



## LONG ISLAND LIGHTING COMPANY

SHOREHAM NUCLEAR POWER STATION

P.O. BOX 618, NORTH COUNTRY ROAD • WADING RIVER, N.Y. 11792

November 22, 1982

SNRC-787

Mr. Harold R. Denton, Director  
Office of Nuclear Reactor Regulation  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

Reactor Building Foundation  
Shoreham Nuclear Power Station - Unit 1  
Docket No. 50-322

Dear Mr. Denton:

In an October 7 letter from Mr. A. Schwencer of the NRC, LILCO was asked for additional information regarding Reactor Building settlement and the effect of varying the dynamic shear modulus of the subgrade soil on the seismic response of the structure. This letter responds to that request.

The plot of accumulated reactor building settlement and load time history shown in Figure 5 of Appendix 2J to the FSAR has been extended in the three sheets of the attached figure to show all data now available. It should be noted that the horizontal scale of the third sheet has been condensed subsequent to the middle of 1978 due to a reduced frequency of surveys and that data taken during a month have been plotted at the end of the month, (e.g. data taken in November 1976 are plotted above the word December). The settlements of markers R-1, R-2, R-3, and R-4 are shown for the period through November 1976 because of construction requirements. Markers L-19 and L-21 were installed equidistant from marker R-1, and marker R-3 was replaced by L-20 at the same plan location. Continuity of readings was easily maintained during the transition due to the uniformity of the settlement. The FSAR will be updated to reflect the revised Figure 5.

A parametric study has been performed to determine the effect of hypothesized variations in the shear modulus of the foundation soil upon the seismic response of the Reactor Building. The shear modulus,  $G$ , was varied by +25 percent from its base value,  $G_0$ , and building accelerations for both Operating Basis Earthquakes and Design Basis Earthquakes were computed at several elevations.

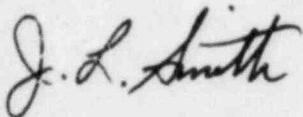
Boo1  
1/41

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Page 2

The results are tabulated in Table I. The maximum computed accelerations for each elevation as shown in Table II.

LILCO believes that the update of information provided here will satisfy your request; however, if you require further information, do not hesitate to contact this office.

