



**U.S. - JAPAN COORDINATED PROGRAM  
FOR  
MASONRY BUILDING RESEARCH**

REPORT NO. 3.2 (b2)



PB93-214609

**THE TRANSVERSE RESPONSE  
OF  
CLAY MASONRY WALLS  
SUBJECTED TO STRONG MOTION  
EARTHQUAKES**

**Summary of Dynamic Test Results  
Volume 3: Walls No. 8, 9, 10, and 11 (Group 2)**

by

**Marcial Blondet  
Ronald L. Mayes**

**APRIL 1991**

**supported by:**

**NATIONAL SCIENCE FOUNDATION**

**GRANT NO. CES-8518700**

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COMPUTECH ENGINEERING SERVICES, INCORPORATED



This report presents the results of a research project which was part of the U.S. Coordinated Program for Masonry Building Research. The program constitutes the United States part of the United States - Japan Coordinated Masonry Research Program conducted under the auspices of the Panel on Wind and Seismic Effects of the U.S.-Japan Natural Resources Development Program (UJNR).

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Any opinions, findings, and conclusions or recommendations expressed in this publication are those of the authors and do not necessarily reflect the views of the National Science Foundation and/or the United States Government.



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## INTRODUCTION

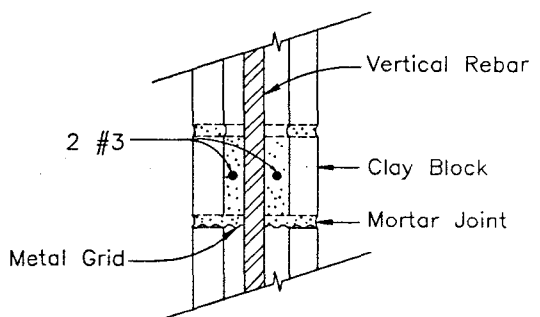
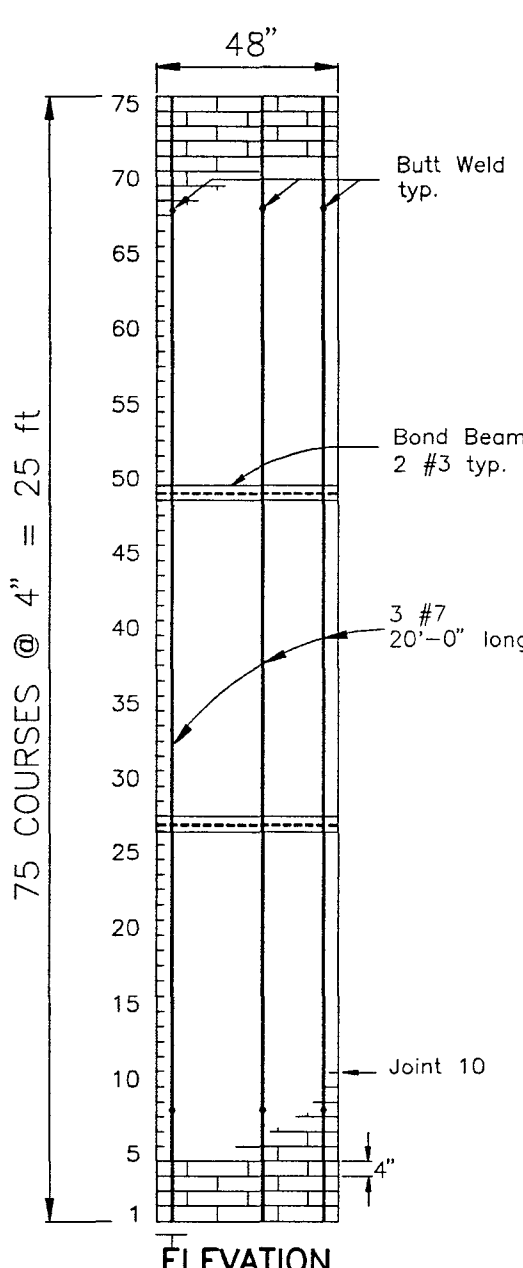
This report is Volume 3 of a four volume set of reports. It includes detailed test information on Walls No. 8, 9, 10, and 11 (Group 2), which were part of a test program on the out of plane response of nine reinforced, clay brick masonry walls that were subjected to simulated earthquake loading. The project was developed by Computech Engineering Services (CES), as part of the US/Japan Coordinated Program for Masonry Building Research (TCCMAR). Its main objective was to evaluate the influence of the amount of vertical reinforcement, vertical ledger load, height-to-thickness (H/t) ratio, rebar splicing, and extent of grouting on the out-of-plane response of the walls.

Testing was performed at the Earthquake Engineering Research Center (EERC), University of California, Berkeley. The walls were 20 and 25 feet high, with a nominal thickness of 6 inches; the vertical reinforcement consisted of 2 # 5 or 3 # 7 rebar with steel ratios of  $0.16\rho_b$  and  $0.50\rho_b$ , respectively. Simulated earthquake motions were applied at the base and the top of each wall. The base motions corresponded to the seismic ground excitation; the top motions represented the response, at the diaphragm level, of a typical warehouse structure. Both stiff and flexible diaphragm conditions were considered. The seismic inputs were generated by scaling recorded ground motions in the time and frequency domains, to attain specified intensities of 0.1, 0.2, 0.4, and 0.8 EPA (Effective Peak Acceleration) for a rock site. The first three EPA levels corresponded, respectively, to the lower, medium and highest seismic zones of the United States. The 0.8 EPA motions represented events of twice the intensity specified by the SEAOC requirements for a soil type 1 site (S1), although the longer period part of these spectra are similar to the 0.4 EPA soil type 3 spectra.

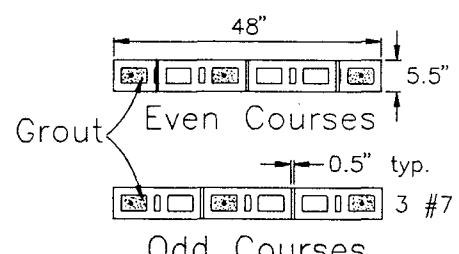
Volume 1 of the series provides detailed descriptions of the experimental setup, input signal characteristics, data processing techniques, and summary data derived from the dynamic tests. Volume 2 contains the results from the first group of walls (Group 1): Walls 4 and 6. Volume 3 contains the results from Group 2: Walls 8, 9, 10, and 11. Volume 4 contains the results from Group 3: Walls 3, 5, and 7.

This volume is organized as follows: First, a set of figures with construction drawings and test setup and instrumentation schematics is presented. This is followed by a table with test sequence and peak displacement, acceleration measured at the bottom, center and top of each wall, as well as measured peak rebar strain. For each run, a summary table is given indicating: a) peak values of input and global response (i.e., displacements and accelerations at the top, center and bottom of the wall, peak deflection, peak inertia force and bending moment, and seismic coefficient); b) summary of mechanical properties, average stiffness  $EI_{eqv}$  compared to code reference value  $EmI_g$ , and the average vibration frequency observed during the run; and c) local response, characterized by peak values of rebar strain, joint opening (near rebar), and faceshell compression strain and opening. Since these do not





**BOND BEAM**

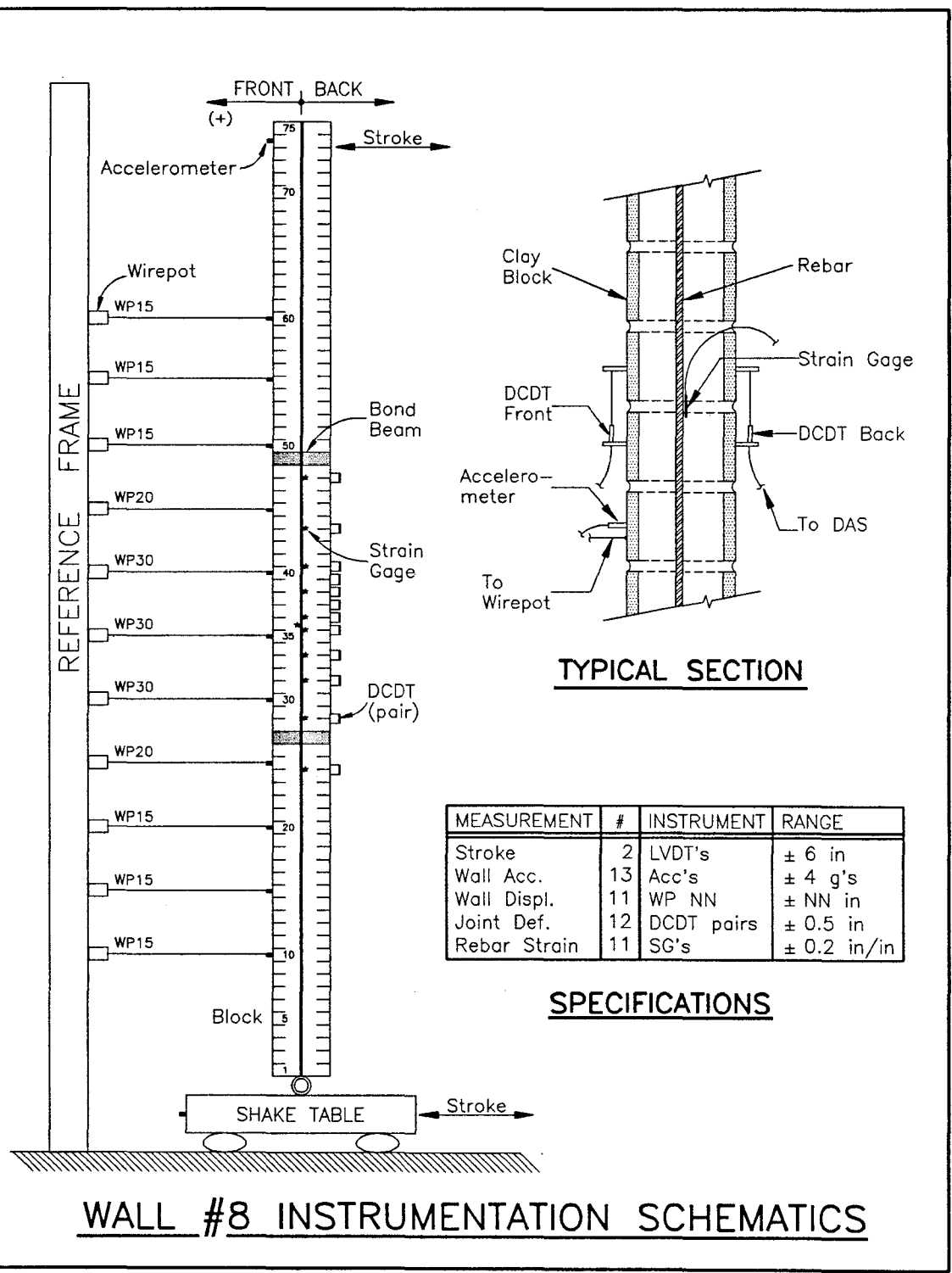


**COURSE LAYOUT**

Wall Height: 25 ft  
 Nominal Thickness: 6"  
 $H/t = 50$   
 Vertical Reinf.: 3 #7  
 Butt-Welded Reinf.  
 Partial Grouting  
 Dead Load: 300 lb/ft

**SPECIFICATIONS**

**WALL #8 CONSTRUCTION DRAWINGS**



MEASUREMENT	#	INSTRUMENT	RANGE
Stroke	2	LVDT's	± 6 in
Wall Acc.	13	Acc's	± 4 g's
Wall Displ.	11	WP NN	± NN in
Joint Def.	12	DCDT pairs	± 0.5 in
Rebar Strain	11	SG's	± 0.2 in/in

**SPECIFICATIONS**

**WALL #8 INSTRUMENTATION SCHEMATICS**



**Wall No. 8: Test Sequence & Peak Measurements**

Run No	Run ID	EPA	Diaphragm	Displacement (in)			Acceleration (g)			Rebar Strain (in/in)
				Bottom	Center	Top	Bottom	Center	Top	
1	MS1C	0.80	Flexible	1.34	2.77	1.59	0.42	1.89	1.40	0.0009
2	BONDCH	0.80	Flexible	2.79	15.42	5.86	0.58	1.84	1.23	0.0069
3	BONDCSH	0.80	Stiff	4.13	19.40	4.94	1.03	2.51	2.02	0.0094

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TCCMAR PROJECT

WALL No 8 DYNAMIC TEST Run No 1: MS1C 0.80 EPA

---

Wall Weight: 5.88 kips H/t Ratio: 50  
Vert. Reinf: 3 # 7 Grouting : Partial  
Dead Load: 300 lb/ft Splices : no

---

SUMMARY OF EXTREME VALUES

GLOBAL WALL RESPONSE

Disp Top	1.59 in	Acc Top	1.40 g
Disp Cent	2.77 in	Acc Cent	1.89 g
Disp Bot	1.34 in	Acc Bot	0.42 g
Peak Defl	2.61 in		
Inertia Force	1.34 kips	Eqv Load	140.0 lb/ft
Bending Mt	127.27 kip-in	Seismic C	0.58
		C/Acc Bot	1.37

MATERIAL & MECHANICAL PROPERTIES

f'm	4900 psi	Em (Code)	3680 ksi
Ig	666 in4	EmIg	2449000 kip-in2
Avg Freq	1.50 Hz	EIeqv	457000 kip-in2
		EmIg/EIeqv	5.36

LOCAL RESPONSE

	Peak	Joint	35
Rebar Strain	0.0009	0.0003	in/in
Strain Ductility	0.36	0.12	
Avg Joint Opening	0.0046	0.0033	in
Faceshell Comp. Strain	0.0006	0.0002	in/in
Faceshell Opening	0.0099	0.0072	in
Curvature	0.5200	0.3600	(1/in)*10-3
EI joint		170000	kip-in2

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CES

January 2, 1990

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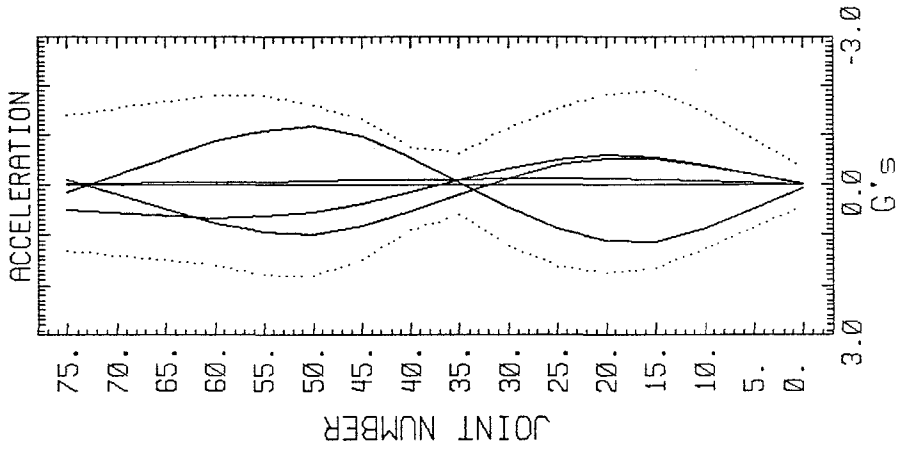
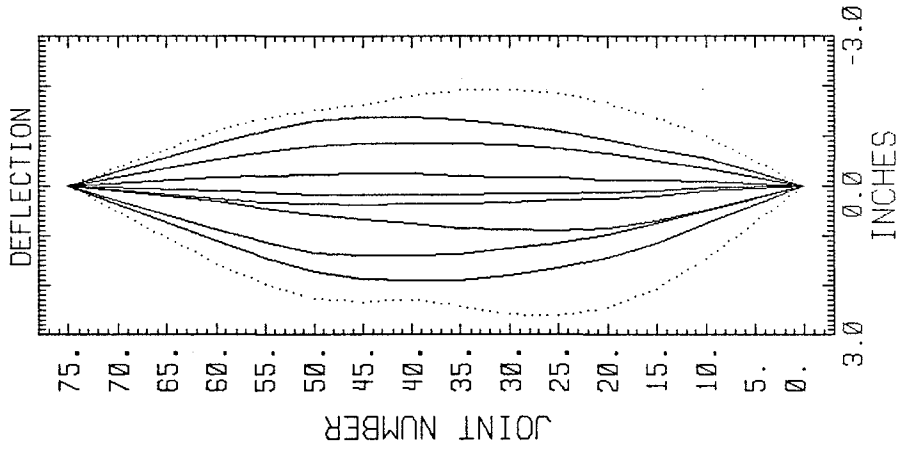
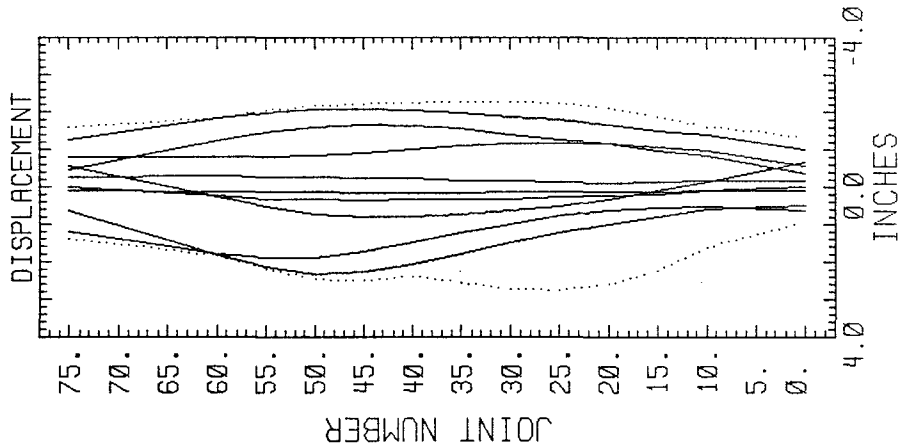
WALL # 8 DYNAMIC TEST

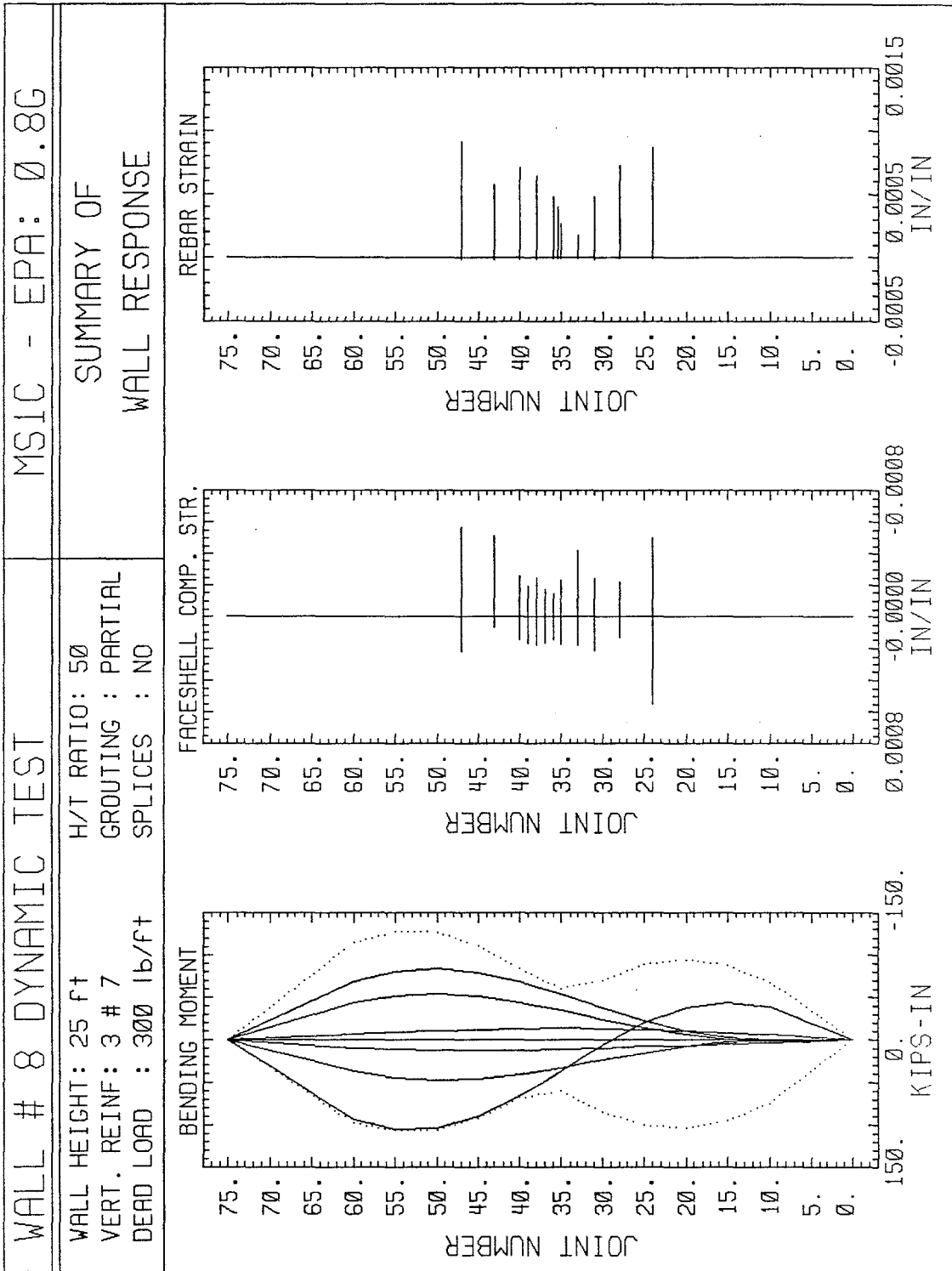
MSIC - EPA: 0.8G

WALL HEIGHT: 25 ft  
 VERT. REINF: 3 # 7  
 DEAD LOAD : 300 lb/ft

H/T RATIO: 50  
 GROUTING : PARTIAL  
 SPLICES : NO

SUMMARY OF  
 WALL RESPONSE





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TCCMAR PROJECT

WALL No 8 DYNAMIC TEST Run No 2: BONDCH 0.80 EPA

---

Wall Weight: 5.88 kips H/t Ratio: 50  
Vert. Reinf: 3 # 7 Grouting : Partial  
Dead Load: 300 lb/ft Splices : no

---

SUMMARY OF EXTREME VALUES

GLOBAL WALL RESPONSE

Disp Top	5.86 in	Acc Top	1.23 g
Disp Cent	15.42 in	Acc Cent	1.84 g
Disp Bot	2.79 in	Acc Bot	0.58 g
Peak Defl	14.42 in		
Inertia Force	6.10 kips	Eqv Load	310.0 lb/ft
Bending Mt	292.64 kip-in	Seismic C	1.33
		C/Acc Bot	2.29

MATERIAL & MECHANICAL PROPERTIES

f'm	4900 psi	Em (Code)	3680 ksi
Ig	666 in4	EmIg	2449000 kip-in2
Avg Freq	0.92 Hz	EIeqv	190000 kip-in2
		EmIg/EIeqv	12.89

LOCAL RESPONSE

Rebar Strain	Peak	Joint	35
Strain Ductility	0.0069	0.0055	in/in
	2.76	2.20	
Avg Joint Opening	0.0241	0.0151	in
Faceshell Comp. Strain	0.0027	0.0023	in/in
Faceshell Opening	0.0531	0.0393	in
Curvature	2.6300	2.2000	(1/in)*10-3
EI joint		133000	kip-in2

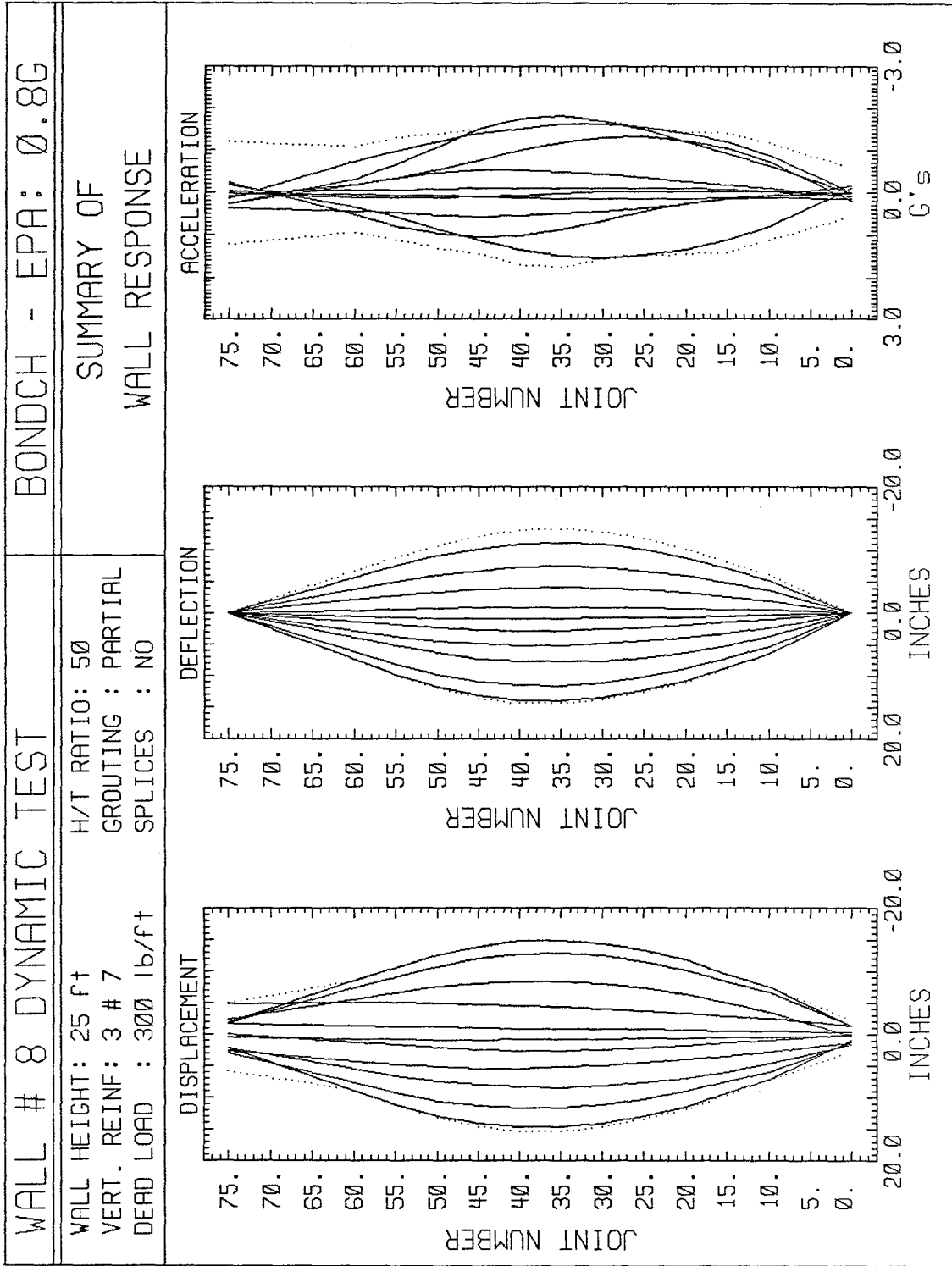
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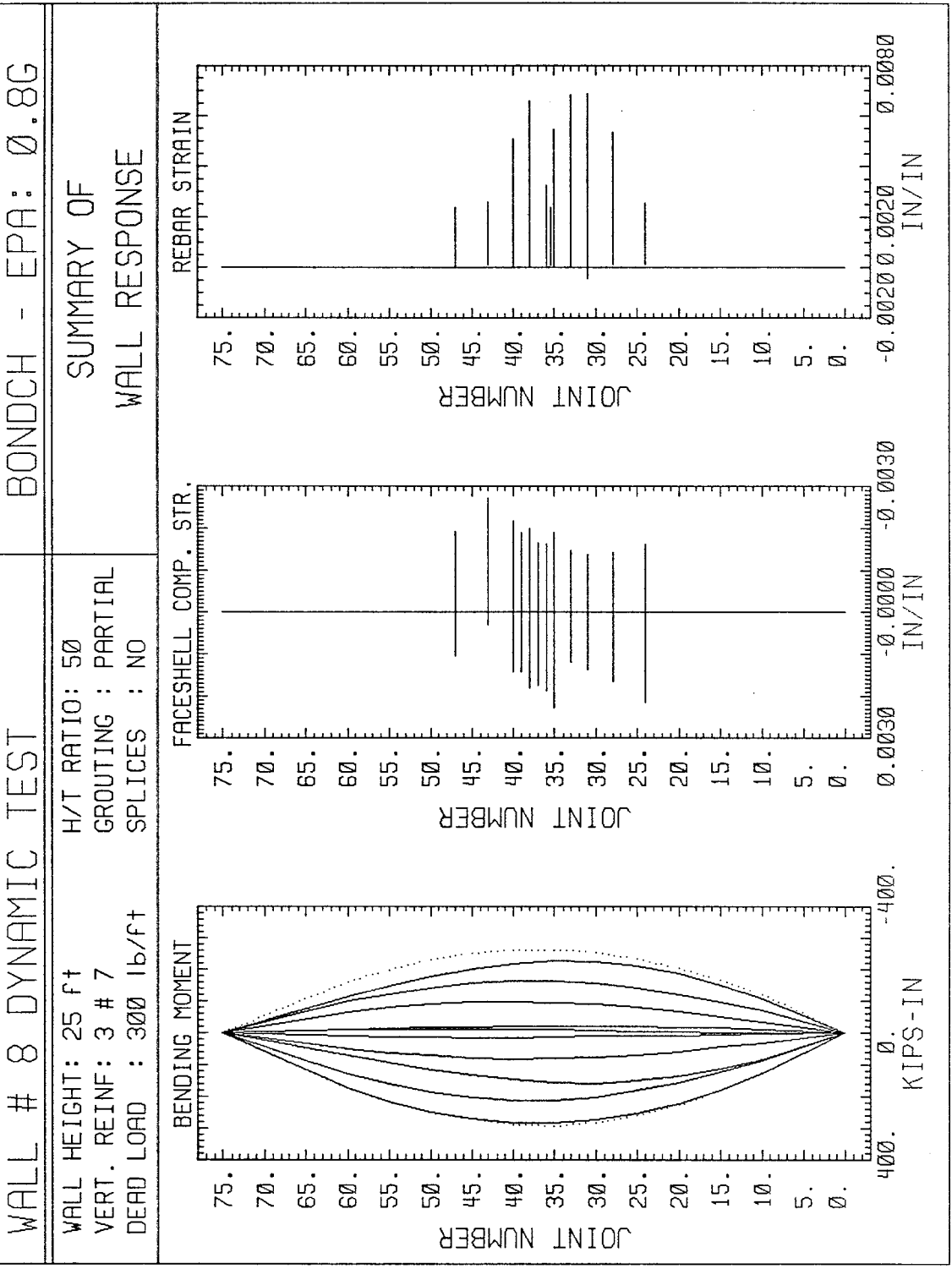
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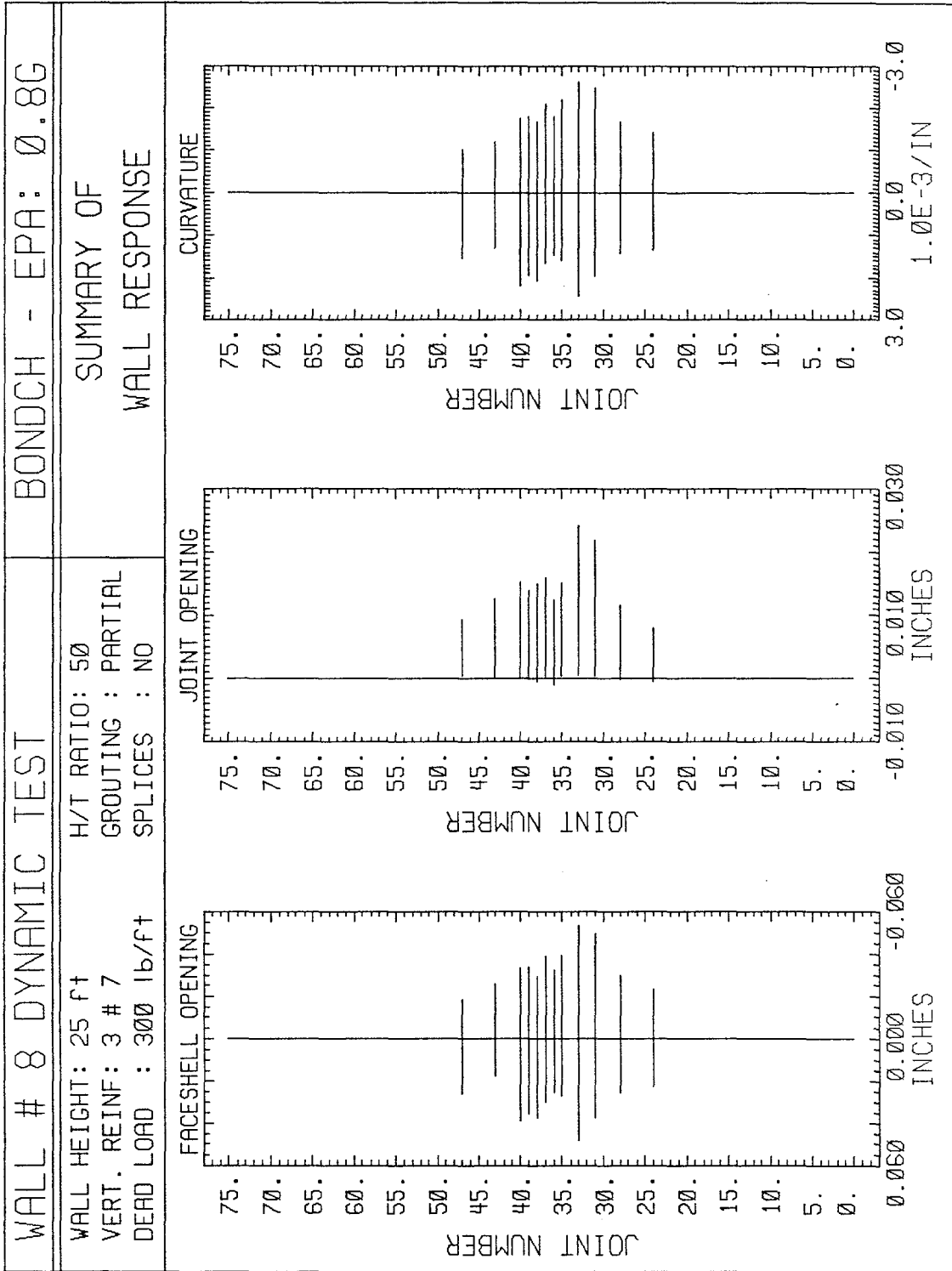
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TCCMAR PROJECT

WALL No 8 DYNAMIC TEST Run No 3: BONDCSH 0.80 EPA

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Wall Weight: 5.88 kips H/t Ratio: 50  
Vert. Reinf: 3 # 7 Grouting : Partial  
Dead Load: 300 lb/ft Splices : no

---

SUMMARY OF EXTREME VALUES

GLOBAL WALL RESPONSE

Disp Top	4.94 in	Acc Top	2.02 g
Disp Cent	19.40 in	Acc Cent	2.51 g
Disp Bot	4.13 in	Acc Bot	1.03 g
Peak Defl	17.92 in		
Inertia Force	5.71 kips	Eqv Load	280.0 lb/ft
Bending Mt	265.12 kip-in	Seismic C	1.20
		C/Acc Bot	1.17

MATERIAL & MECHANICAL PROPERTIES

f'm	4900 psi	Em (Code)	3680 ksi
Ig	666 in <sup>4</sup>	EmIg	2449000 kip-in <sup>2</sup>
Avg Freq	0.72 Hz	EIeqv	139000 kip-in <sup>2</sup>
		EmIg/EIeqv	17.62

LOCAL RESPONSE

Rebar Strain	Peak	Joint	35
Strain Ductility	0.0094	0.0083	in/in
	3.76	3.32	
Avg Joint Opening	0.0325	0.0228	in
Faceshell Comp. Strain	0.0033	0.0026	in/in
Faceshell Opening	0.0696	0.0556	in
Curvature	3.4600	3.0000	(1/in)*10 <sup>-3</sup>
EI joint		87000	kip-in <sup>2</sup>

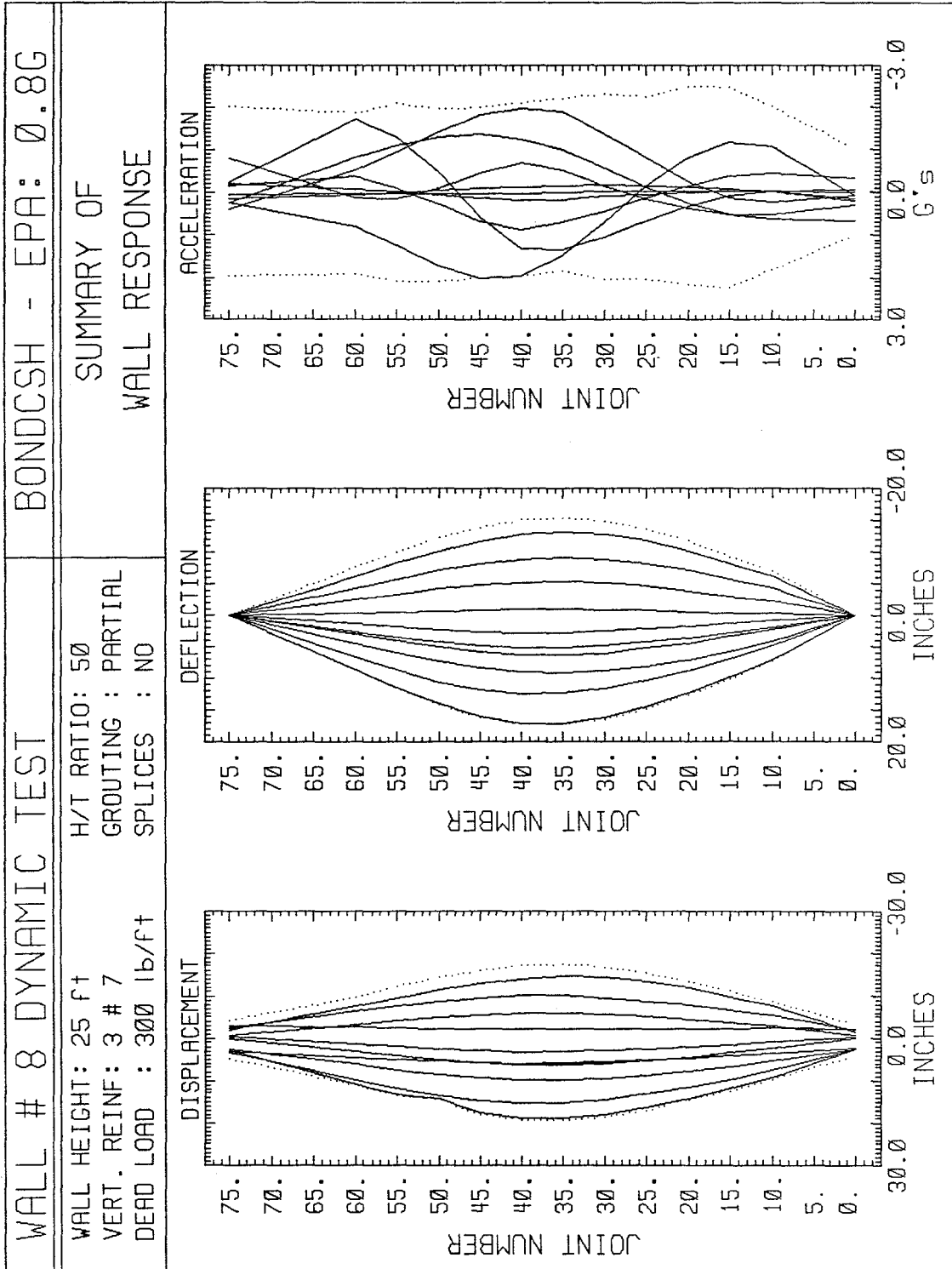
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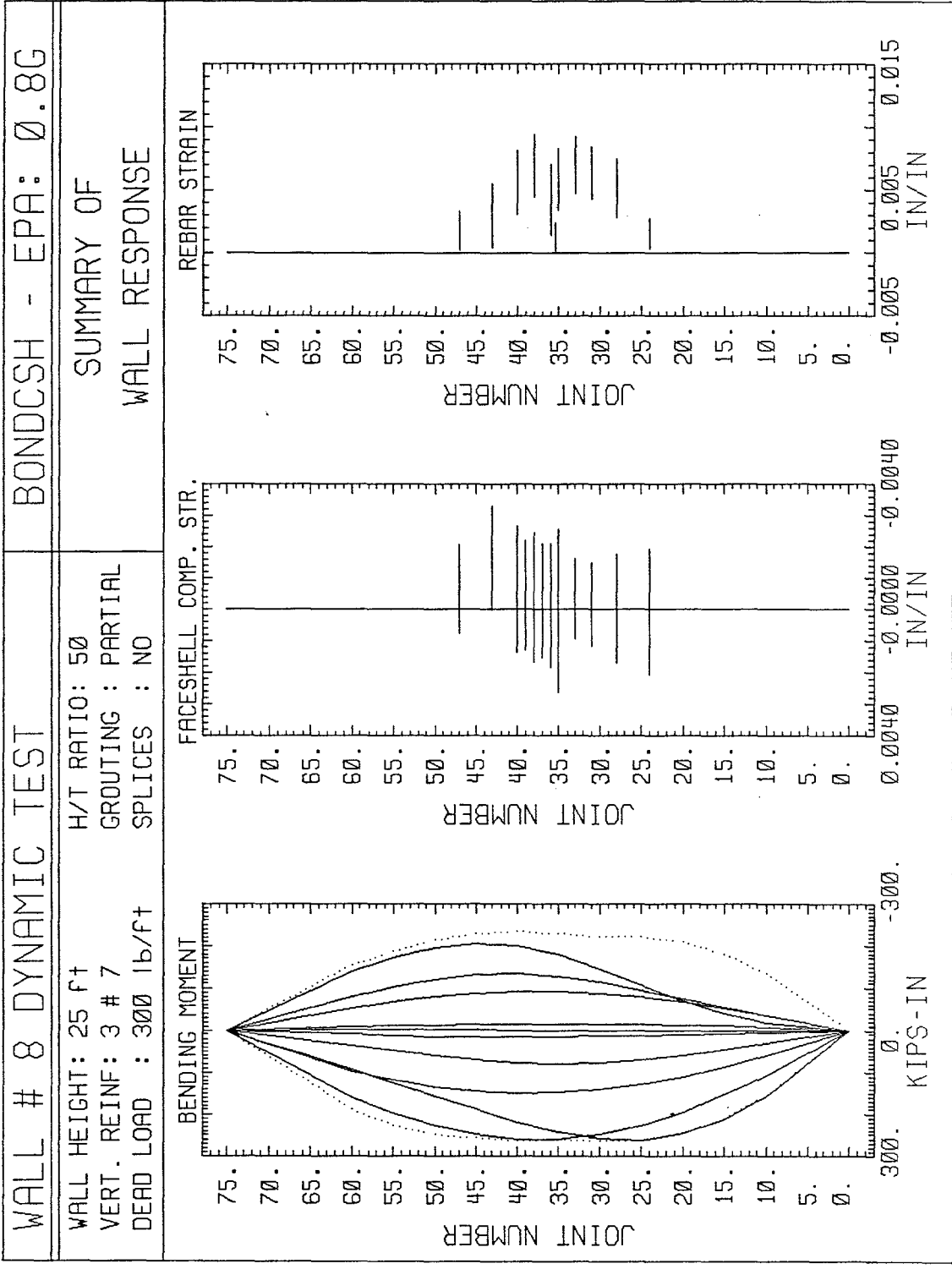
January 2, 1990

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WALL # 8 DYNAMIC TEST		MSIC - EPA: 0.8G	
WALL HEIGHT: 25 f+ VERT. REINF: 3 # 7 DEAD LOAD : 300 lb/f+		H/T RATIO: 50 GROUTING : PARTIAL SPLICES : NO	
SUMMARY OF WALL RESPONSE			
FACESHELL OPENING 	JOINT OPENING 	CURVATURE 	



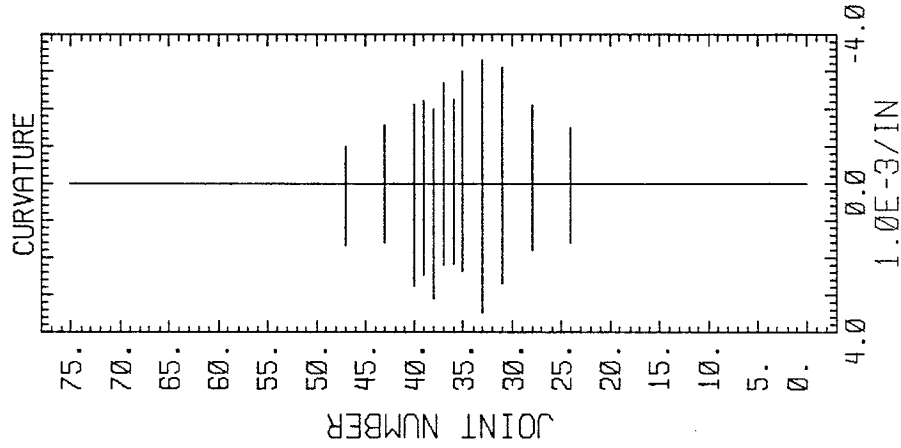
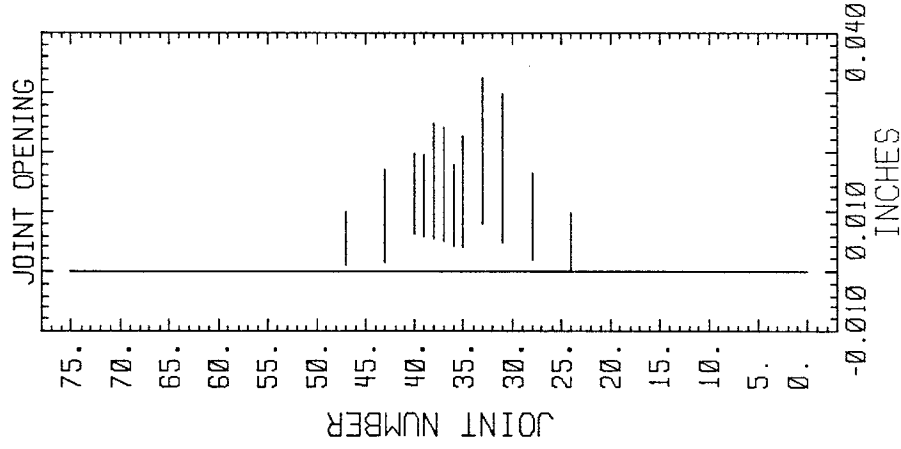
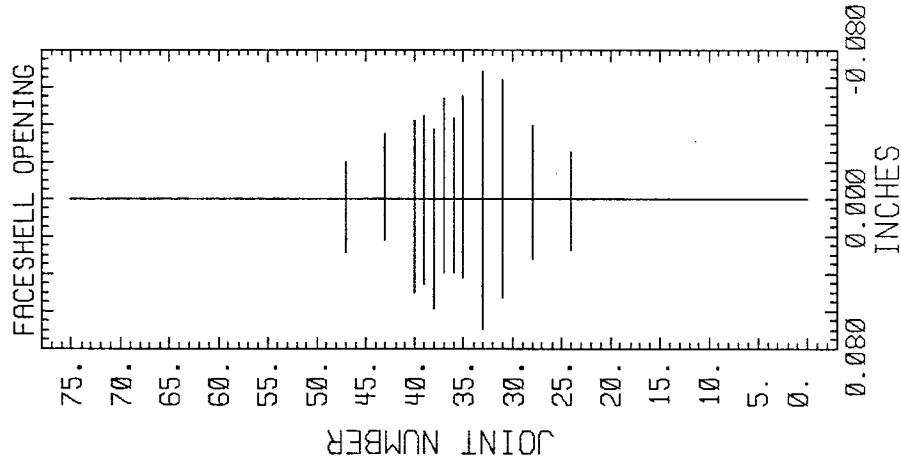
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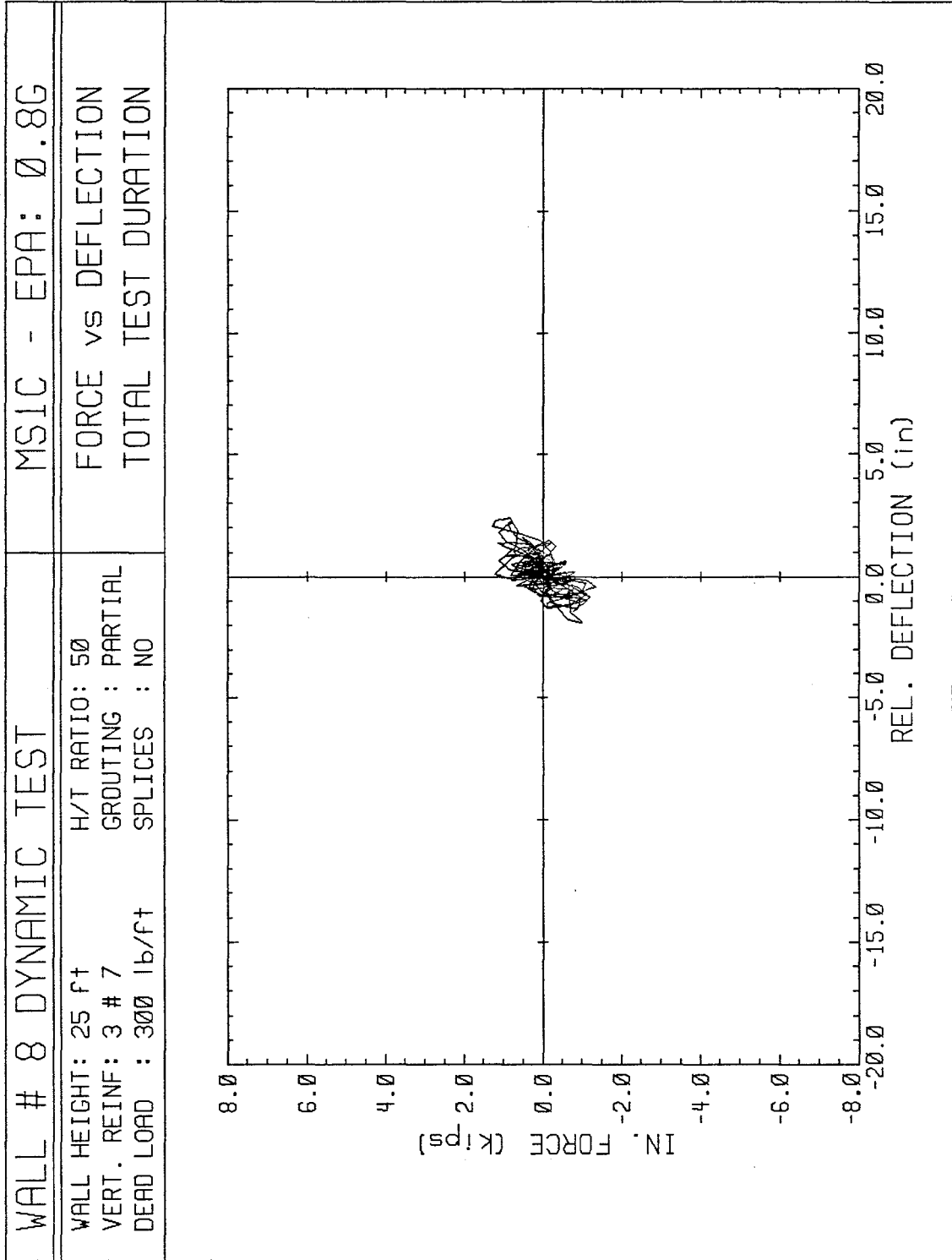
BOND CSH - EPA: 0.8G

