

## Part 4 -Collapse (Pushover) Analysis

- 1) Under “**Training Project**”, create “**Collapse**” subdirectory
- 2) Copy **SACINP.DAT** model file, **SEAINP.DAT** Seastate file and **PSIINP.DAT** soil data from “**Static PSI**” directory to “**Collapse**” directory. Rename the model file to **SACINP.CLP** and Seastate file to **SEAINP.CLP**.
- 3) Modify Seastate file necessary for collapse analysis  
Delete LCSEL and AMOD lines;  
Delete operating storm load cases and extreme storm load case S045 and S090;  
Delete all load combinations;  
Delete dead load from extreme storm load case S000;  
Add DEAD load condition with selected weight groups for ANOD and WKWY;
- 4) Create collapse input file **CLPINP.CLP**

### Collapse options:

Member segments 8 will be chosen along with 60 iterations allowed for both load increment and member iterations.

Joint flexibility and joint strength will be included;

Collapse max. deflection = 500 cm will be used with .005 strain hardening ratio.

One Load sequence **AAAA** defined for applying dead loads and then environmental load:

Load case **DEAD, EQPT, MISC, AREA** will be added in one step;

Load case **LIVE** will be added in one step for 50 percent load value;

Environmental load **S000** will be added in 100 steps for load factor of 5.0.

One Load sequence **AAAA** defined for applying dead loads and then environmental load:

Load case **DEAD, EQPT, MISC, AREA** will be added in one step;

Elastic member groups can be defined using **GRPELA** line for member groups **W01, W02, W03, LG7** and **W.B**.

Elastic plate group will be defined for **PL1** using **PGRELA** line.

Collapse input file defined shall looks like following:

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CLPOPT      60   8  60                JF   JS              0.100.001 0.01 500. .005  
LDSEQ AAAA                DEAD    1              1.0EQPT    1              1.0MISC    1              1.0  
LDSEQ                AREA    1              1.0LIVE    1              0.5S000 100              5.0  
GRPELA                W01 W02 W03 LG7 W.B  
PGRELA      PL1  
END  
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```

- 5) Create RUN file and run the analysis, using Collapse View to view the results.

# Collapse solution summary report:

***** COLLAPSE SOLUTION SUMMARY *****															
LOAD SEQUENCE 1															
INCR	LOAD CASE	LOAD FACTOR	NO. LOOPS	* MAXIMUM DEFL. CM	DEFLECTION JOINT	* DOF	** MAXIMUM ROT. ROT.	ROTATION JOINT	** DOF	** SOLUTION DATA **			*** REACTION SUMMATION ***		
										MAX. DIGITS	JOINT	DOF	FX KN	FY KN	FZ KN
1	DEAD	1.00	1	-2.708	7013	DX	-0.0009452	103P	RY	3	807L	DX	0.00	0.00	0.00
2	EQPT	1.00	1	-4.629	7013	DX	0.0041766	8011	RX	3	807L	DX	0.00	0.00	0.00
3	MISC	1.00	1	-4.725	7013	DX	0.0040845	8011	RX	3	807L	DX	0.00	0.00	0.00
4	AREA	1.00	1	-5.014	7013	DX	0.0041928	8011	RX	3	807L	DX	0.00	0.00	0.00
5	LIVE	0.50	1	-5.874	7013	DX	0.0045523	8011	RX	3	807L	DX	0.00	0.00	0.00
6	S000	0.05	1	-4.999	8006	DZ	0.0045401	8011	RX	3	807L	DX	0.00	0.00	0.00
7	S000	0.10	1	-4.931	8006	DZ	0.0045381	8011	RX	3	807L	DX	0.00	0.00	0.00
8	S000	0.15	1	-4.864	8006	DZ	0.0045362	8011	RX	3	807L	DX	0.00	0.00	0.00
9	S000	0.20	1	-4.797	8006	DZ	0.0045342	8011	RX	3	807L	DX	0.00	0.00	0.00
10	S000	0.25	1	-4.731	8006	DZ	0.0045324	8011	RX	3	807L	DX	0.00	0.00	0.00
11	S000	0.30	1	-4.664	8006	DZ	0.0045305	8011	RX	3	807L	DX	0.00	0.00	0.00
12	S000	0.35	1	4.824	8004	DX	0.0045535	801L	RY	3	807L	DX	0.00	0.00	0.00
13	S000	0.40	1	6.251	8001	DX	0.0046306	801L	RY	3	807L	DX	0.00	0.00	0.00
14	S000	0.45	1	7.704	8001	DX	0.0047077	801L	RY	3	807L	DX	0.00	0.00	0.00
15	S000	0.50	1	9.156	8001	DX	0.0047848	801L	RY	3	807L	DX	0.00	0.00	0.00
16	S000	0.55	1	10.609	8001	DX	0.0048619	801L	RY	3	807L	DX	0.00	0.00	0.00
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...															
28	S000	1.15	1	29.311	8001	DX	0.0066612	103P	RY	3	807L	DX	0.00	0.00	0.00
29	S000	1.20	1	31.055	8001	DX	0.0072999	103P	RY	3	807L	DX	0.00	0.00	0.00
30	S000	1.25	1	32.891	8001	DX	0.0079899	103P	RY	3	807L	DX	0.00	0.00	0.00
31	S000	1.30	1	34.768	8001	DX	0.0087161	103P	RY	3	807L	DX	0.00	0.00	0.00
32	S000	1.35	1	36.746	8001	DX	0.0095312	103P	RY	3	807L	DX	0.00	0.00	0.00
33	S000	1.40	2	38.937	8001	DX	0.0105250	103P	RY	3	807L	DX	0.00	0.00	0.00
34	S000	1.45	1	41.051	8001	DX	0.0114054	103P	RY	3	807L	DX	0.00	0.00	0.00
35	S000	1.50	2	43.449	8001	DX	0.0125429	103P	RY	3	807L	DX	0.00	0.00	0.00
36	S000	1.55	2	45.866	8001	DX	0.0136520	103P	RY	3	807L	DX	0.00	0.00	0.00
37	S000	1.60	2	48.399	8001	DX	0.0148418	103P	RY	3	807L	DX	0.00	0.00	0.00
38	S000	1.65	2	51.042	8001	DX	0.0160906	103P	RY	3	807L	DX	0.00	0.00	0.00
39	S000	1.70	2	53.799	8001	DX	0.0174029	103P	RY	3	807L	DX	0.00	0.00	0.00
40	S000	1.75	2	56.661	8001	DX	0.0187682	103P	RY	3	807L	DX	0.00	0.00	0.00
41	S000	1.80	2	59.656	8001	DX	0.0202122	103P	RY	3	807L	DX	0.00	0.00	0.00
42	S000	1.85	2	62.768	8001	DX	0.0217175	103P	RY	3	807L	DX	0.00	0.00	0.00
43	S000	1.90	3	66.343	8001	DX	0.0237838	103P	RY	3	807L	DX	0.00	0.00	0.00
44	S000	1.95	5	70.626	8001	DX	0.0266287	103P	RY	3	807L	DX	0.00	0.00	0.00
45	S000	2.00	15	80.247	8001	DX	0.0353492	103P	RY	3	807L	DX	0.00	0.00	0.00
46	S000	2.05	25	361.978	8001	DX	0.1989188	103P	RY	3	807L	DX	0.00	0.00	0.00