Very truly yours,



J. L. Smith  
Manager, Special Projects  
Shoreham Nuclear Power Station

RSH:mp

Attachment

cc: J. Higgins  
All parties

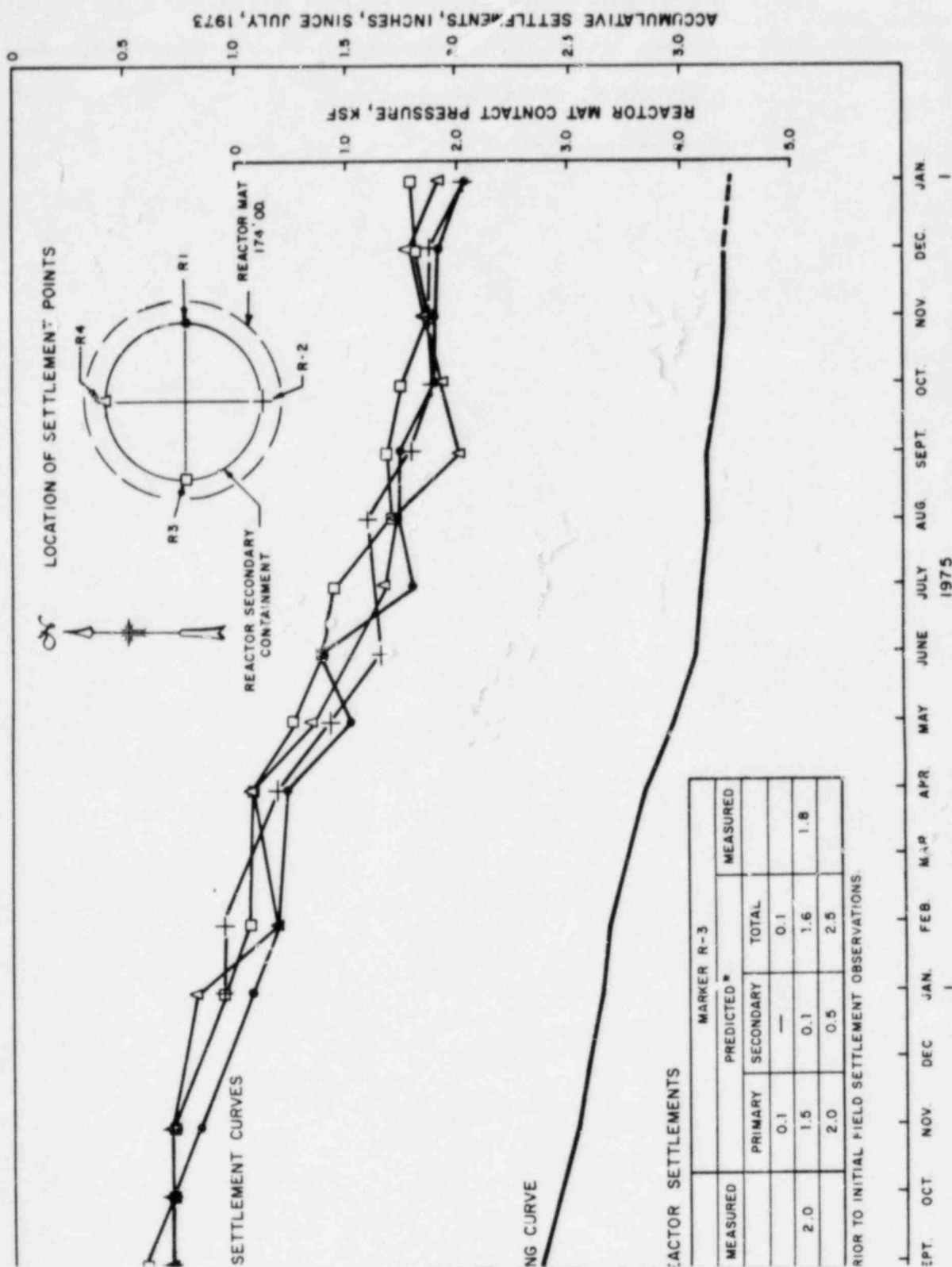
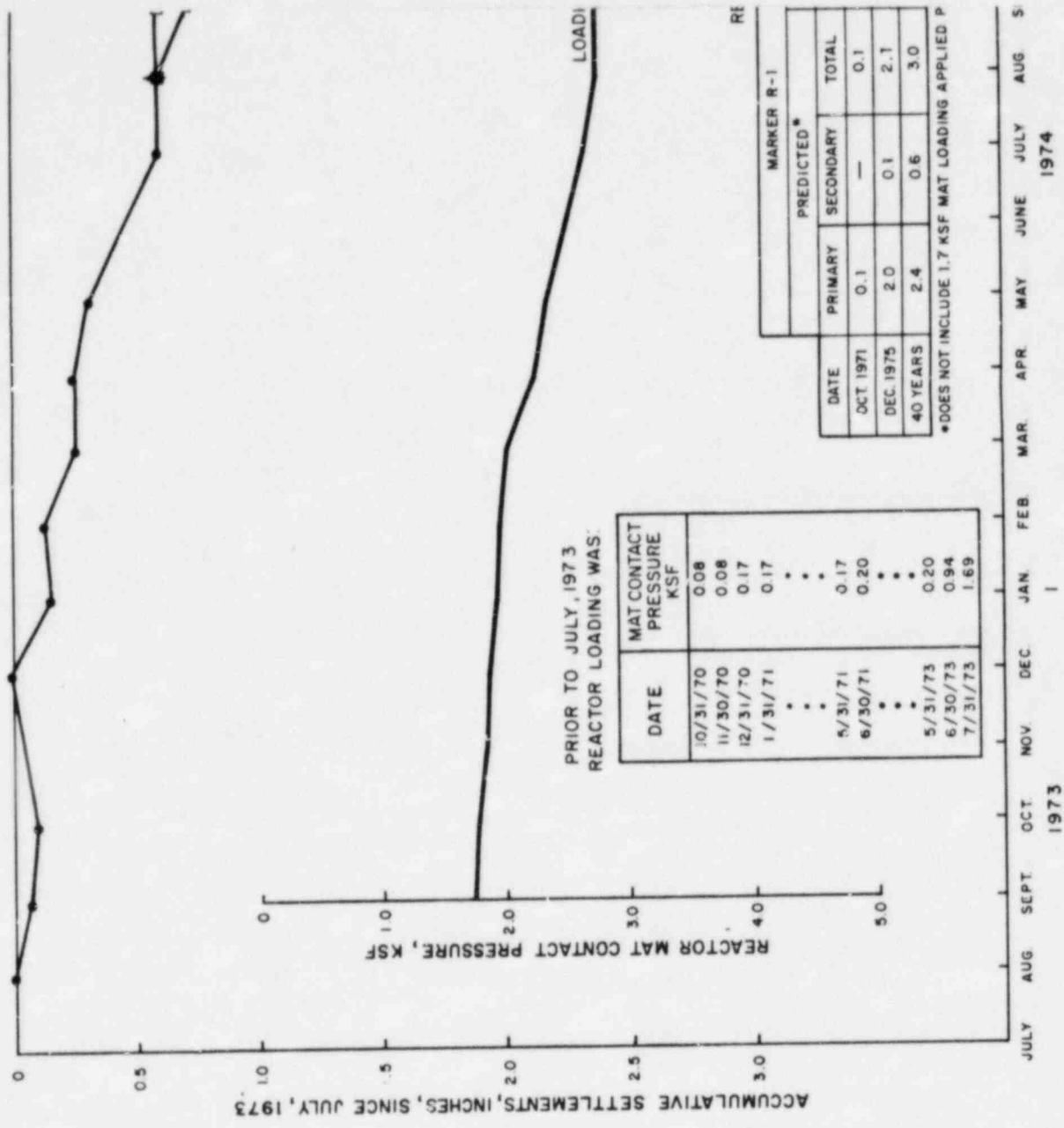