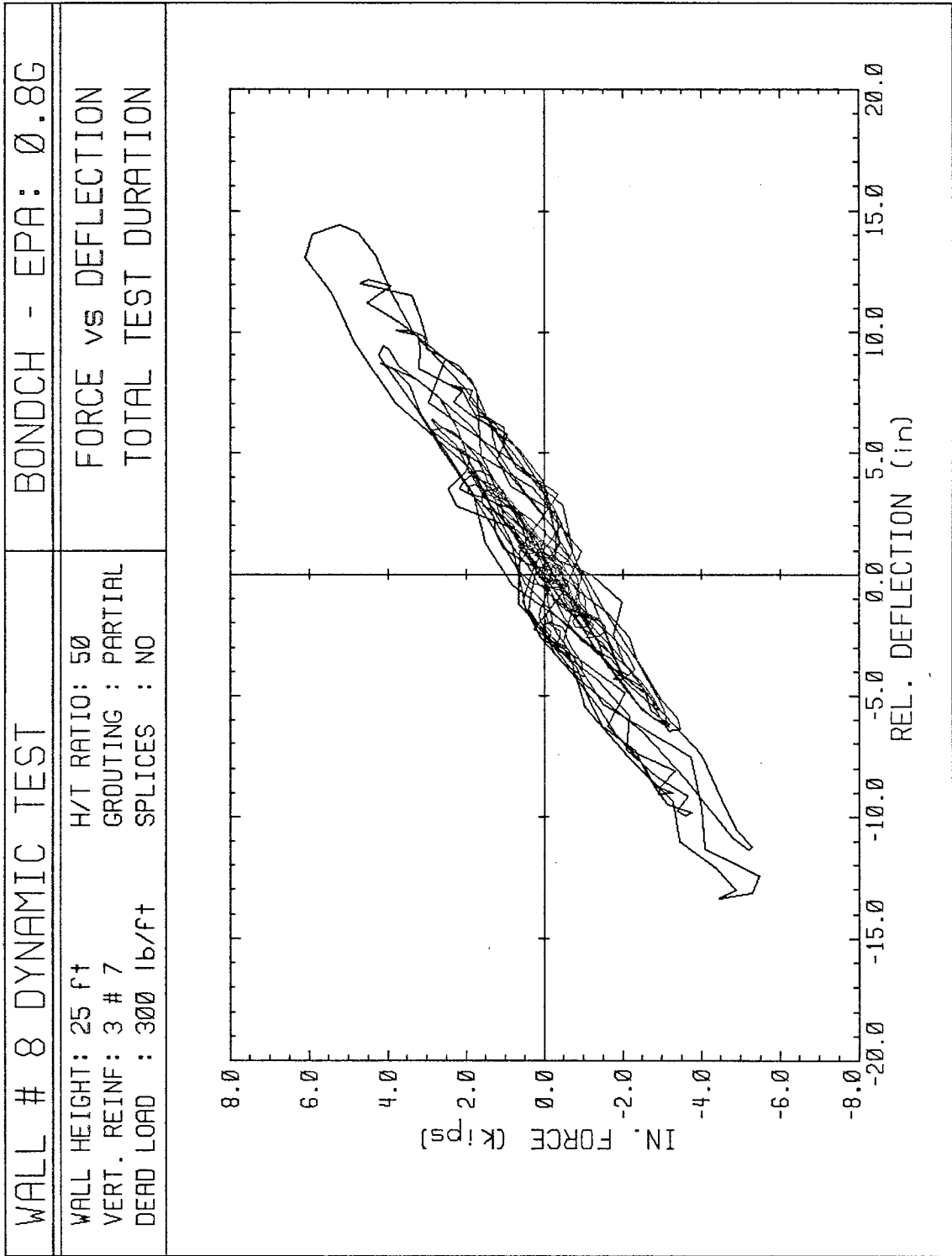
WALL HEIGHT: 25 ft  
 VERT. REINF: 3 # 7  
 DEAD LOAD : 300 lb/ft

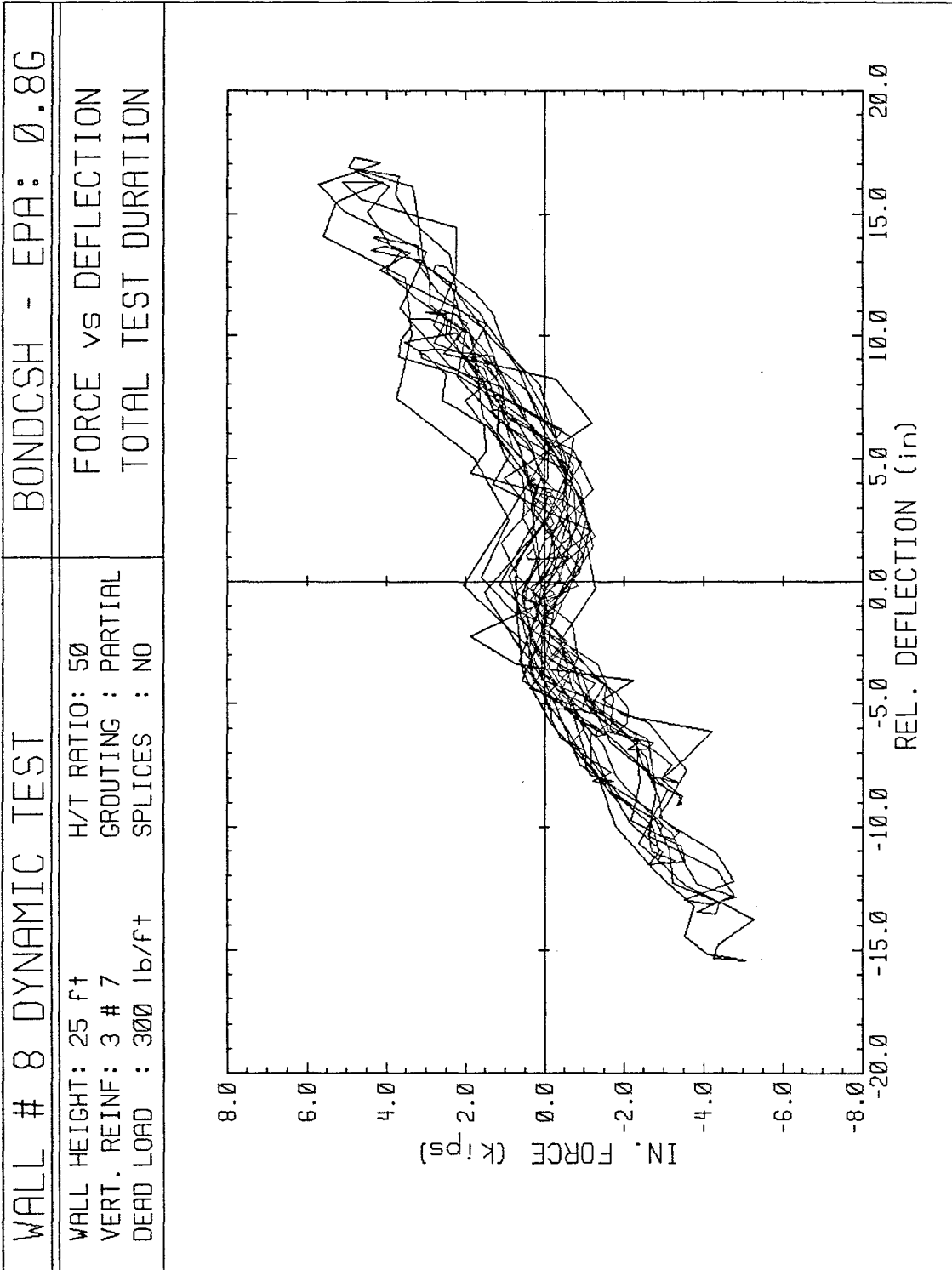
H/T RATIO: 50  
 GROUTING : PARTIAL  
 SPLICES : NO

SUMMARY OF WALL RESPONSE

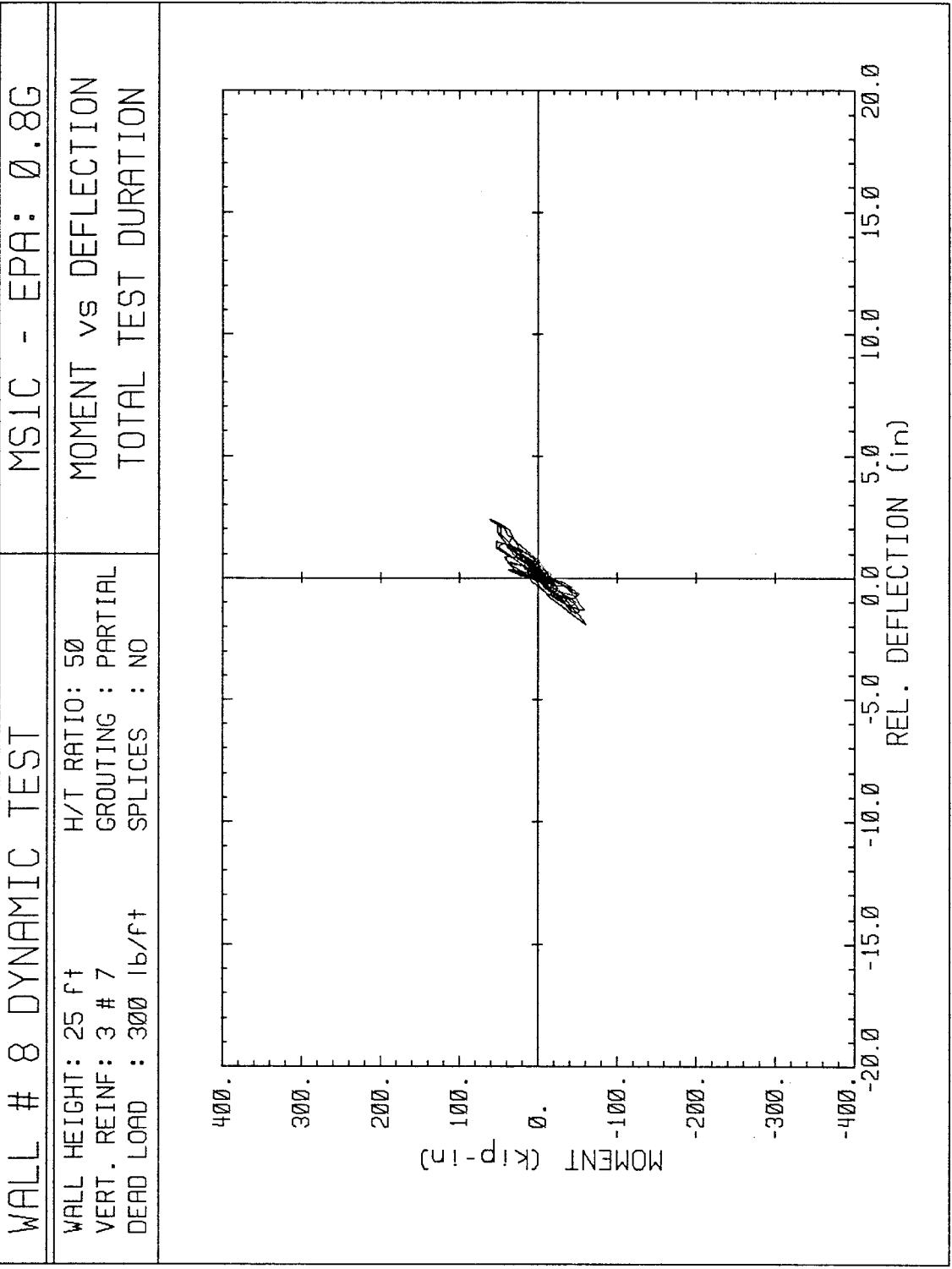


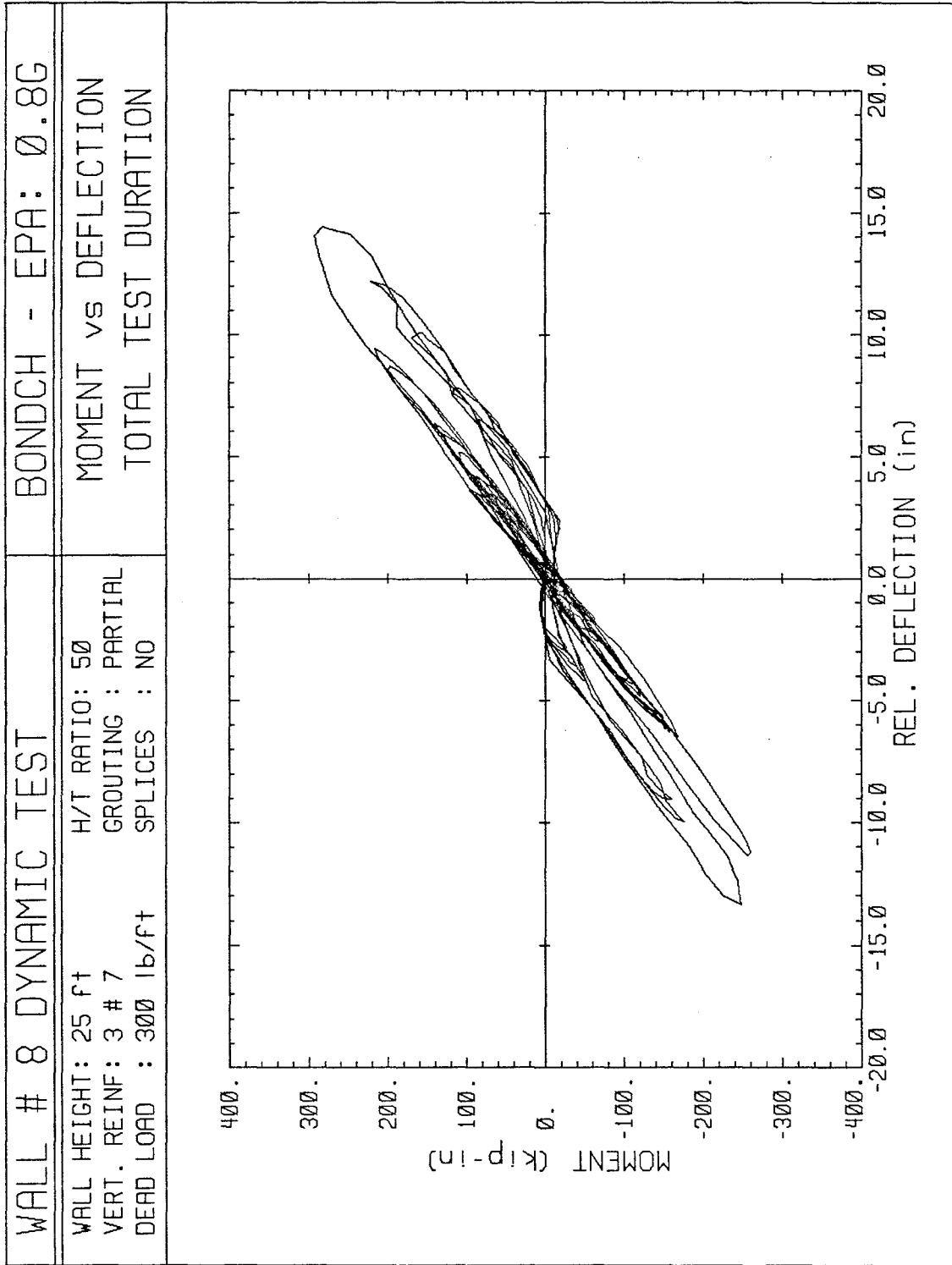


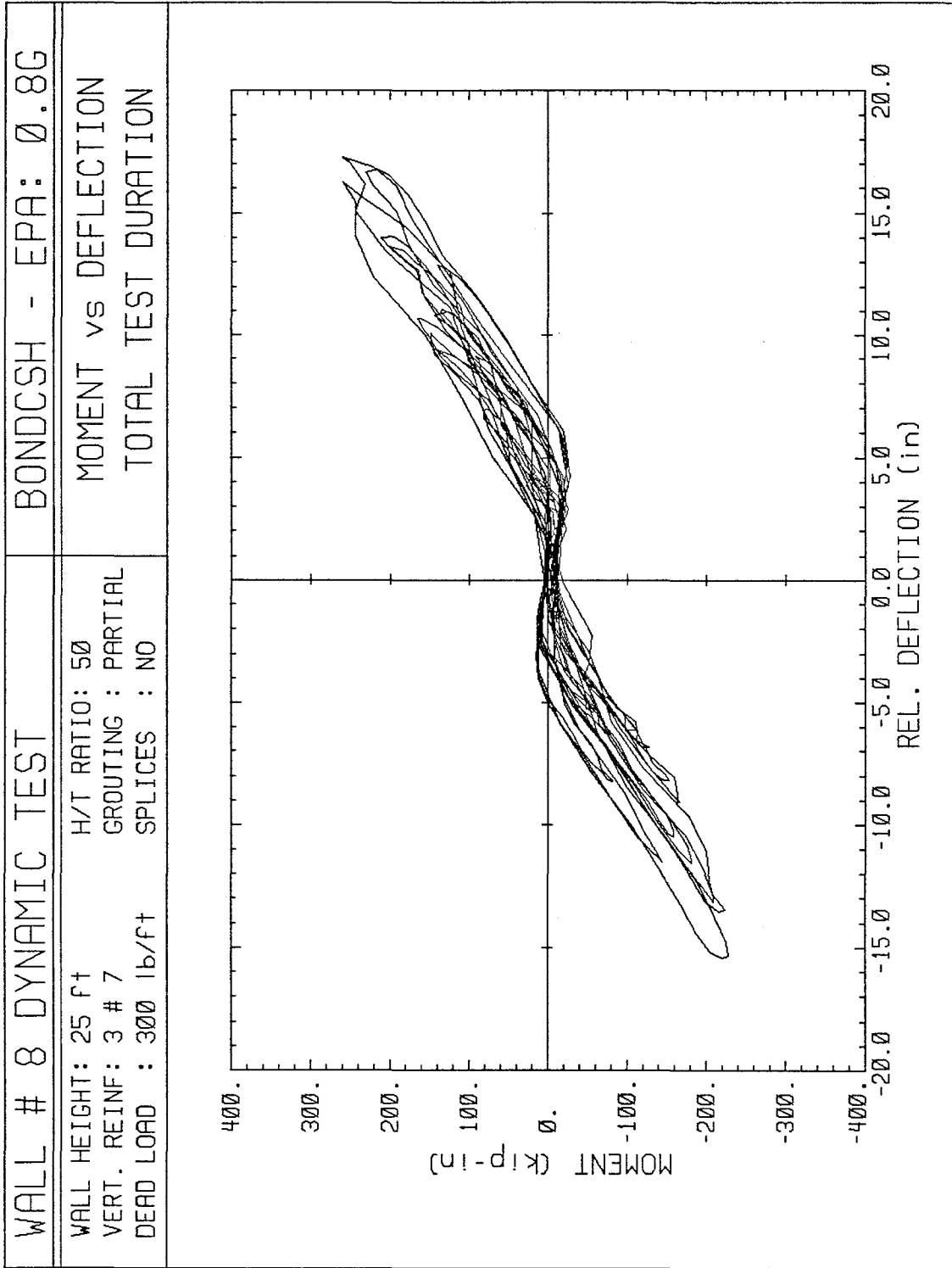


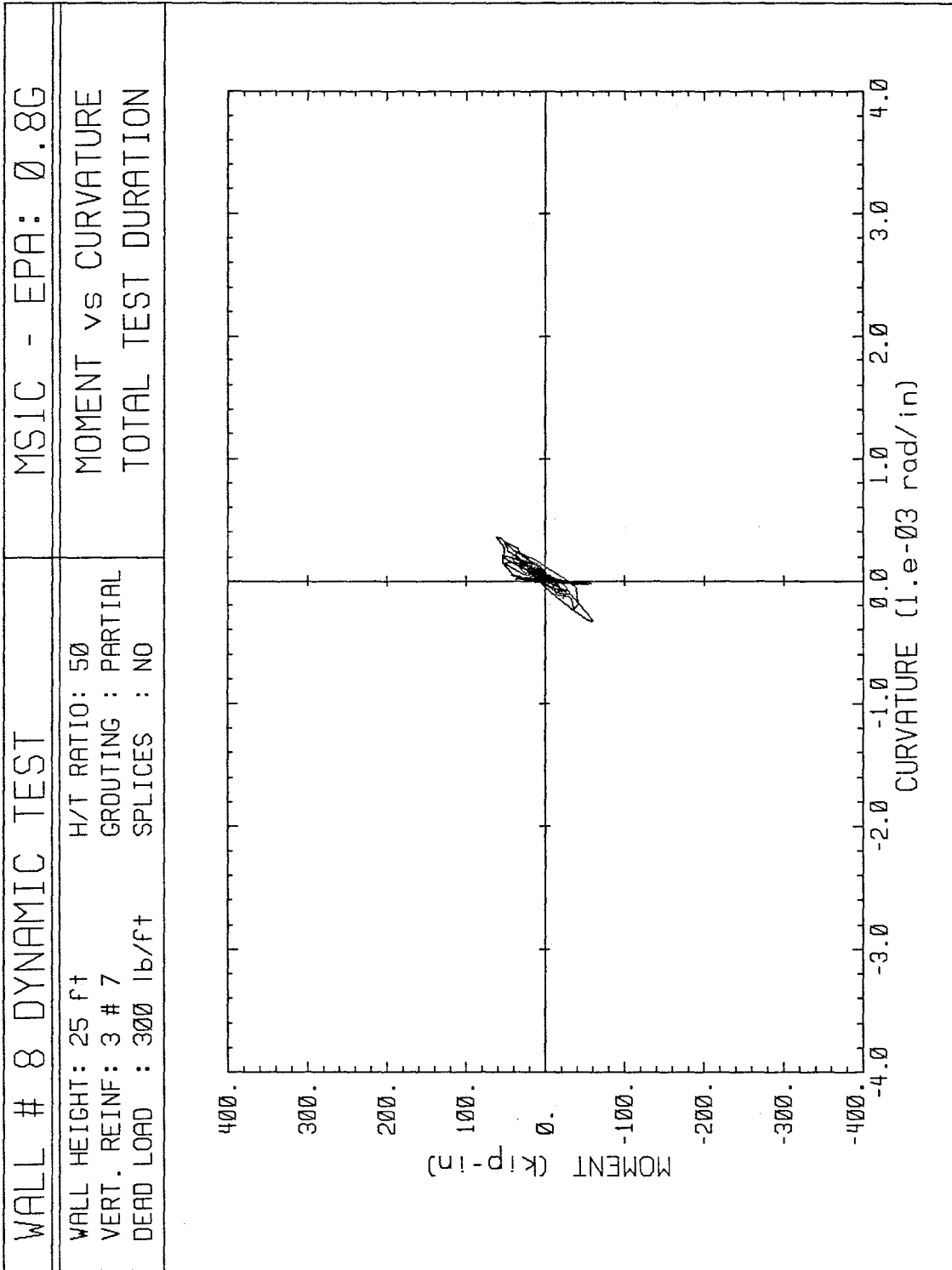


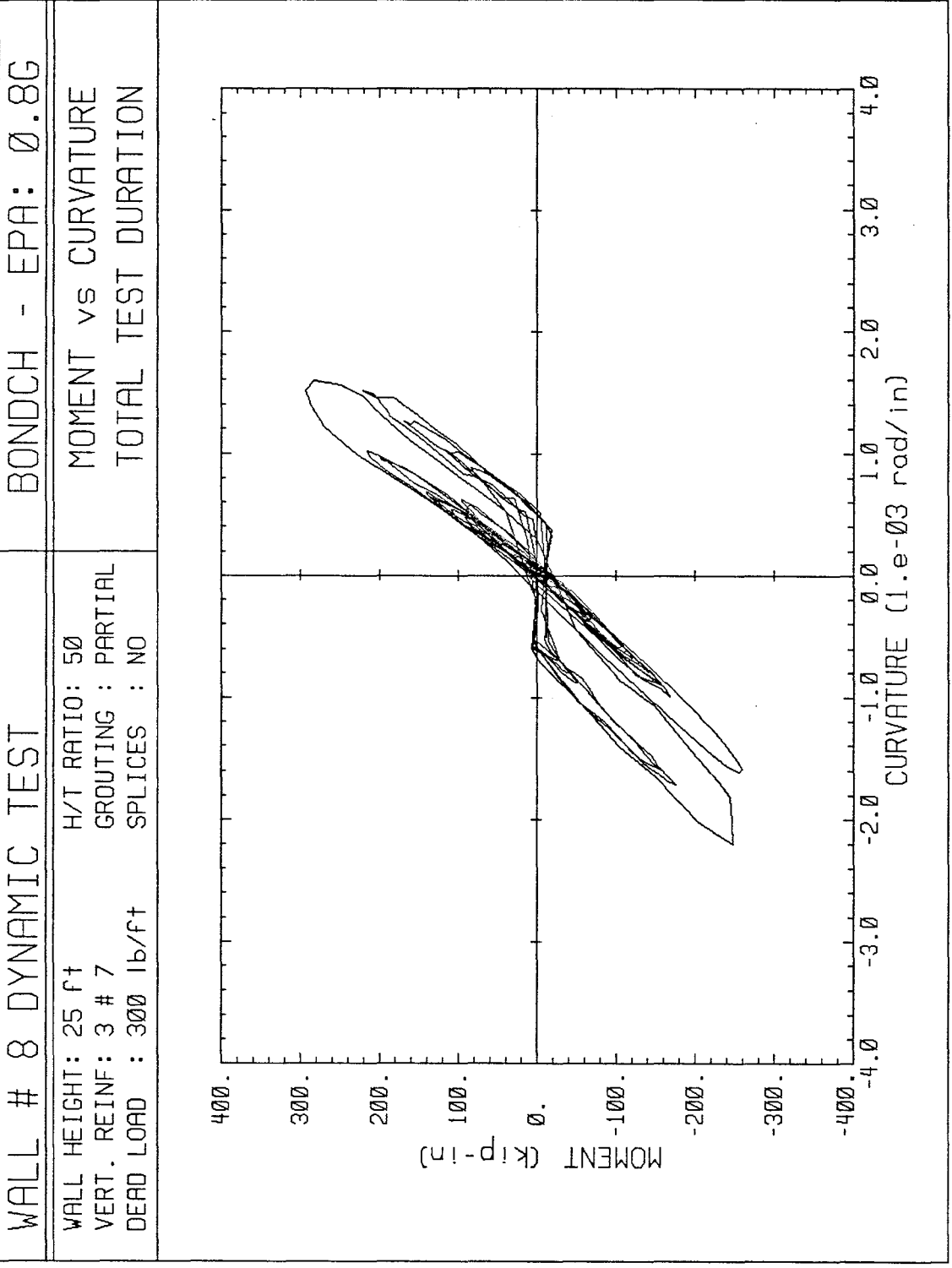


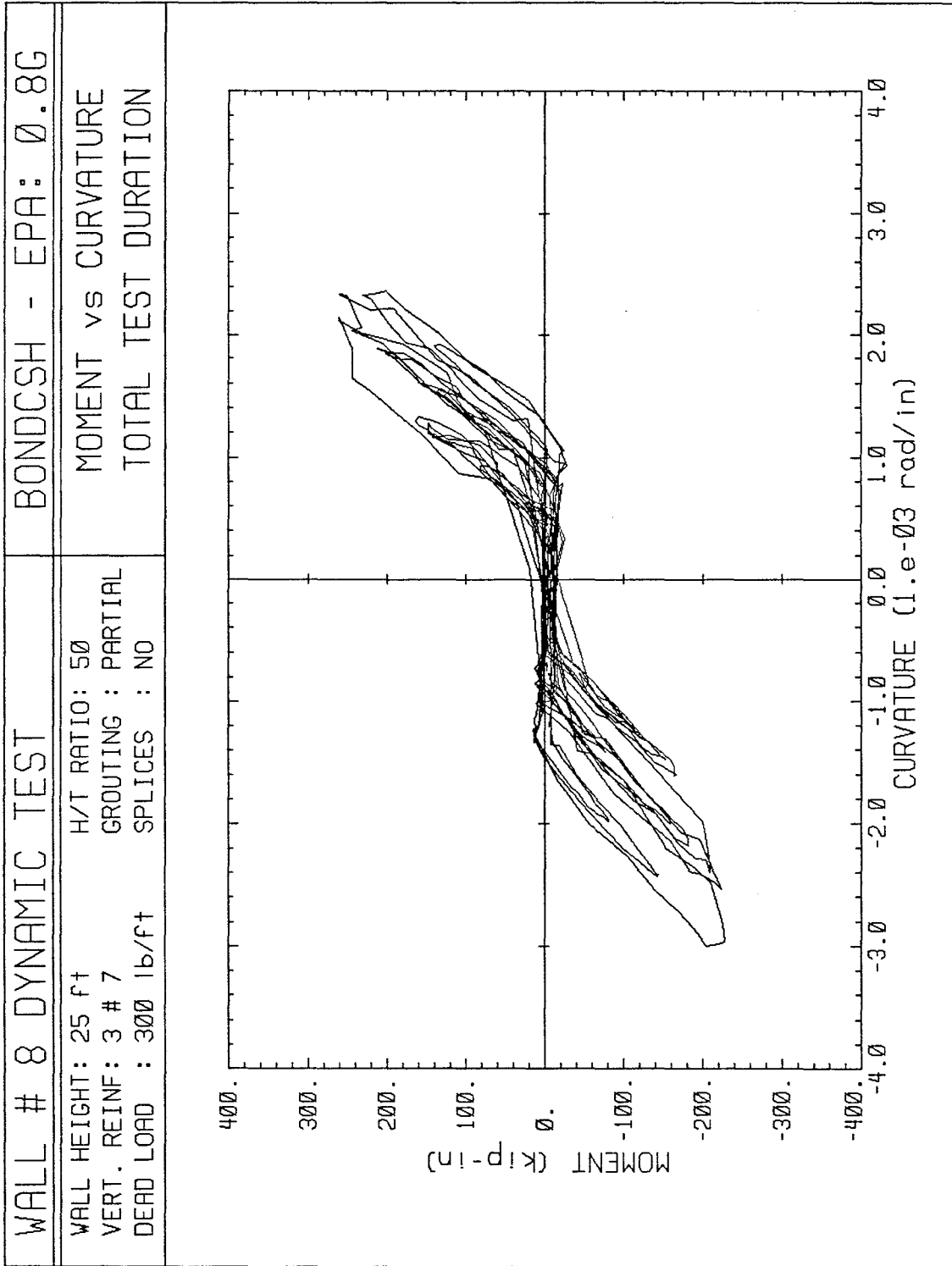


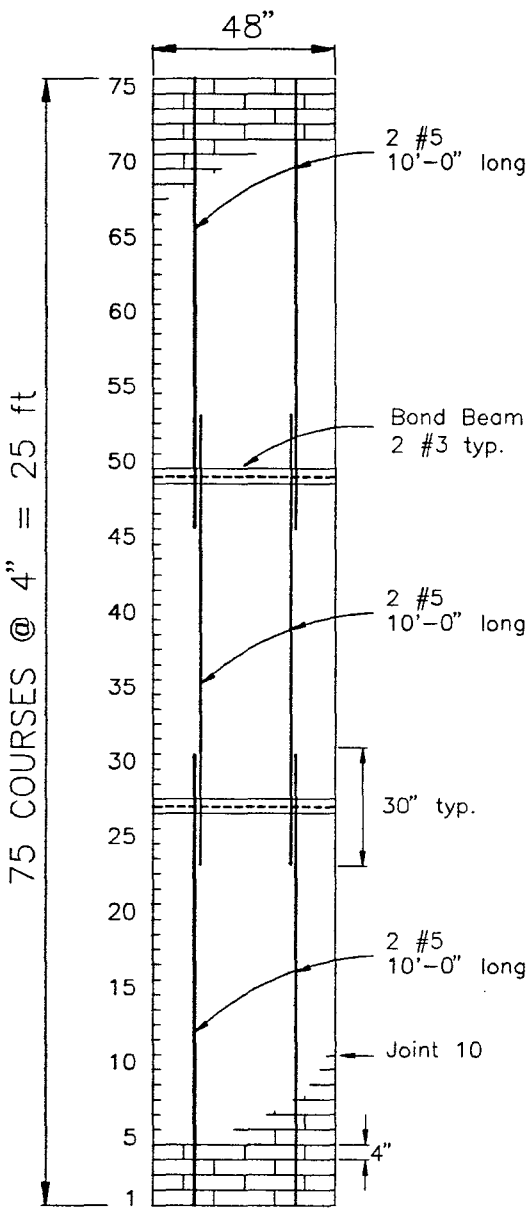




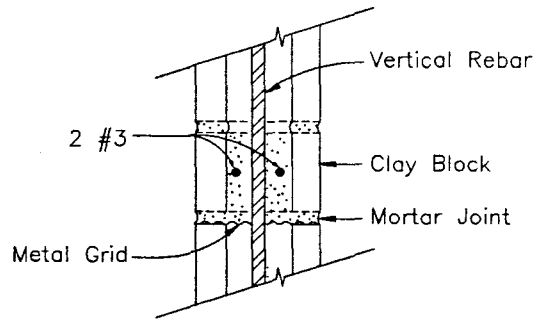




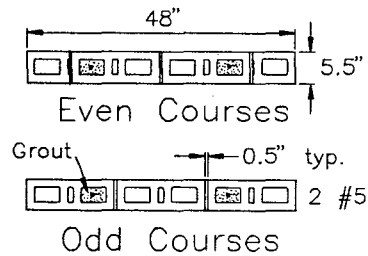




**ELEVATION**



**BOND BEAM**

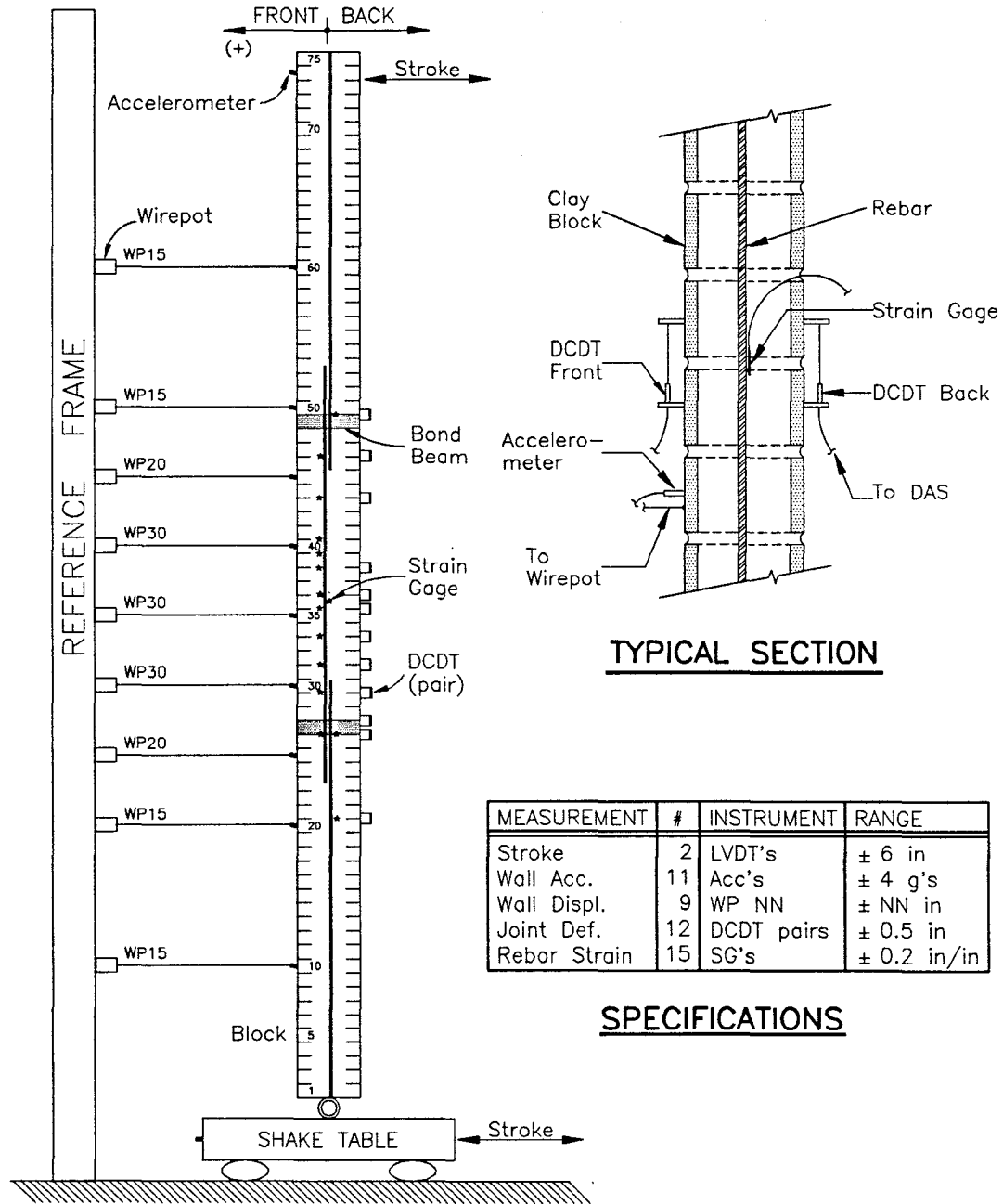


**COURSE LAYOUT**

Wall Height: 25 ft  
 Nominal Thickness: 6"  
 $H/t = 50$   
 Vertical Reinf.: 2 #5  
 Spliced Reinforcement  
 Partial Grouting  
 Dead Load: 300 lb/ft

**SPECIFICATIONS**

**WALL #9 CONSTRUCTION DRAWINGS**



**WALL #9 INSTRUMENTATION SCHEMATICS**



Wall No. 9: Test Sequence & Peak Measurements

Run No	ID	EPA	Diaphragm	Displacement (in)			Acceleration (g)			Rebar Strain (in/in)
				Bottom	Center	Top	Bottom	Center	Top	
1	MS1	0.10	Flexible	1.37	2.35	1.48	0.09	0.40	0.26	0.0007
2	MS2	0.10	Stiff	0.28	0.41	0.29	0.10	0.19	0.28	0.0002
3	TAFT1	0.10	Flexible	0.84	1.26	0.86	0.07	0.26	0.13	0.0004
4	ELC1	0.10	Stiff	1.29	2.33	1.37	0.15	0.57	0.40	0.0007
5	TAFT2	0.20	Flexible	2.35	4.80	2.72	0.19	0.58	0.31	0.0012
6	ELC2	0.20	Stiff	1.51	3.27	1.65	0.19	0.68	0.44	0.0012
7	BONDC	0.40	Flexible	2.63	7.08	3.81	0.35	0.64	0.40	0.0026
8	ELC	0.40	Flexible	3.09	10.00	4.89	0.33	0.83	0.48	0.0037
9	BONDCH	0.40	Stiff	2.62	5.61	3.13	0.33	0.77	0.65	0.0025
10	TAFTS	0.40	Stiff	4.92	7.23	4.96	0.39	0.84	0.64	0.0025
11	BONDCH	0.80	Flexible	4.64	11.52	5.59	1.17	1.19	1.24	0.0081
12	BONDCHSH	0.80	Stiff	4.65	15.54	5.19	1.28	1.40	1.95	0.0107

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TCCMAR PROJECT

WALL No 9 DYNAMIC TEST Run No 1: MS1 0.10 EPA

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Wall Weight: 5.83 kips H/t Ratio: 50  
Vert. Reinf: 2 # 5 Grouting : Partial  
Dead Load: 300 lb/ft Splices : yes

---

SUMMARY OF EXTREME VALUES

GLOBAL WALL RESPONSE

Disp Top	1.48 in	Acc Top	0.26 g
Disp Cent	2.35 in	Acc Cent	0.40 g
Disp Bot	1.37 in	Acc Bot	0.09 g
Peak Defl	1.98 in		
Inertia Force	1.24 kips	Eqv Load	60.0 lb/ft
Bending Mt	59.48 kip-in	Seismic C	0.27
		C/Acc Bot	3.02

MATERIAL & MECHANICAL PROPERTIES

f'm	4940 psi	Em (Code)	3710 ksi
Ig	666 in <sup>4</sup>	EmIg	2469000 kip-in <sup>2</sup>
Avg Freq	1.39 Hz	EIeqv	282000 kip-in <sup>2</sup>
		EmIg/EIeqv	8.76

LOCAL RESPONSE

	Peak	Joint 36	
Rebar Strain	0.0007	0.0005	in/in
Strain Ductility	0.28	0.20	in
Avg Joint Opening	0.0084	0.0060	in
Faceshell Comp. Strain	0.0006	0.0005	in/in
Faceshell Opening	0.0187	0.0102	in
Curvature	0.9500	0.3800	(1/in)*10 <sup>-3</sup>
EI joint		155000	kip-in <sup>2</sup>

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CES

October 9, 1989

10:23:15 am

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TCCMAR PROJECT

WALL No 9 DYNAMIC TEST Run No 2: MS2 0.10 EPA

---

Wall Weight: 5.83 kips	H/t Ratio: 50
Vert. Reinf: 2 # 5	Grouting : Partial
Dead Load: 300 lb/ft	Splices : yes

---

SUMMARY OF EXTREME VALUES

GLOBAL WALL RESPONSE

Disp Top	0.29 in	Acc Top	0.28 g
Disp Cent	0.41 in	Acc Cent	0.19 g
Disp Bot	0.28 in	Acc Bot	0.10 g
Peak Defl	0.49 in		
Inertia Force	0.41 kips	Eqv Load	20.0 lb/ft
Bending Mt	23.25 kip-in	Seismic C	0.11
		C/Acc Bot	1.06

MATERIAL & MECHANICAL PROPERTIES

f'm	4940 psi	Em (Code)	3710 ksi
Ig	666 in4	EmIg	2469000 kip-in2
Avg Freq	2.58 Hz	EIeqv	445000 kip-in2
		EmIg/EIeqv	5.55

LOCAL RESPONSE

	Peak	Joint 36	
Rebar Strain	0.0002	0.0001	in/in
Strain Ductility	0.08	0.04	in
Avg Joint Opening	0.0023	0.0018	in
Faceshell Comp. Strain	0.0001	0.0001	in/in
Faceshell Opening	0.0051	0.0030	in
Curvature	0.2600	0.1200	(1/in)*10-3
EI joint		192000	kip-in2

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CES

October 9, 1989

10:23:22 am

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TCCMAR PROJECT

WALL No 9 DYNAMIC TEST Run No 3: TAFT1 0.10 EPA

---

Wall Weight: 5.83 kips H/t Ratio: 50  
Vert. Reinf: 2 # 5 Grouting : Partial  
Dead Load: 300 lb/ft Splices : yes

---

SUMMARY OF EXTREME VALUES

GLOBAL WALL RESPONSE

Disp Top	0.86 in	Acc Top	0.13 g
Disp Cent	1.26 in	Acc Cent	0.26 g
Disp Bot	0.84 in	Acc Bot	0.07 g
Peak Defl	1.10 in		
Inertia Force	0.68 kips	Eqv Load	40.0 lb/ft
Bending Mt	36.24 kip-in	Seismic C	0.17
		C/Acc Bot	2.37

MATERIAL & MECHANICAL PROPERTIES

f'm	4940 psi	Em (Code)	3710 ksi
Ig	666 in <sup>4</sup>	EmIg	2469000 kip-in <sup>2</sup>
Avg Freq	1.80 Hz	EIeqv	309000 kip-in <sup>2</sup>
		EmIg/EIeqv	7.99

LOCAL RESPONSE

	Peak	Joint	36
Rebar Strain	0.0004	0.0003	in/in
Strain Ductility	0.16	0.12	in
Avg Joint Opening	0.0047	0.0039	in
Faceshell Comp. Strain	0.0003	0.0002	in/in
Faceshell Opening	0.0105	0.0065	in
Curvature	0.5300	0.2400	(1/in)*10 <sup>-3</sup>
EI joint		150000	kip-in <sup>2</sup>

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CES

October 9, 1989

10:23:30 am

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TCCMAR PROJECT

WALL No 9 DYNAMIC TEST Run No 4: ELC1 0.10 EPA

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Wall Weight: 5.83 kips H/t Ratio: 50  
Vert. Reinf: 2 # 5 Grouting : Partial  
Dead Load: 300 lb/ft Splices : yes

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SUMMARY OF EXTREME VALUES

GLOBAL WALL RESPONSE

Disp Top	1.37 in	Acc Top	0.40 g
Disp Cent	2.33 in	Acc Cent	0.57 g
Disp Bot	1.29 in	Acc Bot	0.15 g
Peak Defl	1.65 in		
Inertia Force	0.95 kips	Eqv Load	50.0 lb/ft
Bending Mt	47.14 kip-in	Seismic C	0.22
		C/Acc Bot	1.44

MATERIAL & MECHANICAL PROPERTIES

f'm	4940 psi	Em (Code)	3710 ksi
Ig	666 in4	EmIg	2469000 kip-in2
Avg Freq	1.89 Hz	EIeqv	268000 kip-in2
		EmIg/EIeqv	9.21

LOCAL RESPONSE

Rebar Strain	Peak 0.0007	Joint 36 0.0005	in/in
Strain Ductility	0.28	0.20	in
Avg Joint Opening	0.0070	0.0056	in
Faceshell Comp. Strain	0.0004	0.0003	in/in
Faceshell Opening	0.0154	0.0095	in
Curvature EI joint	0.7700	0.3500	(1/in)*10-3
		131000	kip-in2

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CES

October 9, 1989

10:23:37 am

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TCCMAR PROJECT

WALL No 9 DYNAMIC TEST Run No 5: TAFT2 0.20 EPA

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Wall Weight: 5.83 kips H/t Ratio: 50  
Vert. Reinf: 2 # 5 Grouting : Partial  
Dead Load: 300 lb/ft Splices : yes

---

SUMMARY OF EXTREME VALUES

GLOBAL WALL RESPONSE

Disp Top	2.72 in	Acc Top	0.31 g
Disp Cent	4.80 in	Acc Cent	0.58 g
Disp Bot	2.35 in	Acc Bot	0.19 g
Peak Defl	3.13 in		
Inertia Force	1.24 kips	Eqv Load	70.0 lb/ft
Bending Mt	69.74 kip-in	Seismic C	0.32
		C/Acc Bot	1.68

MATERIAL & MECHANICAL PROPERTIES

f'm	4940 psi	Em (Code)	3710 ksi
Ig	666 in <sup>4</sup>	EmIg	2469000 kip-in <sup>2</sup>
Avg Freq	1.19 Hz	EIeqv	209000 kip-in <sup>2</sup>
		EmIg/EIeqv	11.81

LOCAL RESPONSE

Rebar Strain	Peak	Joint	36
Strain Ductility	0.0012	0.0008	in/in
	0.48	0.32	in
Avg Joint Opening	0.0108	0.0108	in
Faceshell Comp. Strain	0.0008	0.0008	in/in
Faceshell Opening	0.0232	0.0186	in
Curvature	1.1500	0.7100	(1/in)*10 <sup>-3</sup>
EI joint		97000	kip-in <sup>2</sup>

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CES

October 9, 1989

10:23:45 am

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TCCMAR PROJECT

WALL No 9 DYNAMIC TEST Run No 6: ELC2 0.20 EPA

---

Wall Weight: 5.83 kips H/t Ratio: 50  
Vert. Reinf: 2 # 5 Grouting : Partial  
Dead Load: 300 lb/ft Splices : yes

---

SUMMARY OF EXTREME VALUES

GLOBAL WALL RESPONSE

Disp Top	1.65 in	Acc Top	0.44 g
Disp Cent	3.27 in	Acc Cent	0.68 g
Disp Bot	1.51 in	Acc Bot	0.19 g
Peak Defl	2.14 in		
Inertia Force	1.03 kips	Eqv Load	60.0 lb/ft
Bending Mt	59.83 kip-in	Seismic C	0.27
		C/Acc Bot	1.44

MATERIAL & MECHANICAL PROPERTIES

f'm	4940 psi	Em (Code)	3710 ksi
Ig	666 in <sup>4</sup>	EmIg	2469000 kip-in <sup>2</sup>
Avg Freq	1.77 Hz	EIEqv	262000 kip-in <sup>2</sup>
		EmIg/EIEqv	9.42

