************
/com ***************************  LOAD CASE 1 ********************************
set,1
eall
cmsel,s,cask
/com
/com ******** SUM OF LOADS APPLIED TO CASKS *******
fsum
esel,type,1
cmsel,s,base
/com
/com ******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
fsum
esel,type,2
cmsel,s,boundary
/com
/com ******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
fsum
/com
/com
/com ***************************************************************************
/com ***************************************************************************
/com *************************  LOAD CASE 2 ********************************
set,2
eall
cmsel,s,cask
/com
/com ******** SUM OF LOADS APPLIED TO CASKS *******
fsum
esel,type,1
cmsel,s,base
/com
```

```
/com ******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
fsum
esel,type,2
cmsel,s,boundary
/com
/com ******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
fsum
/com
/com
/com ***************************************************************************
/com ***************************************************************************
/com *************************  LOAD CASE 3 **********************************
set,3
eall
cmsel,s,cask
/com
/com ******** SUM OF LOADS APPLIED TO CASKS *******
fsum
esel,type,1
cmsel,s,base
/com
/com ******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
fsum
esel,type,2
cmsel,s,boundary
/com
/com ******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
fsum
/com
/com
/com ***************************************************************************
/com ***************************************************************************
/com *************************  LOAD CASE 4 **********************************
set,4
eall
cmsel,s,cask
/com
/com ******** SUM OF LOADS APPLIED TO CASKS *******
fsum
esel,type,1
cmsel,s,base
/com
/com ******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
fsum
esel,type,2
/com
cmsel,s,boundary
/com ******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
fsum
/com
/com
/com ***************************************************************************
/com ***************************************************************************
/com *************************  LOAD CASE 5 **********************************
set,5
eall
cmsel,s,cask
```

```
/com
/com ******** SUM OF LOADS APPLIED TO CASKS *******
fsum
esel,type,1
cmsel,s,base
/com
/com ******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
fsum
esel,type,2
cmsel,s,boundary
/com
/com ******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
fsum
/com
/com
/com ************************************************************************
/com ************************************************************************
/com *************************  LOAD CASE 6 ***********************************
set,6
eall
cmsel,s,cask
/com
/com ******** SUM OF LOADS APPLIED TO CASKS *******
fsum
esel,type,1
cmsel,s,base
/com
/com ******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
fsum
esel,type,2
cmsel,s,boundary
/com
/com ******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******
fsum
/com
/com
/com ************************************************************************
/com ************************************************************************
/com
fini
/output
/exit
```

ANSYS output file for reaction loads:

```
*************************************************************************
*************************************************************************
*************************************************************************
*************************************************************************
*************************************************************************
*************************************************************************

************************ Soft Rock Reactions ****************************


CURRENT JOBNAME REDEFINED AS dcslabs9

RESUME ANSYS DATA FROM FILE NAME=dcslabs9.db

*** ANSYS GLOBAL STATUS ***

TITLE = Pad, LTSP(2), 20 Casks, 440 Kip West (X), Soft Rock (Nu = 0.23)
ANALYSIS TYPE =  STATIC (STEADY-STATE)
NUMBER OF ELEMENT TYPES =      6
  15348 ELEMENTS CURRENTLY SELECTED.  MAX ELEMENT NUMBER =    33177
  17051 NODES CURRENTLY SELECTED.     MAX NODE NUMBER =       17051
    259 KEYPOINTS CURRENTLY SELECTED. MAX KEYPOINT NUMBER =     259
    250 LINES CURRENTLY SELECTED.     MAX LINE NUMBER =         396
    181 AREAS CURRENTLY SELECTED.     MAX AREA NUMBER =         295
     70 VOLUMES CURRENTLY SELECTED.   MAX VOL. NUMBER =          70
    11 COMPONENTS CURRENTLY DEFINED
MAXIMUM LINEAR PROPERTY NUMBER        =       5
MAXIMUM REAL CONSTANT SET NUMBER      =       6
ACTIVE COORDINATE SYSTEM              =       0  (CARTESIAN)
MAXIMUM CONSTRAINT EQUATION NUMBER    =    4620
NUMBER OF SPECIFIED CONSTRAINTS       =    2193
NUMBER OF NODAL LOADS                 =    2160

INITIAL JOBNAME = dcslabs9
CURRENT JOBNAME = dcslabs9

***** ANSYS - ENGINEERING ANALYSIS SYSTEM  RELEASE 5.7     *****
ANSYS/Structural U
00150104          VERSION=INTEL NT      16:09:36  JUN 28, 2001 CP=      3.535

Pad, LTSP(2), 20 Casks, 440 Kip West (X), Soft Rock (Nu = 0.23)


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

ENTER  /SHOW,DEVICE-NAME  TO ENABLE GRAPHIC DISPLAY
ENTER  FINISH             TO LEAVE POST1

*** NOTE ***                            CP=      3.535   TIME= 16:09:36
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).