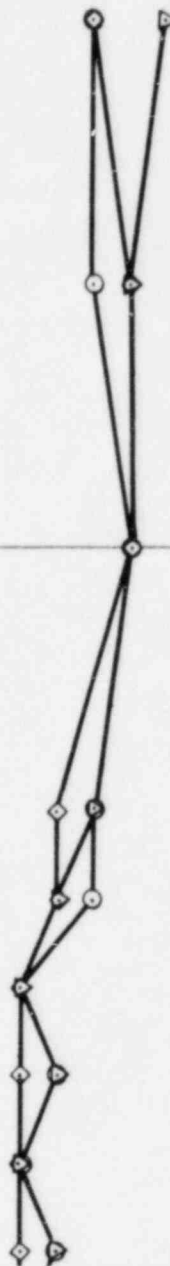
FIG. 5A  
REACTOR BUILDING SETTLEMENTS  
SHOREHAM NUCLEAR POWER STATION - UNIT 1



REACTOR MAT CONTACT PRESSURE (KSF)

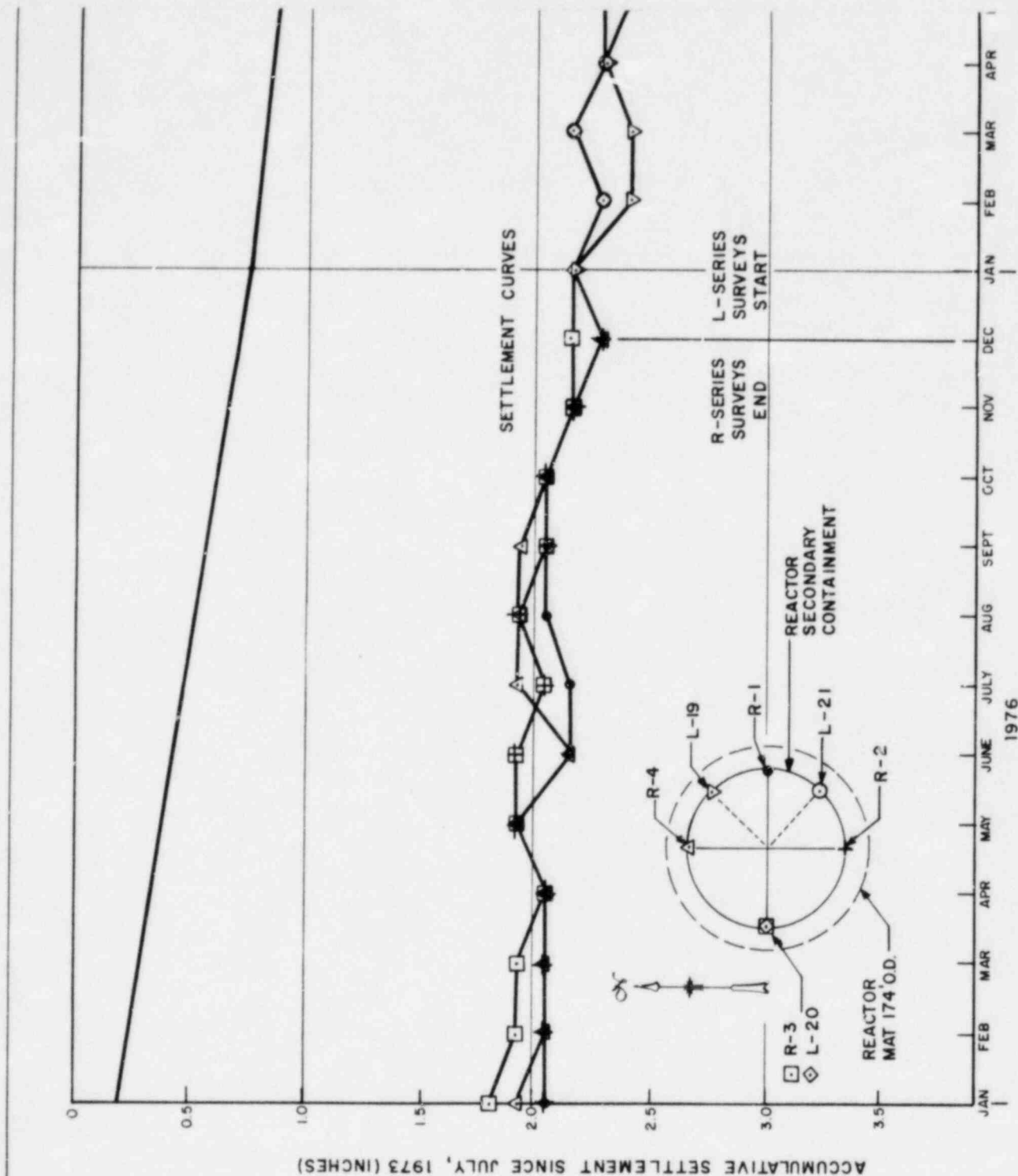