LOCAL RESPONSE

	Peak	Joint 36
Rebar Strain	0.0012	0.0005 in/in
Strain Ductility	0.48	0.20 in
Avg Joint Opening	0.0071	0.0071 in
Faceshell Comp. Strain	0.0006	0.0006 in/in
Faceshell Opening	0.0155	0.0121 in
Curvature	0.7700	0.4600 (1/in)*10 <sup>-3</sup>
EI joint		98000 kip-in <sup>2</sup>

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CES

October 9, 1989

10:23:52 am

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TCCMAR PROJECT

WALL No 9 DYNAMIC TEST Run No 7: BONDC 0.40 EPA

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Wall Weight: 5.83 kips H/t Ratio: 50  
Vert. Reinf: 2 # 5 Grouting : Partial  
Dead Load: 300 lb/ft Splices : yes

---

SUMMARY OF EXTREME VALUES

GLOBAL WALL RESPONSE

Disp Top	3.81 in	Acc Top	0.40 g
Disp Cent	7.08 in	Acc Cent	0.64 g
Disp Bot	2.63 in	Acc Bot	0.35 g
Peak Defl	5.77 in		
Inertia Force	1.62 kips	Eqv Load	90.0 lb/ft
Bending Mt	84.70 kip-in	Seismic C	0.39
		C/Acc Bot	1.11

MATERIAL & MECHANICAL PROPERTIES

f'm	4940 psi	Em (Code)	3710 ksi
Ig	666 in4	EmIg	2469000 kip-in2
Avg Freq	0.92 Hz	EIeqv	138000 kip-in2
		EmIg/EIeqv	17.89

LOCAL RESPONSE

	Peak	Joint	36
Rebar Strain	0.0026	0.0012	in/in
Strain Ductility	1.04	0.48	in
Avg Joint Opening	0.0167	0.0167	in
Faceshell Comp. Strain	0.0019	0.0019	in/in
Faceshell Opening	0.0297	0.0286	in
Curvature	1.4900	1.0900	(1/in)*10-3
EI joint		76000	kip-in2

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CES

October 9, 1989

10:23:59 am

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TCCMAR PROJECT

WALL No 9 DYNAMIC TEST Run No 8: ELC 0.40 EPA

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Wall Weight: 5.83 kips H/t Ratio: 50  
Vert. Reinf: 2 # 5 Grouting : Partial  
Dead Load: 300 lb/ft Splices : yes

---

SUMMARY OF EXTREME VALUES

GLOBAL WALL RESPONSE

Disp Top	4.89 in	Acc Top	0.48 g
Disp Cent	10.00 in	Acc Cent	0.83 g
Disp Bot	3.09 in	Acc Bot	0.33 g
Peak Defl	8.80 in		
Inertia Force	2.23 kips	Eqv Load	110.0 lb/ft
Bending Mt	107.73 kip-in	Seismic C	0.49
		C/Acc Bot	1.49

MATERIAL & MECHANICAL PROPERTIES

f'm	4940 psi	Em (Code)	3710 ksi
Ig	666 in <sup>4</sup>	EmIg	2469000 kip-in <sup>2</sup>
Avg Freq	0.61 Hz	EIeqv	115000 kip-in <sup>2</sup>
		EmIg/EIeqv	21.47

LOCAL RESPONSE

	Peak	Joint 36
Rebar Strain	0.0037	0.0019 in/in
Strain Ductility	1.48	0.76 in
Avg Joint Opening	0.0291	0.0291 in
Faceshell Comp. Strain	0.0026	0.0026 in/in
Faceshell Opening	0.0501	0.0501 in
Curvature	1.9400	1.9100 (1/in)*10 <sup>-3</sup>
EI joint		56000 kip-in <sup>2</sup>

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CES

October 9, 1989

10:24:07 am

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TCCMAR PROJECT

WALL No 9 DYNAMIC TEST Run No 9: BONDCS 0.40 EPA

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Wall Weight: 5.83 kips H/t Ratio: 50  
Vert. Reinf: 2 # 5 Grouting : Partial  
Dead Load: 300 lb/ft Splices : yes

---

SUMMARY OF EXTREME VALUES

GLOBAL WALL RESPONSE

Disp Top	3.13 in	Acc Top	0.65 g
Disp Cent	5.61 in	Acc Cent	0.77 g
Disp Bot	2.62 in	Acc Bot	0.33 g
Peak Defl	4.68 in		
Inertia Force	1.06 kips	Eqv Load	60.0 lb/ft
Bending Mt	58.43 kip-in	Seismic C	0.27
		C/Acc Bot	0.81

MATERIAL & MECHANICAL PROPERTIES

f'm	4940 psi	Em (Code)	3710 ksi
Ig	666 in4	EmIg	2469000 kip-in2
Avg Freq	0.70 Hz	EIeqv	117000 kip-in2
		EmIg/EIeqv	21.10

LOCAL RESPONSE

	Peak	Joint 36	
Rebar Strain	0.0025	0.0010	in/in
Strain Ductility	1.00	0.40	in
Avg Joint Opening	0.0161	0.0161	in
Faceshell Comp. Strain	0.0013	0.0013	in/in
Faceshell Opening	0.0276	0.0276	in
Curvature	1.0900	1.0500	(1/in)*10-3
EI joint		55000	kip-in2

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CES

October 9, 1989

10:24:14 am

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TCCMAR PROJECT

WALL No 9 DYNAMIC TEST Run No 10: TAFTS 0.40 EPA

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Wall Weight: 5.83 kips H/t Ratio: 50  
Vert. Reinf: 2 # 5 Grouting : Partial  
Dead Load: 300 lb/ft Splices : yes

---

SUMMARY OF EXTREME VALUES

GLOBAL WALL RESPONSE

Disp Top	4.96 in	Acc Top	0.64 g
Disp Cent	7.23 in	Acc Cent	0.84 g
Disp Bot	4.92 in	Acc Bot	0.39 g
Peak Defl	5.31 in		
Inertia Force	1.27 kips	Eqv Load	70.0 lb/ft
Bending Mt	64.85 kip-in	Seismic C	0.30
		C/Acc Bot	0.76

MATERIAL & MECHANICAL PROPERTIES

f'm	4940 psi	Em (Code)	3710 ksi
Ig	666 in <sup>4</sup>	EmIg	2469000 kip-in <sup>2</sup>
Avg Freq	0.76 Hz	EIeqv	114000 kip-in <sup>2</sup>
		EmIg/EIeqv	21.66

LOCAL RESPONSE

	Peak	Joint	36
Rebar Strain	0.0025	0.0011	in/in
Strain Ductility	1.00	0.44	in
Avg Joint Opening	0.0163	0.0163	in
Faceshell Comp. Strain	0.0017	0.0017	in/in
Faceshell Opening	0.0280	0.0280	in
Curvature	1.3000	1.0700	(1/in)*10 <sup>-3</sup>
EI joint		58000	kip-in <sup>2</sup>

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CES

October 9, 1989

10:24:21 am

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TCCMAR PROJECT

WALL No 9 DYNAMIC TEST Run No 11: BONDCH 0.80 EPA

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Wall Weight: 5.83 kips H/t Ratio: 50  
Vert. Reinf: 2 # 5 Grouting : Partial  
Dead Load: 300 lb/ft Splices : yes

---

SUMMARY OF EXTREME VALUES

GLOBAL WALL RESPONSE

Disp Top	5.59 in	Acc Top	1.24 g
Disp Cent	11.52 in	Acc Cent	1.19 g
Disp Bot	4.64 in	Acc Bot	1.17 g
Peak Defl	11.17 in		
Inertia Force	2.45 kips	Eqv Load	120.0 lb/ft
Bending Mt	112.09 kip-in	Seismic C	0.51
		C/Acc Bot	0.44

MATERIAL & MECHANICAL PROPERTIES

f'm	4940 psi	Em (Code)	3710 ksi
Ig	666 in4	EmIg	2469000 kip-in2
Avg Freq	0.52 Hz	EIeqv	94000 kip-in2
		EmIg/EIeqv	26.27

LOCAL RESPONSE

	Peak	Joint	36
Rebar Strain	0.0081	0.0020	in/in
Strain Ductility	3.24	0.80	in
Avg Joint Opening	0.0311	0.0311	in
Faceshell Comp. Strain	0.0038	0.0038	in/in
Faceshell Opening	0.0567	0.0535	in
Curvature	2.8300	2.0300	(1/in)*10-3
EI joint		52000	kip-in2

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CES

October 9, 1989

10:24:29 am

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TCCMAR PROJECT

WALL No 9 DYNAMIC TEST Run No 12: BONDCSH 0.80 EPA

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Wall Weight: 5.83 kips H/t Ratio: 50  
Vert. Reinf: 2 # 5 Grouting : Partial  
Dead Load: 300 lb/ft Splices : yes

---

SUMMARY OF EXTREME VALUES

GLOBAL WALL RESPONSE

Disp Top	5.19 in	Acc Top	1.95 g
Disp Cent	15.54 in	Acc Cent	1.40 g
Disp Bot	4.65 in	Acc Bot	1.28 g
Peak Defl	16.79 in		
Inertia Force	2.39 kips	Eqv Load	120.0 lb/ft
Bending Mt	109.20 kip-in	Seismic C	0.50
		C/Acc Bot	0.39

MATERIAL & MECHANICAL PROPERTIES

f'm	4940 psi	Em (Code)	3710 ksi
Ig	666 in <sup>4</sup>	EmIg	2469000 kip-in <sup>2</sup>
Avg Freq	0.65 Hz	EIeqv	61000 kip-in <sup>2</sup>
		EmIg/EIeqv	40.48

LOCAL RESPONSE

Rebar Strain	Peak 0.0107	Joint 36 0.0068	in/in
Strain Ductility	4.28	2.72	in
Avg Joint Opening	0.0466	0.0466	in
Faceshell Comp. Strain	0.0039	0.0039	in/in
Faceshell Opening	0.0747	0.0801	in
Curvature	3.3900	3.0500	(1/in)*10 <sup>-3</sup>
EI joint		35000	kip-in <sup>2</sup>

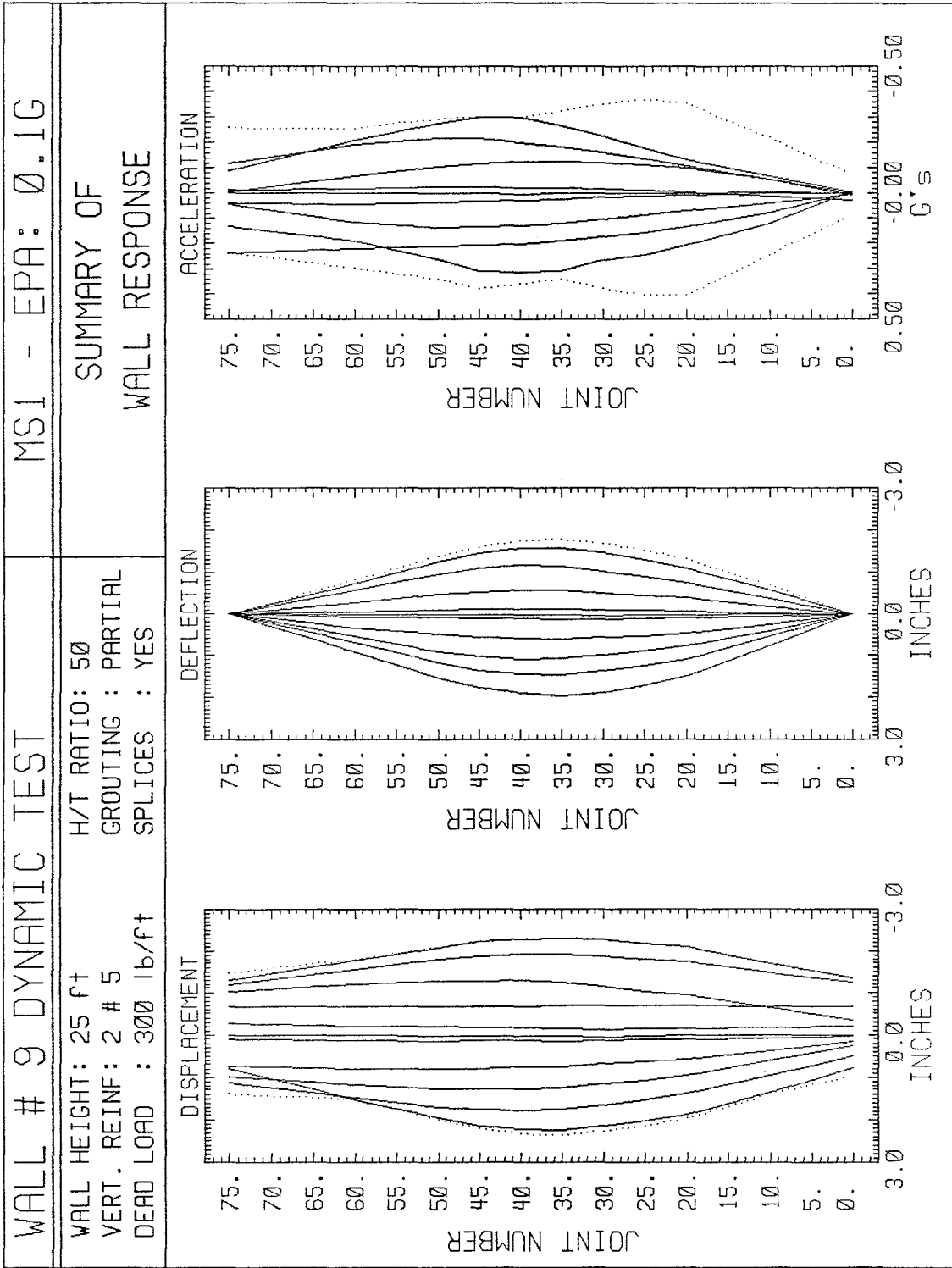
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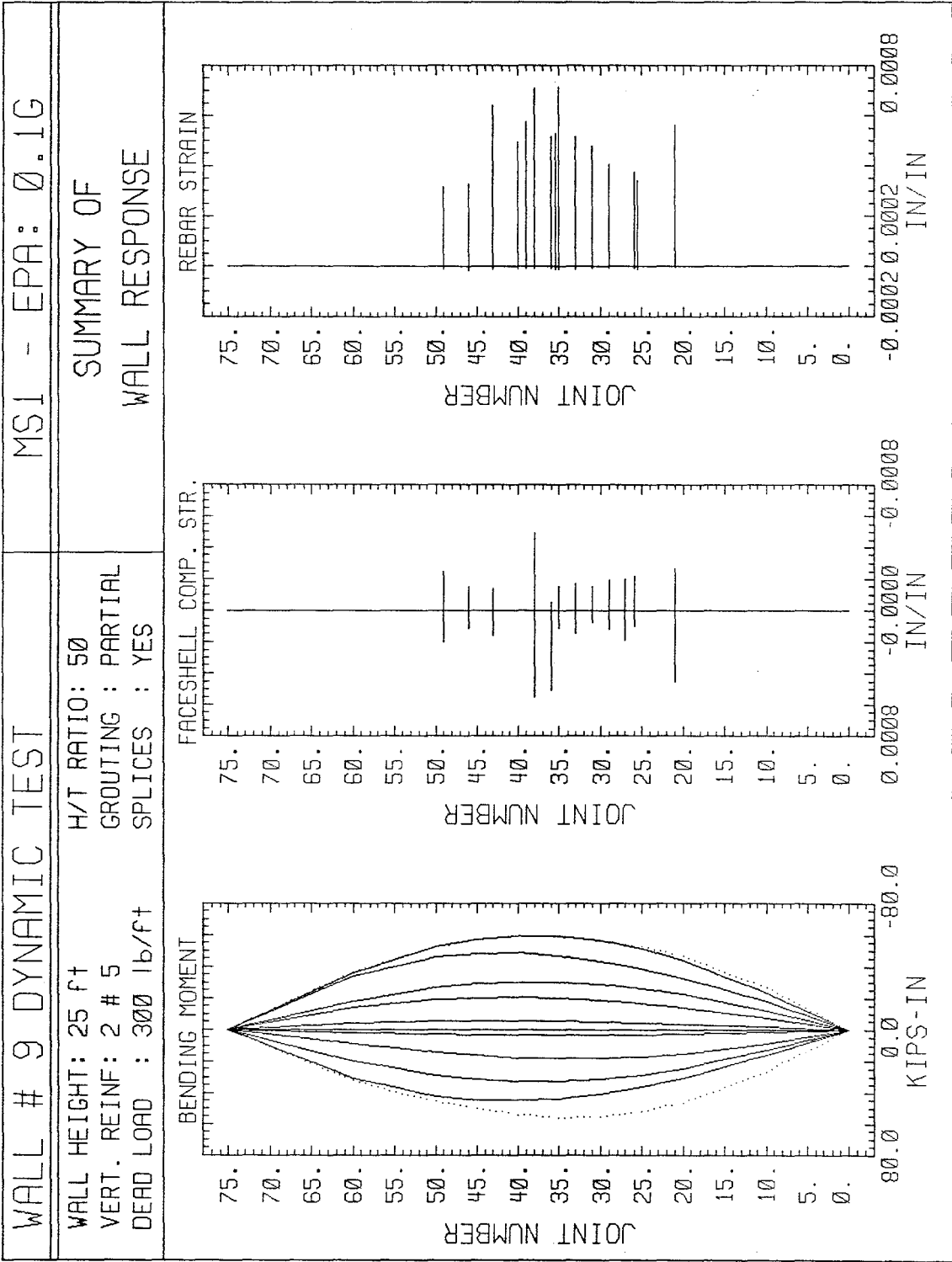
CES

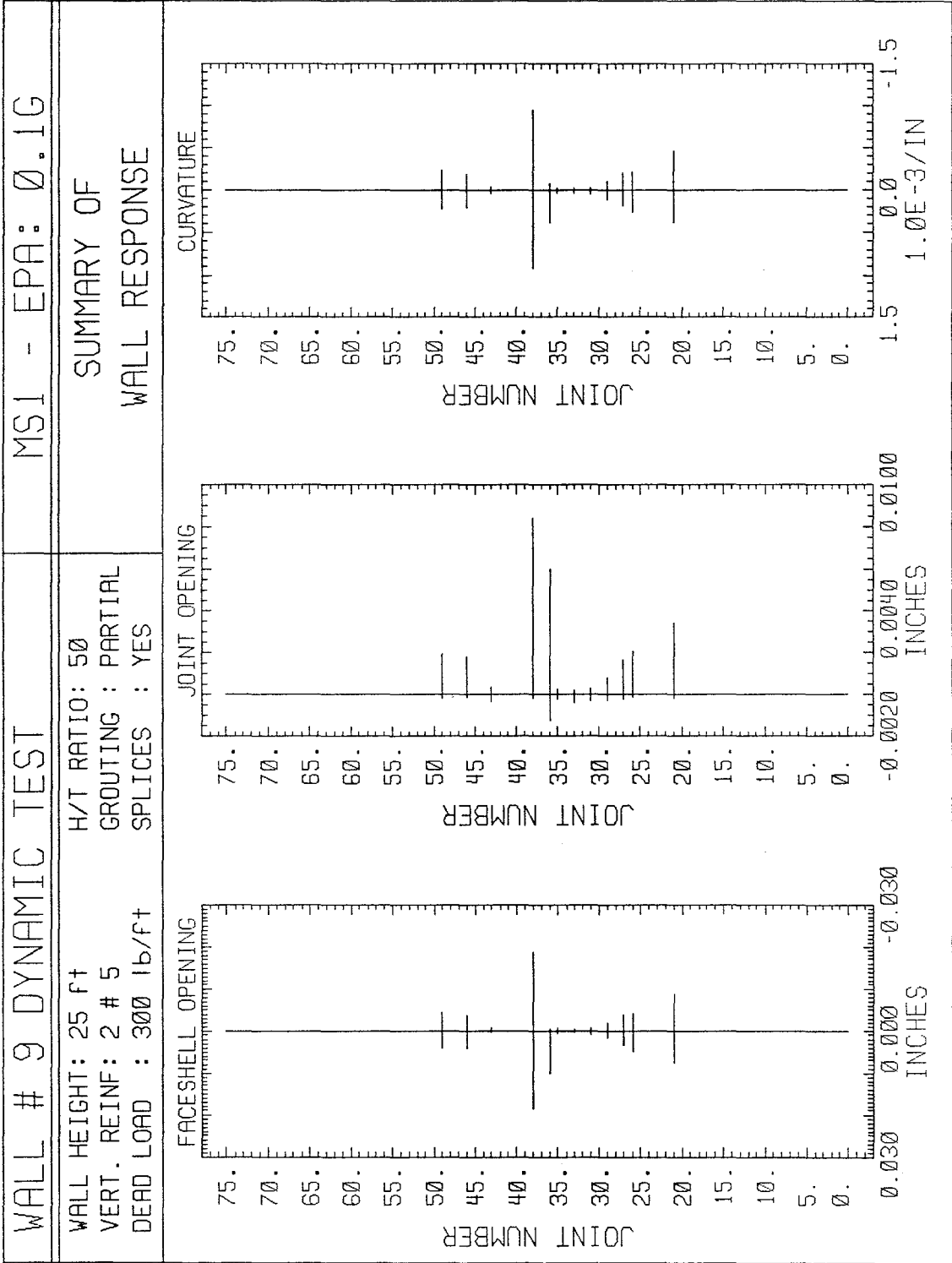
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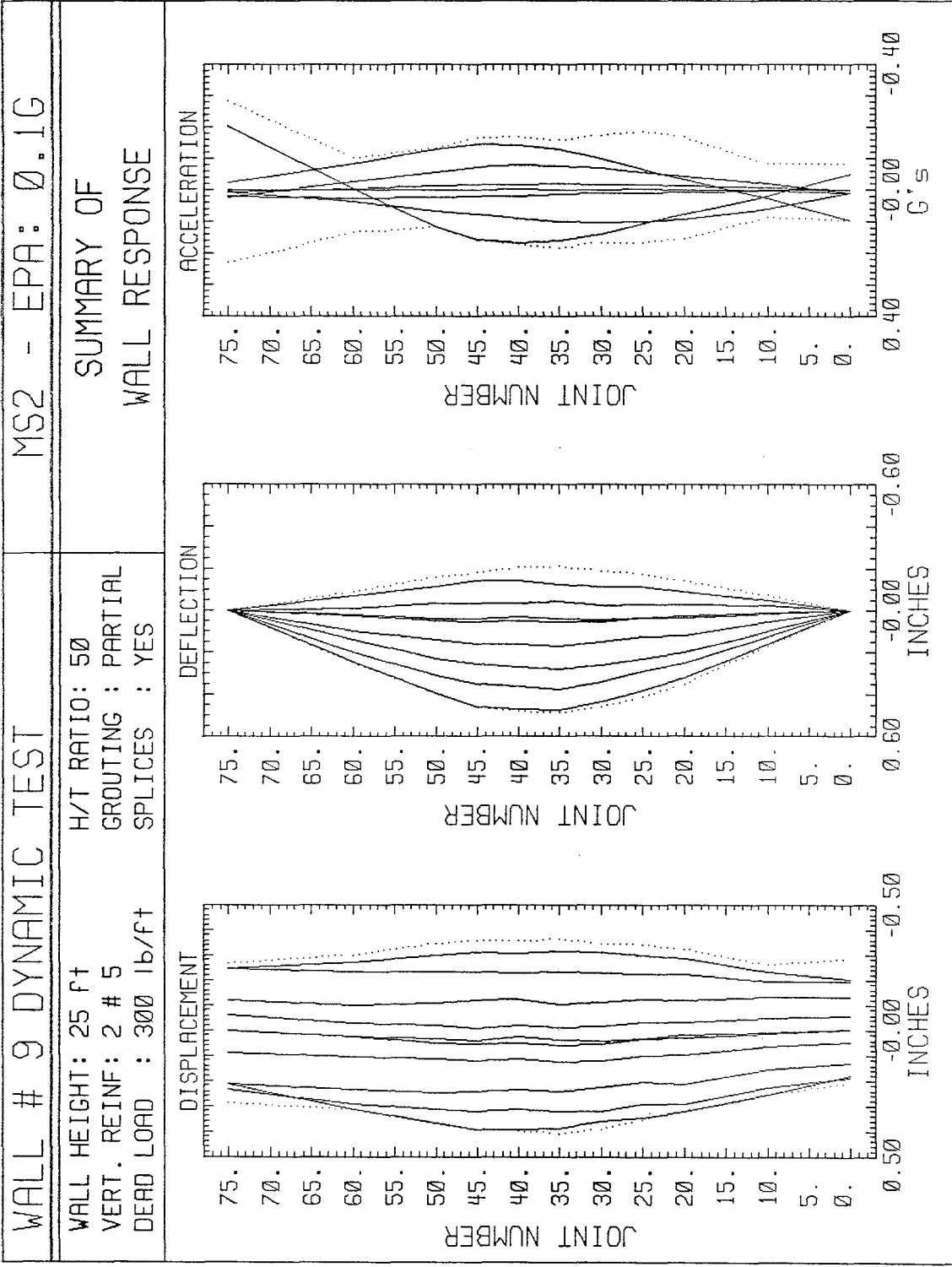
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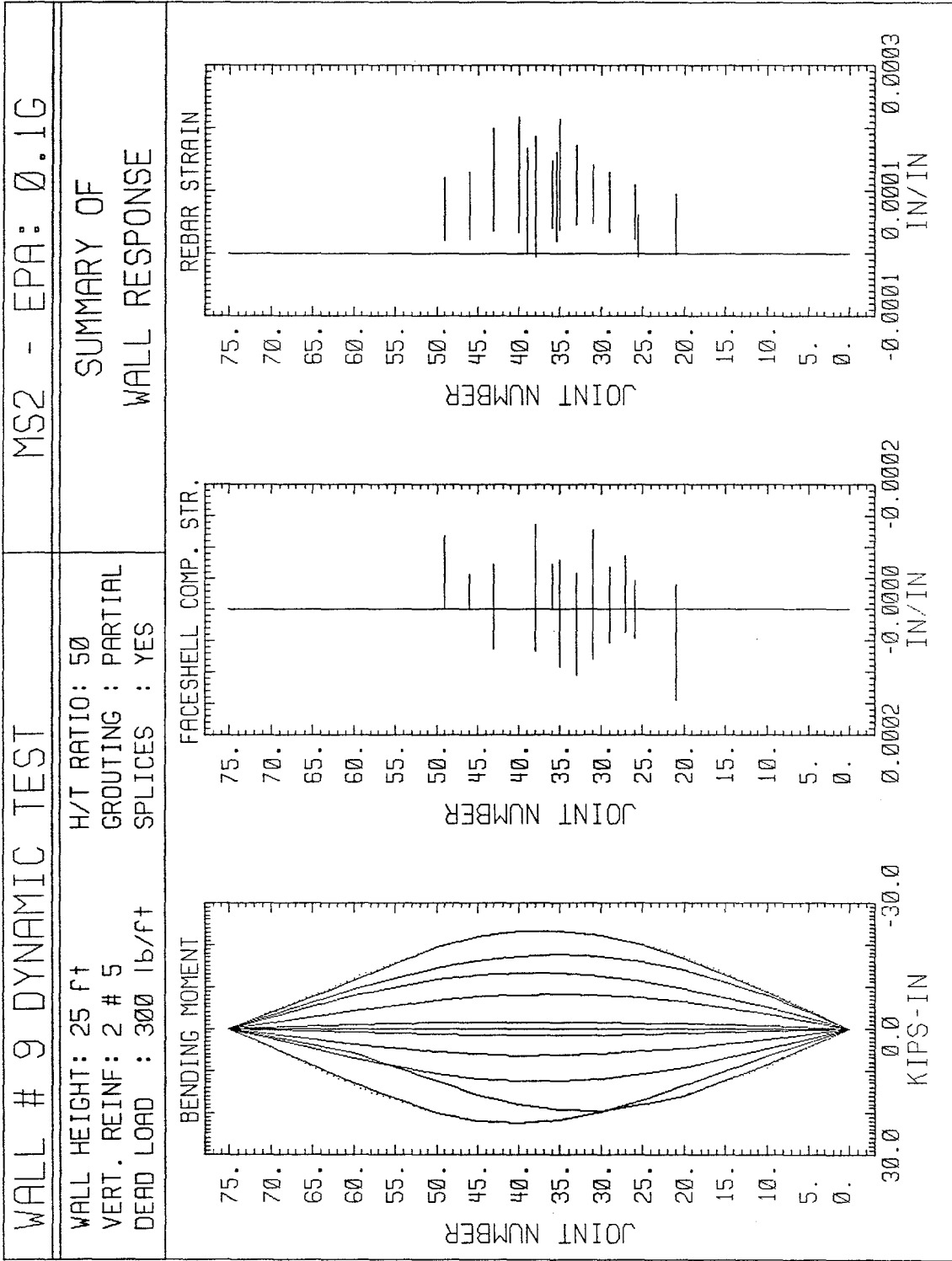




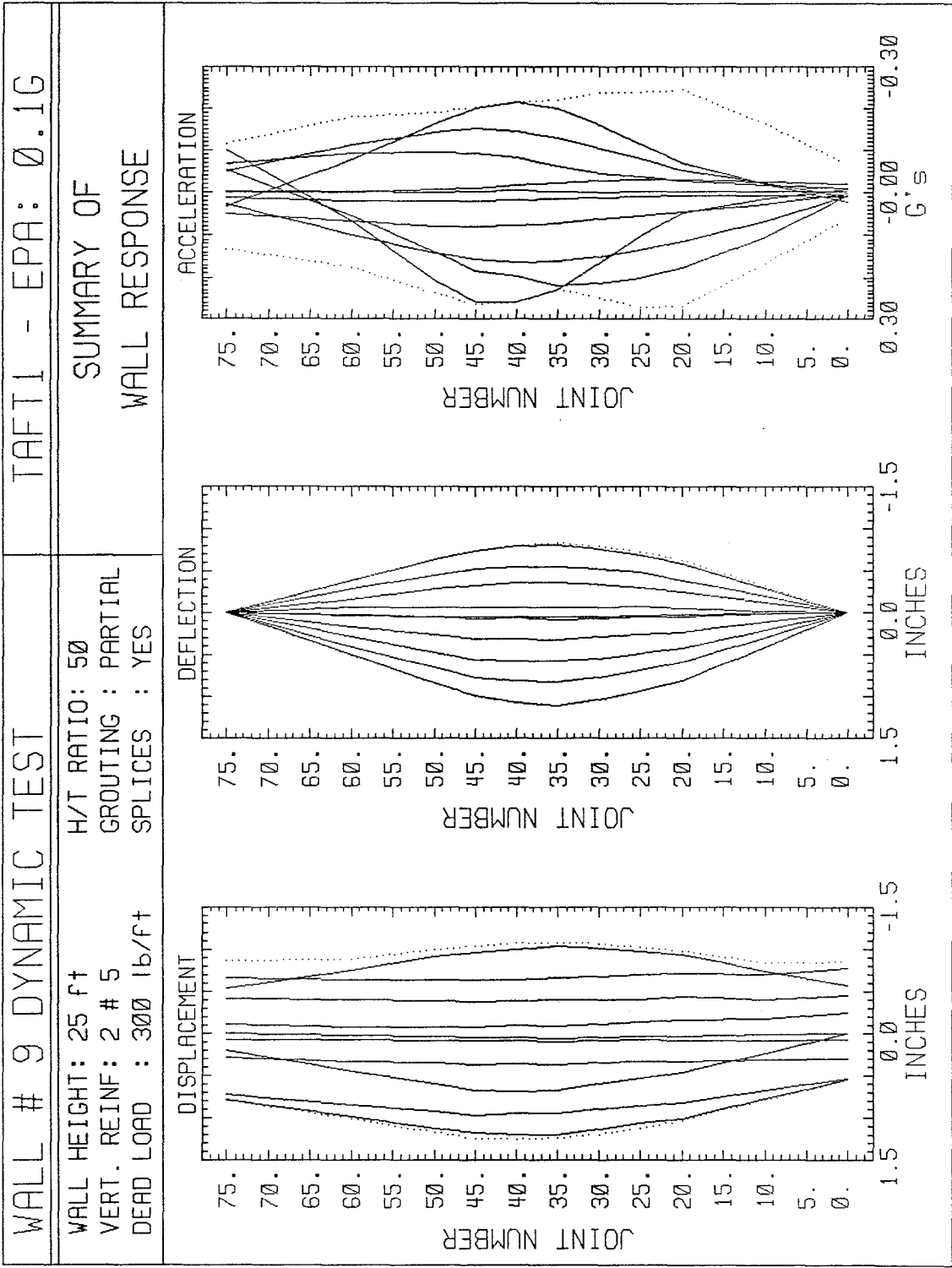


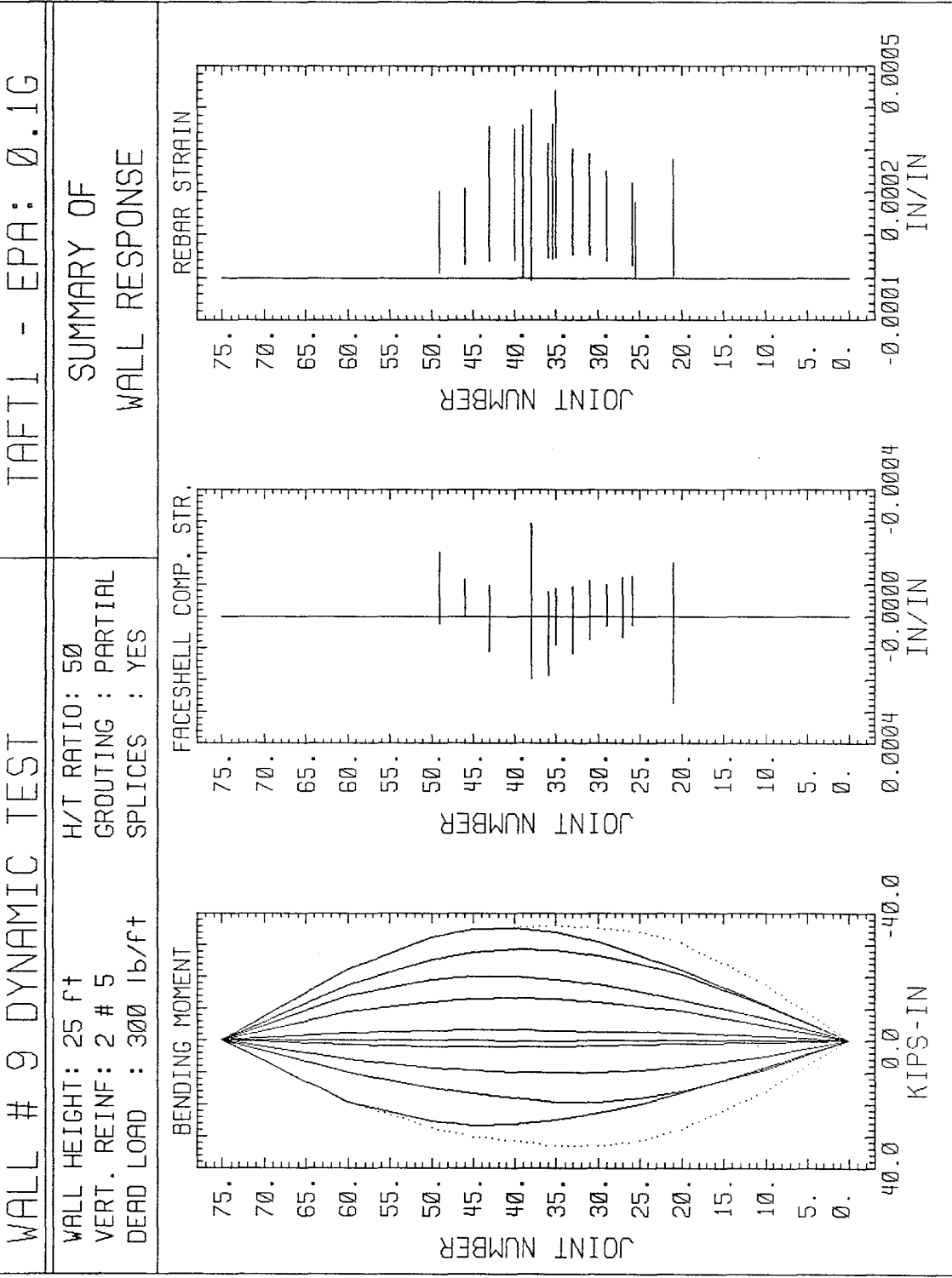


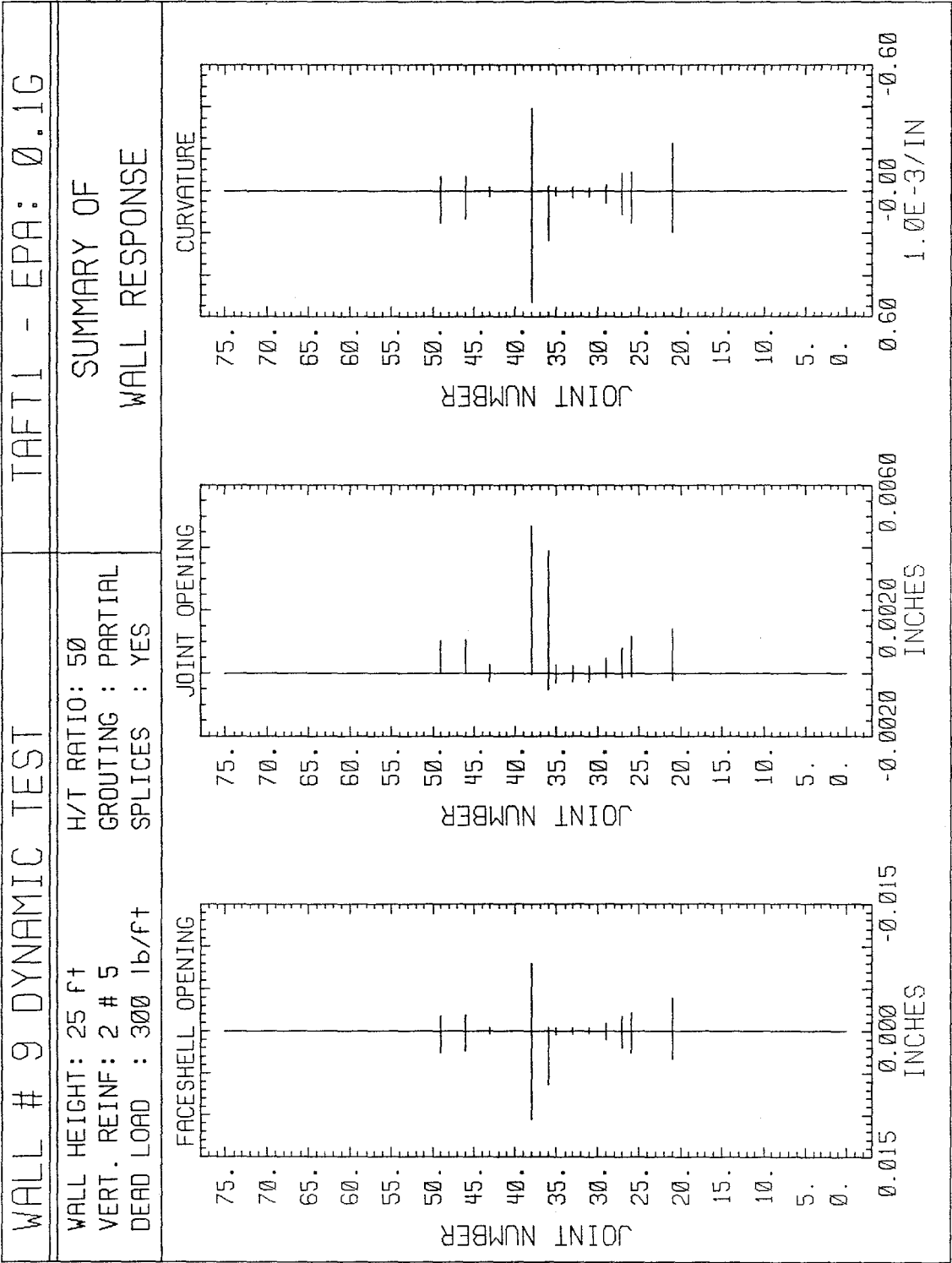


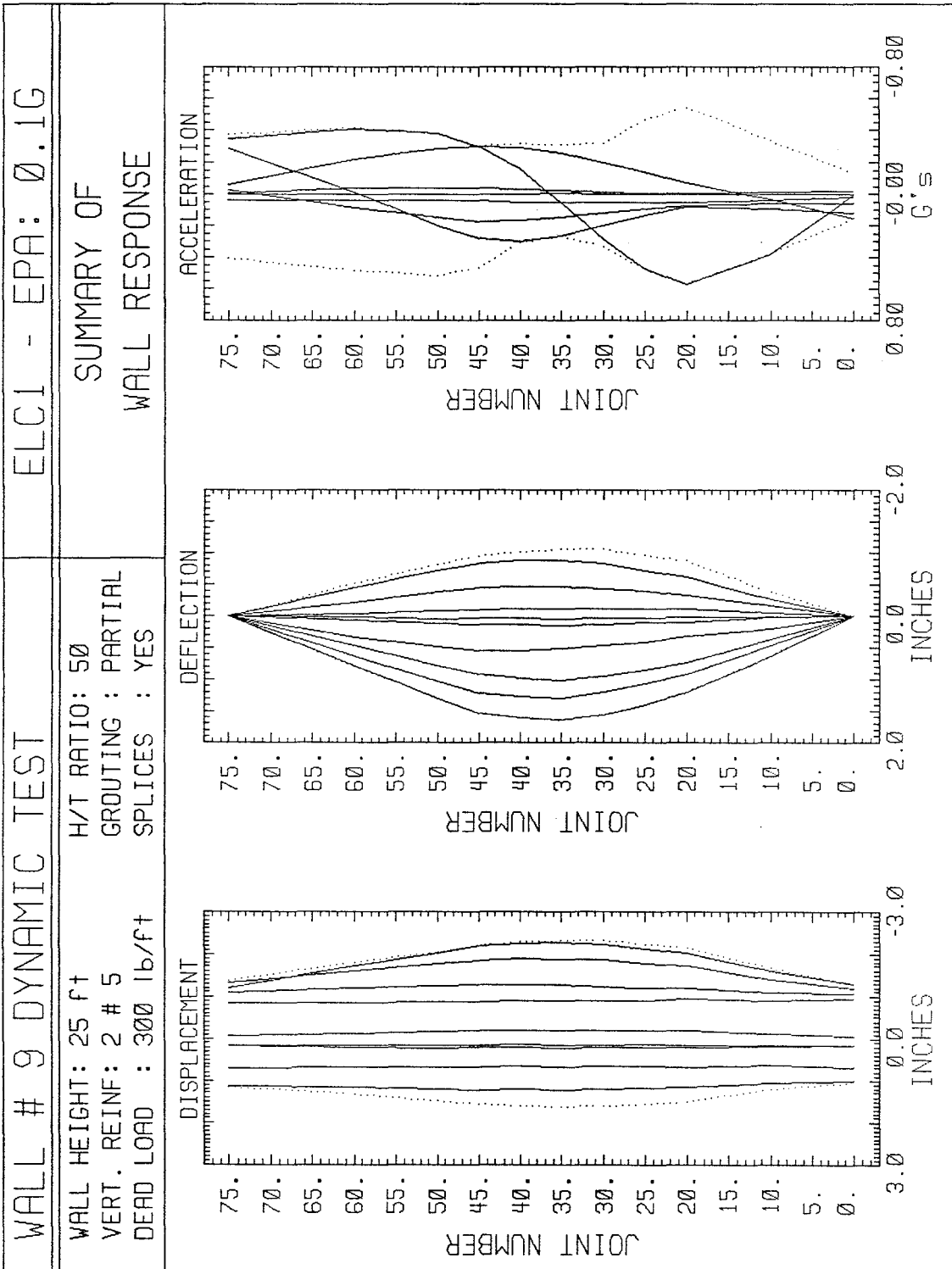


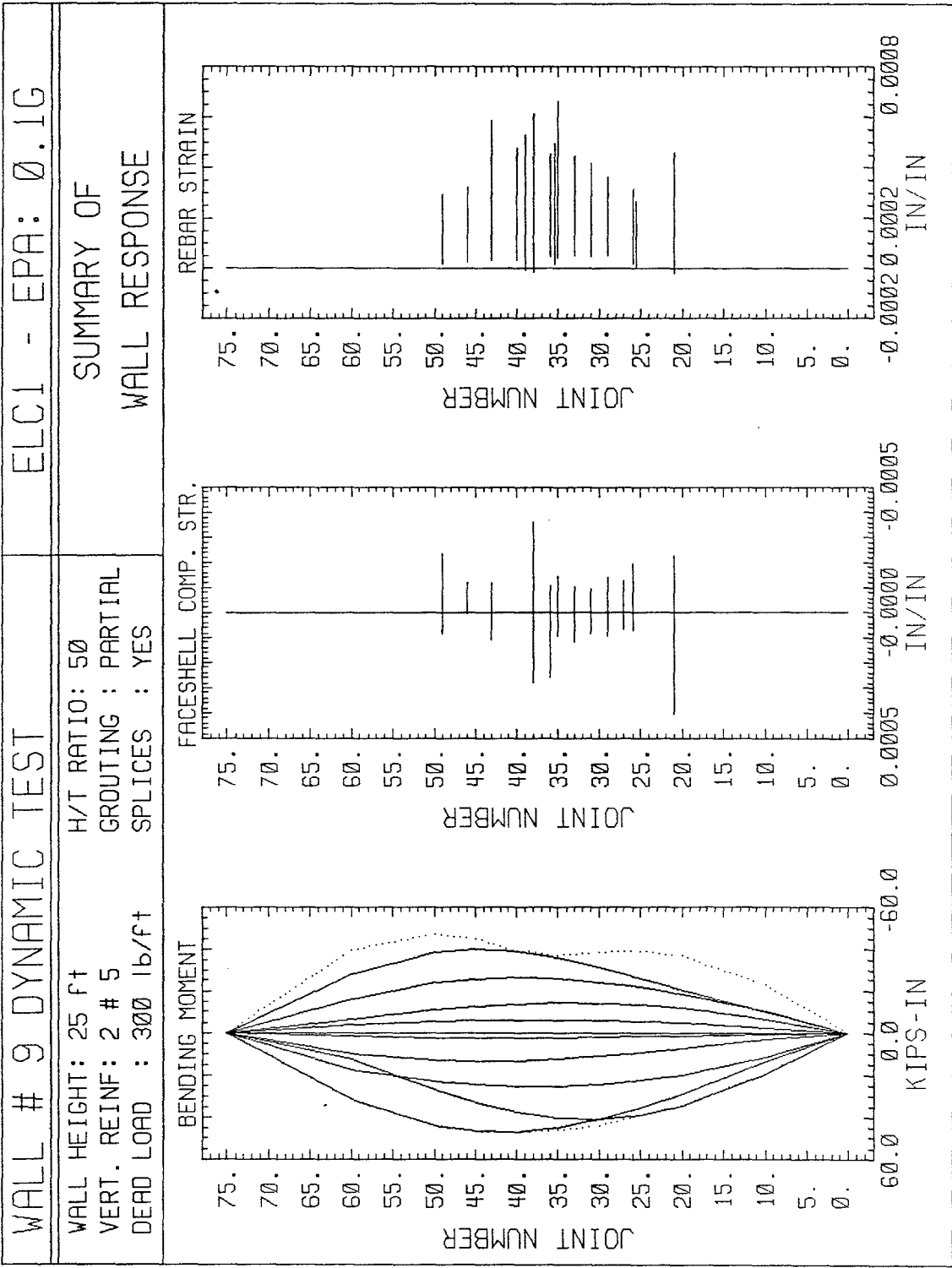
WALL # 9 DYNAMIC TEST	MS2 - EPA: Ø.1G
WALL HEIGHT: 25 ft VERT. REINF: 2 # 5 DEAD LOAD : 300 lb/ft	H/T RATIO: 50 GROUTING : PARTIAL SPLICES : YES
SUMMARY OF WALL RESPONSE	