*************************************************************************
*************************************************************************
*************************  LOAD CASE 1 ***********************************

USE LOAD STEP     1  SUBSTEP     0  FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP=     1  SUBSTEP=     1  CUMULATIVE ITERATION=    12
  TIME/FREQUENCY=  1.0000
TITLE= Pad, HE(1), 20 Casks, 515 Kip N (Z), Soft Rock (Nu = 0.23)

   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

SELECT      COMPONENT CASK

******** SUM OF LOADS APPLIED TO CASKS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  0.3674820E-04
 FY  =   5340800.
 FZ  = -0.1030000E+08
 MX  =  0.9584964E+09
 MY  =  0.3151800E+10
 MZ  =  0.1634285E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     1 TO     1 BY    1

    9056  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BASE

******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  = -0.3662529E-04
 FY  = -0.1176680E+08
 FZ  =  0.1679026E+08
 MX  = -0.3872366E+10
 MY  = -0.5137820E+10
 MZ  = -0.3600641E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     2 TO     2 BY    1

    1728  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BOUNDARY

******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  = -0.5910846E-05
```

```
 FY  = -0.1176680E+08
 FZ  =  0.1679026E+08
 MX  = -0.3872366E+10
 MY  = -0.5137820E+10
 MZ  = -0.3600641E+10

SUMMATION POINT=  0.0000      0.0000      0.0000


*************************************************************************
*************************************************************************
*************************  LOAD CASE 2 **********************************


USE LOAD STEP.     2  SUBSTEP     0  FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP=     2  SUBSTEP=     1  CUMULATIVE ITERATION=    22
  TIME/FREQUENCY=  2.0000
TITLE= Pad, HE(1), 20 Casks, 515 Kip N 45 W (Z,X), Soft Rock (Nu = 0.23)

   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

SELECT      COMPONENT CASK

******** SUM OF LOADS APPLIED TO CASKS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  -7283200.
 FY  =   5340800.
 FZ  =  -7283200.
 MX  =  0.1315987E+10
 MY  =  0.5200205E+10
 MZ  =  0.2497344E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     1 TO     1 BY    1

    9056  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BASE

******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  0.1186976E+08
 FY  = -0.1176680E+08
 FZ  =  0.1186976E+08
 MX  = -0.4144190E+10
 MY  = -0.8475007E+10
 MZ  = -0.4257305E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     2 TO     2 BY    1

    1728  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.
```

```
SELECT      COMPONENT BOUNDARY

******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  0.1186976E+08
 FY  = -0.1176680E+08
 FZ  =  0.1186976E+08
 MX  = -0.4144190E+10
 MY  = -0.8475007E+10
 MZ  = -0.4257305E+10

SUMMATION POINT=  0.0000      0.0000      0.0000


*************************************************************************
*************************************************************************
*************************  LOAD CASE 3 ***********************************


USE LOAD STEP     3  SUBSTEP     0  FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP=     3  SUBSTEP=     1  CUMULATIVE ITERATION=    32
  TIME/FREQUENCY=  3.0000
TITLE= Pad, HE(1), 20 Casks, 515 Kip West (W), Soft Rock (Nu = 0.23)

   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

SELECT      COMPONENT CASK

******** SUM OF LOADS APPLIED TO CASKS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  = -0.1030000E+08
 FY  =   5340800.
 FZ  =  0.1745064E-04
 MX  =  0.2179046E+10
 MY  =  0.4202400E+10
 MZ  =  0.2854835E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     1 TO     1 BY    1

    9056  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BASE

******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  0.1679026E+08
 FY  = -0.1176680E+08
 FZ  =  0.1546240E-04
 MX  = -0.4800854E+10
 MY  = -0.6850426E+10
```

```
 MZ   = -0.4529129E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     2 TO     2 BY    1

    1728  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BOUNDARY

******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX   =  0.1679026E+08
 FY   = -0.1176680E+08
 FZ   =  0.6384819E-03
 MX   = -0.4800854E+10
 MY   = -0.6850426E+10
 MZ   = -0.4529129E+10

SUMMATION POINT=  0.0000      0.0000      0.0000


*************************************************************************
*************************************************************************
*************************  LOAD CASE 4 **********************************


USE LOAD STEP     4  SUBSTEP     0  FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP=     4  SUBSTEP=     1  CUMULATIVE ITERATION=    47
  TIME/FREQUENCY=  4.0000
TITLE= Pad, LTSP(2), 20 Casks, 440 Kip N (Z), Soft Rock (Nu = 0.23)

   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

SELECT      COMPONENT CASK

******** SUM OF LOADS APPLIED TO CASKS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX   = -0.7554507E-05
 FY   =   5166400.
 FZ   =  -8800000.
 MX   =  0.1065091E+10
 MY   =  0.2692800E+10
 MZ   =  0.1580918E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     1 TO     1 BY    1

    9056  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BASE

******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******
```

```
***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  = -0.2412734E-04
 FY  = -0.1094980E+08
 FZ  =  0.1598106E+08
 MX  = -0.3747866E+10
 MY  = -0.4890203E+10
 MZ  = -0.3350639E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     2 TO     2 BY    1

    1728  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.