4.0  
5.0  
6.0  
7.0

LOADING CURVE



MAY JUNE JULY AUG SEPT OCT NOV DEC JAN FEB MAR APR MAY JUNE JULY  
1977 1978

FIG. 5B  
REACTOR BUILDING SETTLEMENTS  
SHOREHAM NUCLEAR POWER STATION-UNIT 1



NOTE: THIS FIGURE IS A CONTINUATION OF DATA PRESENTED IN FSAR  
FIG. 5 APPENDIX 2J

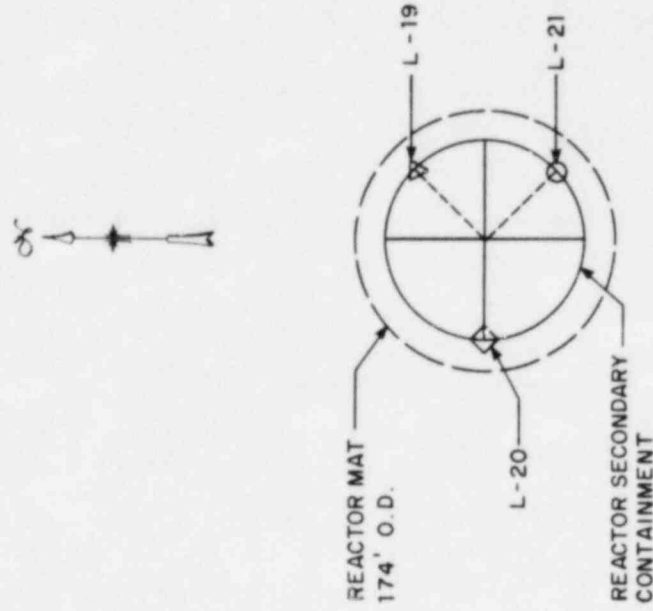
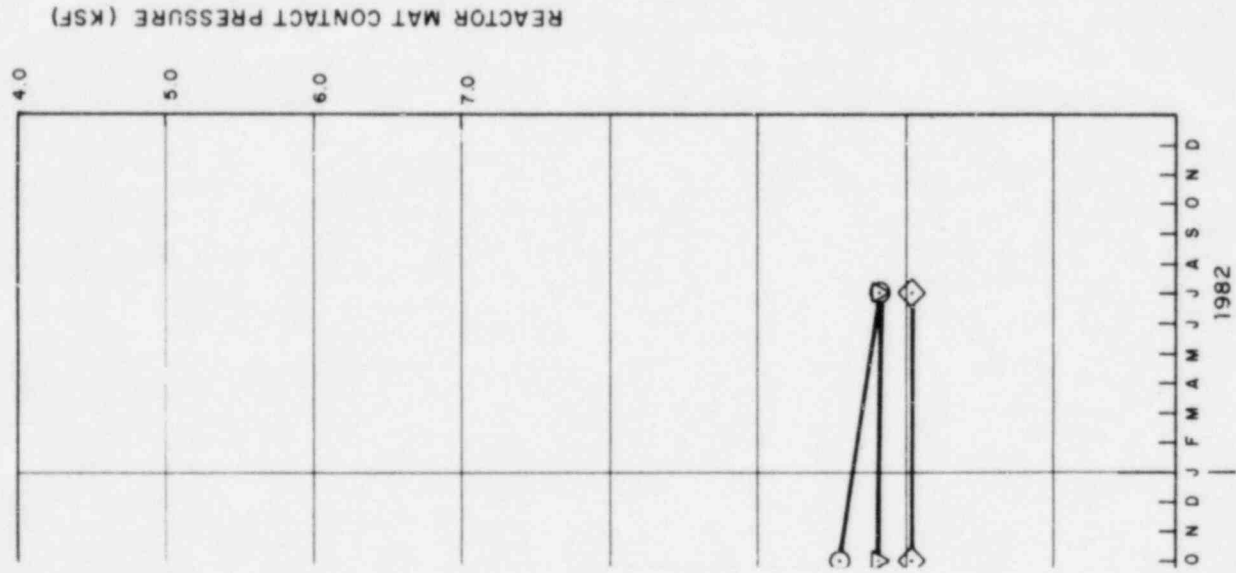
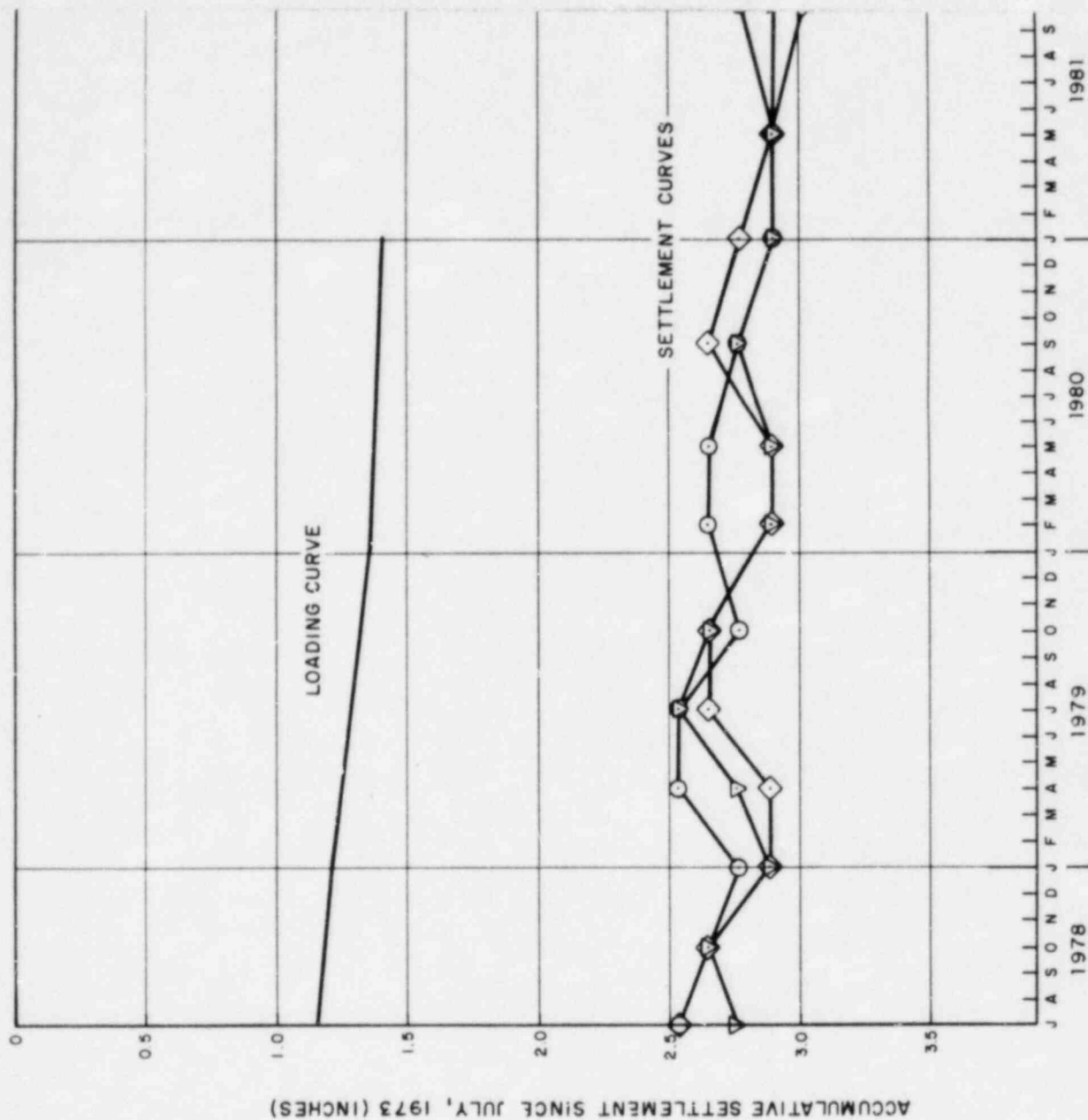