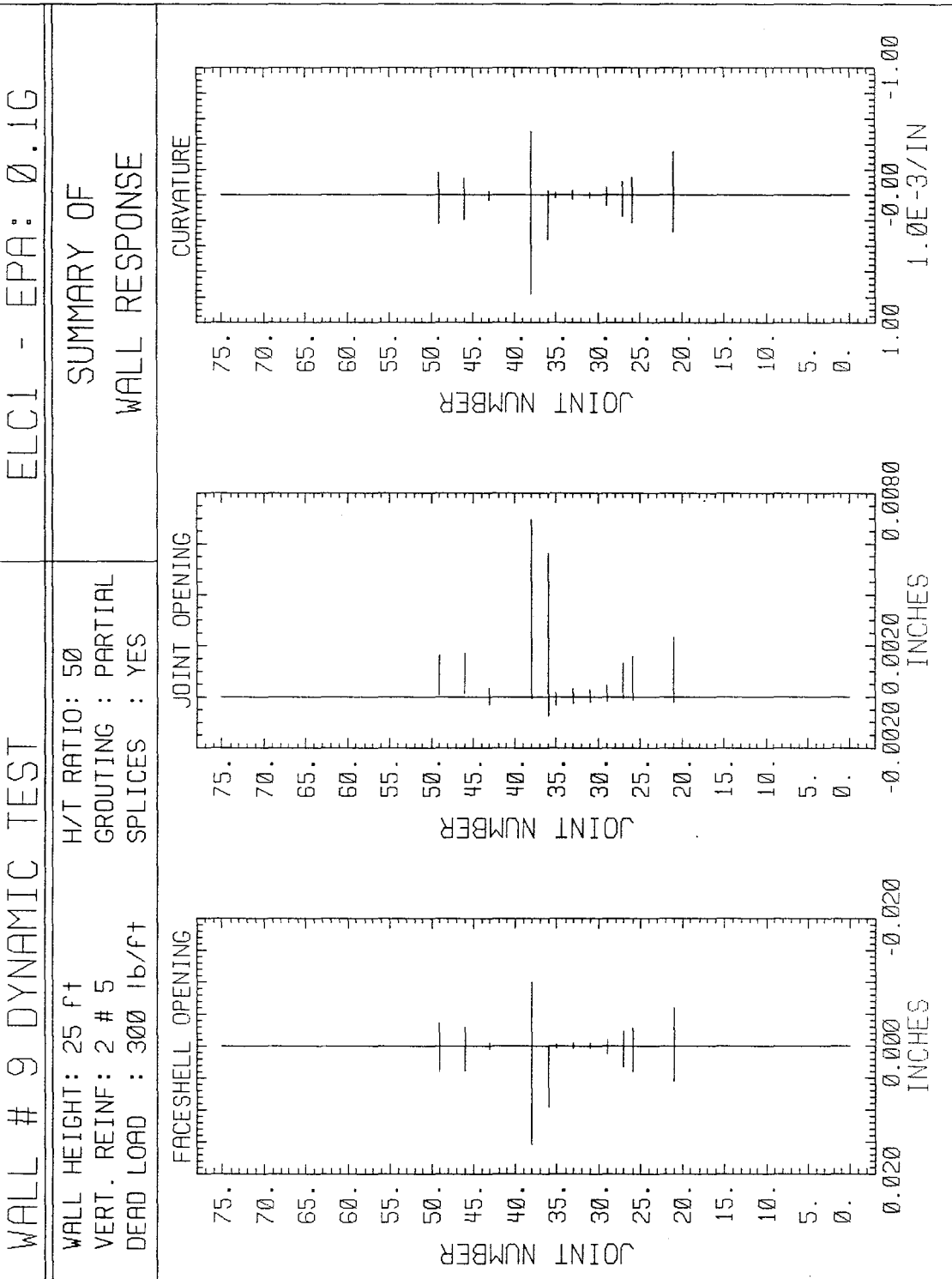


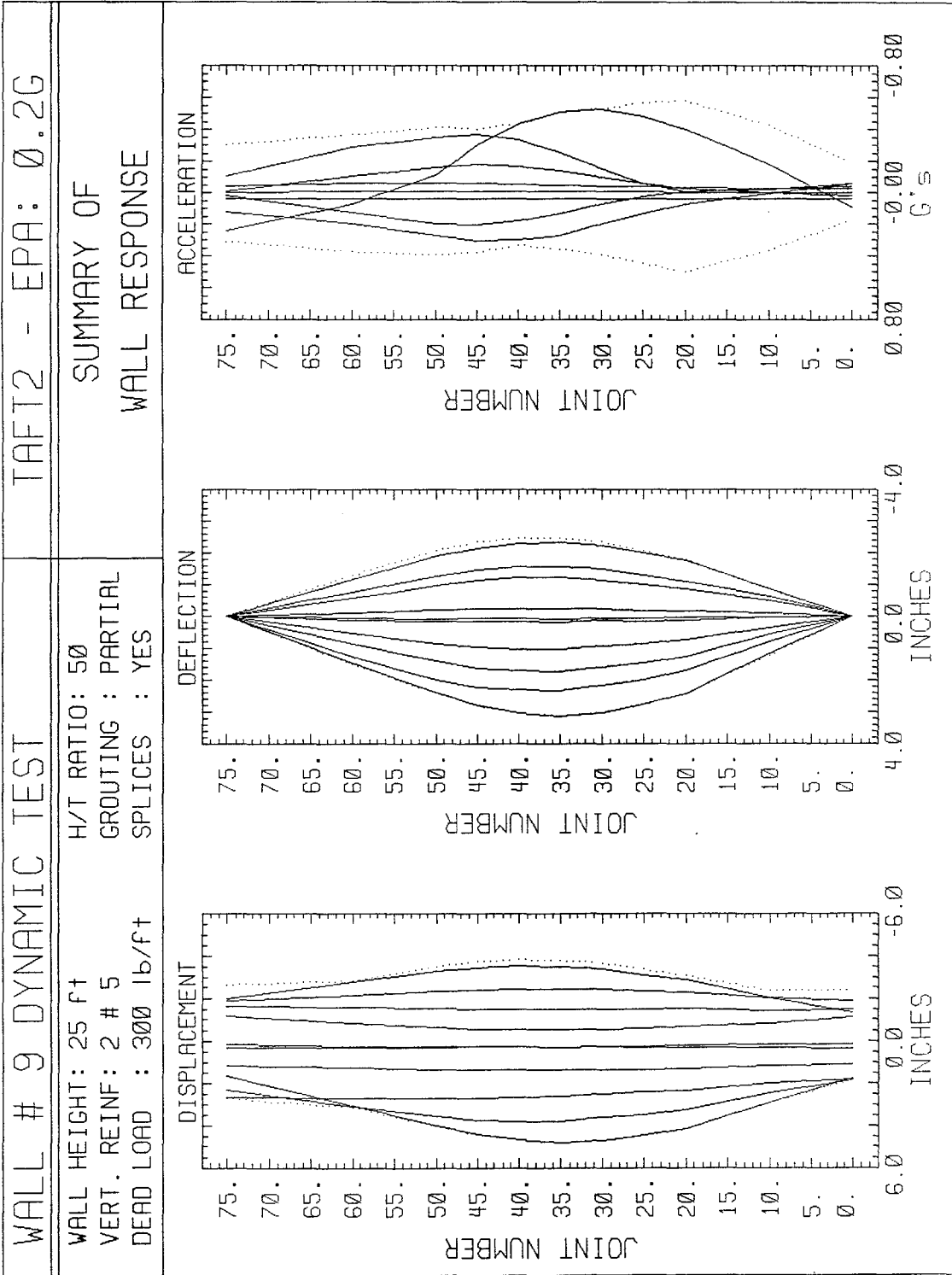


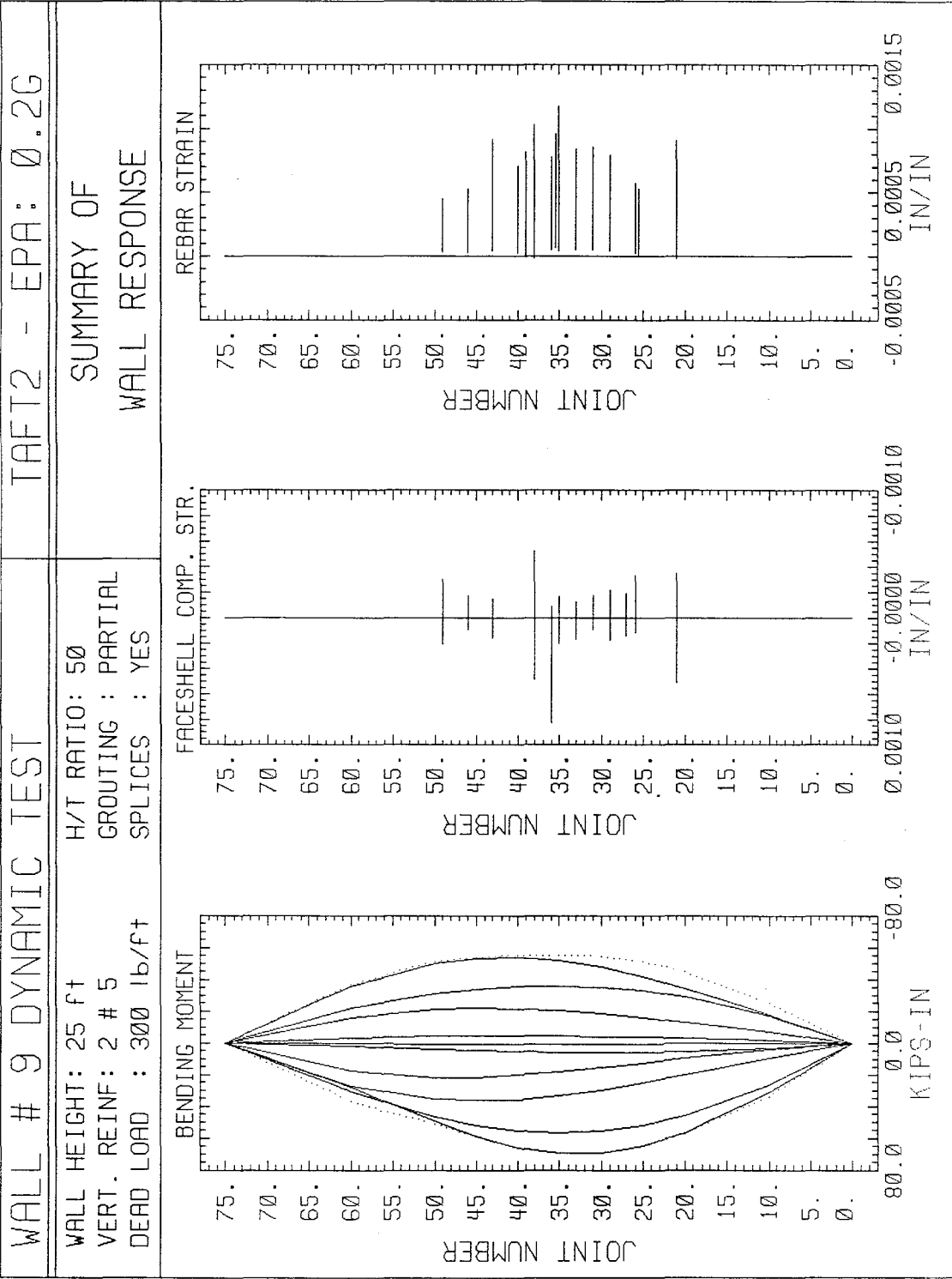


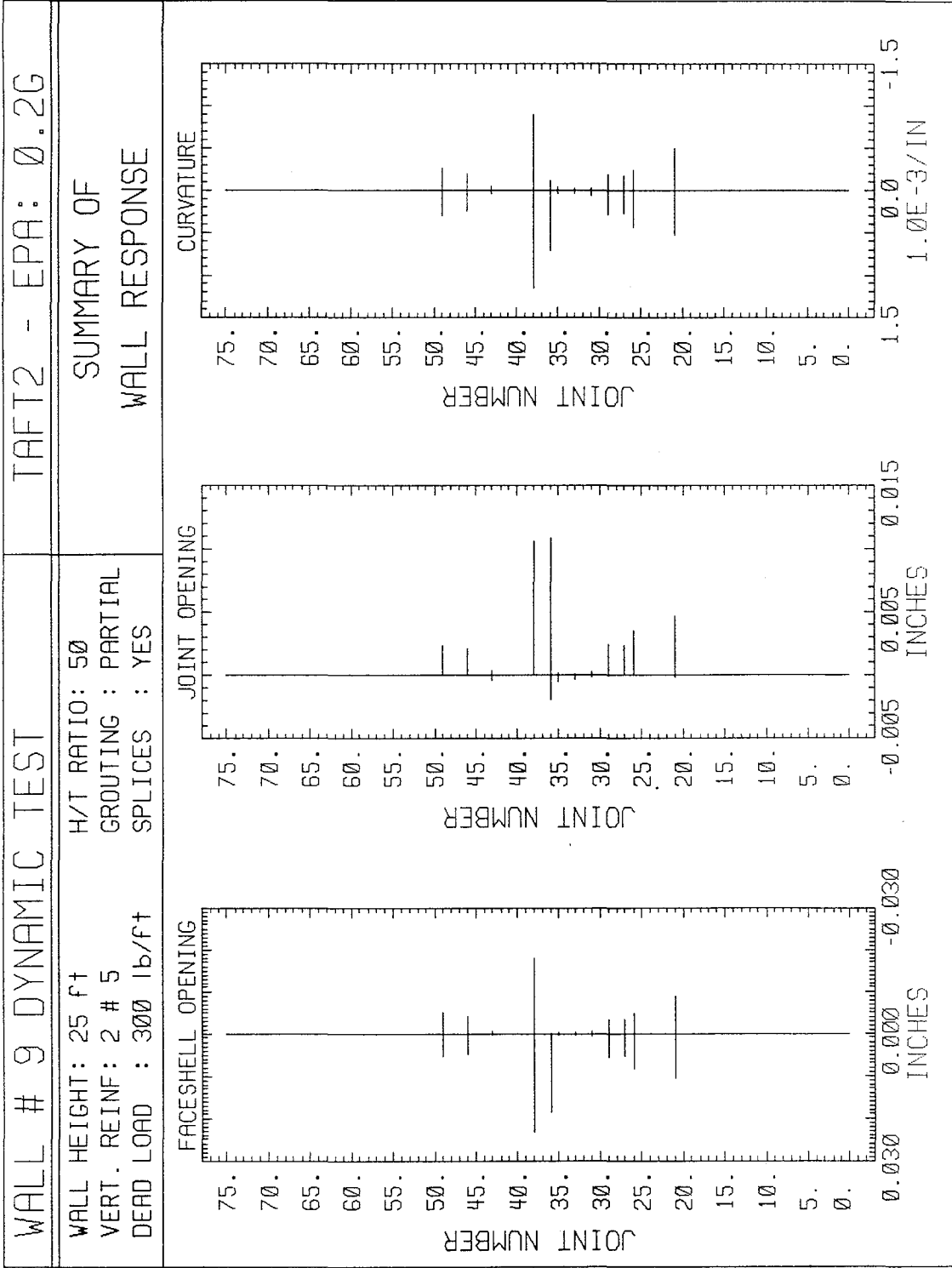












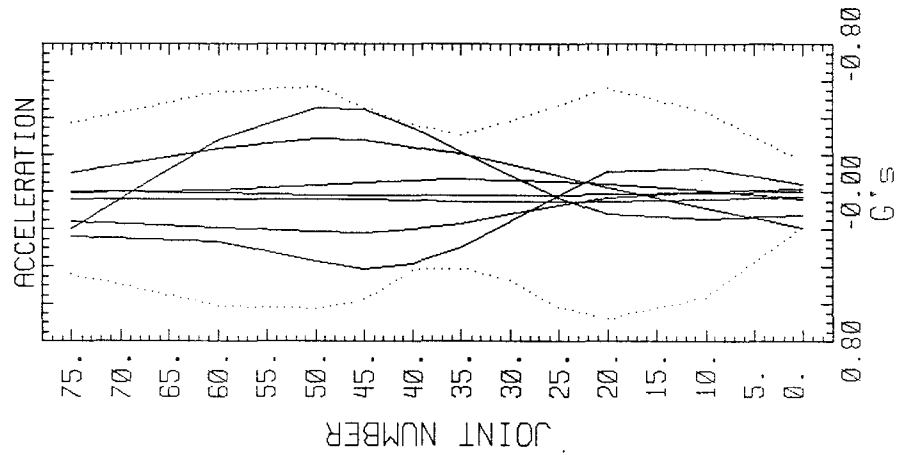
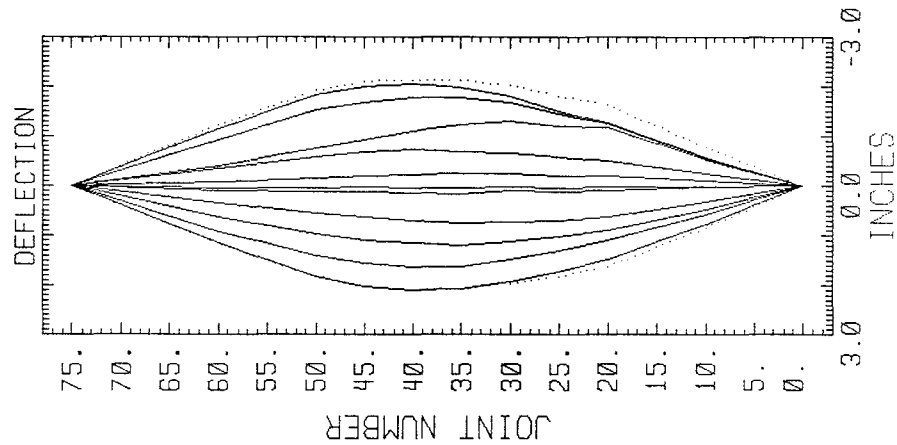
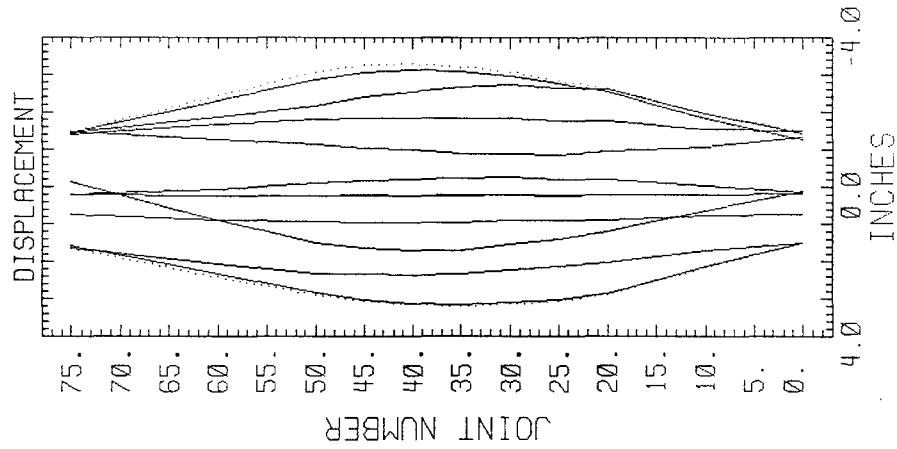
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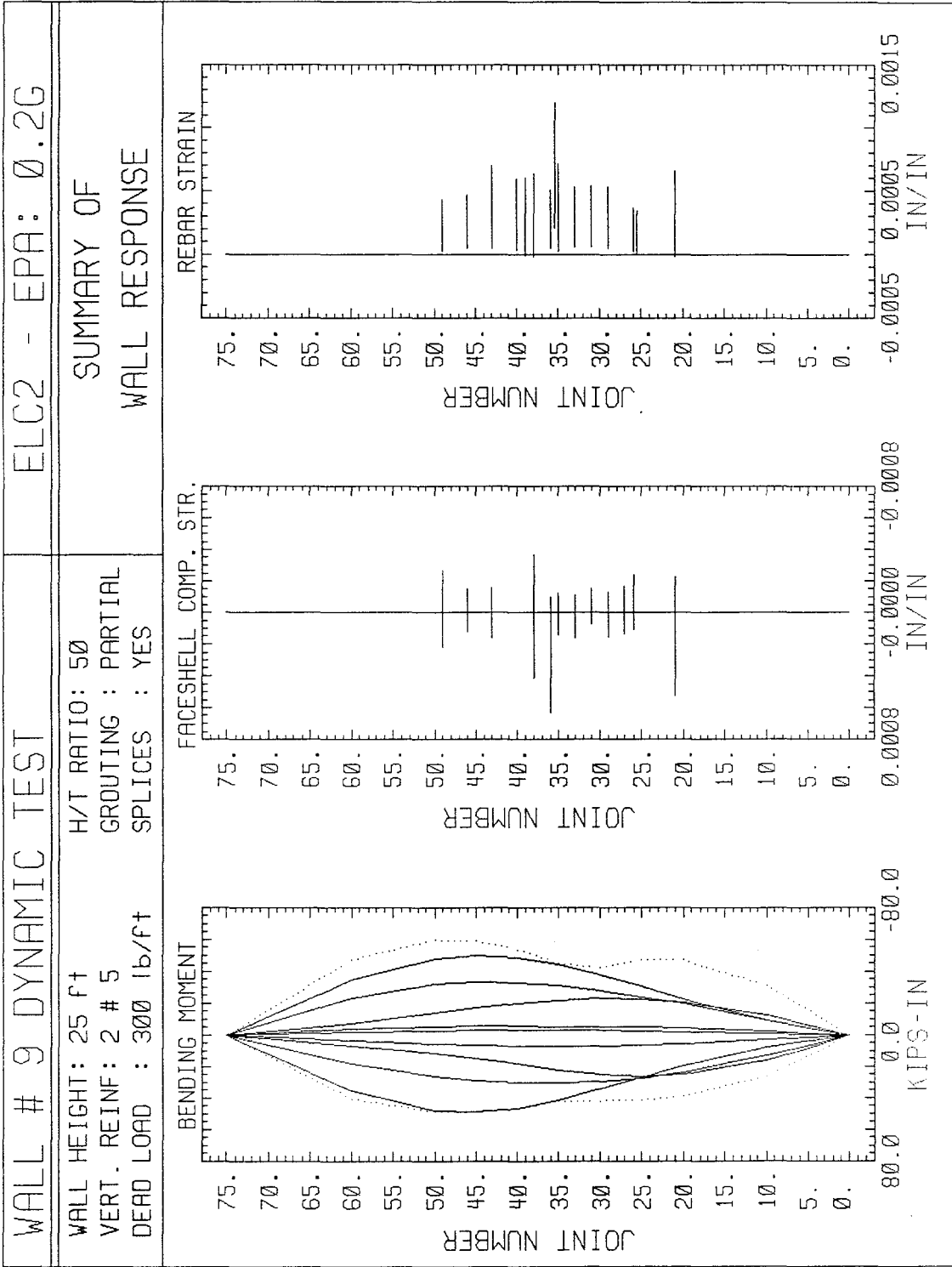
ELC2 - EPA: 0.2G

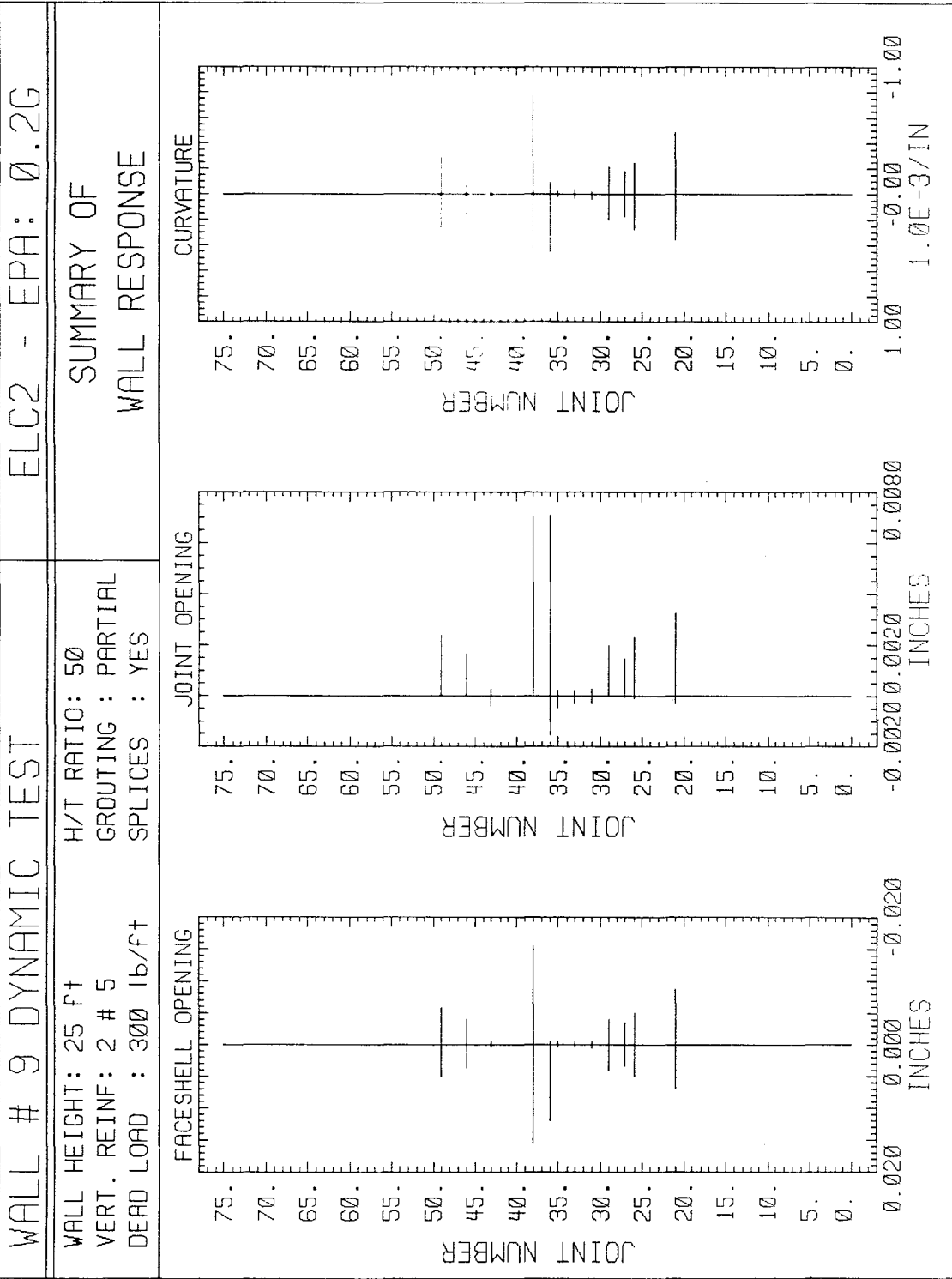
WALL HEIGHT: 25 FT  
 VERT. REINF: 2 # 5  
 DEAD LOAD : 300 lb/ft

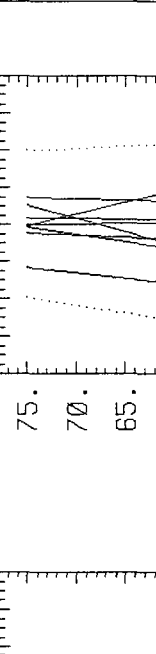
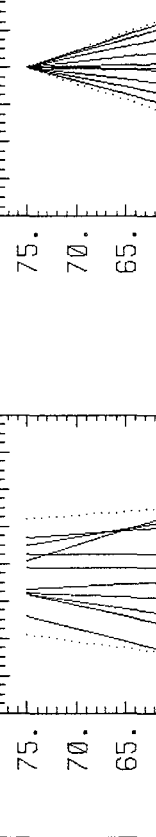
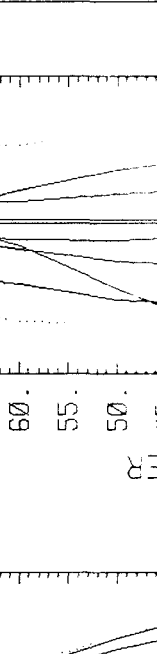
H/T RATIO: 50  
 GROUTING : PARTIAL  
 SPLICES : YES

SUMMARY OF  
 WALL RESPONSE







WALL # 9 DYNAMIC TEST	BONDC - EPA: 0.4G
WALL HEIGHT: 25 FT VERT. REINF: 2 # 5 DEAD LOAD : 300 lb/ft+	H/T RATIO: 50 GROUTING : PARTIAL SPLICES : YES
SUMMARY OF WALL RESPONSE	
DISPLACEMENT 	DEFLECTION 
ACCELERATION 	



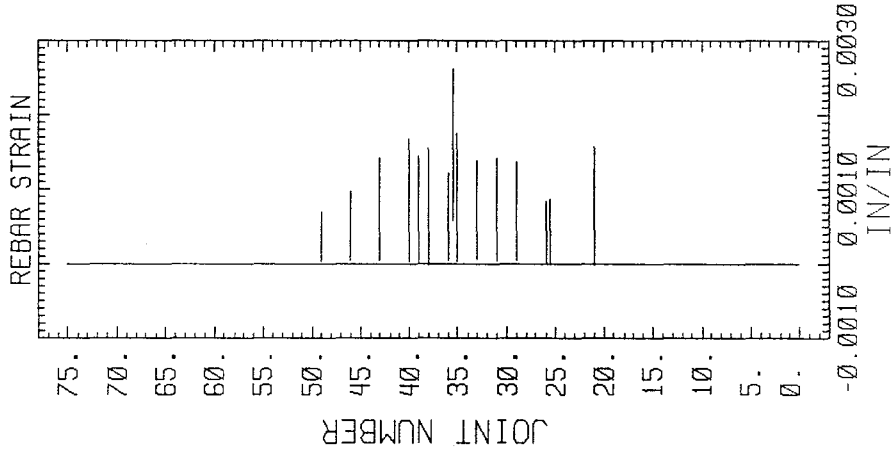
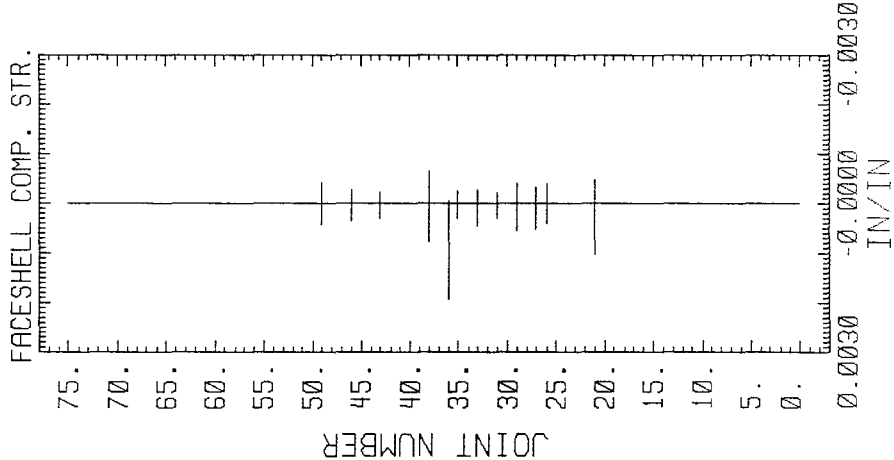
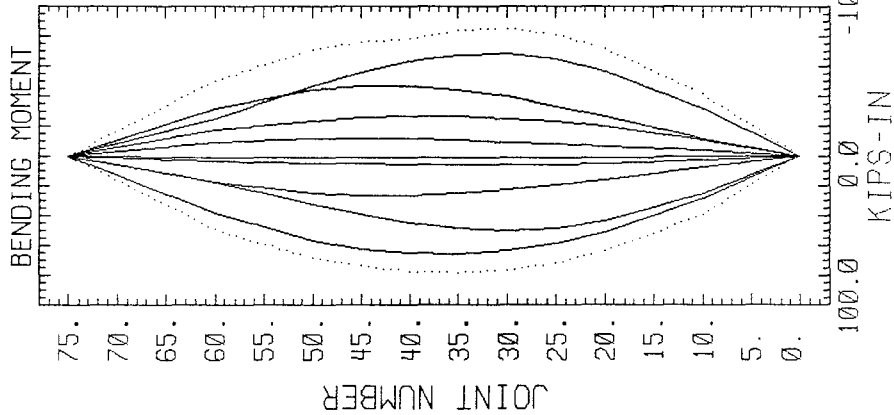
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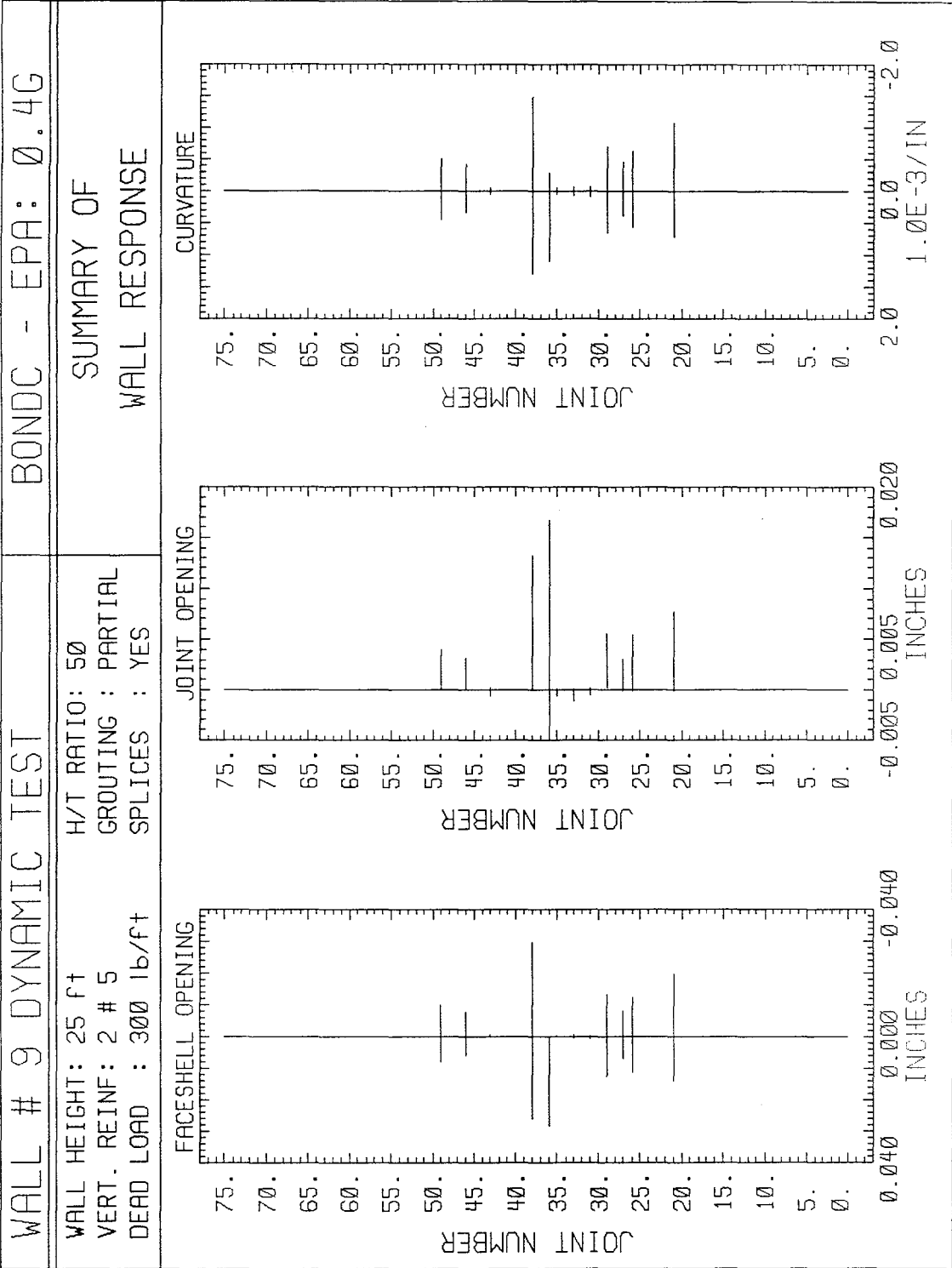
BONDC - EPA: 0.4G

WALL HEIGHT: 25 FT  
 VERT. REINF: 2 # 5  
 DEAD LOAD : 300 lb/ft

H/T RATIO: 50  
 GROUTING : PARTIAL  
 SPLICES : YES

SUMMARY OF  
 WALL RESPONSE





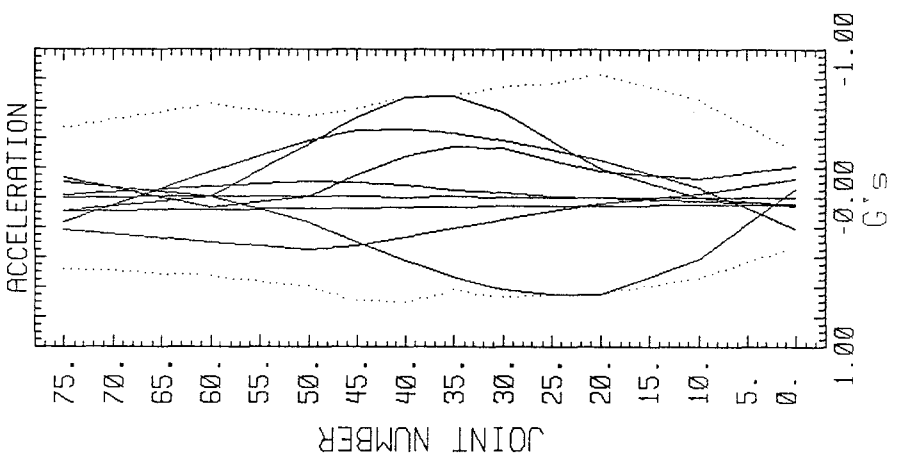
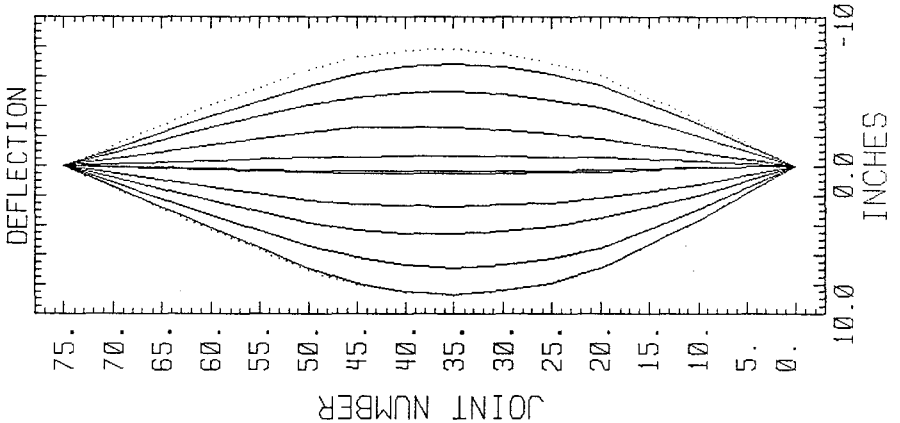
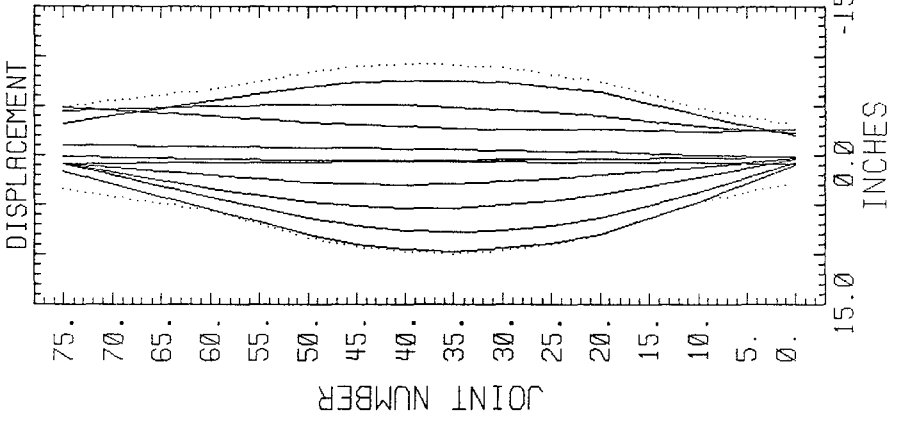
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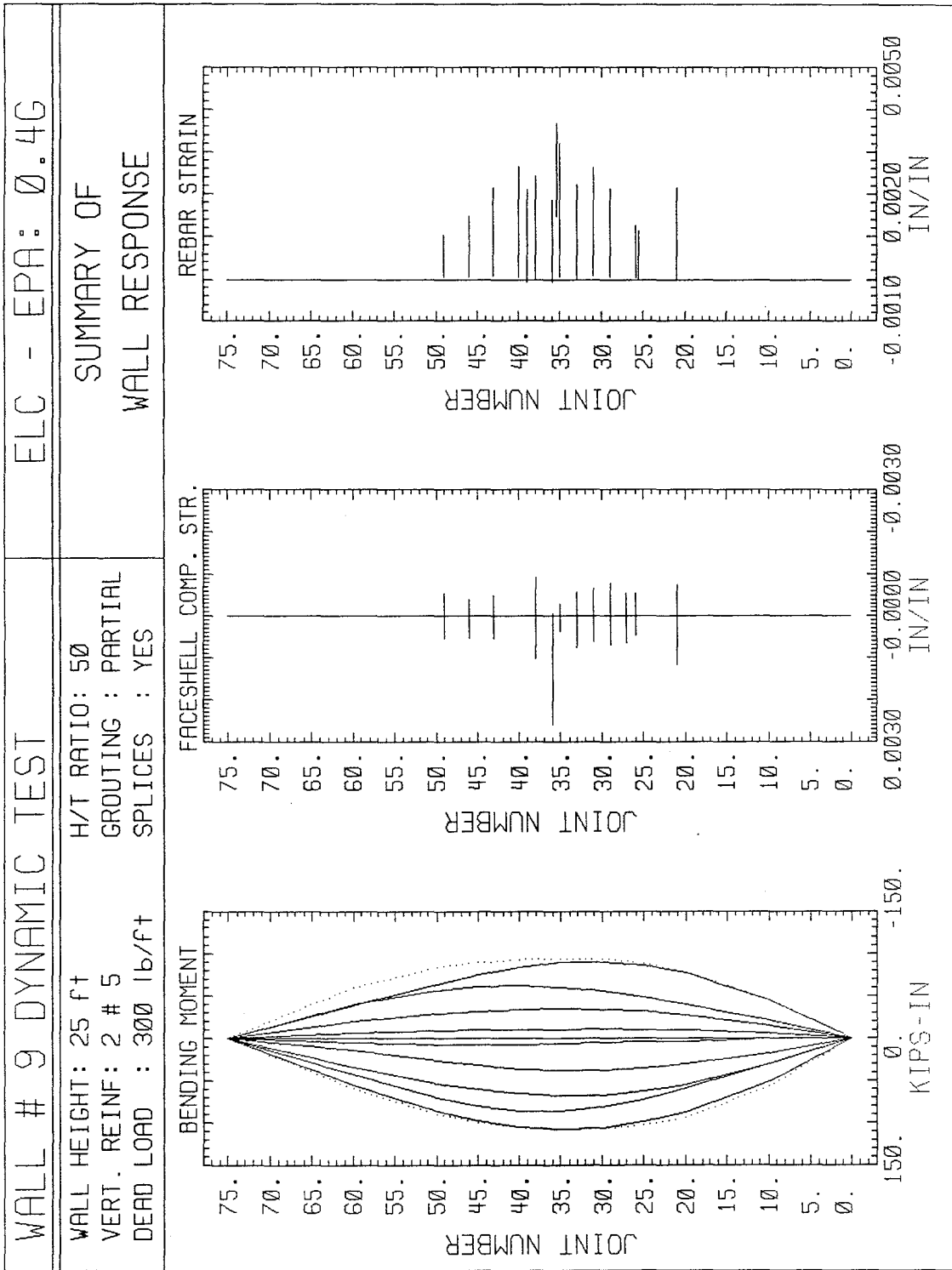
ELC - EPA: 0.4G

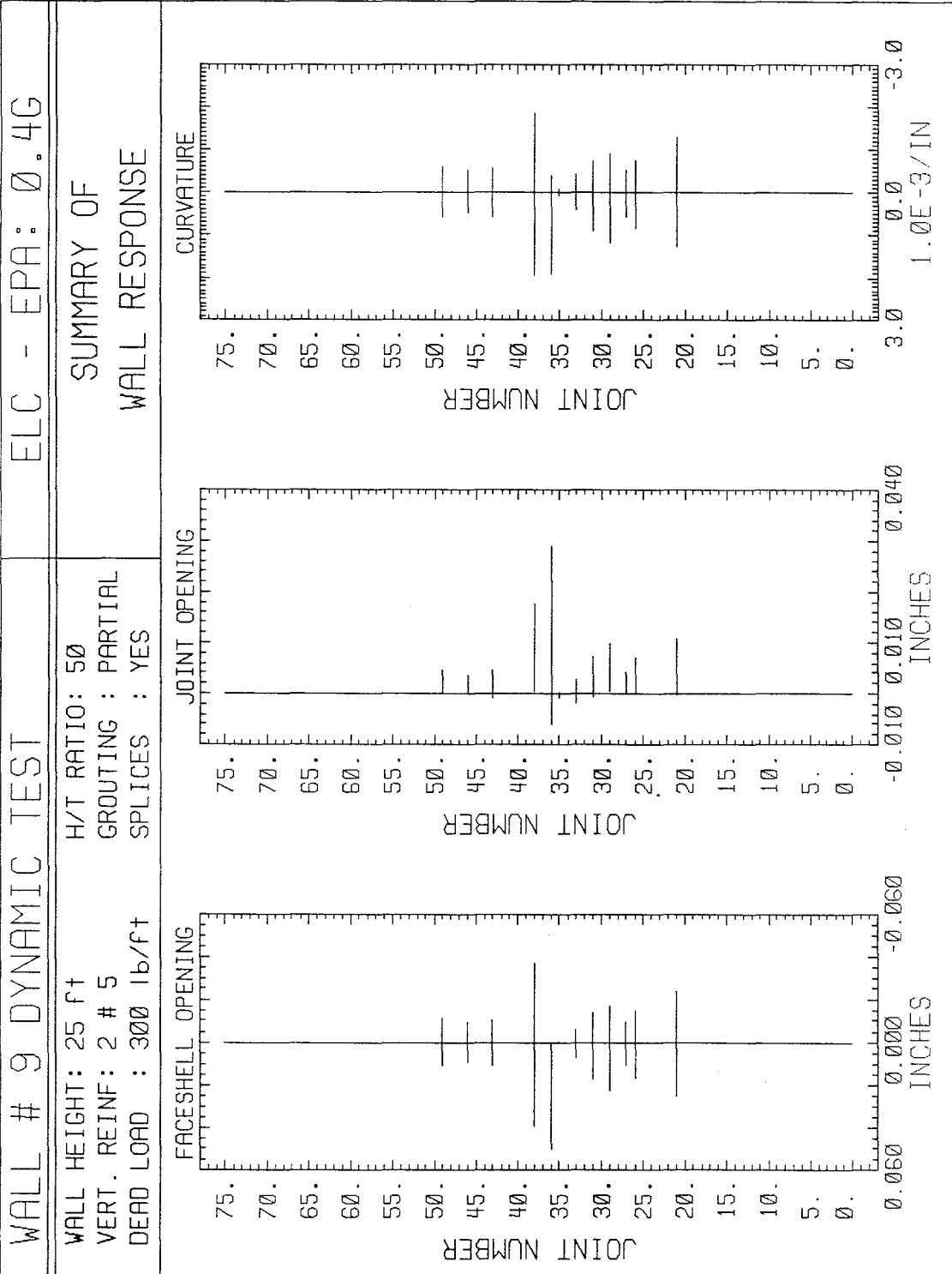
WALL HEIGHT: 25 FT  
 VERT. REINF: 2 # 5  
 DEAD LOAD : 300 lb/ft

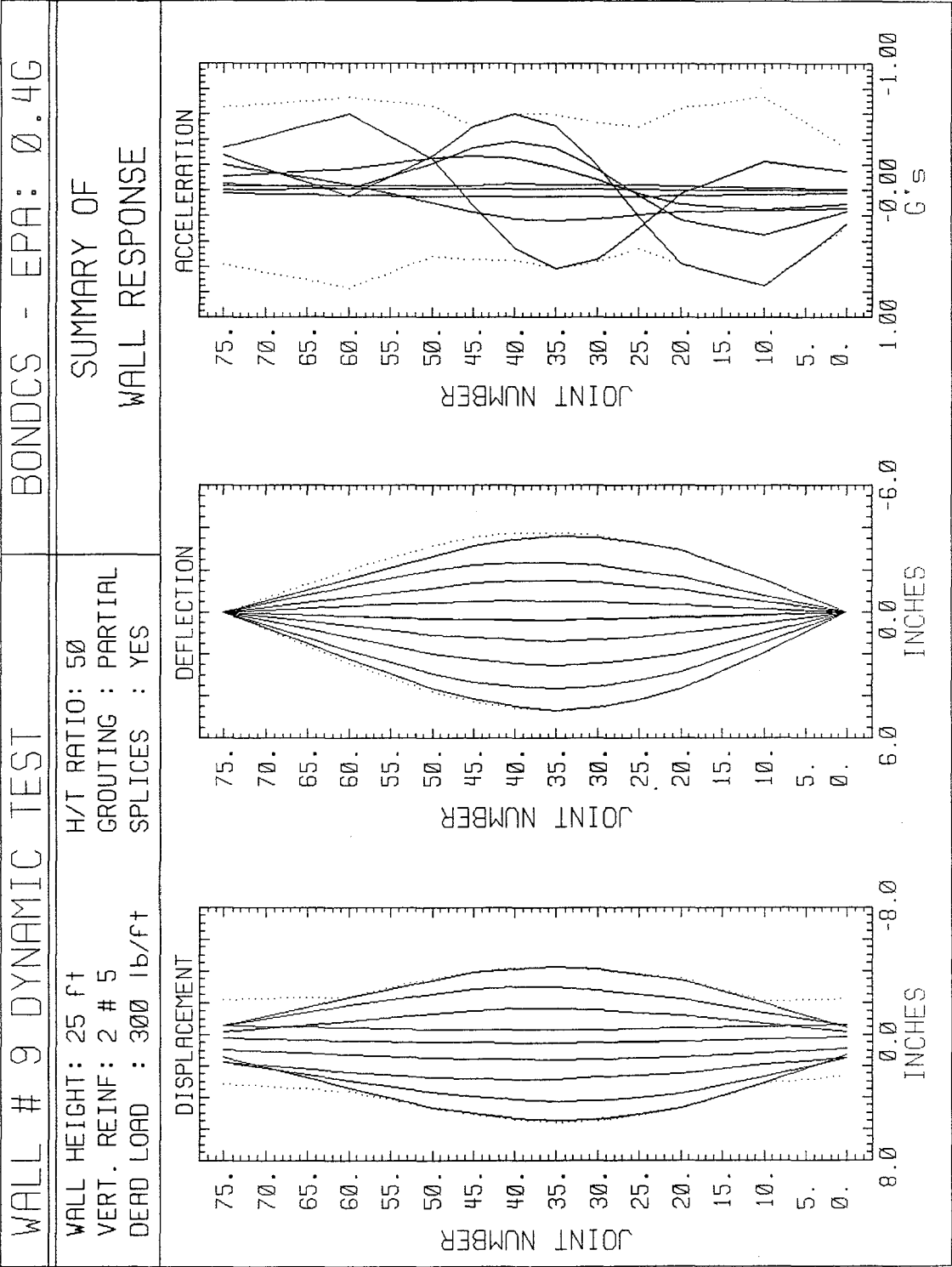
H/T RATIO: 50  
 GROUTING : PARTIAL  
 SPLICES : YES