SELECT      COMPONENT BOUNDARY
******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  = -0.9249689E-05
 FY  = -0.1094980E+08
 FZ  =  0.1598105E+08
 MX  = -0.3747866E+10
 MY  = -0.4890203E+10
 MZ  = -0.3350639E+10

SUMMATION POINT=  0.0000      0.0000      0.0000


*************************************************************************
*************************************************************************
*************************  LOAD CASE 5 ***********************************


USE LOAD STEP     5  SUBSTEP     0  FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP=     5  SUBSTEP=     1  CUMULATIVE ITERATION=    56
  TIME/FREQUENCY=  5.0000
TITLE= Pad, LTSP(2), 20 Casks, 440 Kip N 45 W (Z,X), Soft Rock (Nu = 0.23)

   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

SELECT      COMPONENT CASK

******** SUM OF LOADS APPLIED TO CASKS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  -6222540.
 FY  =   5166400.
 FZ  =  -6222540.
 MX  =  0.1370520E+10
 MY  =  0.4442894E+10
 MZ  =  0.2318289E+10

SUMMATION POINT=  0.0000      0.0000      0.0000
```

```
ESEL  FOR LABEL= TYPE  FROM     1 TO     1 BY    1

    9056  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BASE

******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  0.1129908E+08
 FY  = -0.1094980E+08
 FZ  =  0.1129908E+08
 MX  = -0.3958592E+10
 MY  = -0.8067543E+10
 MZ  = -0.3859565E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     2 TO     2 BY    1

    1728  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BOUNDARY

******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  0.1129908E+08
 FY  = -0.1094980E+08
 FZ  =  0.1129908E+08
 MX  = -0.3958592E+10
 MY  = -0.8067543E+10
 MZ  = -0.3859566E+10

SUMMATION POINT=  0.0000      0.0000      0.0000


***************************************************************************
***************************************************************************
*************************  LOAD CASE 6 ***********************************


USE LOAD STEP     6  SUBSTEP     0  FOR LOAD CASE 0

SET COMMAND GOT LOAD STEP=     6  SUBSTEP=     1  CUMULATIVE ITERATION=    65
  TIME/FREQUENCY=  6.0000
TITLE= Pad, LTSP(2), 20 Casks, 440 Kip West (X), Soft Rock (Nu = 0.23)

   15348  ELEMENTS (OF    15348  DEFINED) SELECTED BY  EALL  COMMAND.

SELECT      COMPONENT CASK

******** SUM OF LOADS APPLIED TO CASKS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  -8800000.
 FY  =   5166400.
```

```
 FZ  = -0.1693612E-04
 MX  =  0.2107891E+10
 MY  =  0.3590400E+10
 MZ  =  0.2623718E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     1 TO     1 BY    1

    9056  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BASE

******** LOADS TRANSMITTED THRU CONCRETE/ROCK INTERFACE *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  0.1598106E+08
 FY  = -0.1094980E+08
 FZ  = -0.1160489E-04
 MX  = -0.4467518E+10
 MY  = -0.6520270E+10
 MZ  = -0.4070291E+10

SUMMATION POINT=  0.0000      0.0000      0.0000

ESEL  FOR LABEL= TYPE  FROM     2 TO     2 BY    1

    1728  ELEMENTS (OF    15348  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      COMPONENT BOUNDARY

******** LOADS REACTED AT ROCK BOUNDARY CONSTRAINTS *******

***** SUMMATION OF TOTAL    FORCES AND MOMENTS IN GLOBAL COORDINATES *****
 FX  =  0.1598105E+08
 FY  = -0.1094980E+08
 FZ  =  0.7216000E-03
 MX  = -0.4467518E+10
 MY  = -0.6520270E+10
 MZ  = -0.4070291E+10

SUMMATION POINT=  0.0000      0.0000      0.0000


*****************************************************************************
*****************************************************************************


EXIT THE ANSYS POST1 DATABASE PROCESSOR


***** ROUTINE COMPLETED *****  CP =        21.381


*** NOTE ***                            CP=      21.381   TIME= 16:10:04
A total of 2 warnings and errors written to dcslabs9.err.
```