FIG. 5C  
 REACTOR BUILDING SETTLEMENTS  
 SHOREHAM NUCLEAR POWER STATION-UNIT 1



NOTES

1. FREQUENCY OF FIELD SURVEY WAS REDUCED IN SEPT, 1977.
2. HORIZONTAL SCALE OF THIS SHEET IS CONDENSED COMPARED TO PREVIOUS SHEETS.
3. SEE FSAR FIGURE 5 IN APPENDIX 2J.



TABLE I

SUMMARY OF COMPUTER RUNS

3/73

ACCELERATION IN FT/SEC<sup>2</sup>G = 1.25G<sub>o</sub>

DIST. FT.	UNCRACKED				SEMICRACKED				UNCRACKED		
	HOR.DBE	VER.DBE	HOR.OBE	VER.OBE	HOR.DBE	VER.DBE	HOR.OBE	VER.OBE	HOR.DBE	VER.DBE	HOR.OBE
8	5.54	5.52	3.09	3.04	4.82	5.51	2.69	3.04	6.15	5.57	3.42
39	5.33	5.74	3.01	3.17	4.90	5.74	2.77	3.16	5.48	5.71	3.09
57	5.39	5.86	3.07	3.23	5.16	5.86	2.94	3.23	5.26	5.78	3.01
78	5.76	6.00	3.31	3.31	7.53	5.99	3.29	3.30	6.29	5.86	3.08
112	7.44	6.22	4.30	3.43	7.54	6.21	4.36	3.42	6.44	5.99	3.79
134	8.62	6.30	4.93	3.48	8.58	6.29	4.96	3.47	7.34	6.04	4.32
150	9.28	6.34	5.36	3.50	9.28	5.33	5.36	3.49	8.00	6.06	4.70
175	10.95	6.39	6.30	3.52	10.81	6.38	6.23	3.52	9.53	6.09	5.56
204	12.83	6.40	7.37	3.53	12.52	6.39	7.21	3.53	11.32	6.10	6.57
←									SECONDARY CONT.		
8	5.55	5.51	3.10	3.04	4.82	5.51	2.70	3.04	6.16	5.57	3.42
40	5.88	5.56	3.30	3.07	5.37	5.59	3.02	3.08	5.77	5.60	3.24
86	7.16	5.61	4.05	3.09	7.93	5.68	4.48	3.13	5.84	5.63	3.35
149	9.88	5.64	5.61	3.11	13.26	5.73	7.46	3.16	7.14	5.65	4.17
←									PRIMARY CONT.		
8	5.54	5.51	3.10	3.04	4.82	5.50	2.69	3.04	6.15	5.57	3.42
32	6.53	5.61	3.66	3.09	5.54	5.60	3.11	3.09	6.21	5.63	3.48
63	8.92	5.71	5.00	3.15	8.27	5.70	4.64	3.14	6.73	5.69	3.80
90	10.45	5.76	5.87	3.18	10.97	5.75	6.15	2.17	7.00	5.72	3.99
114	10.97	5.77	6.18	3.18	12.78	5.76	7.17	3.17	7.12	5.72	4.09
137	11.10	5.77	6.25	3.18	14.18	5.76	7.96	3.18	7.28	5.73	4.23
←									PEDESTAL & SHIELD		
60	6.32	5.58	3.56	3.08	6.23	5.63	3.52	3.11	5.70	5.62	3.23
←									PRIMARY CONT.		

CALCULATION SHEET

Preliminary 2-1

Client LILCO

Location

Est. No.

Subject or Apparatus

DYNAMIC ANALY CONT.

Date 8-21-81

NSB 020

10 m. 11600.