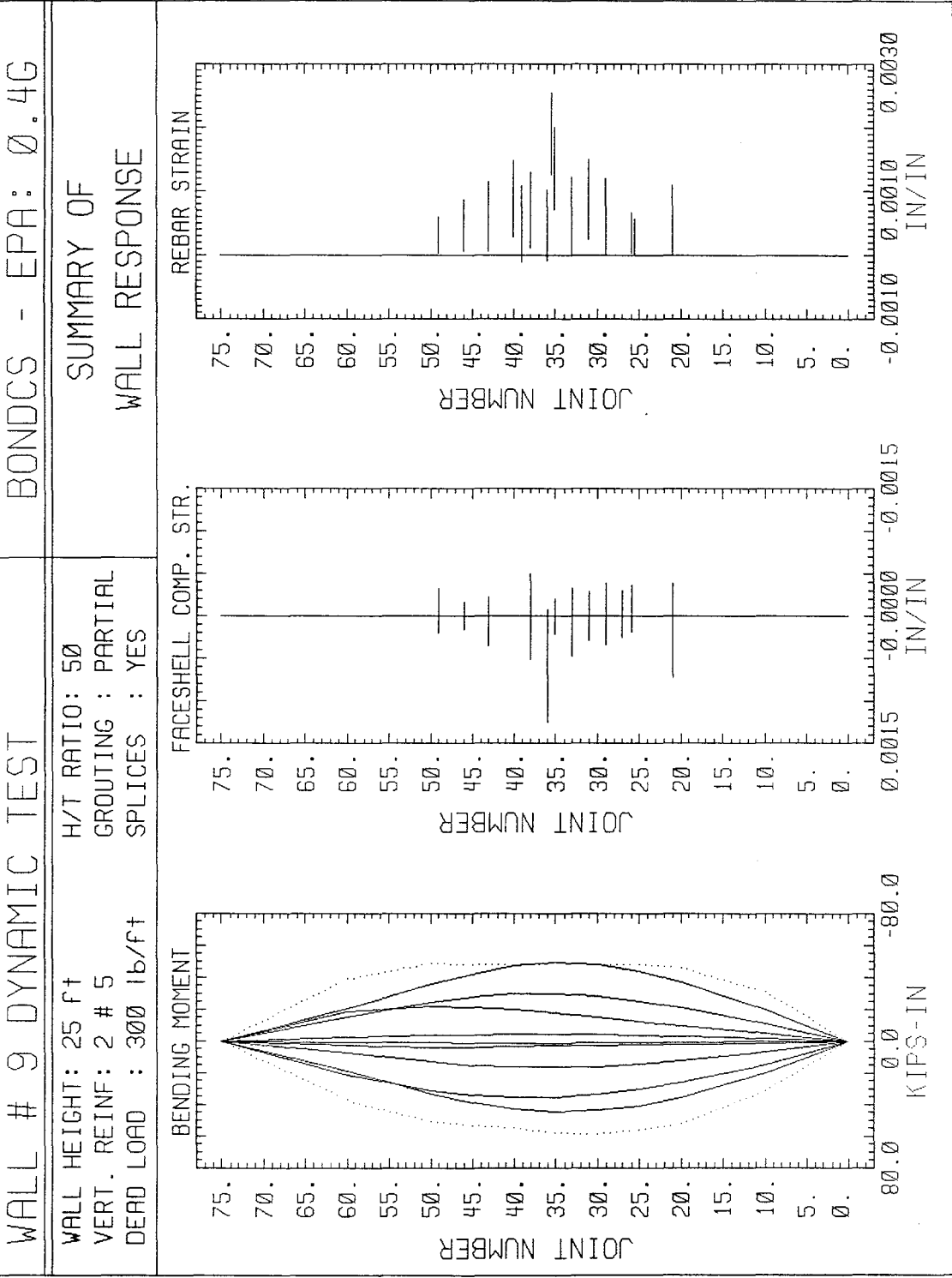
SUMMARY OF WALL RESPONSE

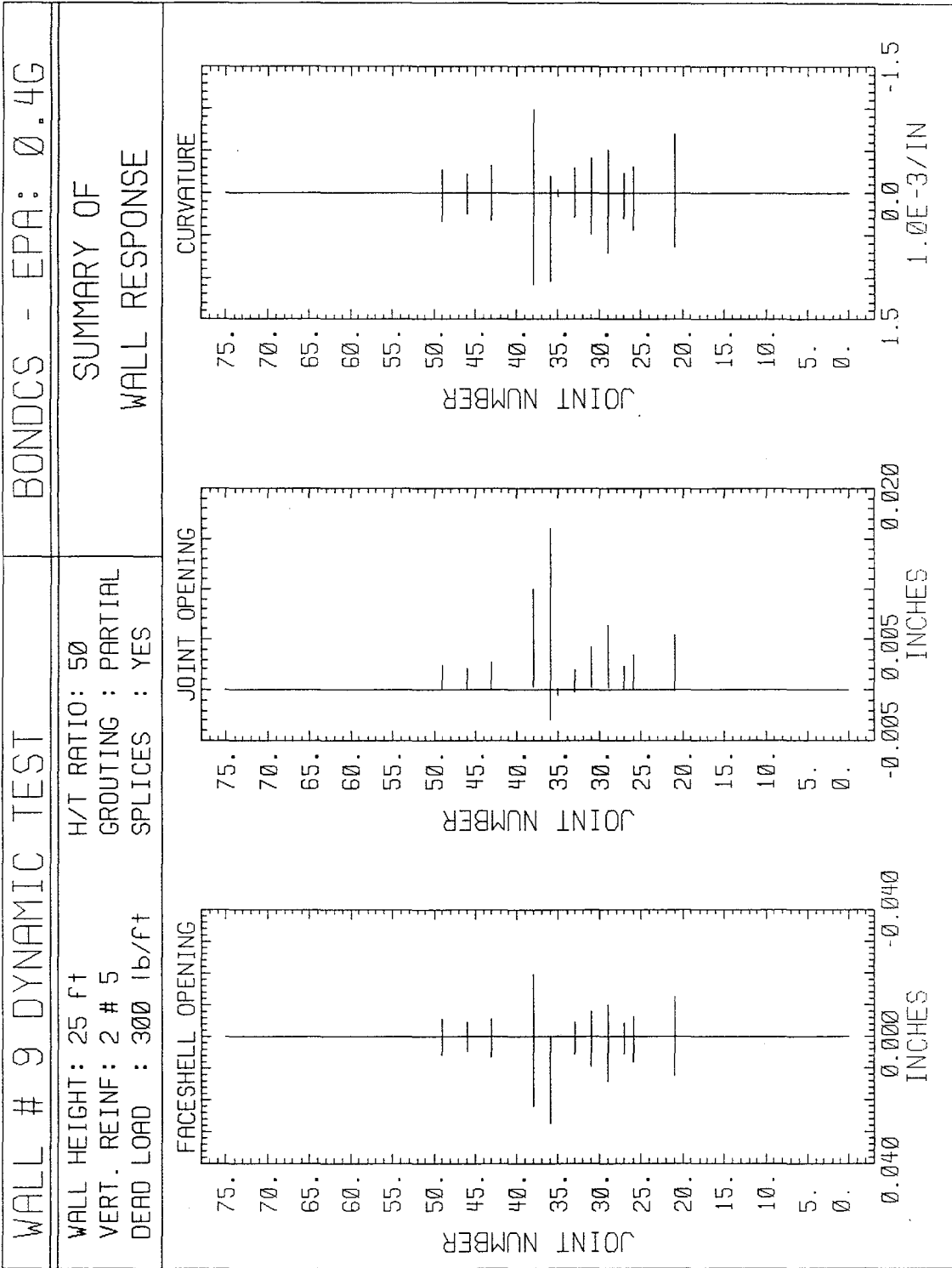














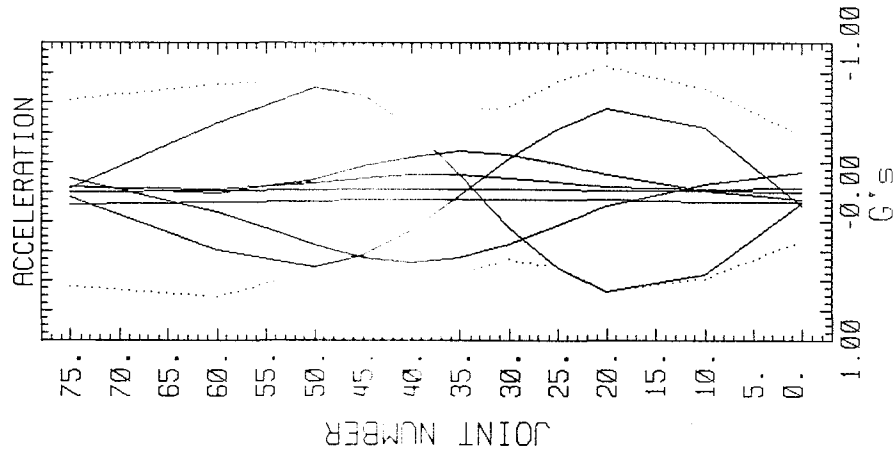
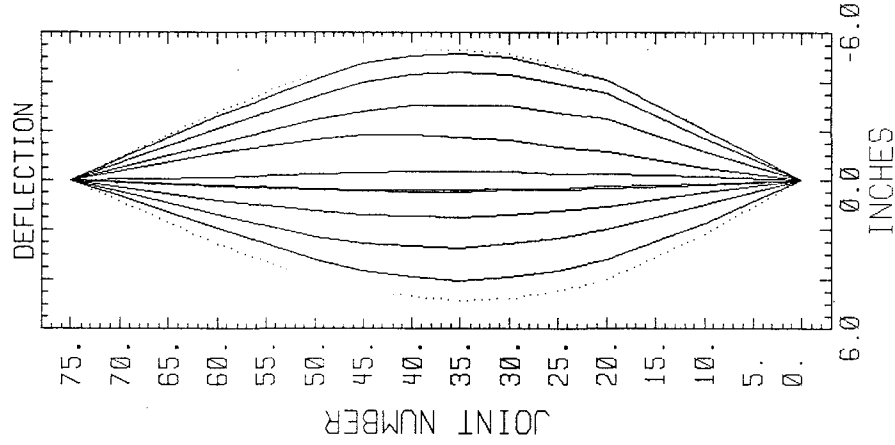
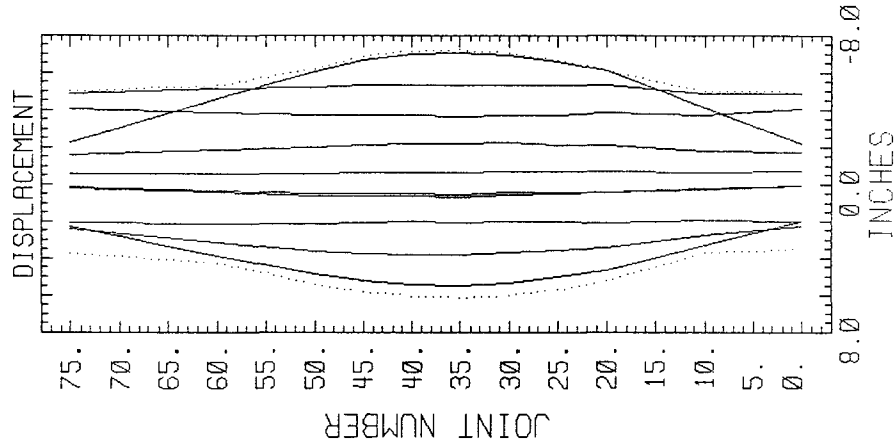
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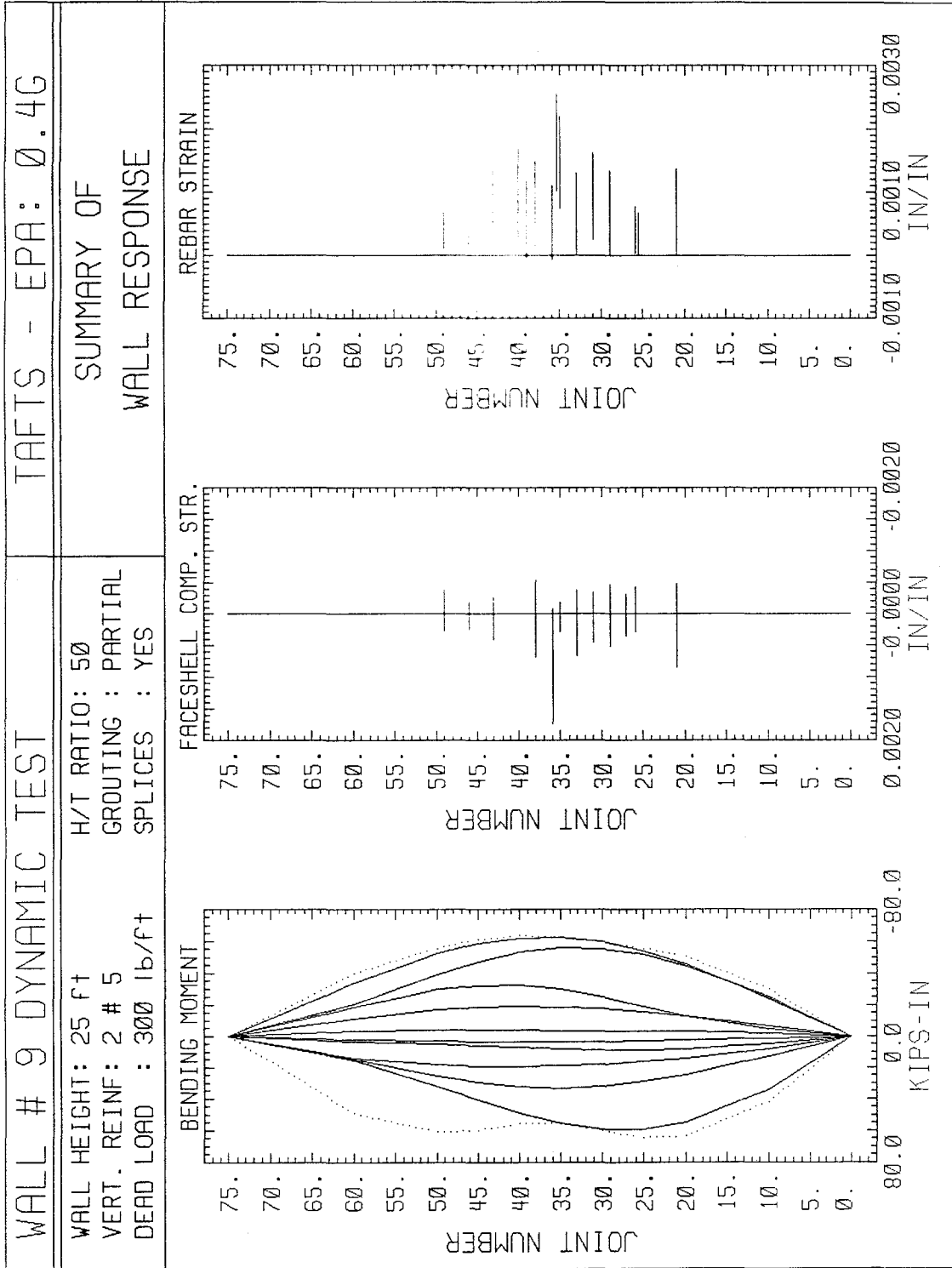
TAFTS - EPA: 0.4G

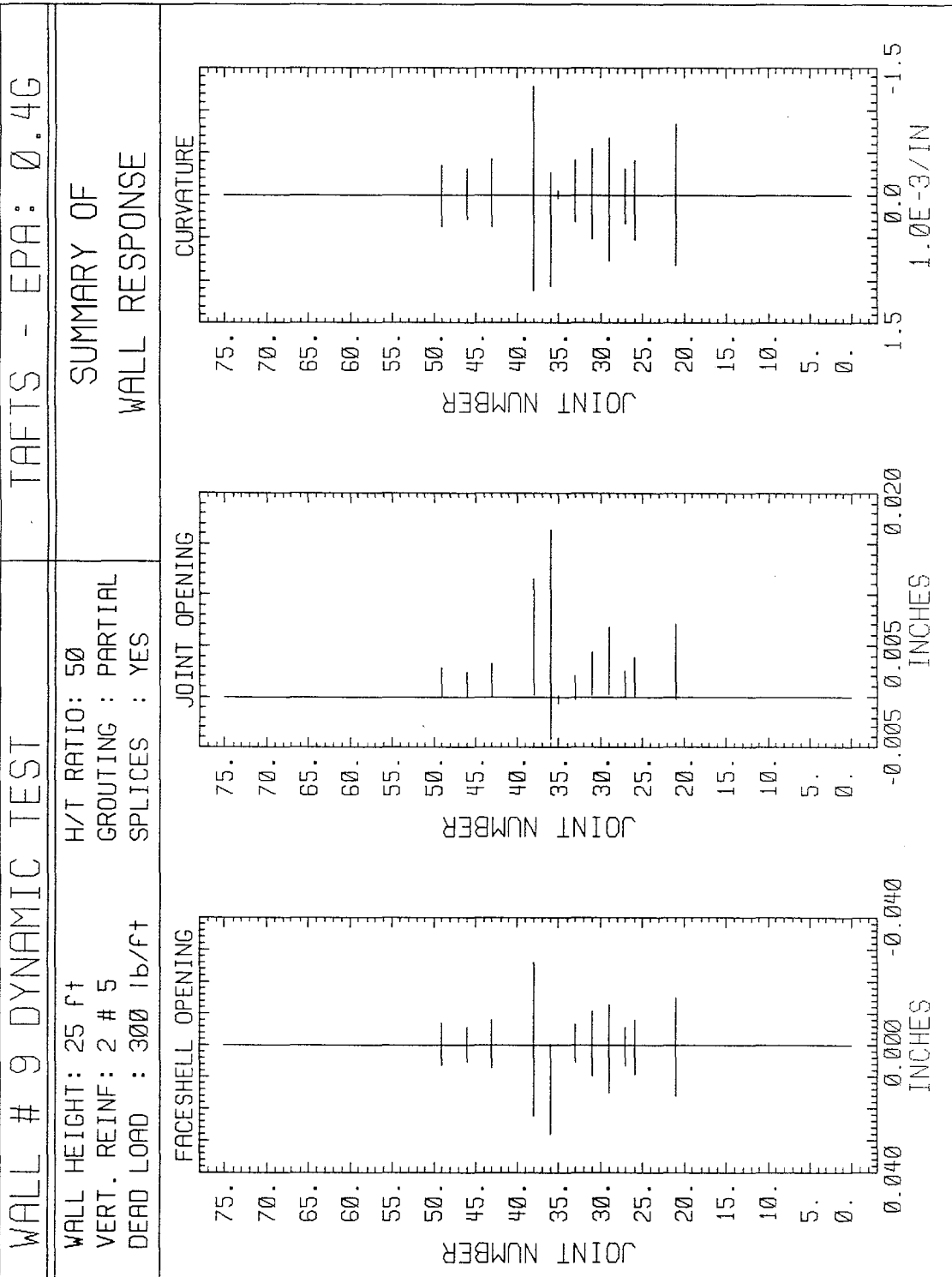
WALL HEIGHT: 25 FT  
 VERT. REINF: 2 # 5  
 DEAD LOAD : 300 lb/ft

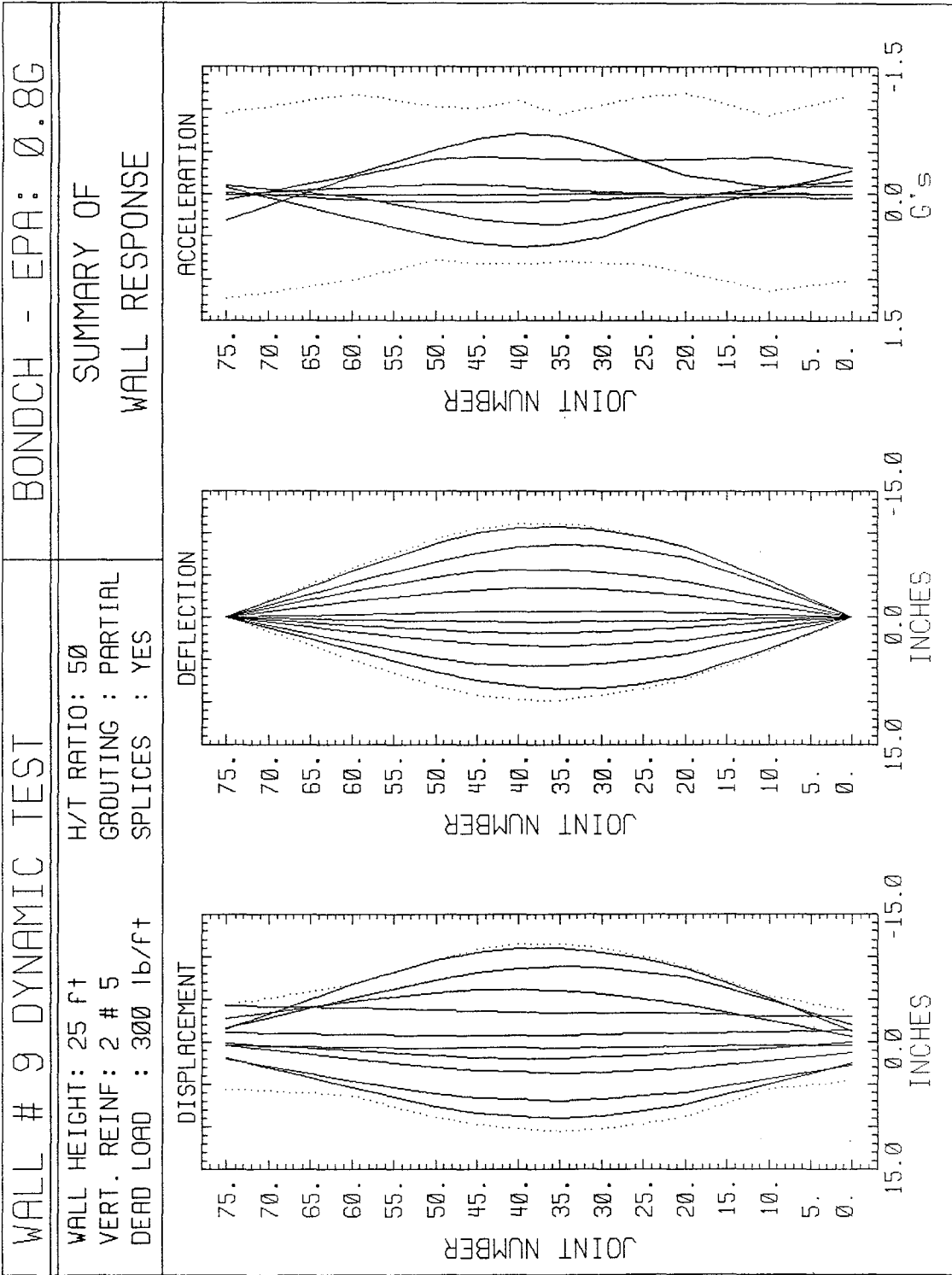
H/T RATIO: 50  
 GROUTING : PARTIAL  
 SPLICES : YES

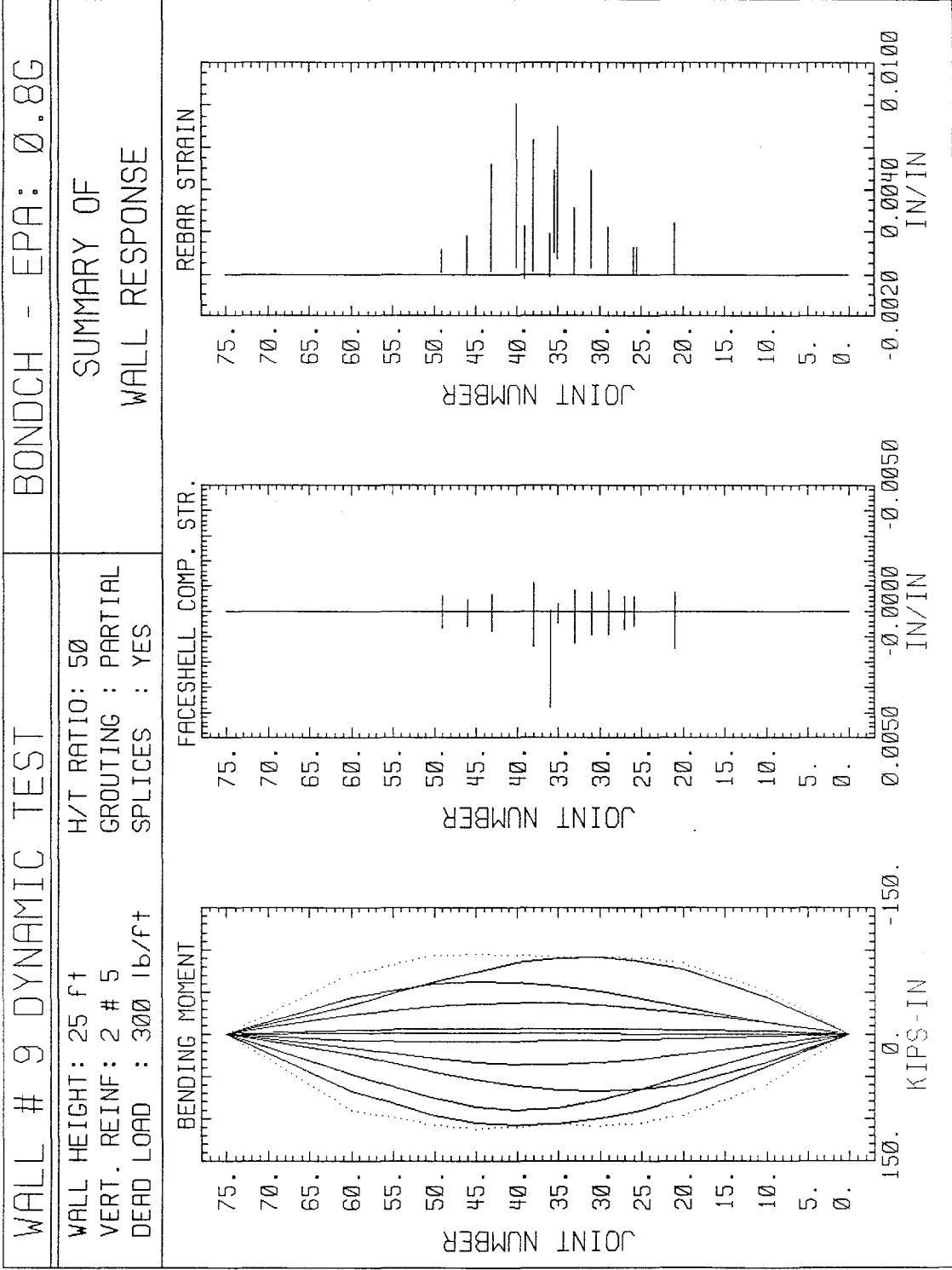
SUMMARY OF  
 WALL RESPONSE

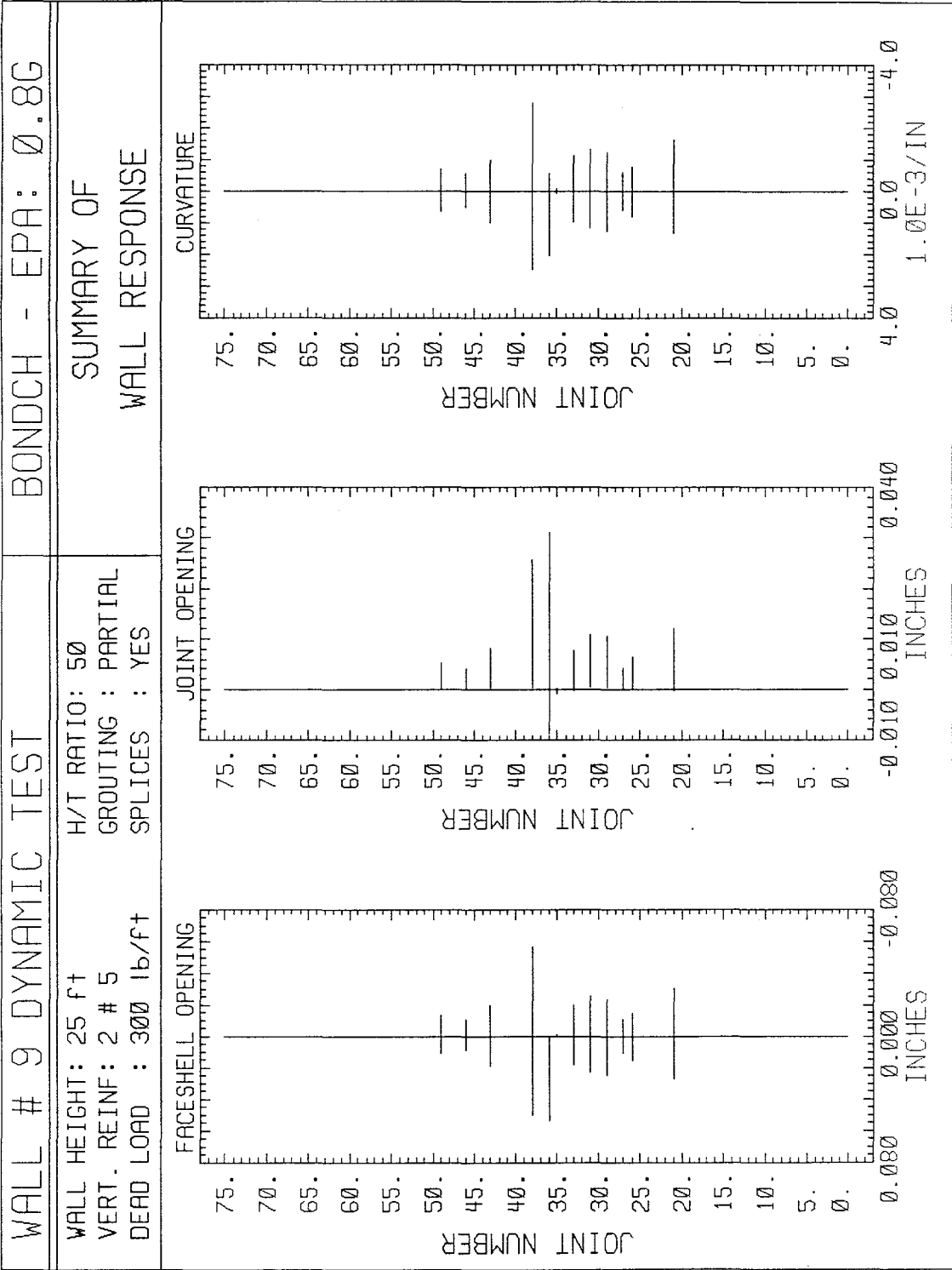


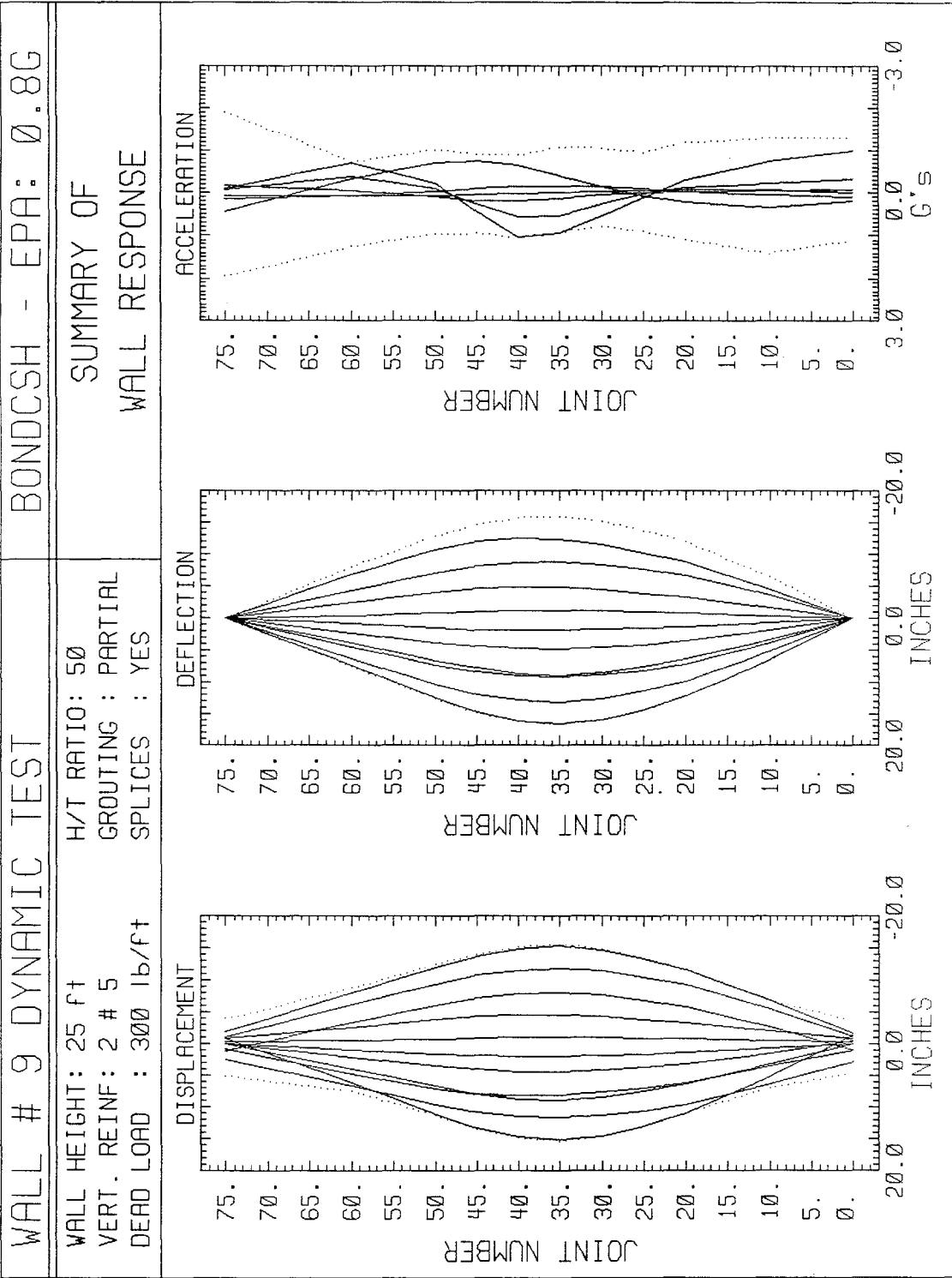


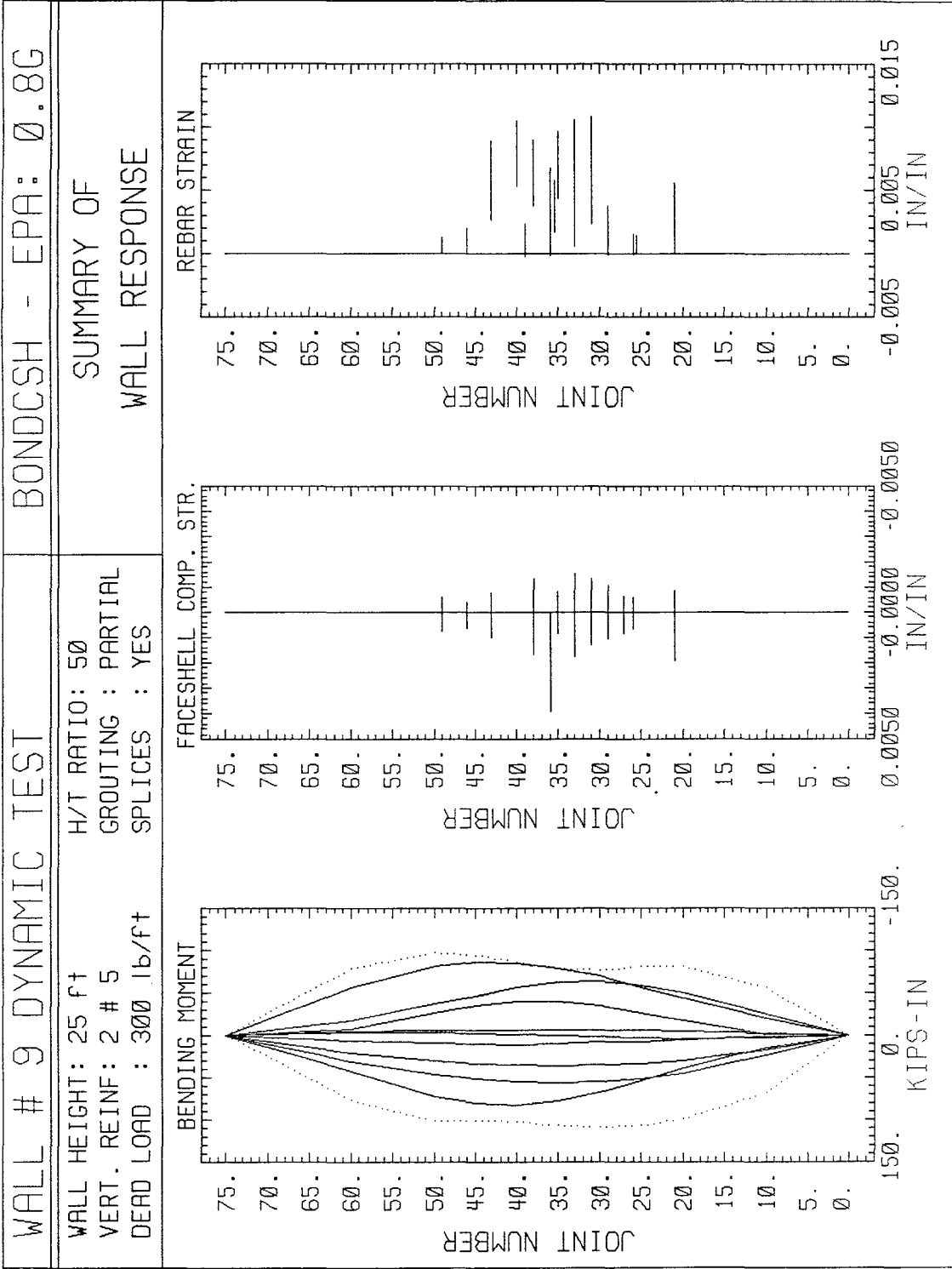




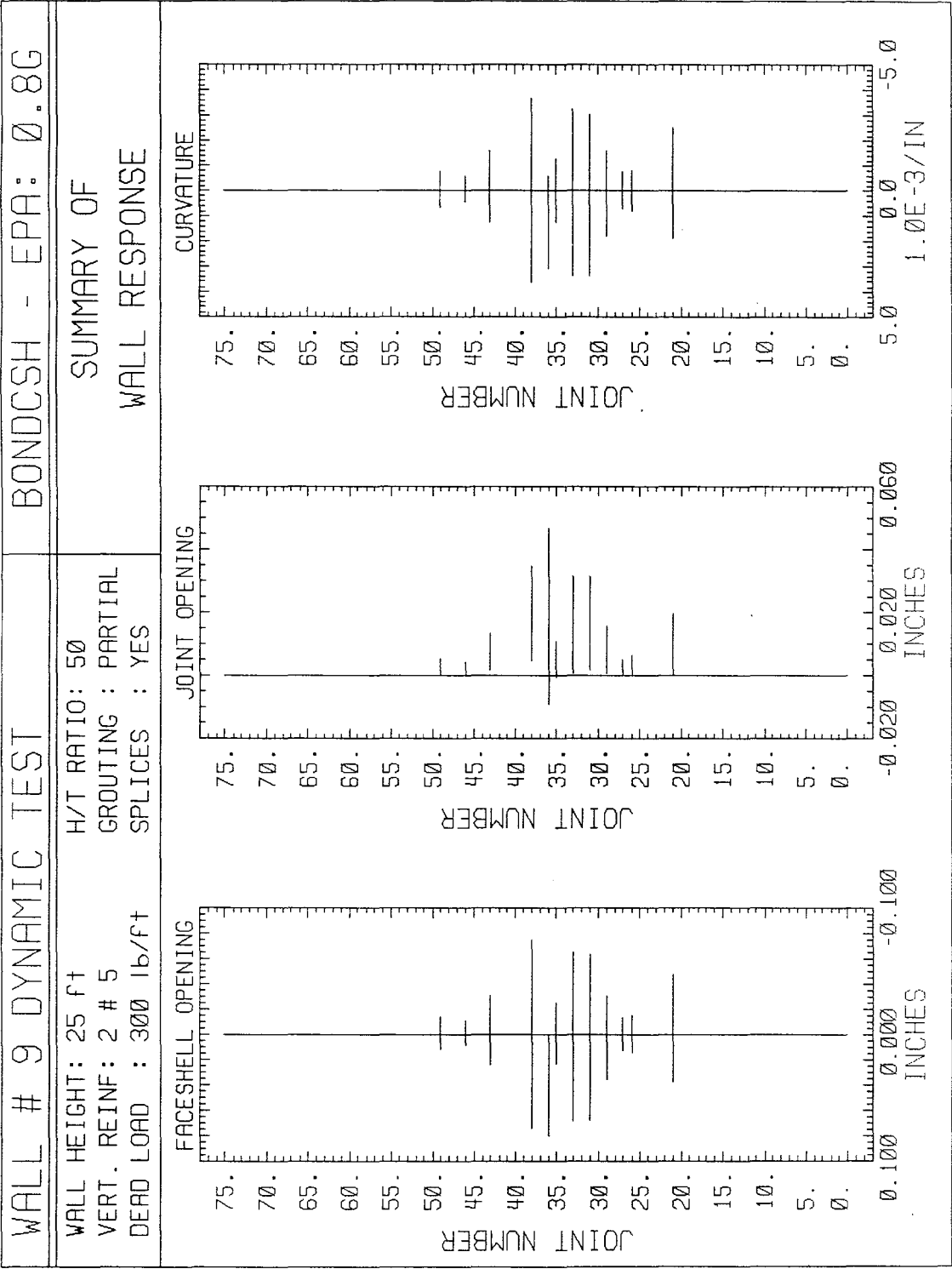


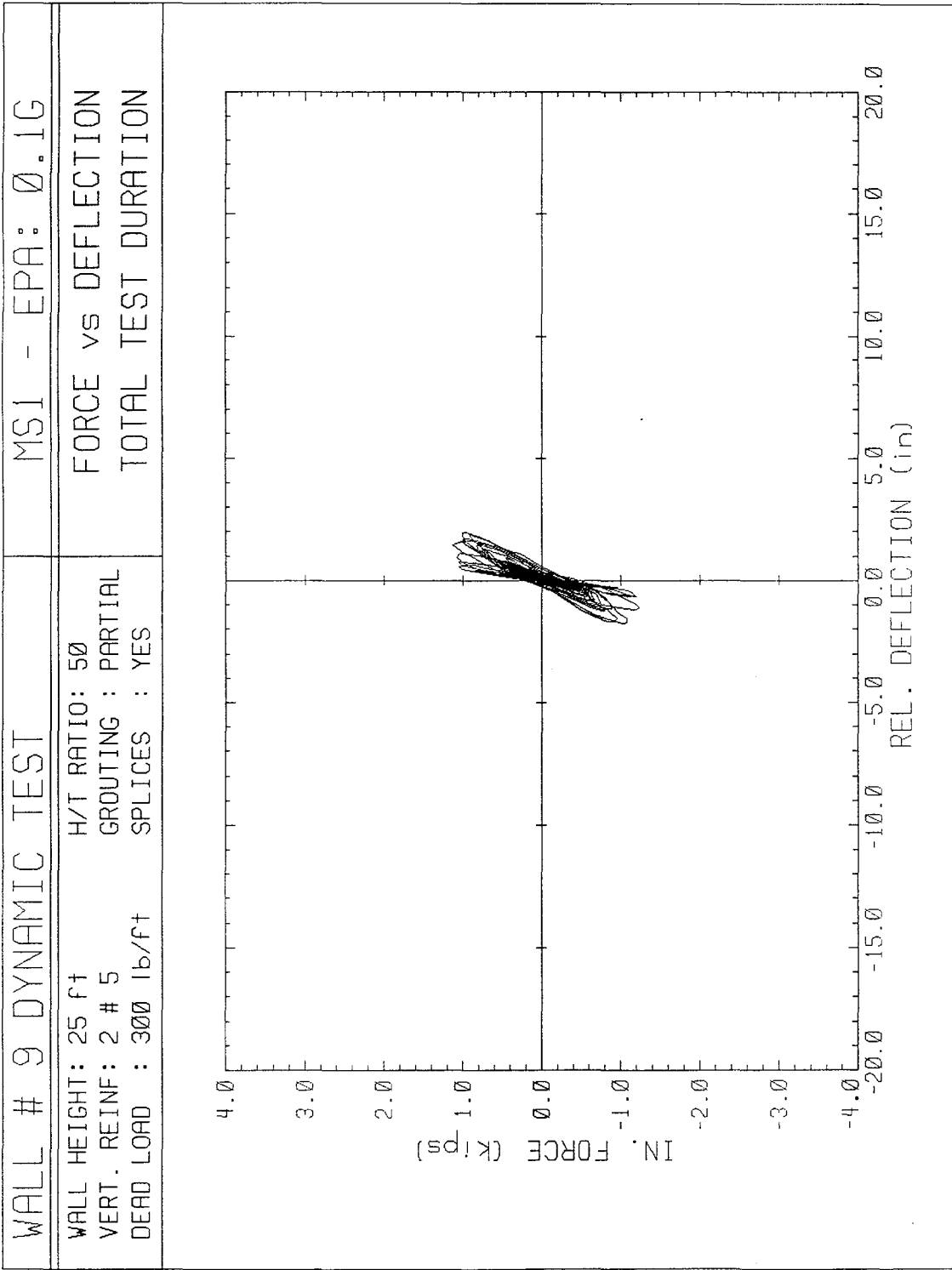


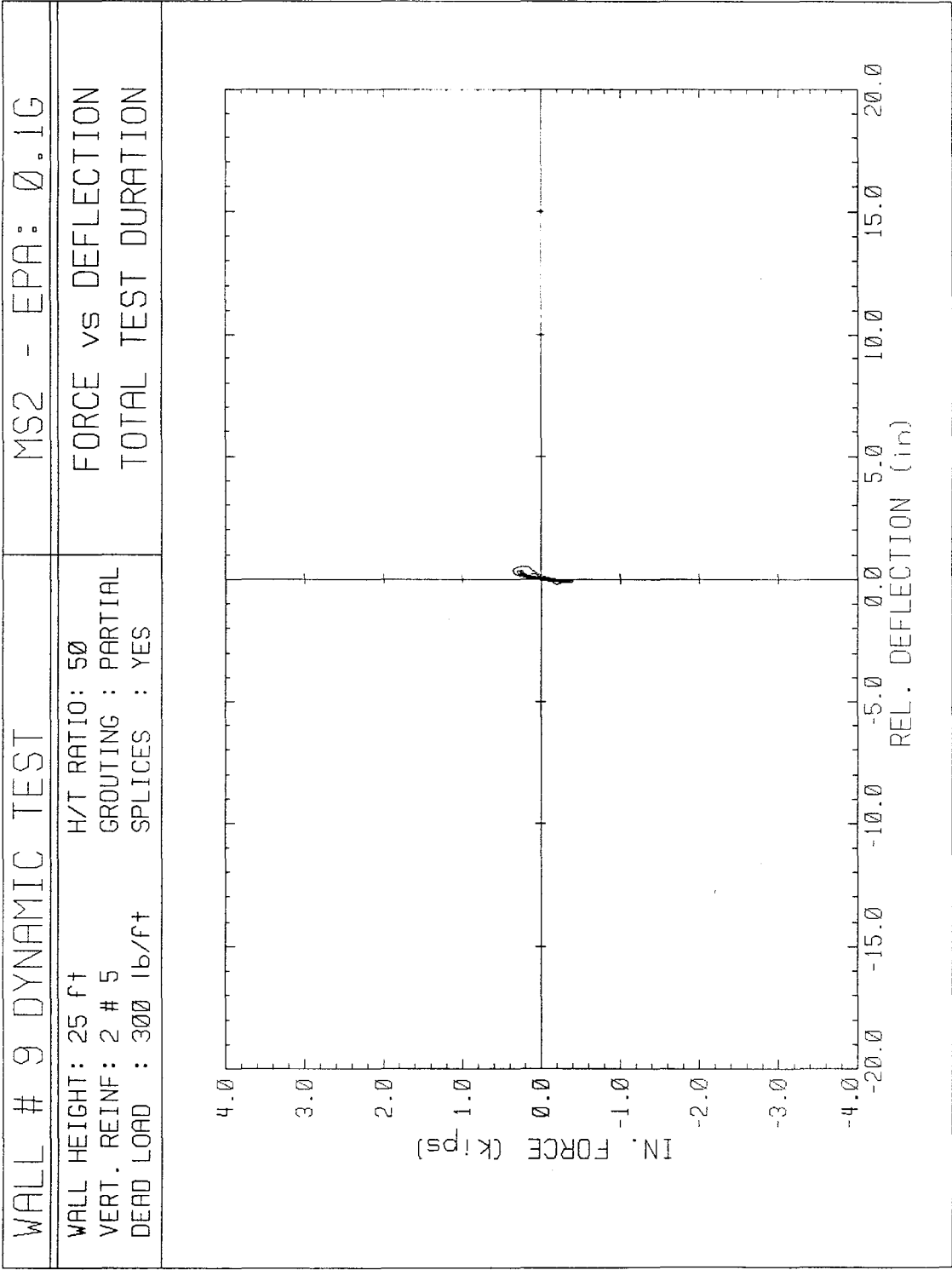






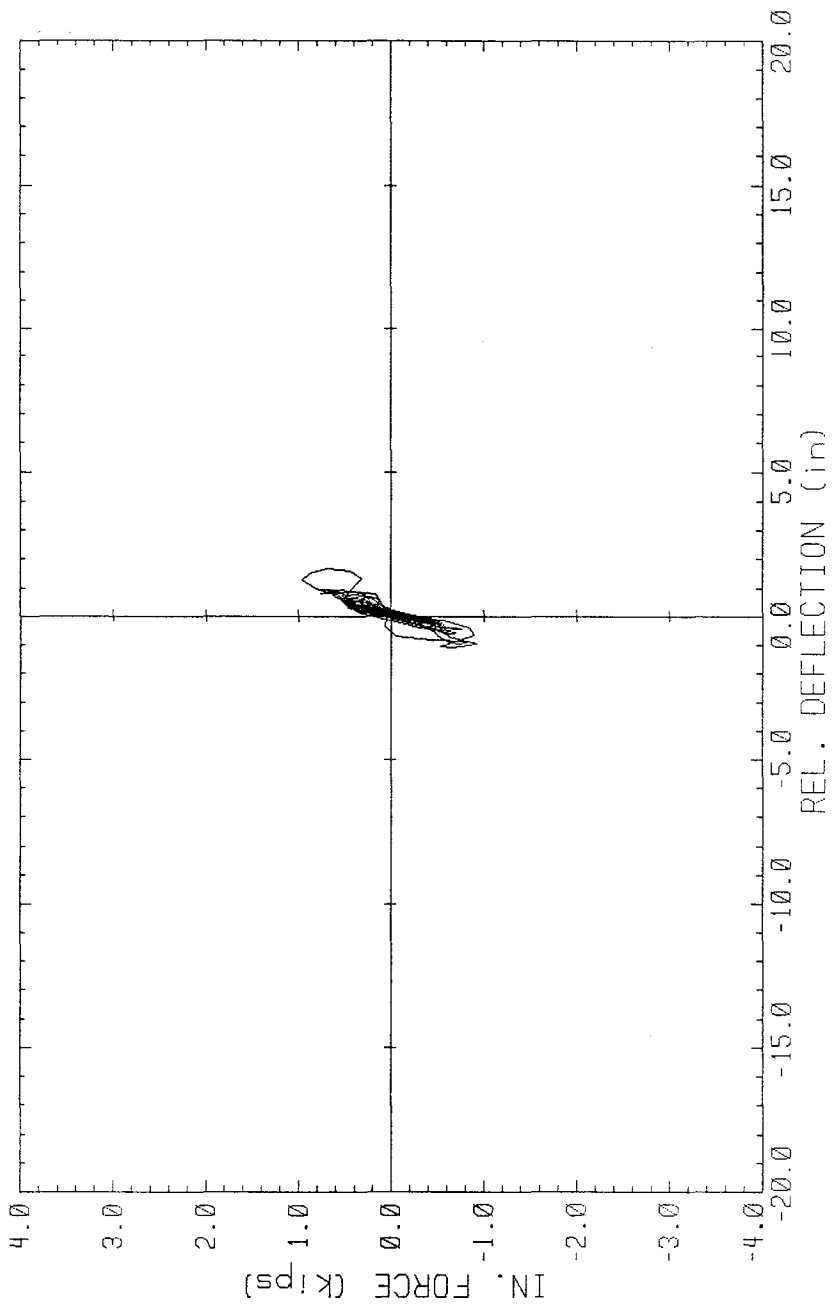


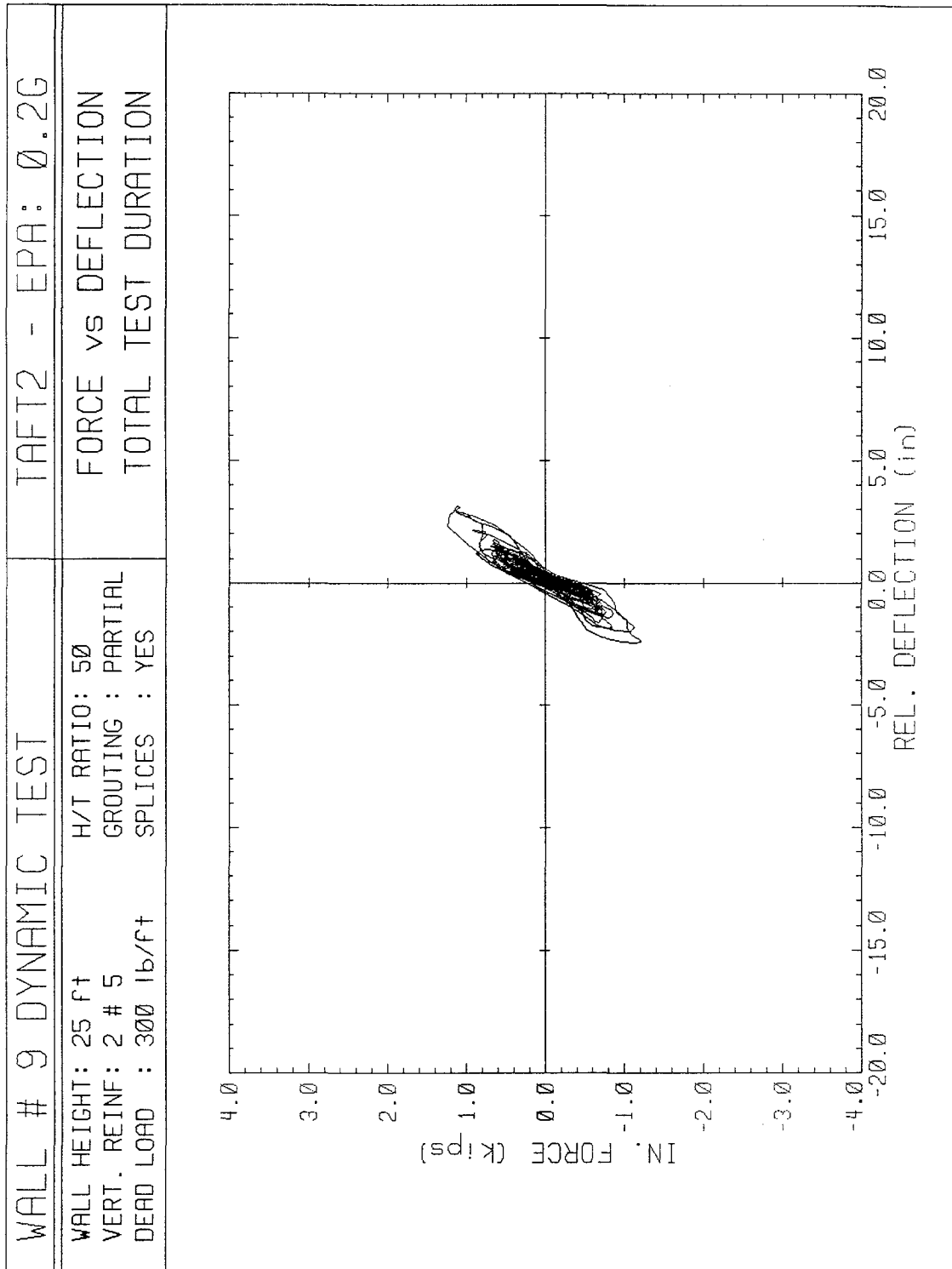




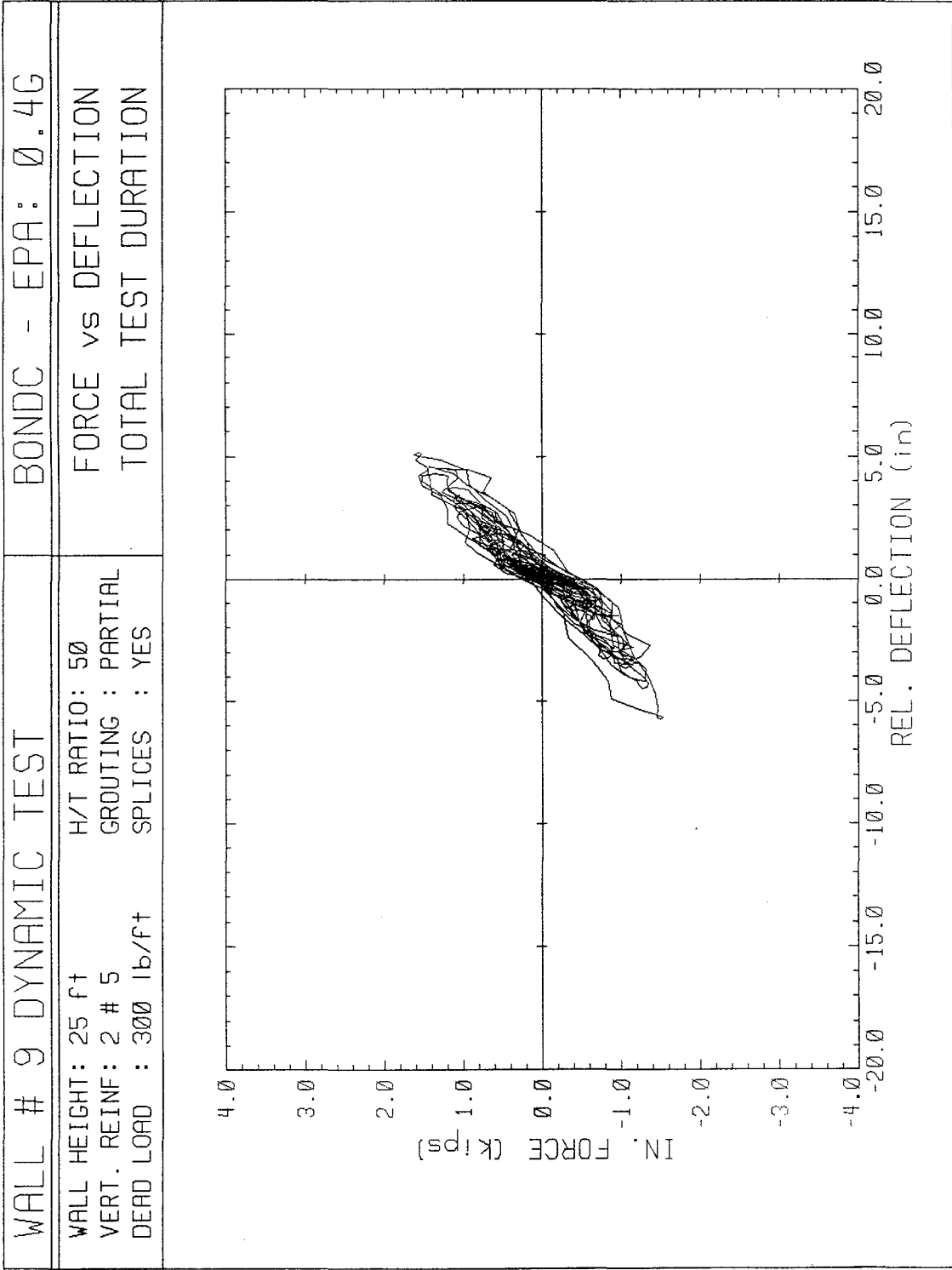
WALL # 9 DYNAMIC TEST	TAFT1 - EPA: 0.1G
WALL HEIGHT: 25 ft VERT. REINF: 2 # 5 DEAD LOAD : 300 lb/ft	H/T RATIO: 50 GROUTING : PARTIAL SPLICES : YES
FORCE vs DEFLECTION TOTAL TEST DURATION	

WALL # 9 DYNAMIC TEST		ELC1 - EPA: 0.1G	
WALL HEIGHT: 25 ft	H/T RATIO: 50	FORCE vs DEFLECTION	
VERT. REINF: 2 # 5	GROUTING : PARTIAL	TOTAL TEST DURATION	
DEAD LOAD : 300 lb/ft	SPLICES : YES		

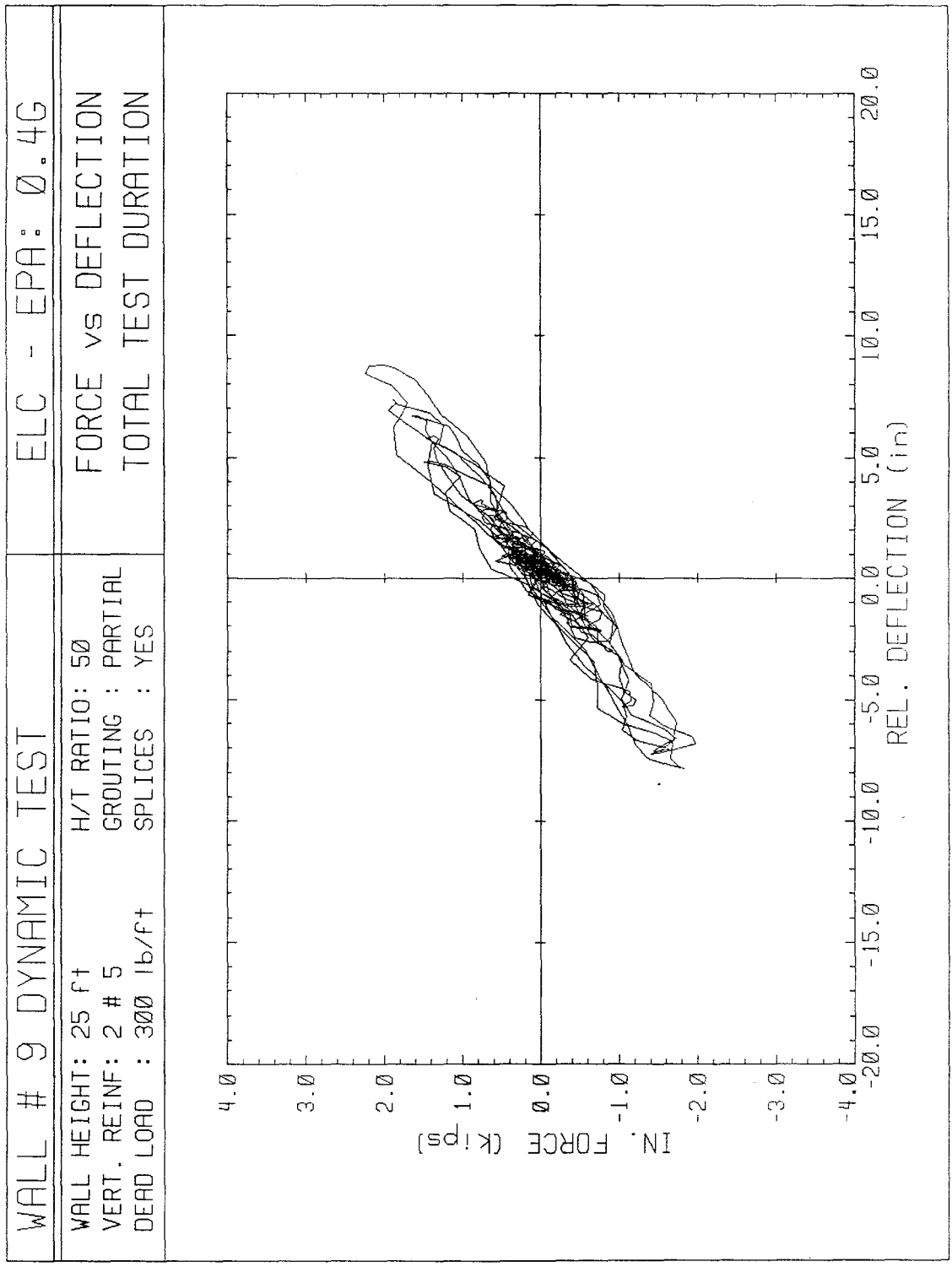


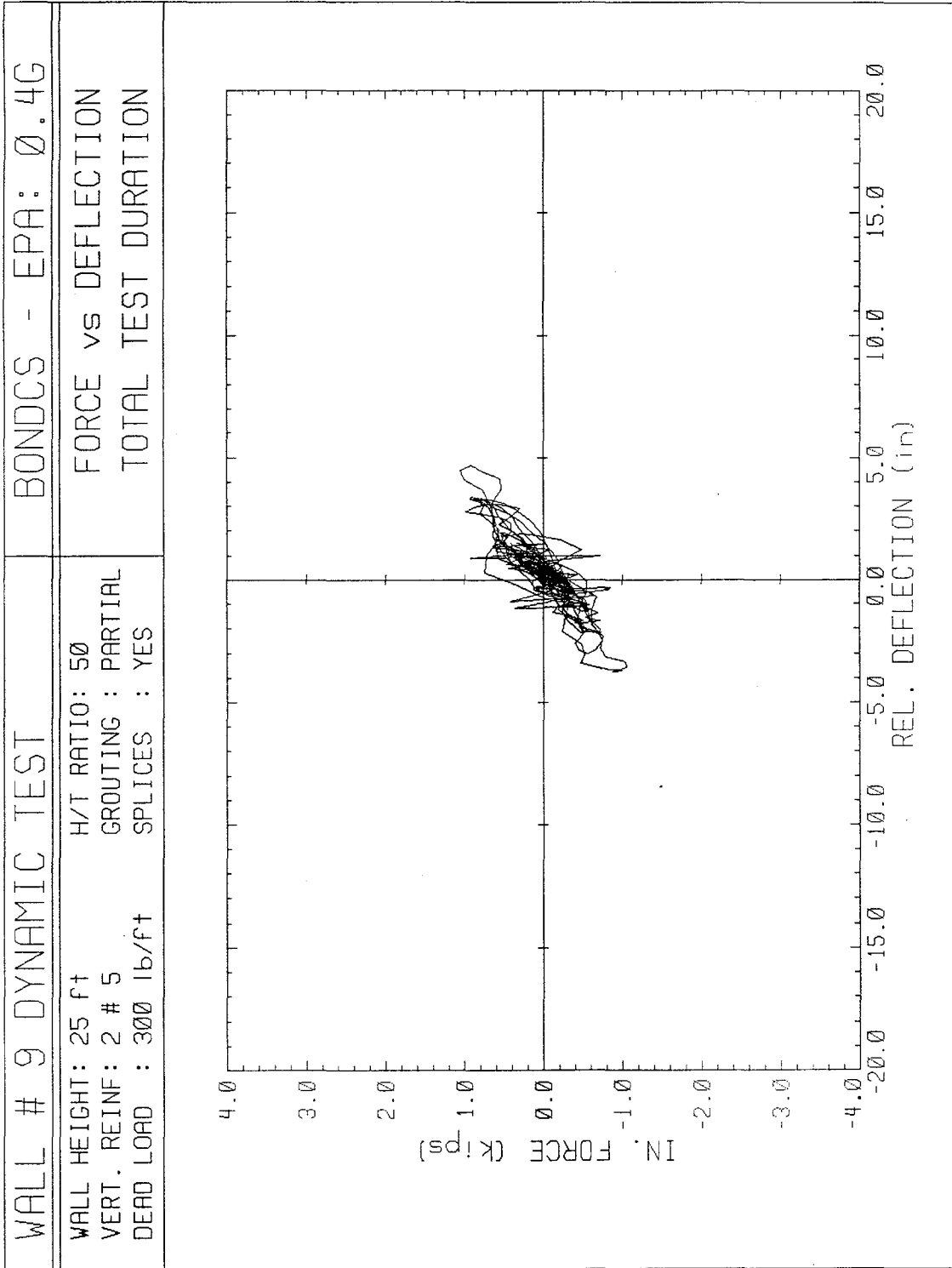


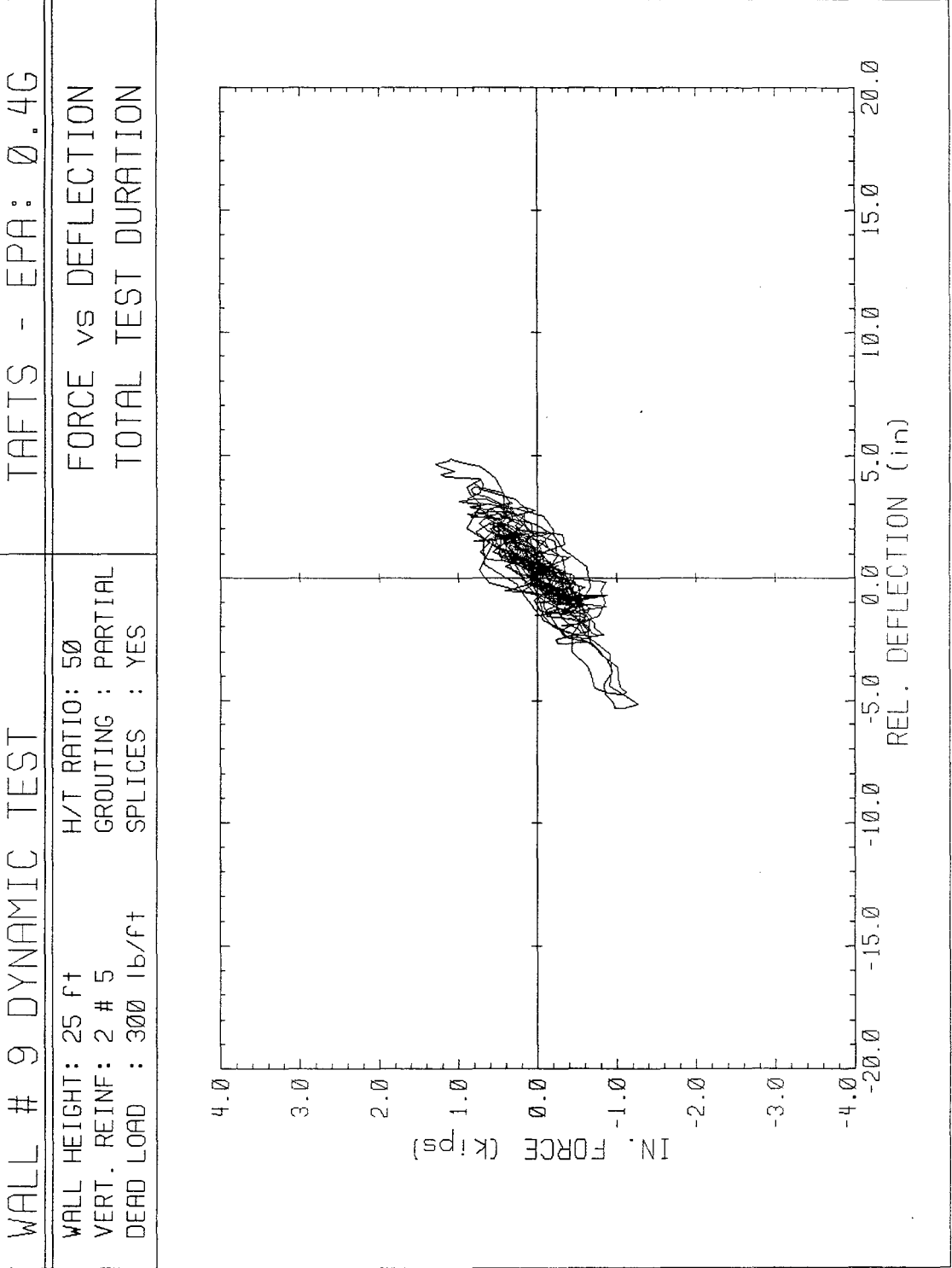
WALL # 9 DYNAMIC TEST	ELC2 - EPA: 0.2G
WALL HEIGHT: 25 FT VERT. REINF: 2 # 5 DEAD LOAD : 300 lb/ft	H/T RATIO: 50 GROUTING : PARTIAL SPLICES : YES
FORCE vs DEFLECTION	
TOTAL TEST DURATION	

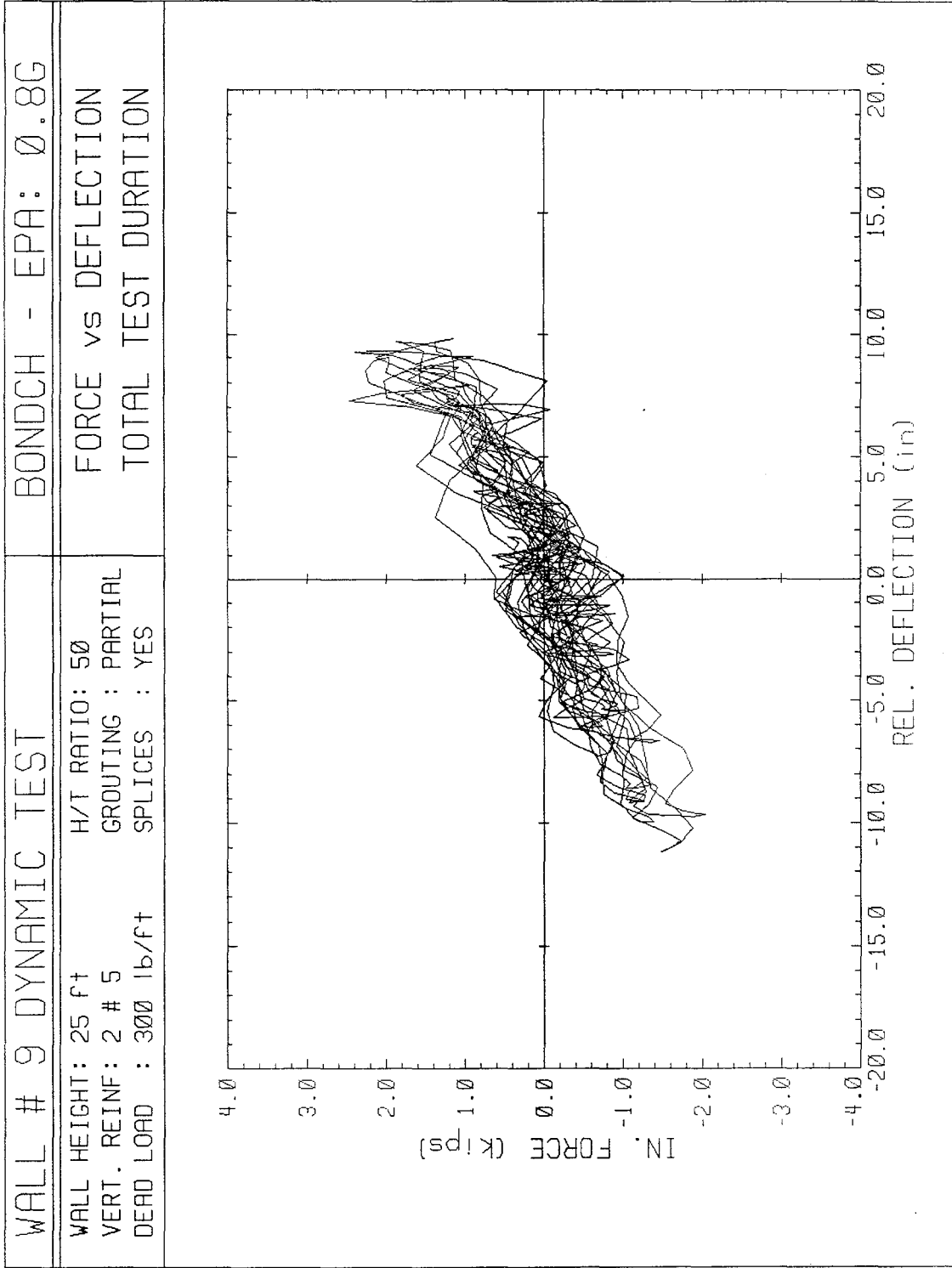


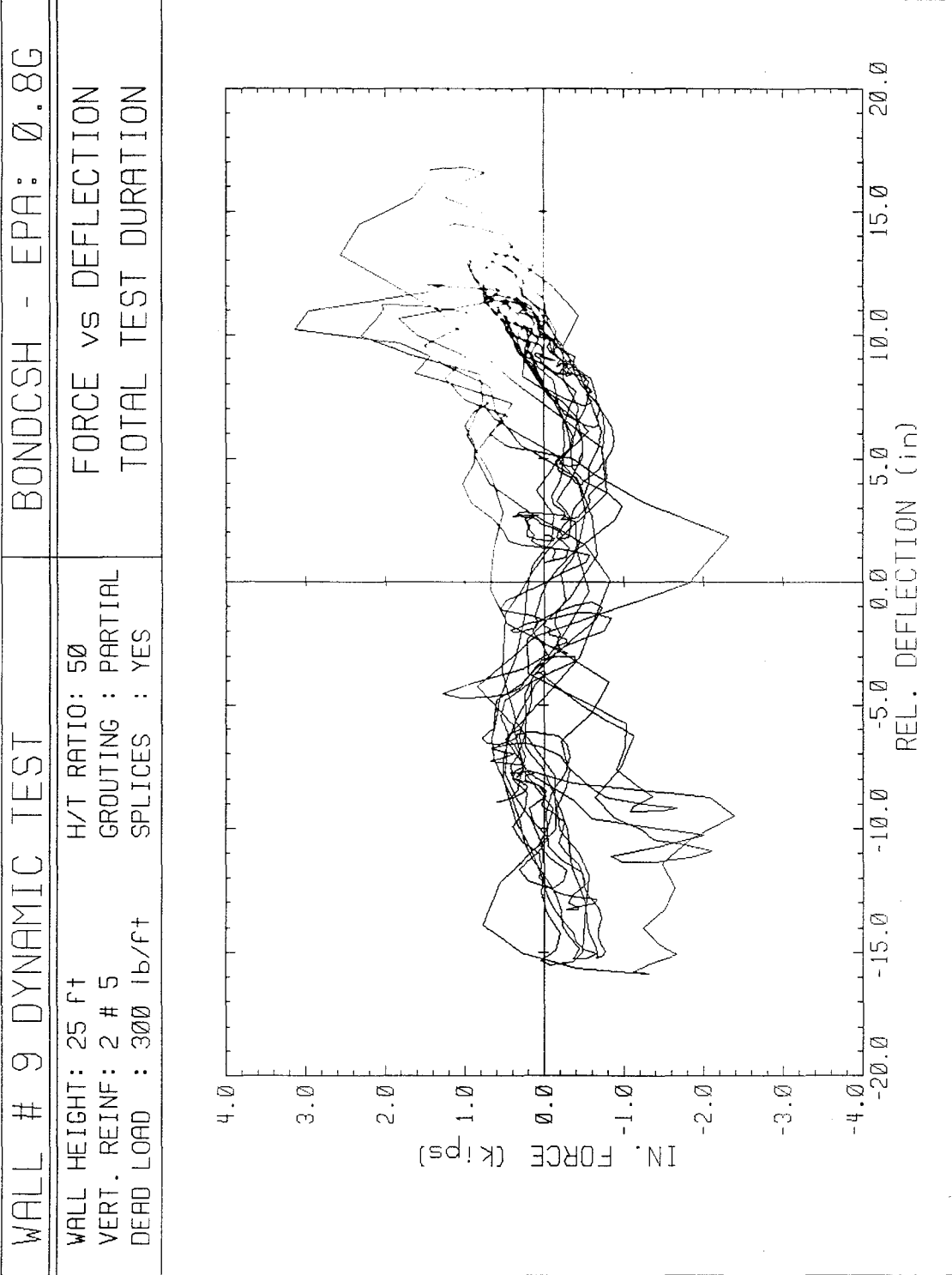


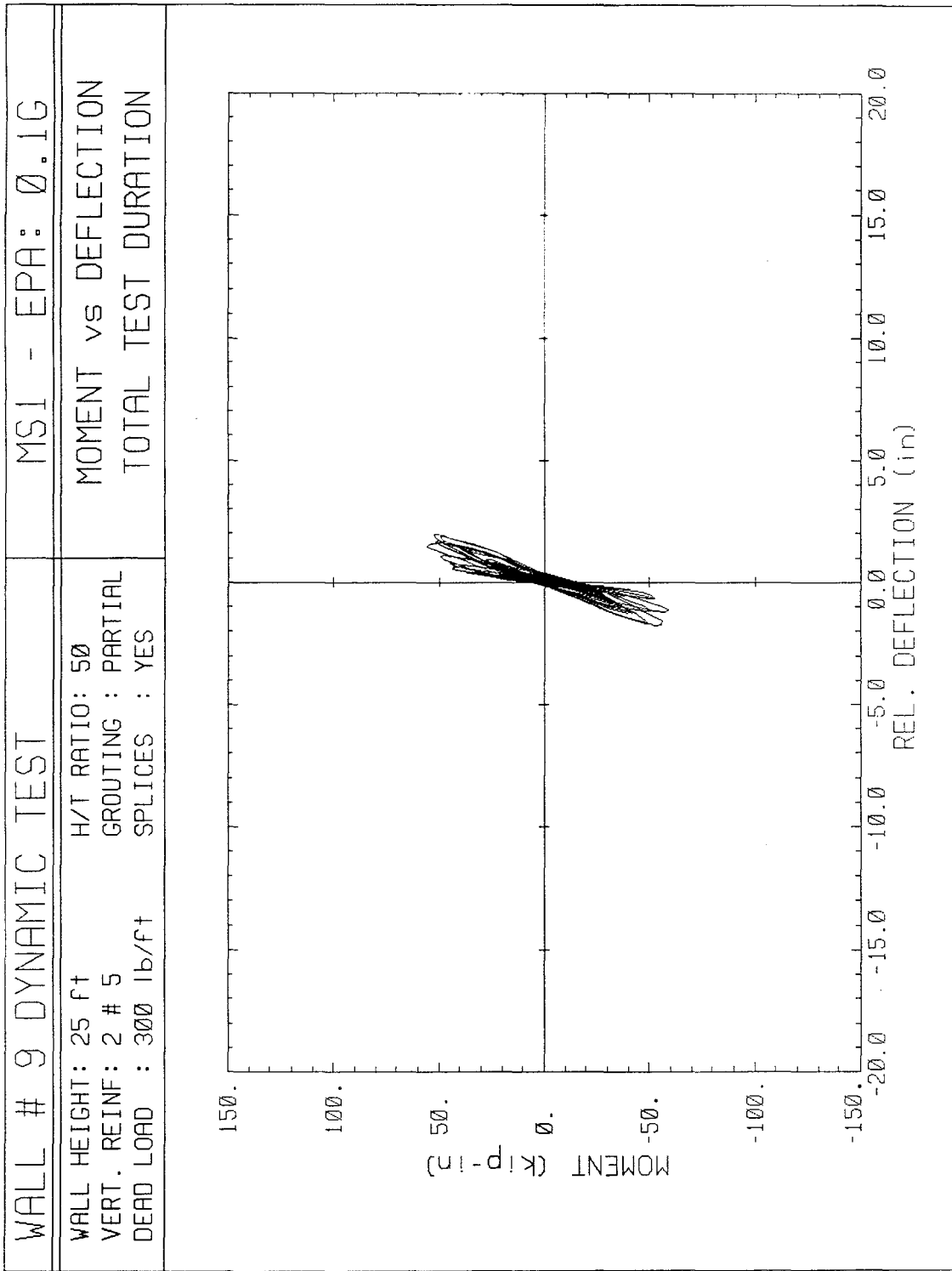




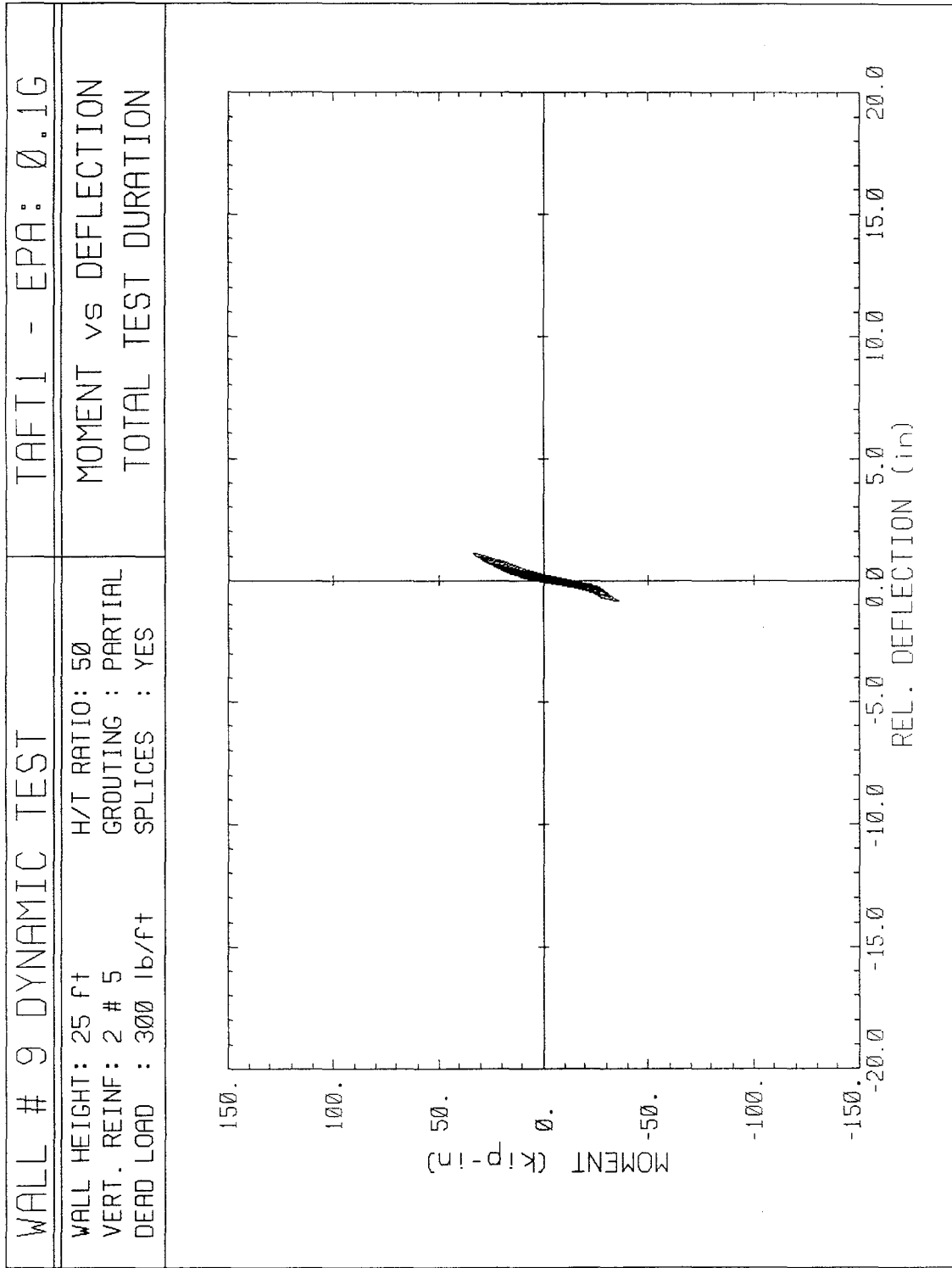






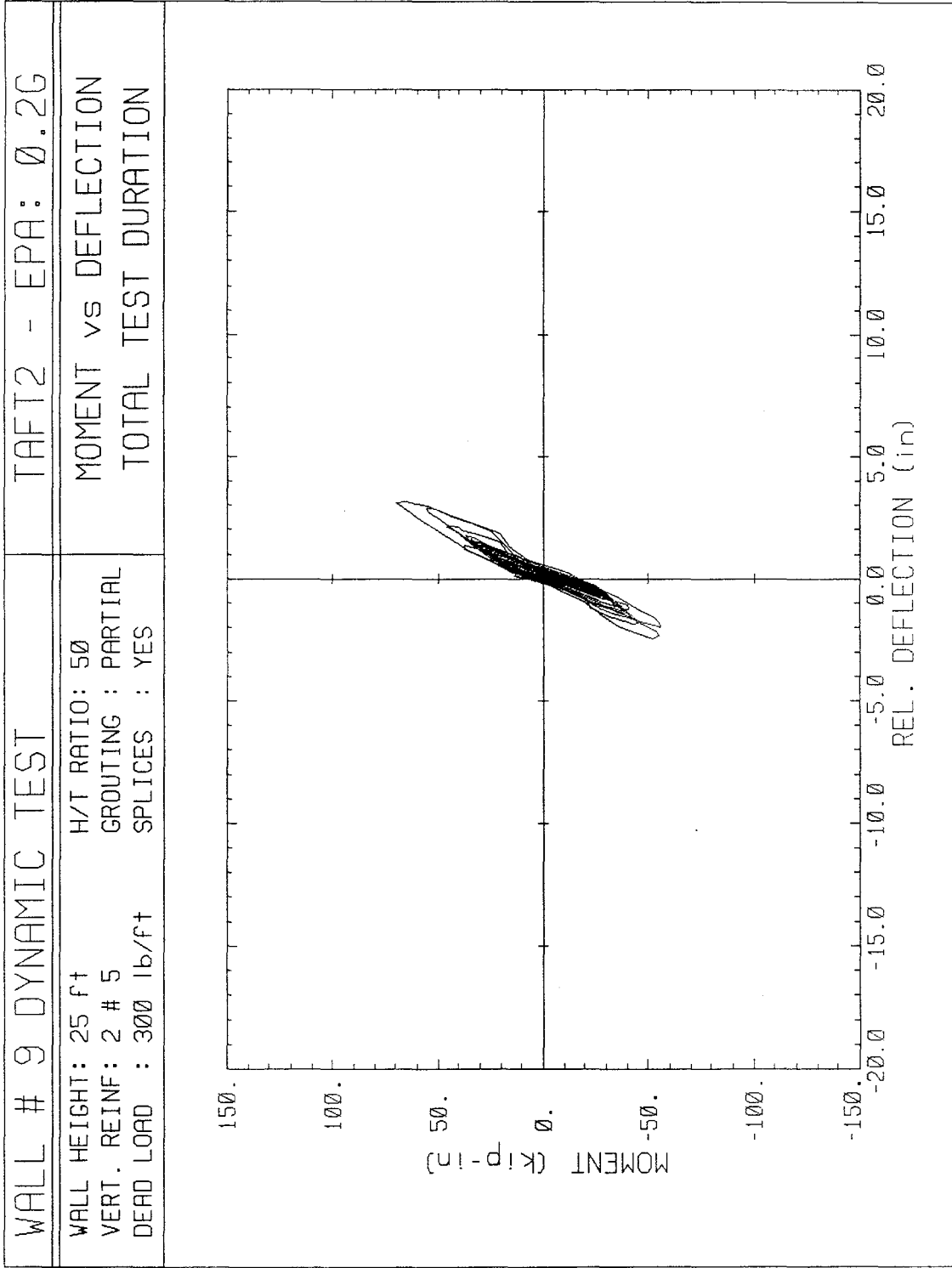


WALL # 9 DYNAMIC TEST	MS2 - EPA: 0.1G
WALL HEIGHT: 25 FT VERT. REINF: 2 # 5 DEAD LOAD : 300 lb/ft+	H/T RATIO: 50 GROUTING : PARTIAL SPLICES : YES
MOMENT vs DEFLECTION	
TOTAL TEST DURATION	

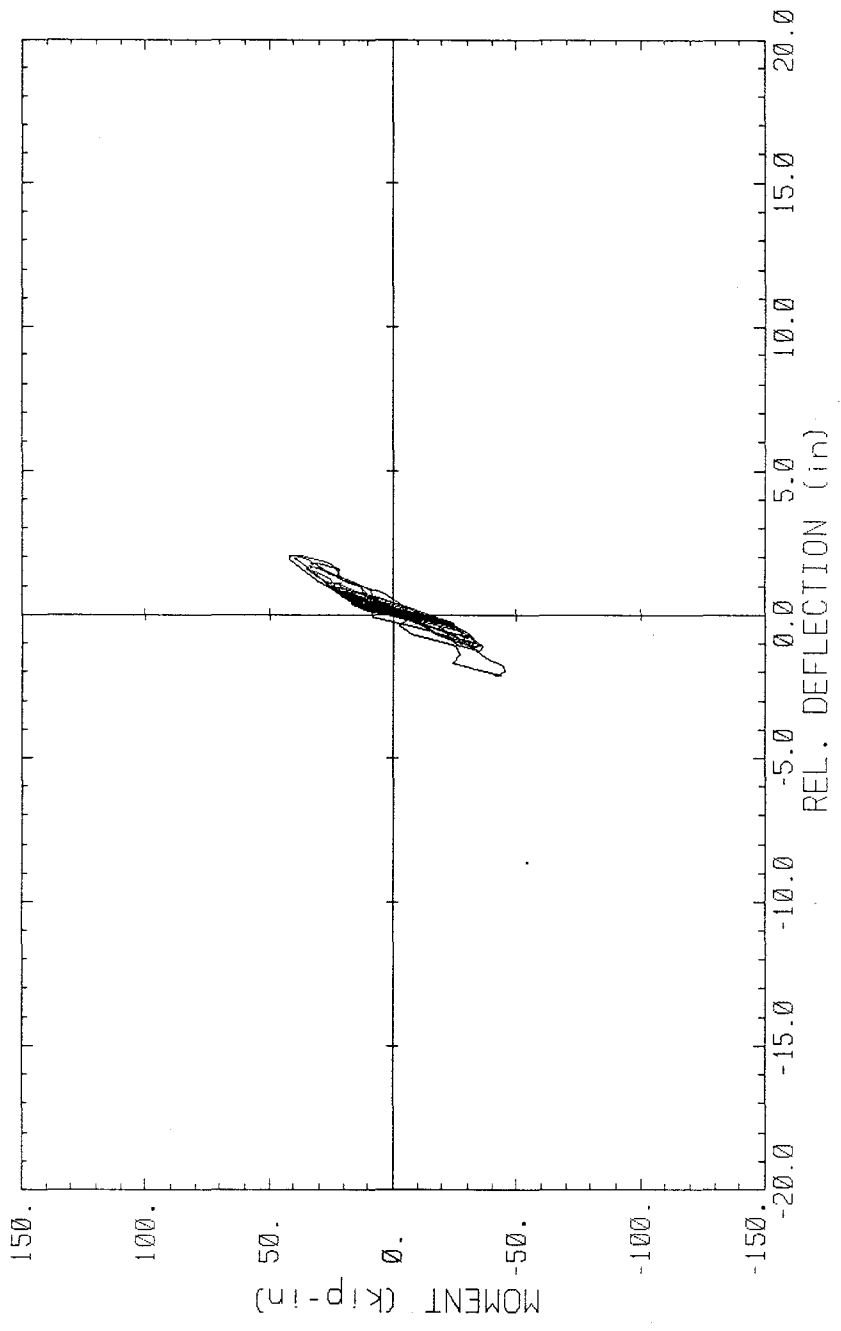


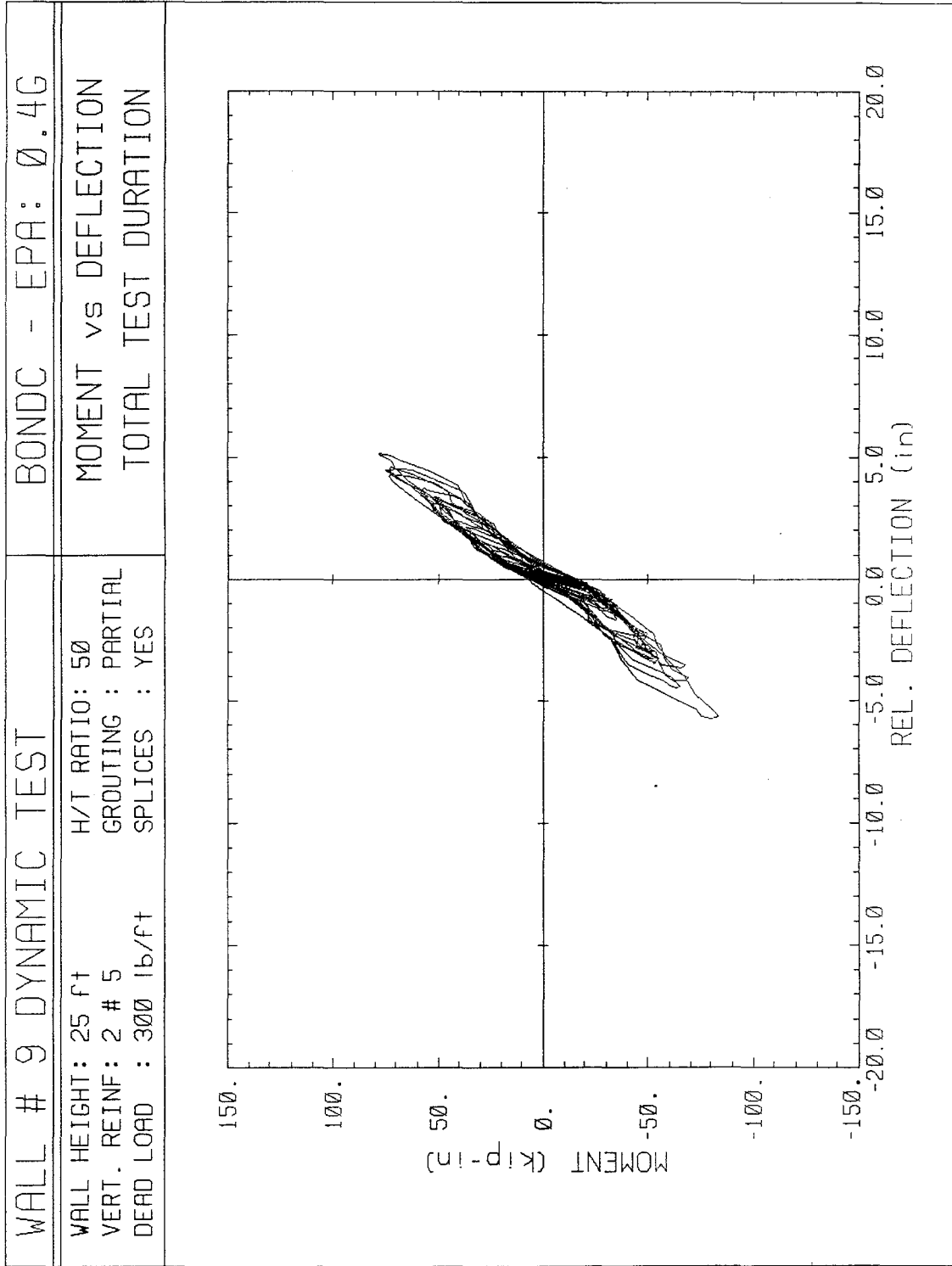


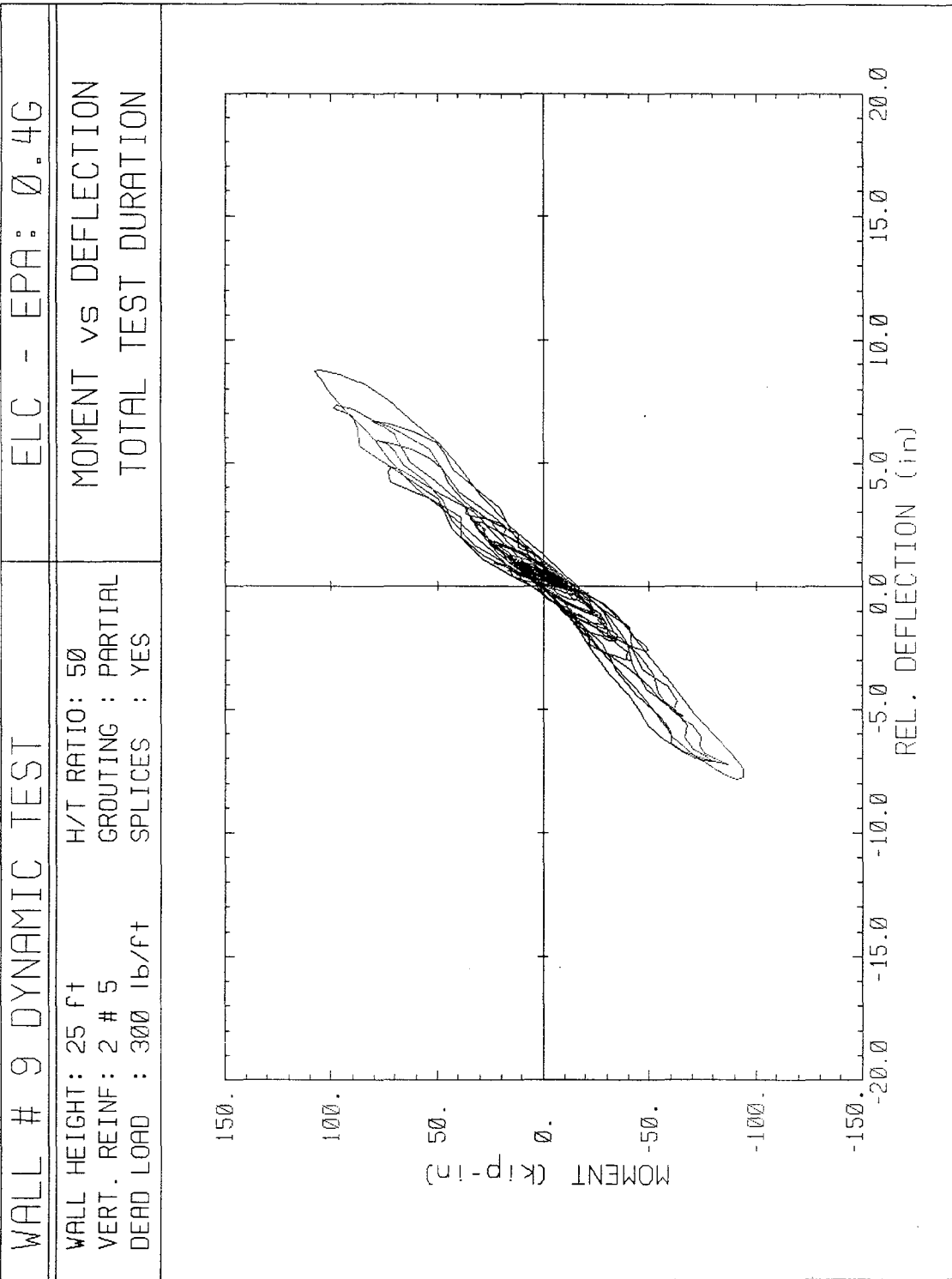
WALL # 9 DYNAMIC TEST	ELC1 - EPA: 0.1G
WALL HEIGHT: 25 FT VERT. REINF: 2 # 5 DEAD LOAD : 300 lb/ft	H/T RATIO: 50 GROUTING : PARTIAL SPLICES : YES
MOMENT vs DEFLECTION TOTAL TEST DURATION	