S.K. Jones

Checked

By

Revised

By

Based on

$G = 0.75G_0$

$G = G_0$

SEMICRACKED

UNCRAKED

SEMICRACKED

VER. OBE	HOR. DBE	VER. DBE	HOR. OBE	VER. OBE	HOR. DBE	VER. DBE	HOR. OBE	VER. OBE	HOR. DBE	VER. DBE	HOR. OBE	VER. OBE
3-12	5-90	5-57	3-28	3-35	5-91	5-58	3-29	3-08	5-34	5-58	2-97	3-08
3-19	5-27	5-10	2-98	3-27	5-46	5-77	3-07	3-18	5-04	5-76	2-84	3-18
3-23	5-09	5-78	2-92	3-23	5-37	5-86	3-04	3-23	5-08	5-86	2-88	3-23
3-28	5-19	5-85	3-02	3-27	5-56	5-97	3-19	3-29	5-42	5-96	3-11	3-29
3-35	5-43	5-98	3-19	3-35	6-98	5-15	4-03	3-39	7-02	6-14	4-04	3-39
3-38	7-36	6-03	4-33	3-37	7-99	6-21	4-60	3-43	6-04	6-21	4-63	3-42
3-39	8-03	6-06	4-71	3-39	8-71	6-25	5-01	3-45	8-76	6-24	5-03	3-44
3-40	9-55	6-08	5-58	3-40	10-35	6-28	5-93	3-47	10-33	6-27	5-92	3-46
3-41	11-33	6-09	6-58	3-41	12-91	6-29	6-98	"	12-11	6-28	6-92	3-47
3-12	5-91	5-57	3-29	3-11	5-93	5-58	3-30	3-08	5-35	5-57	2-98	3-07
3-13	5-81	5-62	3-27	3-14	5-91	5-62	3-31	3-10	5-76	5-64	3-23	3-11
3-15	6-38	5-87	3-64	3-17	6-54	5-65	3-70	3-12	7-42	5-72	4-18	3-15
3-16	8-26	5-70	4-78	3-19	8-37	5-68	4-77	3-13	10-90	5-76	6-15	3-17
WALL												
3-11	5-91	5-57	3-29	3-11	5-92	5-58	3-30	3-08	5-34	5-57	2-98	3-07
3-15	6-07	5-62	3-40	3-14	6-46	5-66	3-61	3-12	5-98	5-65	3-34	3-12
3-18	6-89	5-68	3-89	3-18	7-85	5-74	4-40	3-17	7-92	5-73	4-44	3-16
3-20	7-58	5-71	4-30	3-19	8-66	5-78	4-87	3-19	9-62	5-77	5-40	3-18
3-20	8-03	5-72	4-59	3-20	8-91	5-79	5-03	"	10-71	5-78	6-01	3-19
3-20	8-47	5-72	4-87	3-20	8-98	5-79	5-09	"	11-53	"	6-49	"
3-14	5-94	5-64	3-37	3-16	6-09	5-64	3-42	3-11	6-32	5-68	3-55	3-13

# TABLE II.

## MAX. ACCELERATION

### SECONDARY CONT.

DIST-FT.	HOR DBE	VER DBE	HOR OBE	VER OBE
8	6.15 = 0.20g	5.58 = 0.17	3.42 = 0.11	3.35 = 0.10
39	5.48 = 0.20	5.77 = 0.18	3.09 = 0.11	3.27 = 0.10
57	5.39 = 0.20	5.86 = 0.18	3.07 = 0.11	3.23 = 0.10
78	7.53 = 0.23	6.00 = 0.19	3.31 = 0.11	3.31 = 0.10
112	7.54 = 0.23	6.22 = 0.19	4.36 = 0.14	3.43 = 0.11
134	8.62 = 0.27	6.30 = 0.20	4.96 = 0.15	3.48 = 0.11
150	9.28 = 0.29	6.34 = 0.20	5.36 = 0.17	3.50 = 0.11
175	10.95 = 0.34	6.39 = 0.20	6.30 = 0.20	3.52 = 0.11
204	12.91 = 0.40	6.40 = 0.20	7.37 = 0.23	3.53 = 0.11

### PRIMARY CONT.

8	6.16 = 0.20	5.58 = 0.17	3.42 = 0.11	3.12 = 0.10
40	5.91 = 0.20	5.64 = 0.18	3.31 = 0.11	3.14 = 0.10
60	6.32 = 0.20	5.64 = 0.18	3.56 = 0.11	3.16 = 0.10
86	7.93 = 0.25	5.72 = 0.18	4.48 = 0.14	3.17 = 0.10
149	13.26 = 0.41	5.76 = 0.18	7.46 = 0.23	3.19 = 0.10

### PEDESTAL & SHIELD WALL

8	6.15 = 0.20	5.58 = 0.17	3.42 = 0.11	3.11 = 0.10
32	6.53 = 0.20	5.66 = 0.18	3.66 = 0.11	3.15 = 0.10
63	8.92 = 0.28	5.74 = 0.18	5.00 = 0.16	3.18 = 0.10
90	10.97 = 0.34	5.78 = 0.18	6.15 = 0.19	3.20 = 0.10
114	12.78 = 0.40	5.79 = 0.18	7.17 = 0.22	" = 0.10
137	14.18 = 0.44	" = 0.18	7.96 = 0.25	" = 0.10