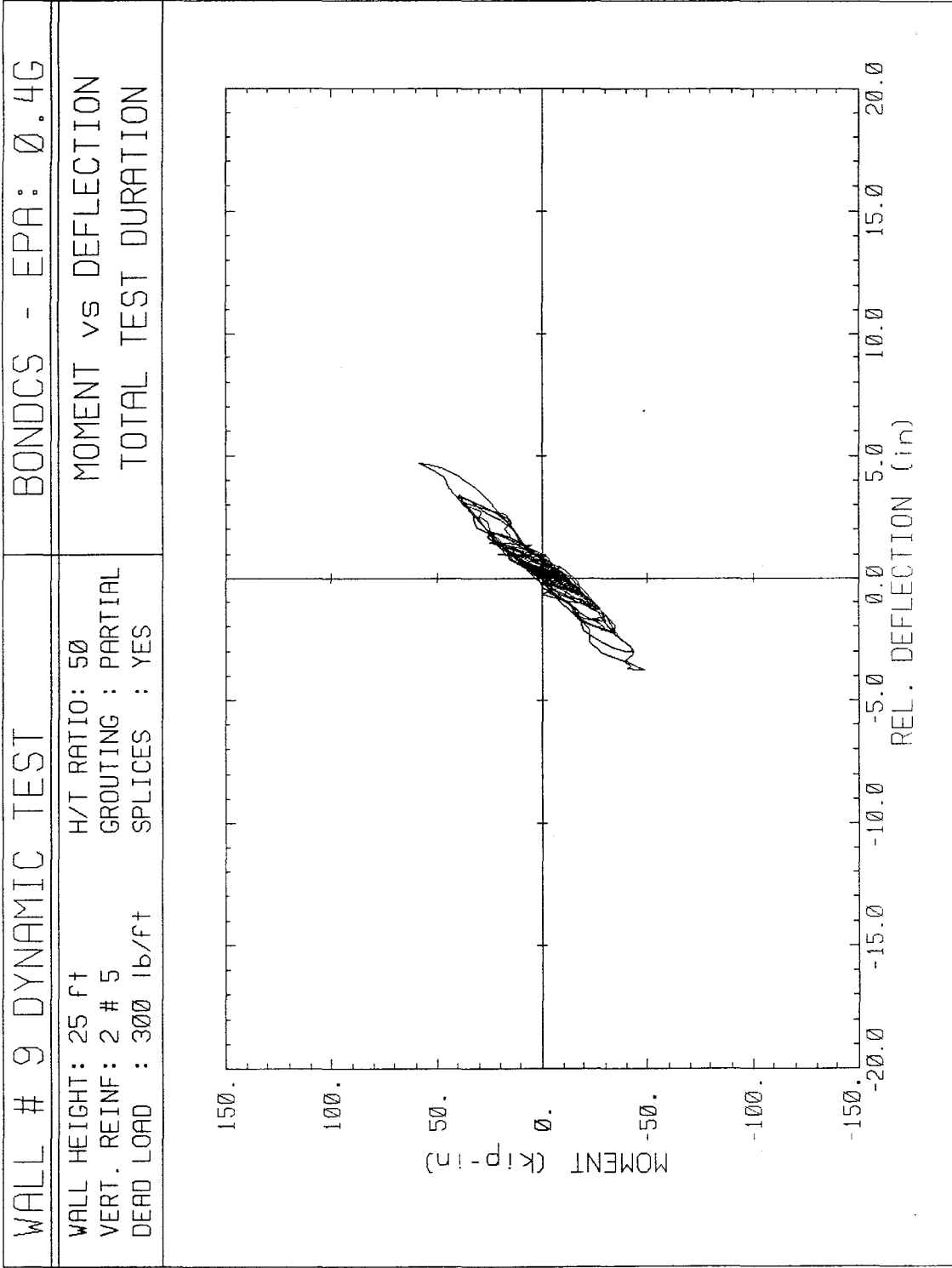


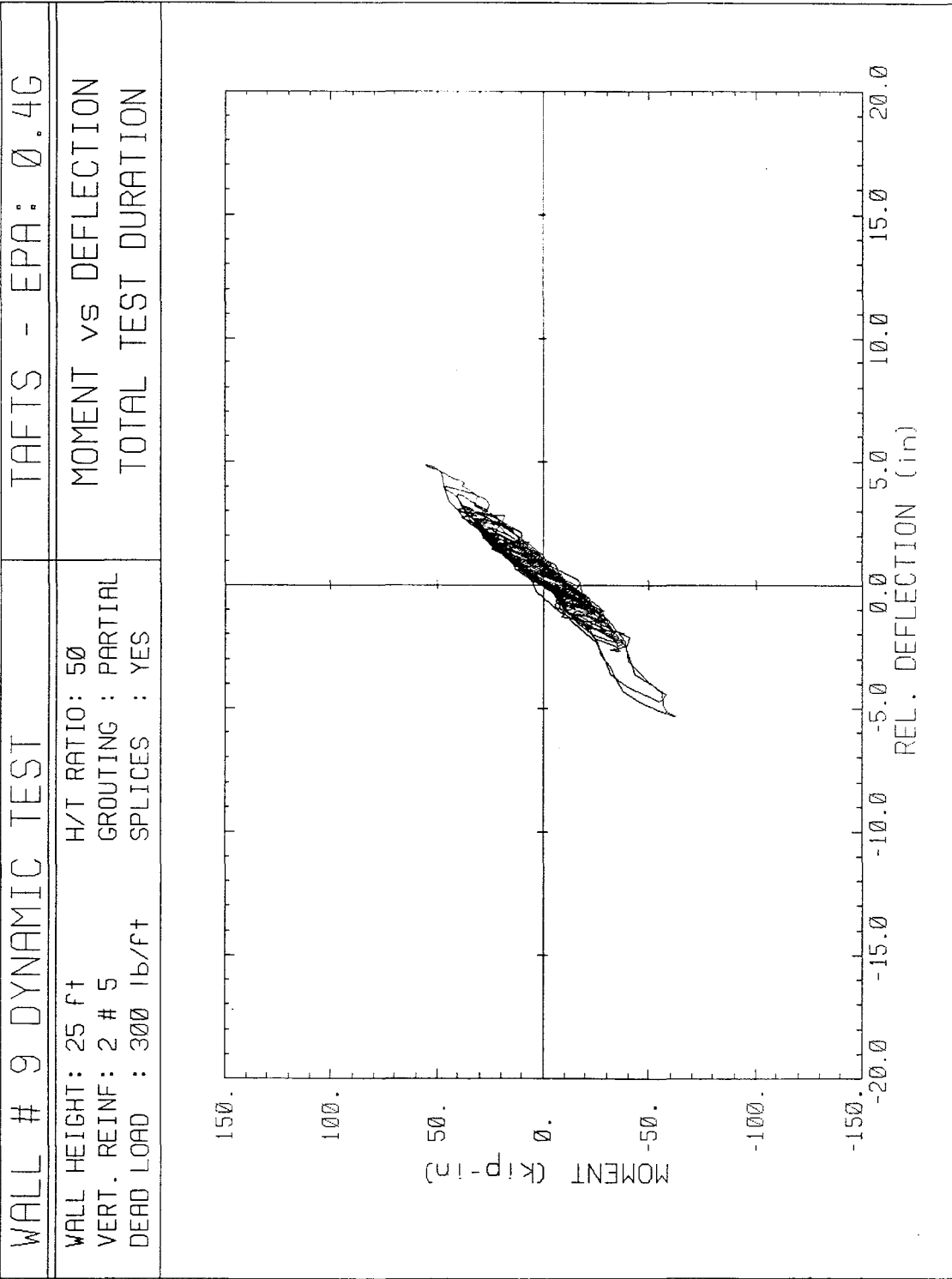
WALL # 9 DYNAMIC TEST		ELC2 - EPA: 0.2G	
WALL HEIGHT: 25 ft	H/T RATIO: 50	MOMENT vs DEFLECTION	
VERT. REINF: 2 # 5	GROUTING : PARTIAL	TOTAL TEST DURATION	
DEAD LOAD : 300 lb/ft	SPLICES : YES		

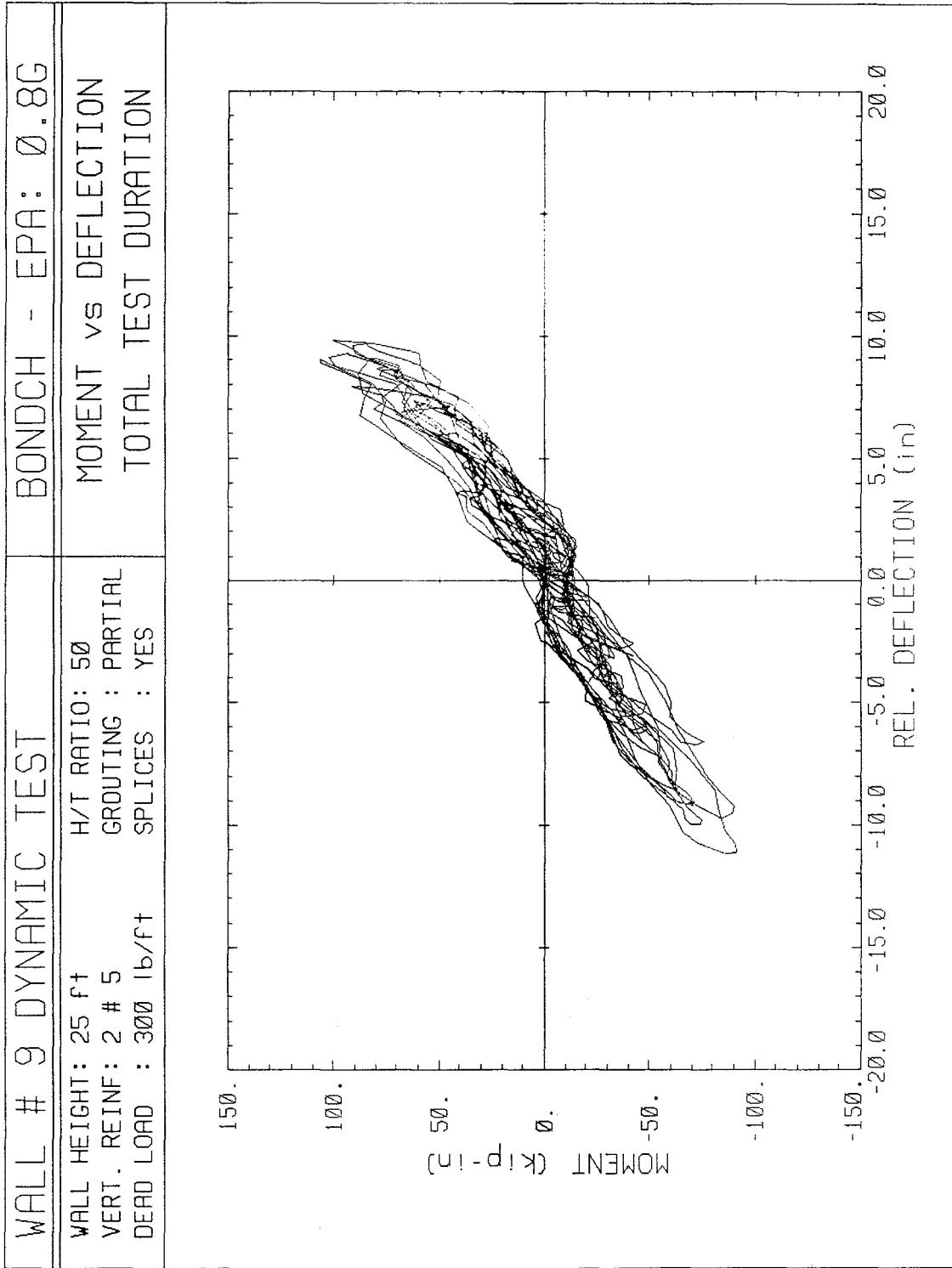




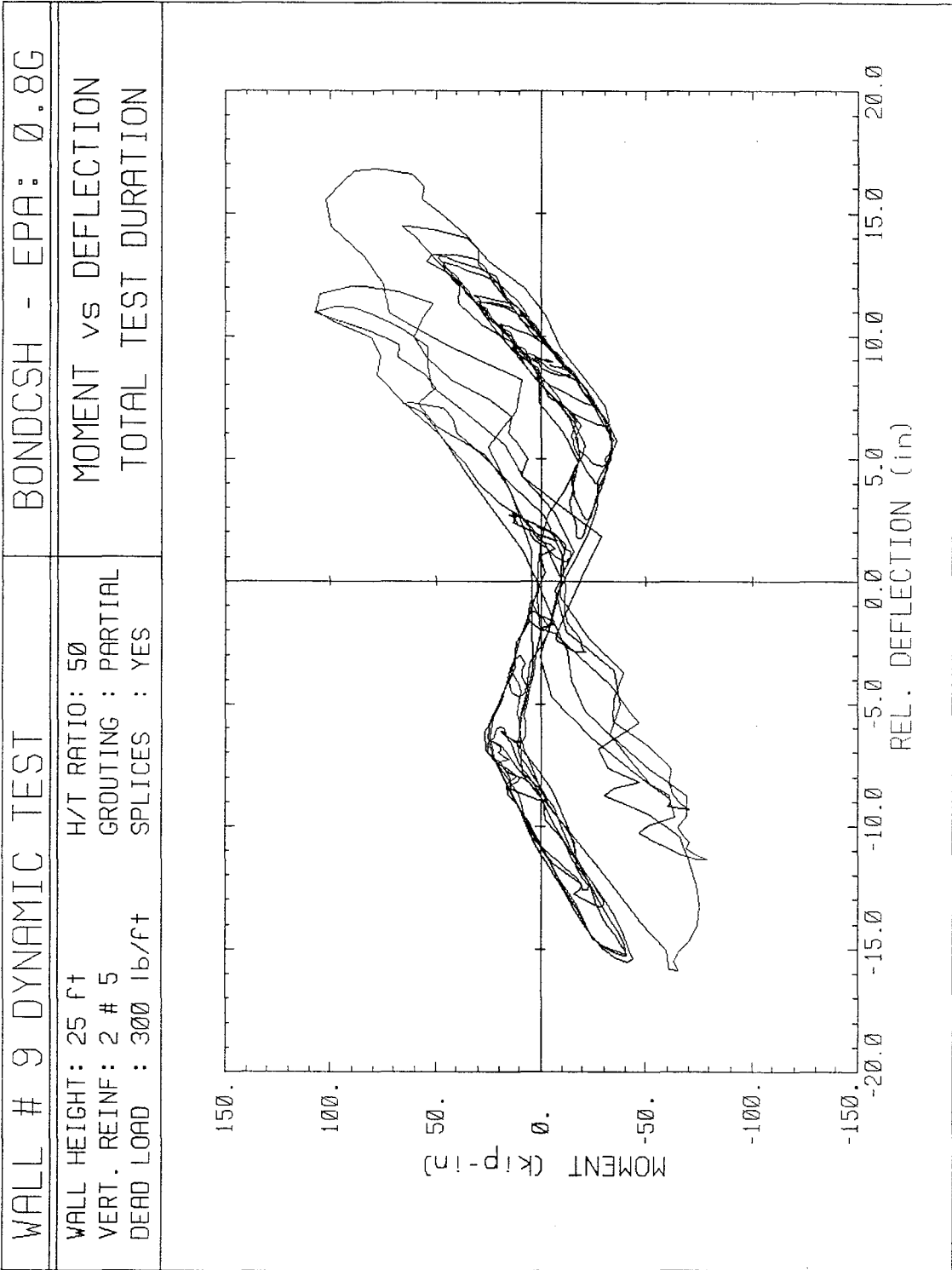


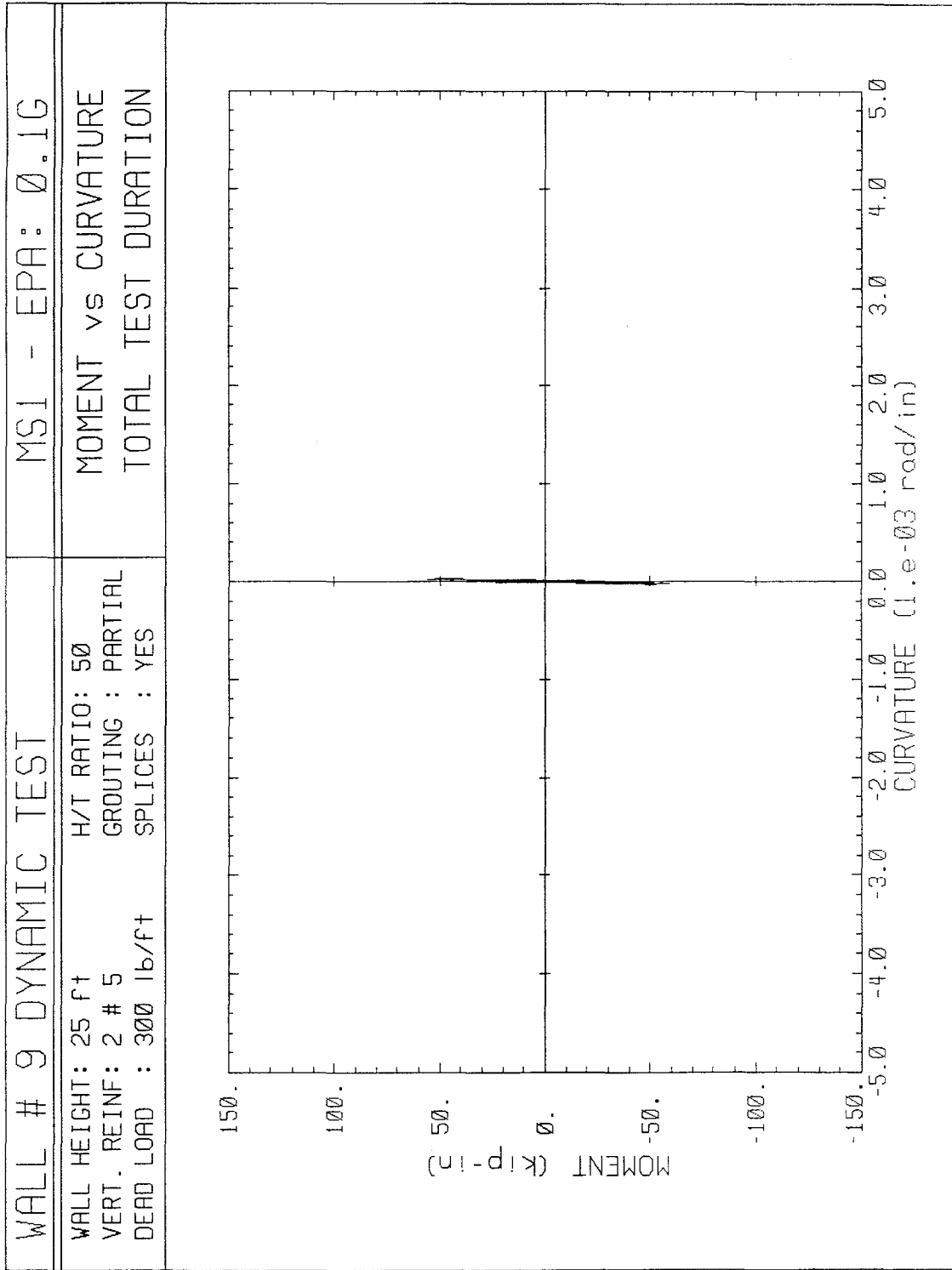


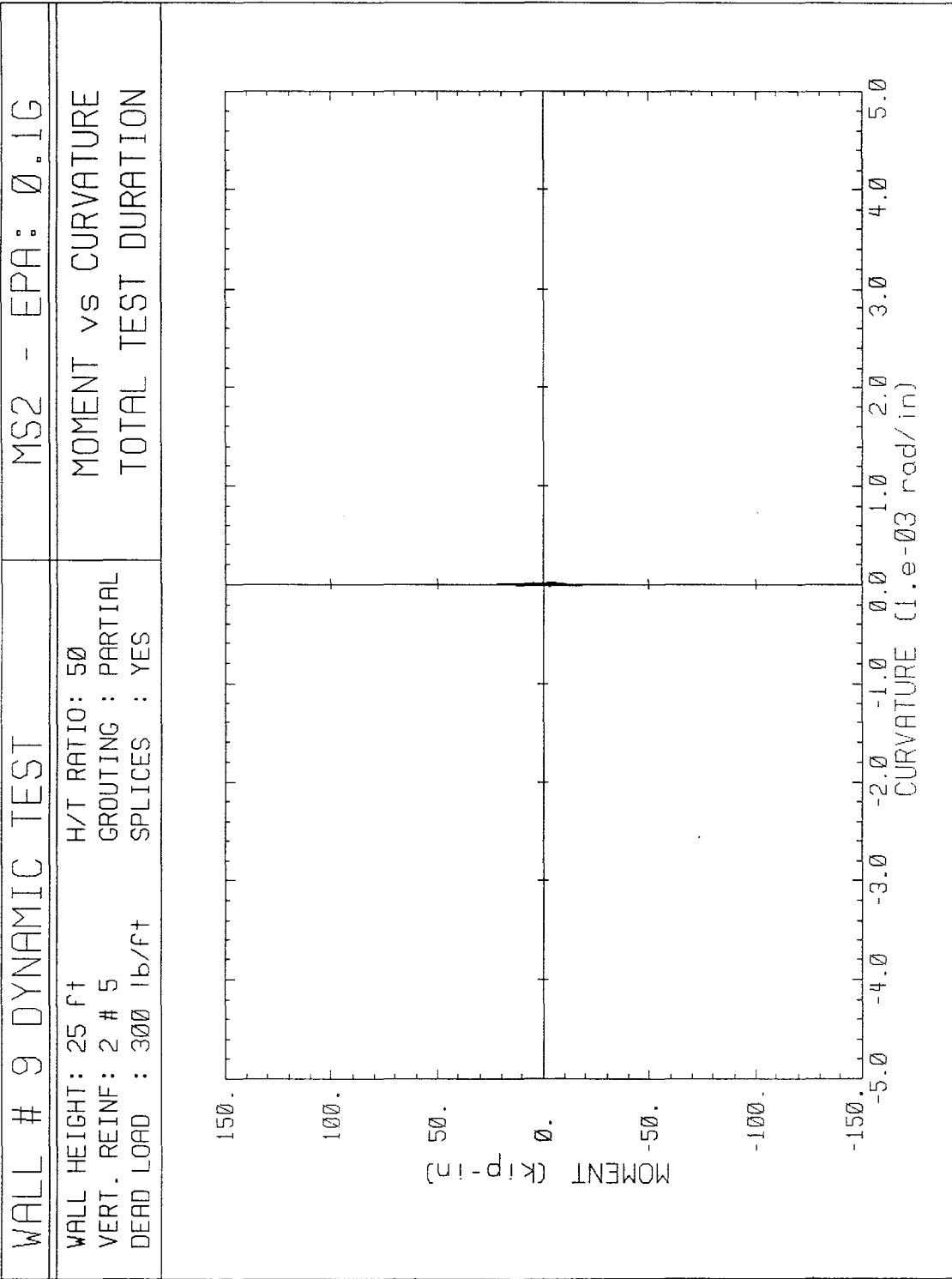


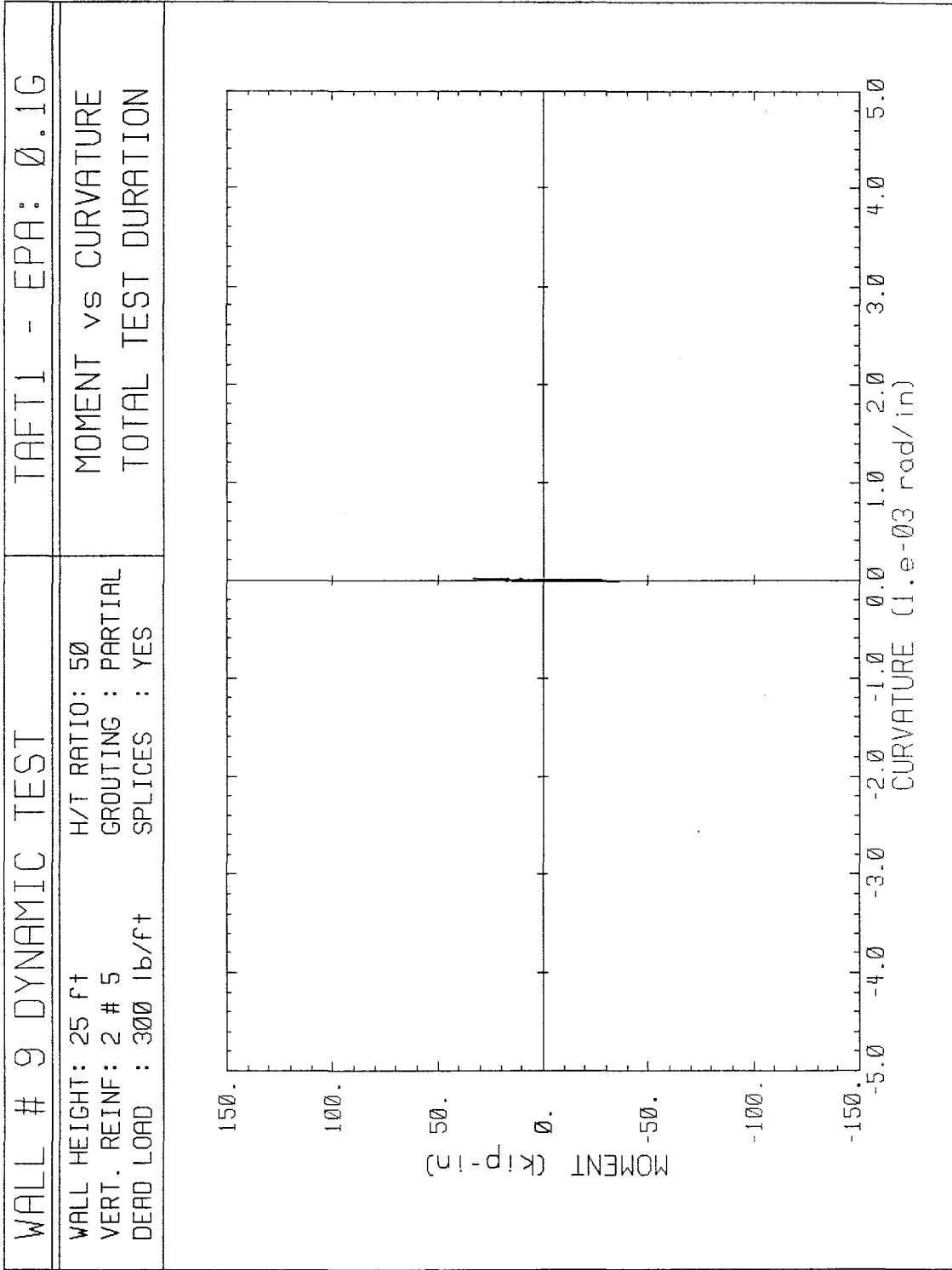


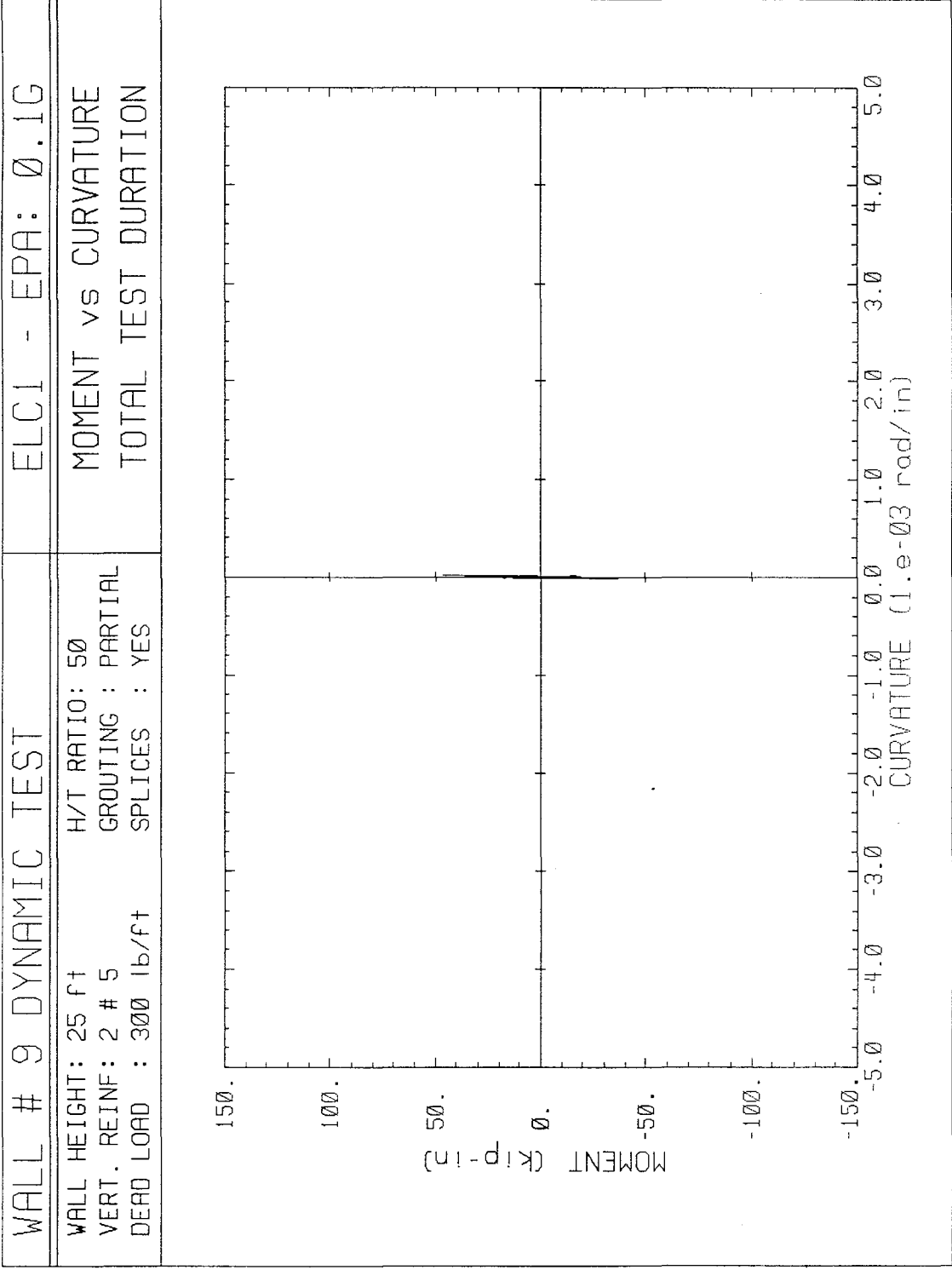


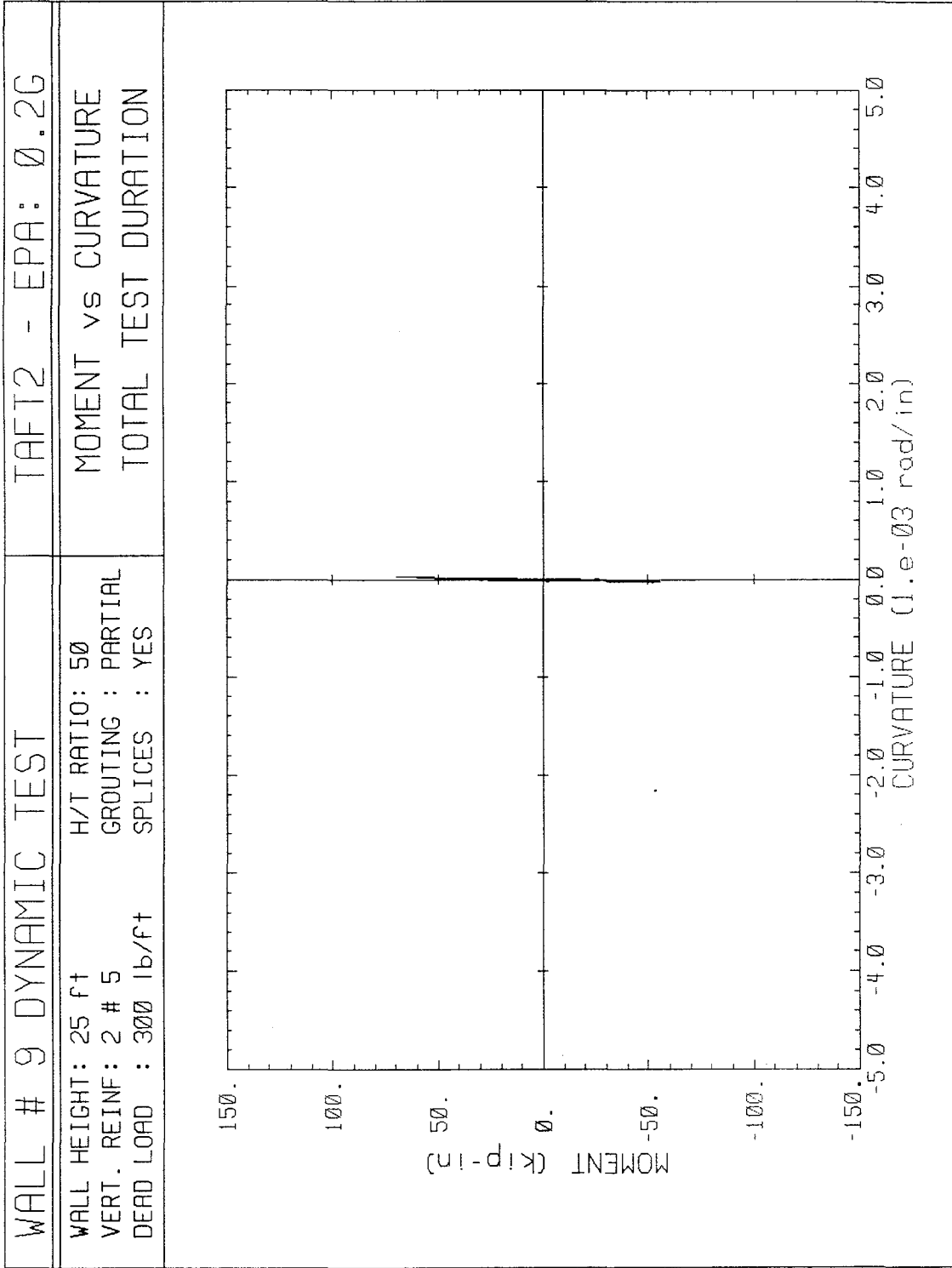


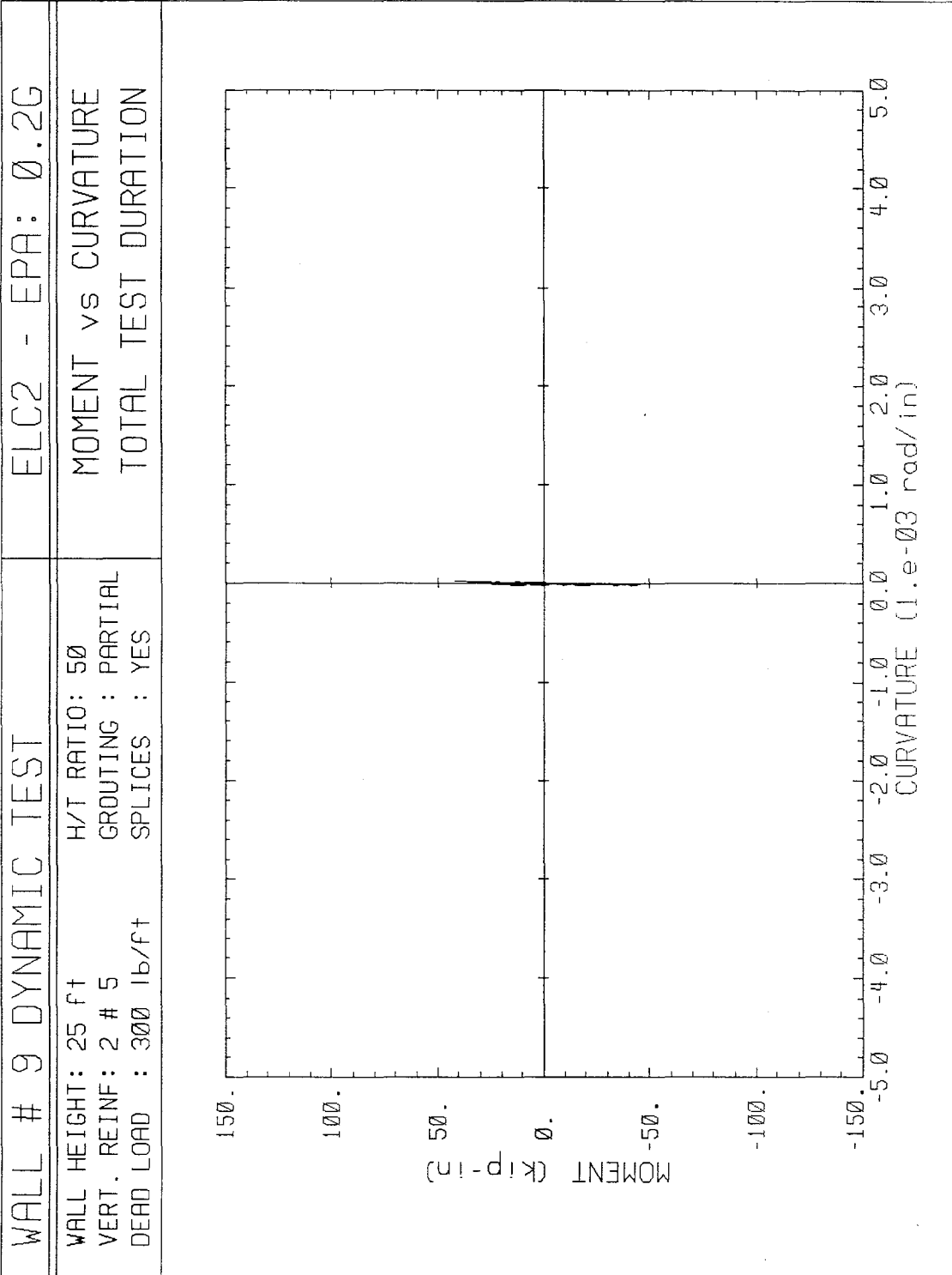


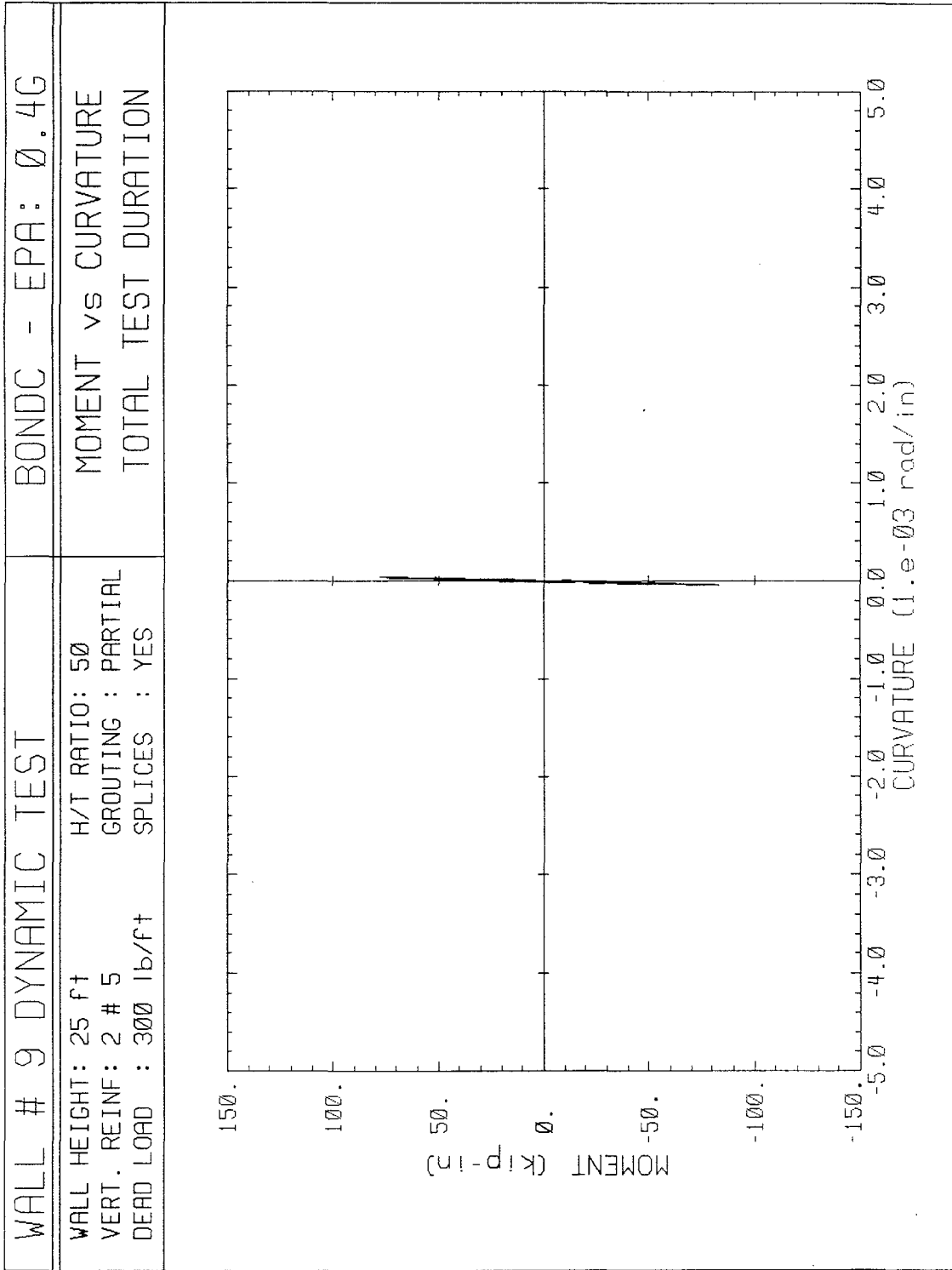




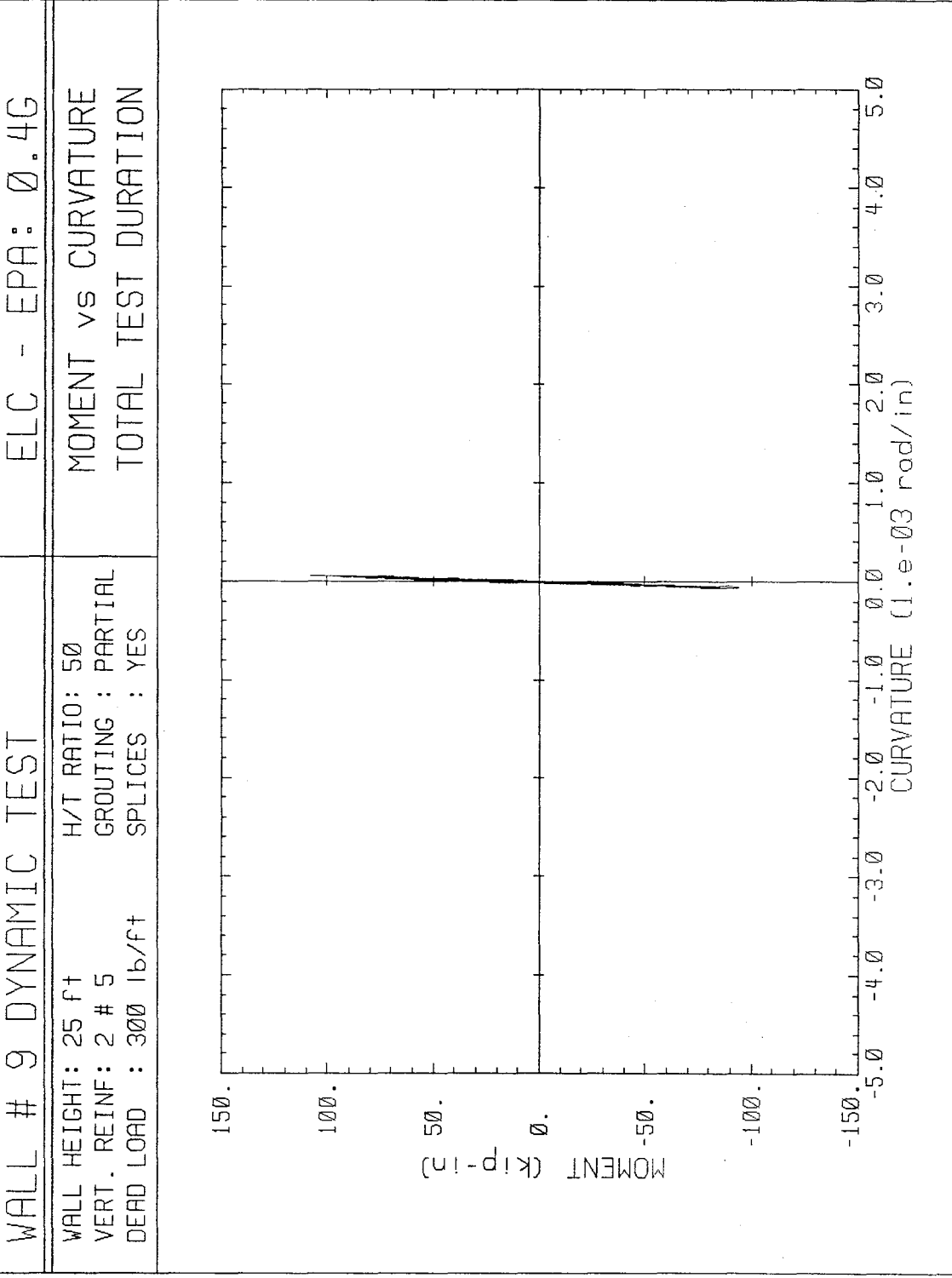


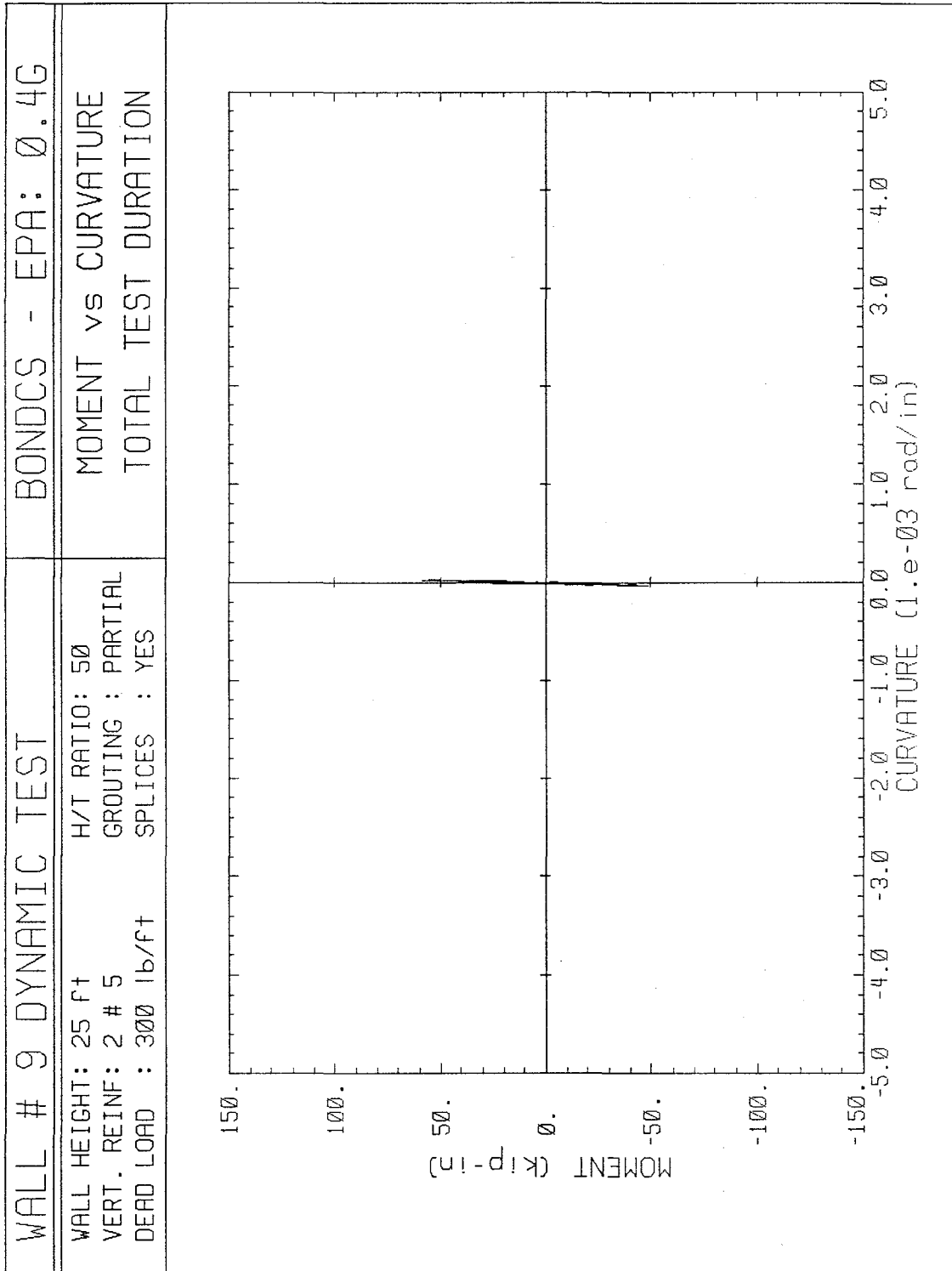


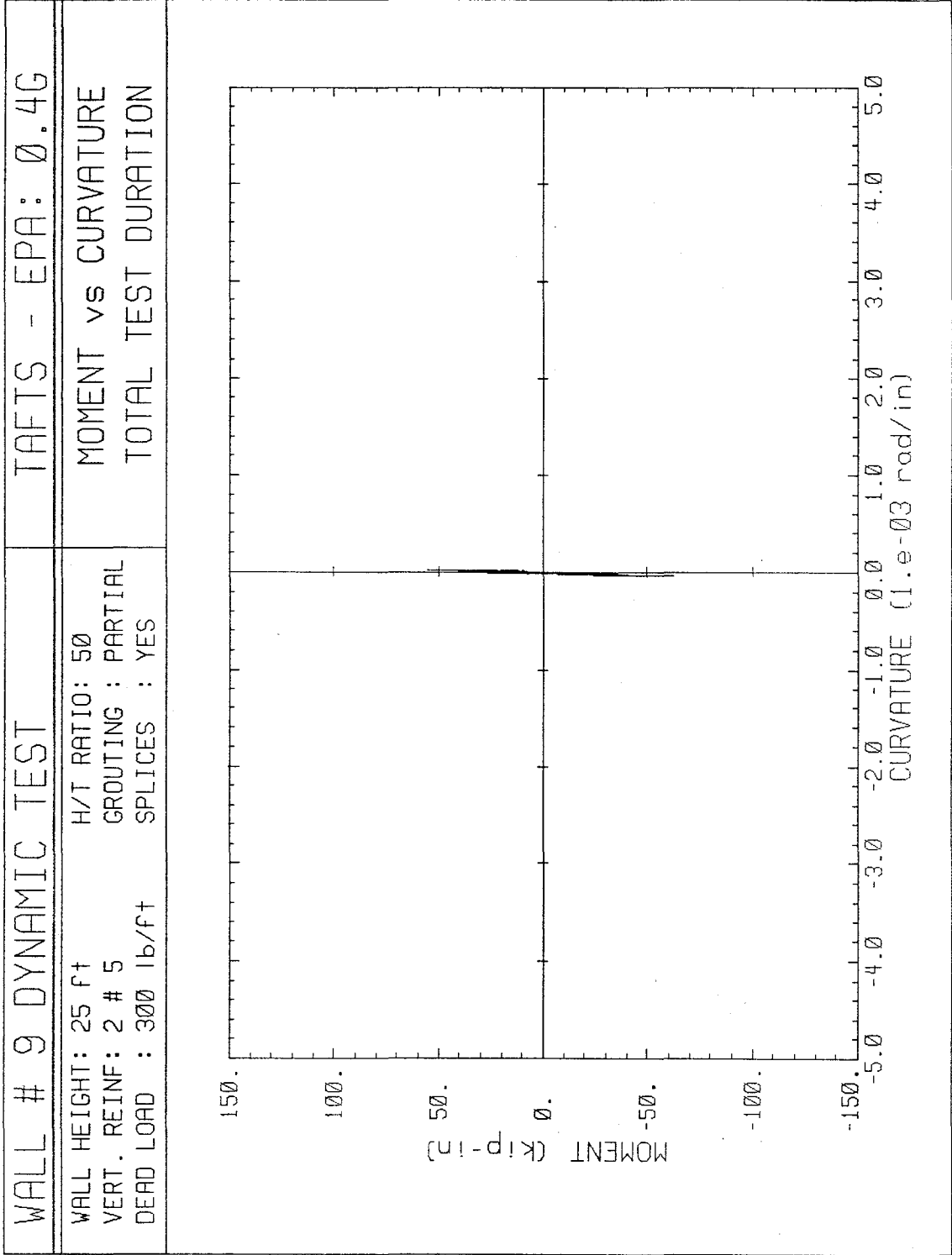


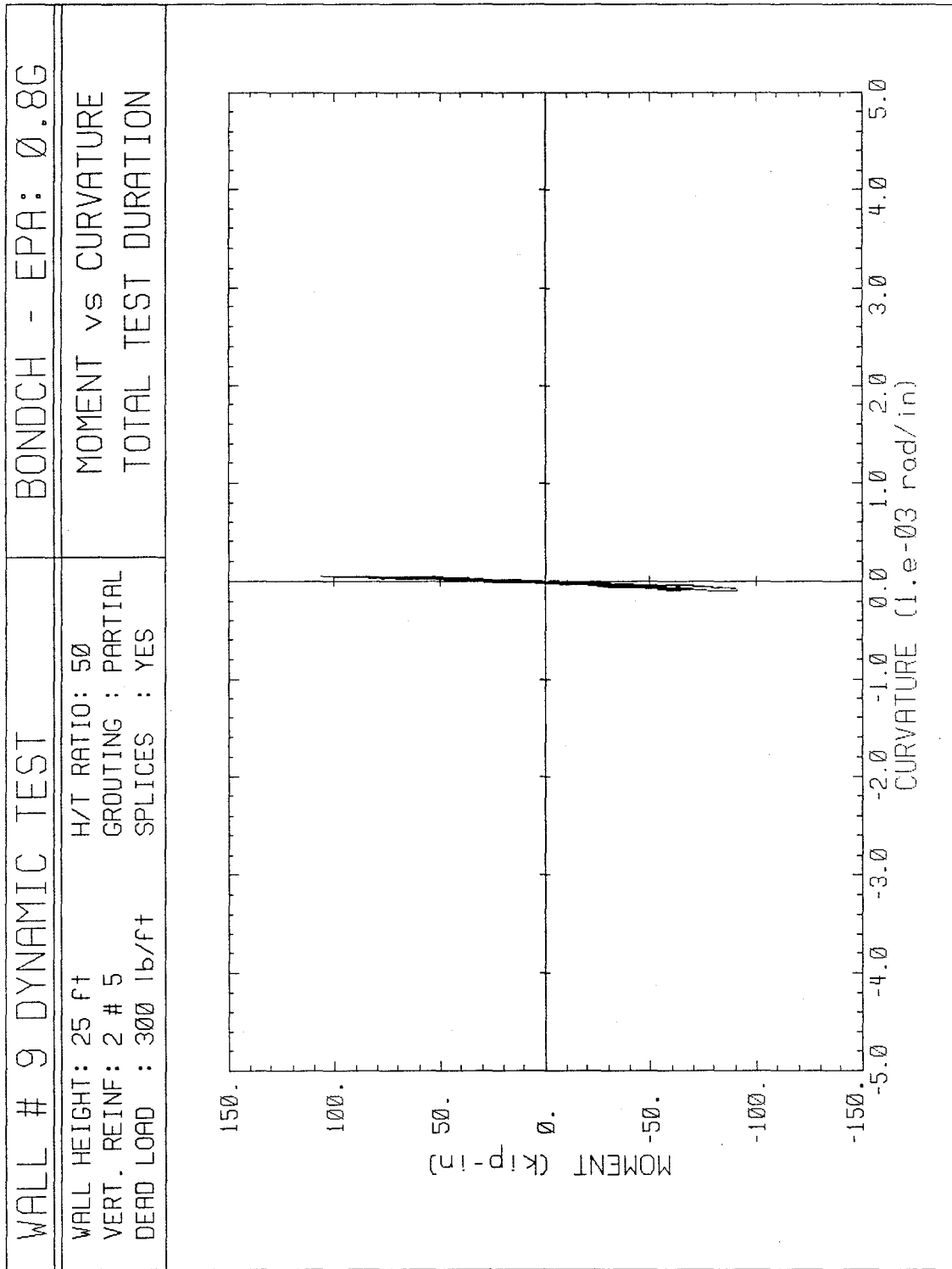


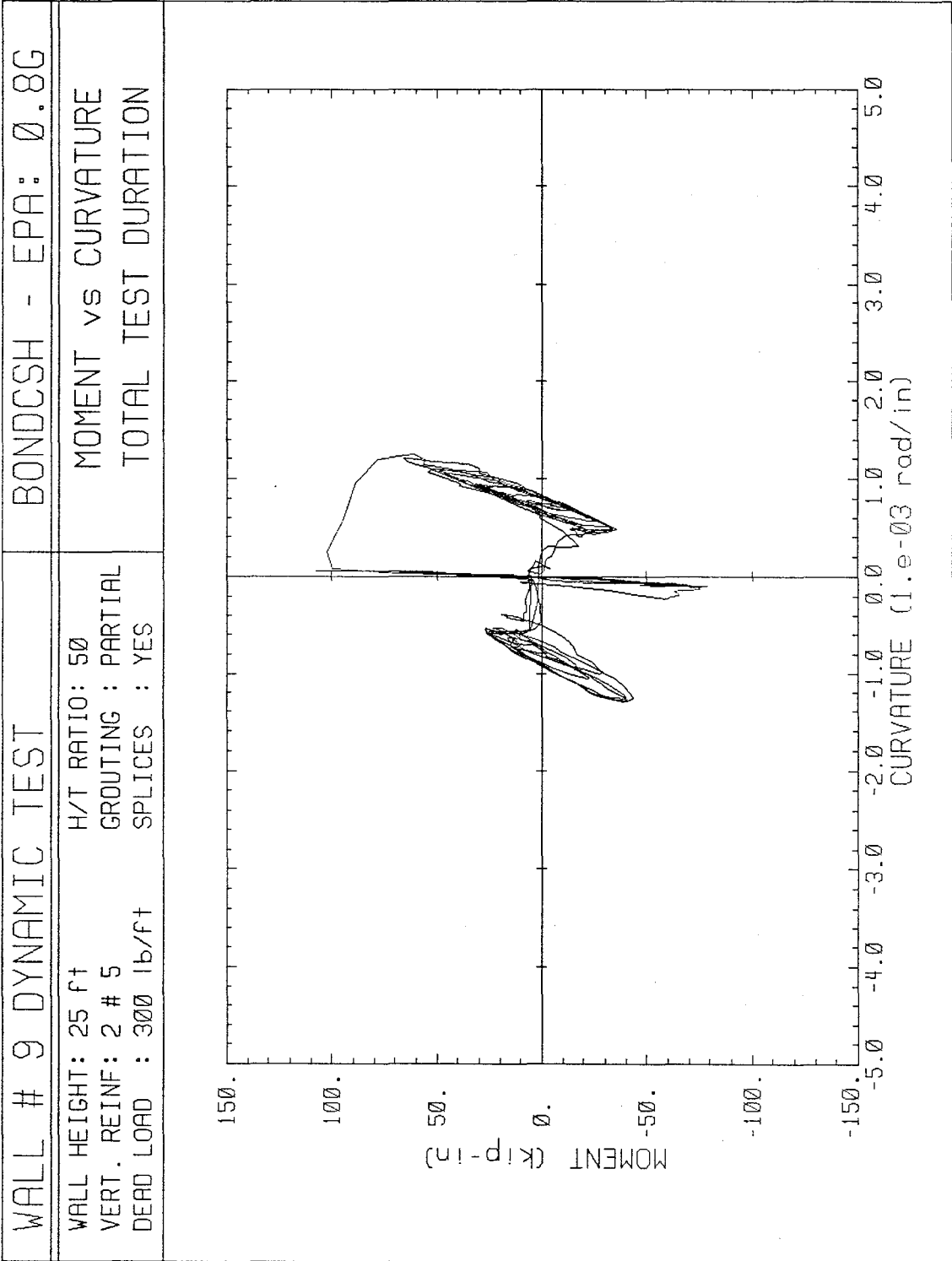


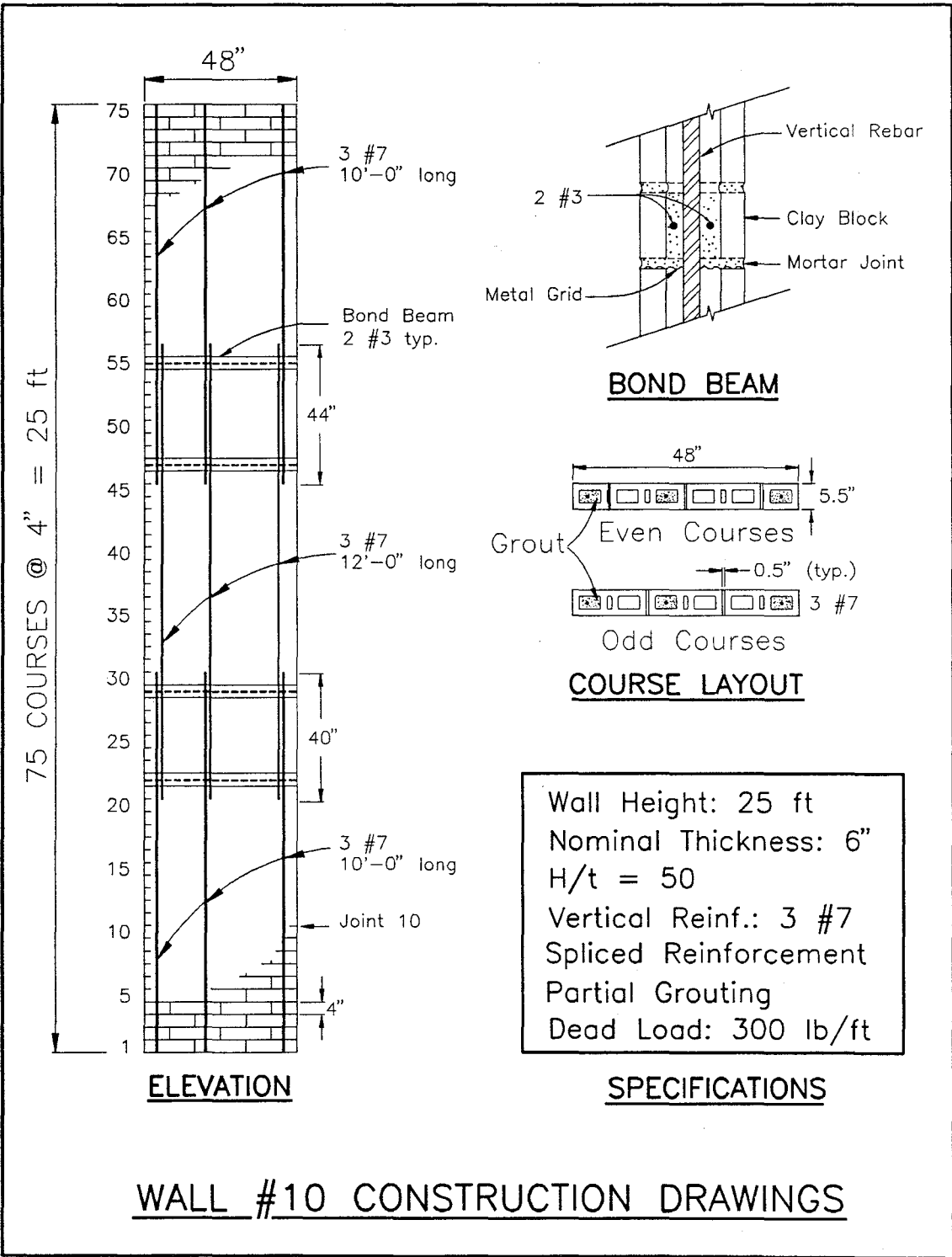


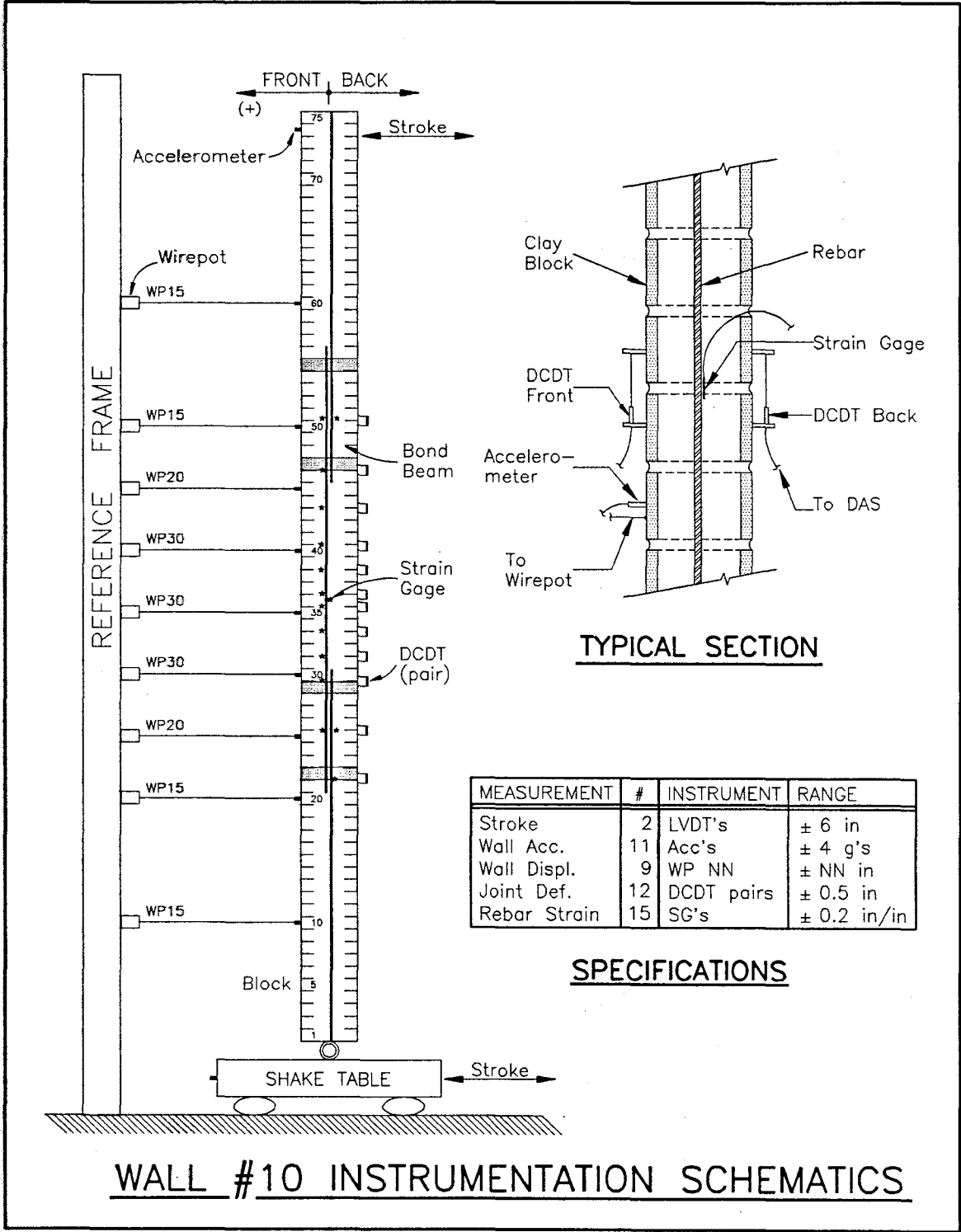












Wall No. 10: Test Sequence & Peak Measurements

Run No	Run ID	EPA	Diaphragm	Displacement (in)			Acceleration (g)			Rebar Strain (in/in)
				Bottom	Center	Top	Bottom	Center	Top	
1	MS1	0.10	Flexible	1.36	1.51	1.49	0.09	0.29	0.25	0.0001
2	MS2	0.10	Stiff	0.28	0.75	0.28	0.11	0.41	0.28	0.0002
3	TAFT1	0.10	Flexible	0.85	0.91	0.89	0.06	0.14	0.13	0.0001
4	ELC1	0.10	Stiff	1.30	2.16	1.41	0.15	0.51	0.40	0.0004
5	TAFT2	0.20	Flexible	2.34	4.19	2.68	0.18	0.80	0.30	0.0007
6	ELC2	0.20	Stiff	1.52	2.72	1.62	0.18	0.51	0.42	0.0004
7	BONDC	0.40	Flexible	2.63	7.95	3.80	0.32	0.96	0.38	0.0014
8	ELC	0.40	Flexible	3.06	9.03	4.94	0.35	1.20	0.48	0.0015
9	BONDCH	0.40	Stiff	2.64	5.63	3.08	0.33	0.70	0.71	0.0009
10	TAFTS	0.40	Stiff	4.84	6.87	4.93	0.38	1.08	0.62	0.0010
11	BONDCH	0.80	Flexible	3.24	17.04	5.63	0.68	1.82	1.11	0.0072
12	BONDCHS	0.80	Stiff	4.73	19.65	5.27	1.25	2.48	2.07	0.0109



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TCCMAR PROJECT

WALL No 10 DYNAMIC TEST Run No 1: MS1 0.10 EPA

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Wall Weight: 5.88 kips H/t Ratio: 50  
Vert. Reinf: 3 # 7 Grouting : Partial  
Dead Load: 300 lb/ft Splices : yes

---

SUMMARY OF EXTREME VALUES

GLOBAL WALL RESPONSE

Disp Top	1.49 in	Acc Top	0.25 g
Disp Cent	1.51 in	Acc Cent	0.29 g
Disp Bot	1.36 in	Acc Bot	0.09 g
Peak Defl	0.49 in		
Inertia Force	1.21 kips	Eqv Load	60.0 lb/ft
Bending Mt	53.77 kip-in	Seismic C	0.24
		C/Acc Bot	2.71

MATERIAL & MECHANICAL PROPERTIES

f'm	4900 psi	Em (Code)	3680 ksi
Ig	666 in <sup>4</sup>	EmIg	2449000 kip-in <sup>2</sup>
Avg Freq	3.43 Hz	EIeqv	1029000 kip-in <sup>2</sup>
		EmIg/EIeqv	2.38

LOCAL RESPONSE

	Peak	Joint 36
Rebar Strain	0.0001	0.0000 in/in
Strain Ductility	0.04	0.00 in
Avg Joint Opening	0.0015	0.0030 in
Faceshell Comp. Strain	0.0002	0.0001 in/in
Faceshell Opening	0.0033	0.0005 in
Curvature	0.0578	0.0263 (1/in)*10 <sup>-3</sup>
EI joint		2015000 kip-in <sup>2</sup>

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CES

October 9, 1989

10:24:44 am

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TCCMAR PROJECT

WALL No 10 DYNAMIC TEST Run No 2: MS2 0.10 EPA

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Wall Weight: 5.88 kips H/t Ratio: 50  
Vert. Reinf: 3 # 7 Grouting : Partial  
Dead Load: 300 lb/ft Splices : yes

---

SUMMARY OF EXTREME VALUES

GLOBAL WALL RESPONSE

Disp Top	0.28 in	Acc Top	0.28 g
Disp Cent	0.75 in	Acc Cent	0.41 g
Disp Bot	0.28 in	Acc Bot	0.11 g
Peak Defl	0.72 in		
Inertia Force	1.21 kips	Eqv Load	70.0 lb/ft
Bending Mt	67.27 kip-in	Seismic C	0.31
		C/Acc Bot	2.77

MATERIAL & MECHANICAL PROPERTIES

f'm	4900 psi	Em (Code)	3680 ksi
Ig	666 in4	EmIg	2449000 kip-in2
Avg Freq	2.55 Hz	EIeqv	876000 kip-in2
		EmIg/EIeqv	2.80

LOCAL RESPONSE

	Peak	Joint	36
Rebar Strain	0.0002	0.0001	in/in
Strain Ductility	0.08	0.04	in
Avg Joint Opening	0.0027	0.0004	in
Faceshell Comp. Strain	0.0002	0.0001	in/in
Faceshell Opening	0.0059	0.0005	in
Curvature	0.3000	0.0451	(1/in)*10-3
EI joint		1463000	kip-in2

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CES

October 9, 1989

10:24:51 am

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TCCMAR PROJECT

WALL No 10 DYNAMIC TEST Run No 3: TAFT1 0.10 EPA

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Wall Weight: 5.88 kips H/t Ratio: 50  
Vert. Reinf: 3 # 7 Grouting : Partial  
Dead Load: 300 lb/ft Splices : yes

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SUMMARY OF EXTREME VALUES

GLOBAL WALL RESPONSE

Disp Top	0.89 in	Acc Top	0.13 g
Disp Cent	0.91 in	Acc Cent	0.14 g
Disp Bot	0.85 in	Acc Bot	0.06 g
Peak Defl	0.27 in		
Inertia Force	0.54 kips	Eqv Load	30.0 lb/ft
Bending Mt	25.55 kip-in	Seismic C	0.12
		C/Acc Bot	1.93

MATERIAL & MECHANICAL PROPERTIES

f'm	4900 psi	Em (Code)	3680 ksi
Ig	666 in <sup>4</sup>	EmIg	2449000 kip-in <sup>2</sup>
Avg Freq	2.90 Hz	EIeqv	887000 kip-in <sup>2</sup>
		EmIg/EIeqv	2.76

LOCAL RESPONSE

	Peak	Joint 36
Rebar Strain	0.0001	0.0000 in/in
Strain Ductility	0.04	0.00 in
Avg Joint Opening	0.0010	0.0003 in
Faceshell Comp. Strain	0.0001	0.0001 in/in
Faceshell Opening	0.0023	0.0005 in
Curvature	0.1200	0.0240 (1/in)*10 <sup>-3</sup>
EI joint		1042000 kip-in <sup>2</sup>

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CES

October 9, 1989

10:24:58 am

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TCCMAR PROJECT

WALL No 10 DYNAMIC TEST Run No 4: ELC1 0.10 EPA

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Wall Weight: 5.88 kips H/t Ratio: 50  
Vert. Reinf: 3 # 7 Grouting : Partial  
Dead Load: 300 lb/ft Splices : yes

---

SUMMARY OF EXTREME VALUES

GLOBAL WALL RESPONSE

Disp Top	1.41 in	Acc Top	0.40 g
Disp Cent	2.16 in	Acc Cent	0.51 g
Disp Bot	1.30 in	Acc Bot	0.15 g
Peak Defl	1.02 in		
Inertia Force	1.41 kips	Eqv Load	80.0 lb/ft
Bending Mt	76.21 kip-in	Seismic C	0.35
		C/Acc Bot	2.30

MATERIAL & MECHANICAL PROPERTIES

f'm	4900 psi	Em (Code)	3680 ksi
Ig	666 in4	EmIg	2449000 kip-in2
Avg Freq	2.14 Hz	EIeqv	700000 kip-in2
		EmIg/EIeqv	3.50

LOCAL RESPONSE

Rebar Strain	Peak	Joint	36
Strain Ductility	0.0004	0.0002	in/in
	0.16	0.08	in
Avg Joint Opening	0.0029	0.0005	in
Faceshell Comp. Strain	0.0003	0.0002	in/in
Faceshell Opening	0.0069	0.0005	in
Curvature	0.3400	0.0391	(1/in)*10-3
EI joint		1944000	kip-in2

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CES

October 9, 1989

10:25:06 am

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TCCMAR PROJECT

WALL No 10 DYNAMIC TEST Run No 5: TAFT2 0.20 EPA

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Wall Weight: 5.88 kips H/t Ratio: 50  
Vert. Reinf: 3 # 7 Grouting : Partial  
Dead Load: 300 lb/ft Splices : yes

---

SUMMARY OF EXTREME VALUES

GLOBAL WALL RESPONSE

Disp Top	2.68 in	Acc Top	0.30 g
Disp Cent	4.19 in	Acc Cent	0.80 g
Disp Bot	2.34 in	Acc Bot	0.18 g
Peak Defl	3.11 in		
Inertia Force	2.21 kips	Eqv Load	110.0 lb/ft
Bending Mt	103.52 kip-in	Seismic C	0.47
		C/Acc Bot	2.61

MATERIAL & MECHANICAL PROPERTIES

f'm	4900 psi	Em (Code)	3680 ksi
Ig	666 in <sup>4</sup>	EmIg	2449000 kip-in <sup>2</sup>
Avg Freq	1.21 Hz	EIeqv	312000 kip-in <sup>2</sup>
		EmIg/EIeqv	7.85

LOCAL RESPONSE

	Peak	Joint 36
Rebar Strain	0.0007	0.0005 in/in
Strain Ductility	0.28	0.20 in
Avg Joint Opening	0.0061	0.0002 in
Faceshell Comp. Strain	0.0006	0.0003 in/in
Faceshell Opening	0.0138	0.0005 in
Curvature	0.7100	0.0667 (1/in)*10 <sup>-3</sup>
EI joint		1529000 kip-in <sup>2</sup>

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CES

October 9, 1989

10:25:13 am

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TCCMAR PROJECT

WALL No 10 DYNAMIC TEST Run No 6: ELC2 0.20 EPA

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Wall Weight: 5.88 kips	H/t Ratio: 50
Vert. Reinf: 3 # 7	Grouting : Partial
Dead Load: 300 lb/ft	Splices : yes

---

SUMMARY OF EXTREME VALUES

GLOBAL WALL RESPONSE

Disp Top	1.62 in	Acc Top	0.42 g
Disp Cent	2.72 in	Acc Cent	0.51 g
Disp Bot	1.52 in	Acc Bot	0.18 g
Peak Defl	2.04 in		
Inertia Force	1.24 kips	Eqv Load	70.0 lb/ft
Bending Mt	67.72 kip-in	Seismic C	0.31
		C/Acc Bot	1.71

MATERIAL & MECHANICAL PROPERTIES

f'm	4900 psi	Em (Code)	3680 ksi
Ig	666 in4	EmIg	2449000 kip-in2
Avg Freq	1.77 Hz	EIeqv	311000 kip-in2
		EmIg/EIeqv	7.87

LOCAL RESPONSE

	Peak	Joint	36
Rebar Strain	0.0004	0.0004	in/in
Strain Ductility	0.16	0.16	in
Avg Joint Opening	0.0040	0.0001	in
Faceshell Comp. Strain	0.0004	0.0003	in/in
Faceshell Opening	0.0091	0.0005	in
Curvature	0.4700	0.0628	(1/in)*10-3
EI joint		1067000	kip-in2

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CES

October 9, 1989

10:25:20 am

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TCCMAR PROJECT

WALL No 10 DYNAMIC TEST Run No 7: BONDC 0.40 EPA

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Wall Weight: 5.88 kips H/t Ratio: 50  
Vert. Reinf: 3 # 7 Grouting : Partial  
Dead Load: 300 lb/ft Splices : yes

---

SUMMARY OF EXTREME VALUES

GLOBAL WALL RESPONSE

Disp Top	3.80 in	Acc Top	0.38 g
Disp Cent	7.95 in	Acc Cent	0.96 g
Disp Bot	2.63 in	Acc Bot	0.32 g
Peak Defl	6.50 in		
Inertia Force	3.48 kips	Eqv Load	180.0 lb/ft
Bending Mt	169.91 kip-in	Seismic C	0.77
		C/Acc Bot	2.41

MATERIAL & MECHANICAL PROPERTIES

f'm	4900 psi	Em (Code)	3680 ksi
Ig	666 in <sup>4</sup>	EmIg	2449000 kip-in <sup>2</sup>
Avg Freq	1.19 Hz	EIeqv	245000 kip-in <sup>2</sup>
		EmIg/EIeqv	10.00

LOCAL RESPONSE

Rebar Strain	Peak 0.0014	Joint 36 0.0012 in/in
Strain Ductility	0.56	0.48 in
Avg Joint Opening	0.0095	0.0026 in
Faceshell Comp. Strain	0.0010	0.0009 in/in
Faceshell Opening	0.0224	0.0087 in
Curvature	1.1800	0.5600 (1/in)*10 <sup>-3</sup>
EI joint		302000 kip-in <sup>2</sup>

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CES

October 9, 1989

10:25:28 am

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TCCMAR PROJECT

WALL No 10 DYNAMIC TEST Run No 8: ELC 0.40 EPA

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Wall Weight: 5.88 kips H/t Ratio: 50  
Vert. Reinf: 3 # 7 Grouting : Partial  
Dead Load: 300 lb/ft Splices : yes

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SUMMARY OF EXTREME VALUES

GLOBAL WALL RESPONSE

Disp Top	4.94 in	Acc Top	0.48 g
Disp Cent	9.03 in	Acc Cent	1.20 g
Disp Bot	3.06 in	Acc Bot	0.35 g
Peak Defl	6.79 in		
Inertia Force	3.69 kips	Eqv Load	190.0 lb/ft
Bending Mt	176.80 kip-in	Seismic C	0.80
		C/Acc Bot	2.29

MATERIAL & MECHANICAL PROPERTIES

f'm	4900 psi	Em (Code)	3680 ksi
Ig	666 in4	EmIg	2449000 kip-in2
Avg Freq	1.13 Hz	EIeqv	244000 kip-in2
		EmIg/EIeqv	10.04

LOCAL RESPONSE

Rebar Strain	Peak	Joint	36
Strain Ductility	0.0015	0.0012	in/in
	0.60	0.48	in
Avg Joint Opening	0.0083	0.0031	in
Faceshell Comp. Strain	0.0011	0.0010	in/in
Faceshell Opening	0.0183	0.0099	in
Curvature	1.0900	0.6300	(1/in)*10-3
EI joint		279000	kip-in2

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CES

October 9, 1989

10:25:35 am

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TCCMAR PROJECT

WALL No 10 DYNAMIC TEST Run No 9: BONDSCS 0.40 EPA

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Wall Weight: 5.88 kips H/t Ratio: 50  
Vert. Reinf: 3 # 7 Grouting : Partial  
Dead Load: 300 lb/ft Splices : yes

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SUMMARY OF EXTREME VALUES

GLOBAL WALL RESPONSE

Disp Top	3.08 in	Acc Top	0.71 g
Disp Cent	5.63 in	Acc Cent	0.70 g
Disp Bot	2.64 in	Acc Bot	0.33 g
Peak Defl	4.37 in		
Inertia Force	2.27 kips	Eqv Load	120.0 lb/ft
Bending Mt	109.73 kip-in	Seismic C	0.50
		C/Acc Bot	1.51

MATERIAL & MECHANICAL PROPERTIES

f'm	4900 psi	Em (Code)	3680 ksi
Ig	666 in4	EmIg	2449000 kip-in2
Avg Freq	1.16 Hz	EIeqv	235000 kip-in2
		EmIg/EIeqv	10.42

LOCAL RESPONSE

	Peak	Joint	36
Rebar Strain	0.0009	0.0008	in/in
Strain Ductility	0.36	0.32	in
Avg Joint Opening	0.0055	0.0019	in
Faceshell Comp. Strain	0.0007	0.0006	in/in
Faceshell Opening	0.0130	0.0060	in
Curvature	0.6900	0.3800	(1/in)*10-3
EI joint		284000	kip-in2

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CES

October 9, 1989

10:25:43 am

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TCCMAR PROJECT

WALL No 10 DYNAMIC TEST Run No 10: TAFTS 0.40 EPA

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Wall Weight: 5.88 kips H/t Ratio: 50  
Vert. Reinf: 3 # 7 Grouting : Partial  
Dead Load: 300 lb/ft Splices : yes

---

SUMMARY OF EXTREME VALUES

GLOBAL WALL RESPONSE

Disp Top	4.93 in	Acc Top	0.62 g
Disp Cent	6.87 in	Acc Cent	1.08 g
Disp Bot	4.84 in	Acc Bot	0.38 g
Peak Defl	4.39 in		
Inertia Force	2.47 kips	Eqv Load	140.0 lb/ft
Bending Mt	128.07 kip-in	Seismic C	0.58
		C/Acc Bot	1.53

MATERIAL & MECHANICAL PROPERTIES

f'm	4900 psi	Em (Code)	3680 ksi
Ig	666 in <sup>4</sup>	EmIg	2449000 kip-in <sup>2</sup>
Avg Freq	1.19 Hz	EIeqv	273000 kip-in <sup>2</sup>
		EmIg/EIeqv	8.97

LOCAL RESPONSE

	Peak	Joint	36
Rebar Strain	0.0010	0.0009	in/in
Strain Ductility	0.40	0.36	in
Avg Joint Opening	0.0056	0.0022	in
Faceshell Comp. Strain	0.0009	0.0006	in/in
Faceshell Opening	0.0135	0.0064	in
Curvature	0.7200	0.4000	(1/in)*10 <sup>-3</sup>
EI joint		320000	kip-in <sup>2</sup>

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CES

October 9, 1989

10:25:50 am

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TCCMAR PROJECT

WALL No 10 DYNAMIC TEST Run No 11: BONDCH 0.80 EPA

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Wall Weight: 5.88 kips	H/t Ratio: 50
Vert. Reinf: 3 # 7	Grouting : Partial
Dead Load: 300 lb/ft	Splices : yes

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SUMMARY OF EXTREME VALUES

GLOBAL WALL RESPONSE

Disp Top	5.63 in	Acc Top	1.11 g
Disp Cent	17.04 in	Acc Cent	1.82 g
Disp Bot	3.24 in	Acc Bot	0.68 g
Peak Defl	15.70 in		
Inertia Force	5.88 kips	Eqv Load	300.0 lb/ft
Bending Mt	285.02 kip-in	Seismic C	1.29
		C/Acc Bot	1.91

MATERIAL & MECHANICAL PROPERTIES

f'm	4900 psi	Em (Code)	3680 ksi
Ig	666 in <sup>4</sup>	EmIg	2449000 kip-in <sup>2</sup>
Avg Freq	0.79 Hz	EIeqv	170000 kip-in <sup>2</sup>
		EmIg/EIeqv	14.41

LOCAL RESPONSE

	Peak	Joint	36
Rebar Strain	0.0072	0.0063	in/in
Strain Ductility	2.88	2.52	in
Avg Joint Opening	0.0329	0.0168	in
Faceshell Comp. Strain	0.0027	0.0021	in/in
Faceshell Opening	0.0760	0.0413	in
Curvature	3.9200	2.2400	(1/in)*10-3
EI joint		127000	kip-in <sup>2</sup>

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CES

October 9, 1989

10:25:57 am

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TCCMAR PROJECT

WALL No 10 DYNAMIC TEST Run No 12: BONDCHS 0.80 EPA

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Wall Weight: 5.88 kips	H/t Ratio: 50
Vert. Reinf: 3 # 7	Grouting : Partial
Dead Load: 300 lb/ft	Splices : yes

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SUMMARY OF EXTREME VALUES

GLOBAL WALL RESPONSE

Disp Top	5.27 in	Acc Top	2.07 g
Disp Cent	19.65 in	Acc Cent	2.48 g
Disp Bot	4.73 in	Acc Bot	1.25 g
Peak Defl	16.92 in		
Inertia Force	5.14 kips	Eqv Load	280.0 lb/ft
Bending Mt	260.51 kip-in	Seismic C	1.18
		C/Acc Bot	0.95

MATERIAL & MECHANICAL PROPERTIES

f'm	4900 psi	Em (Code)	3680 ksi
Ig	666 in4	EmIg	2449000 kip-in2
Avg Freq	0.61 Hz	EIeqv	144000 kip-in2
		EmIg/EIeqv	17.01

LOCAL RESPONSE

	Peak	Joint	36
Rebar Strain	0.0109	0.0077	in/in
Strain Ductility	4.36	3.08	in
Avg Joint Opening	0.0437	0.0230	in
Faceshell Comp. Strain	0.0031	0.0021	in/in
Faceshell Opening	0.0999	0.0542	in
Curvature	5.1100	2.8300	(1/in)*10-3
EI joint		91000	kip-in2

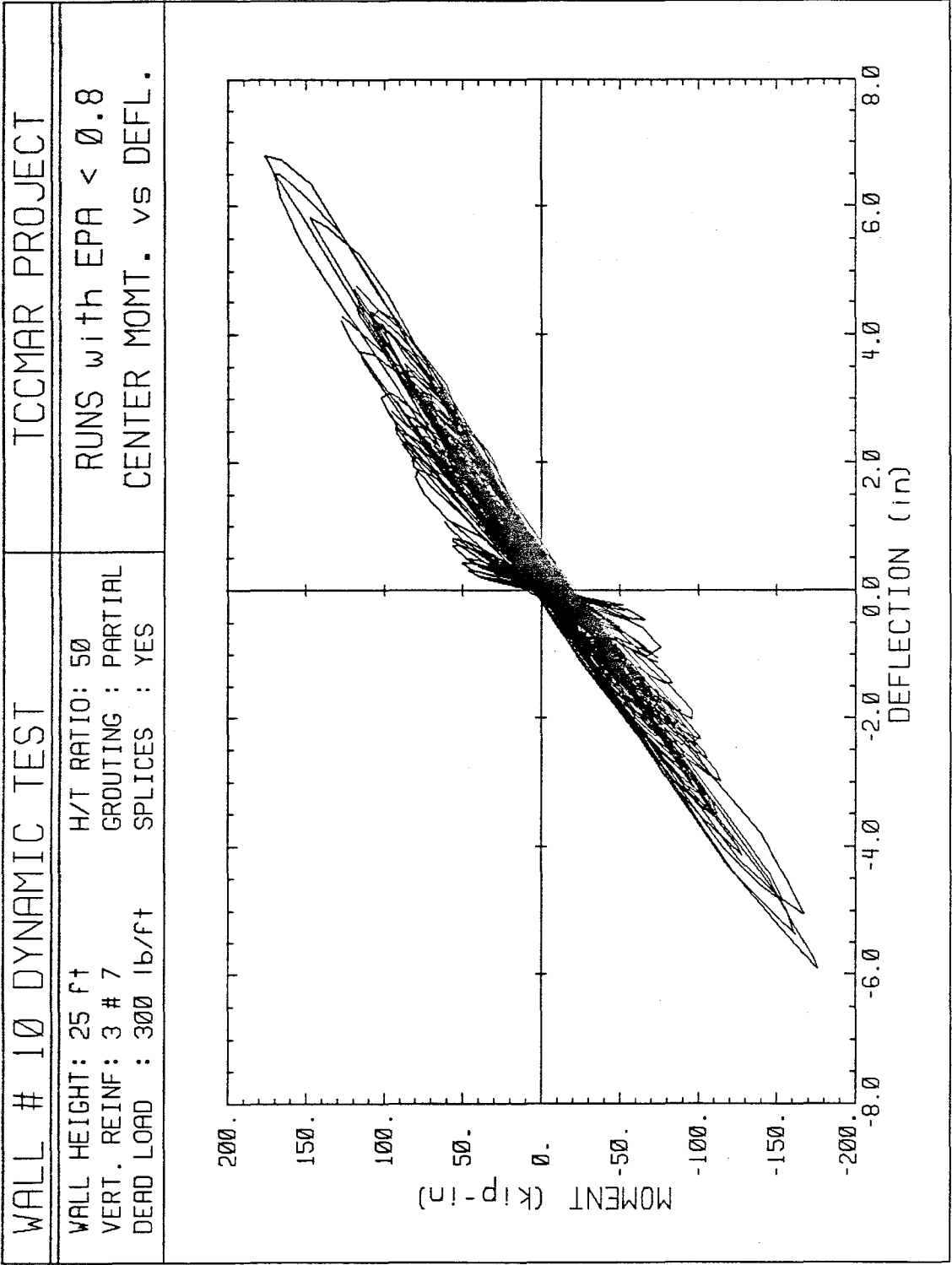
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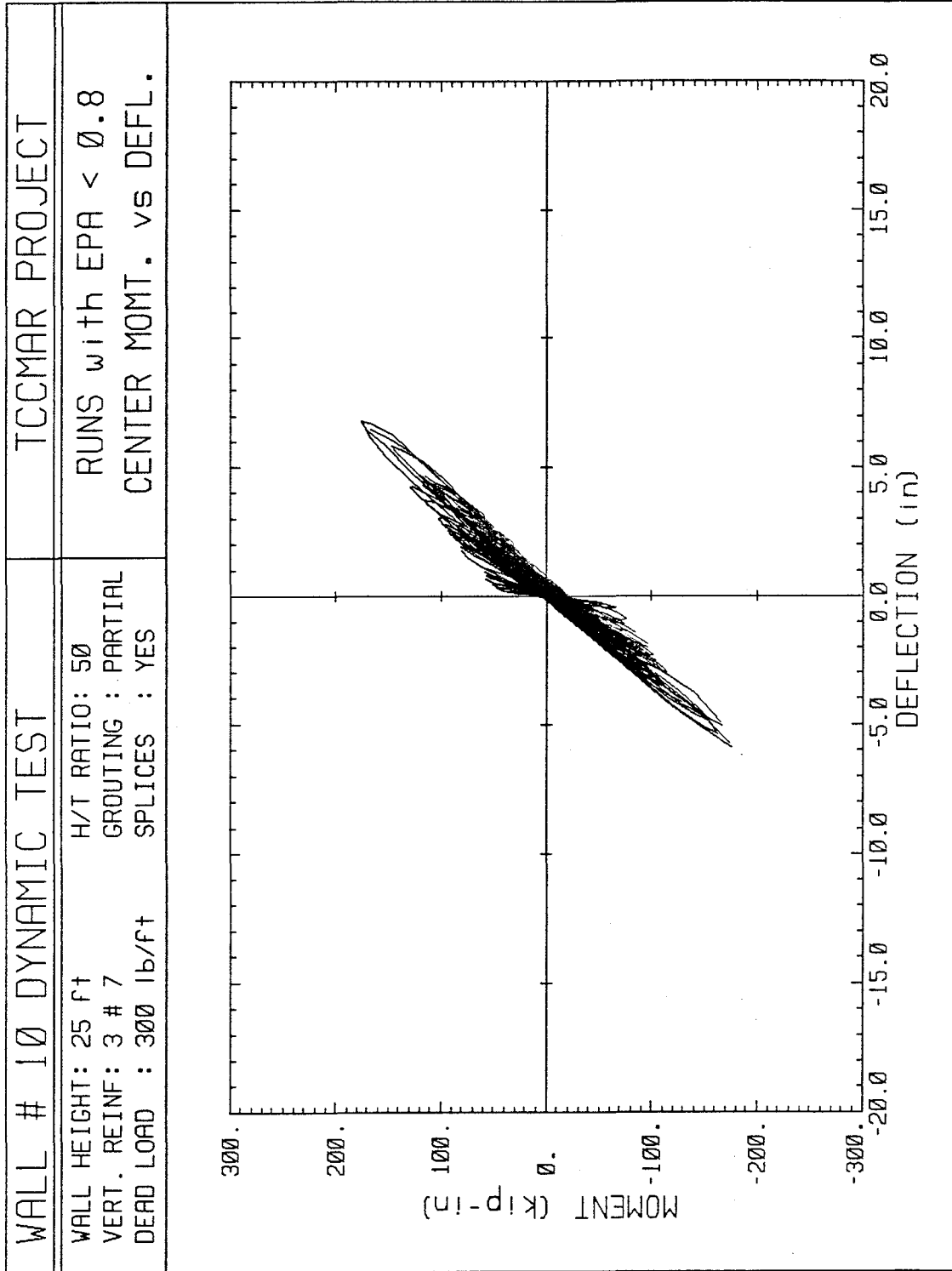
CES

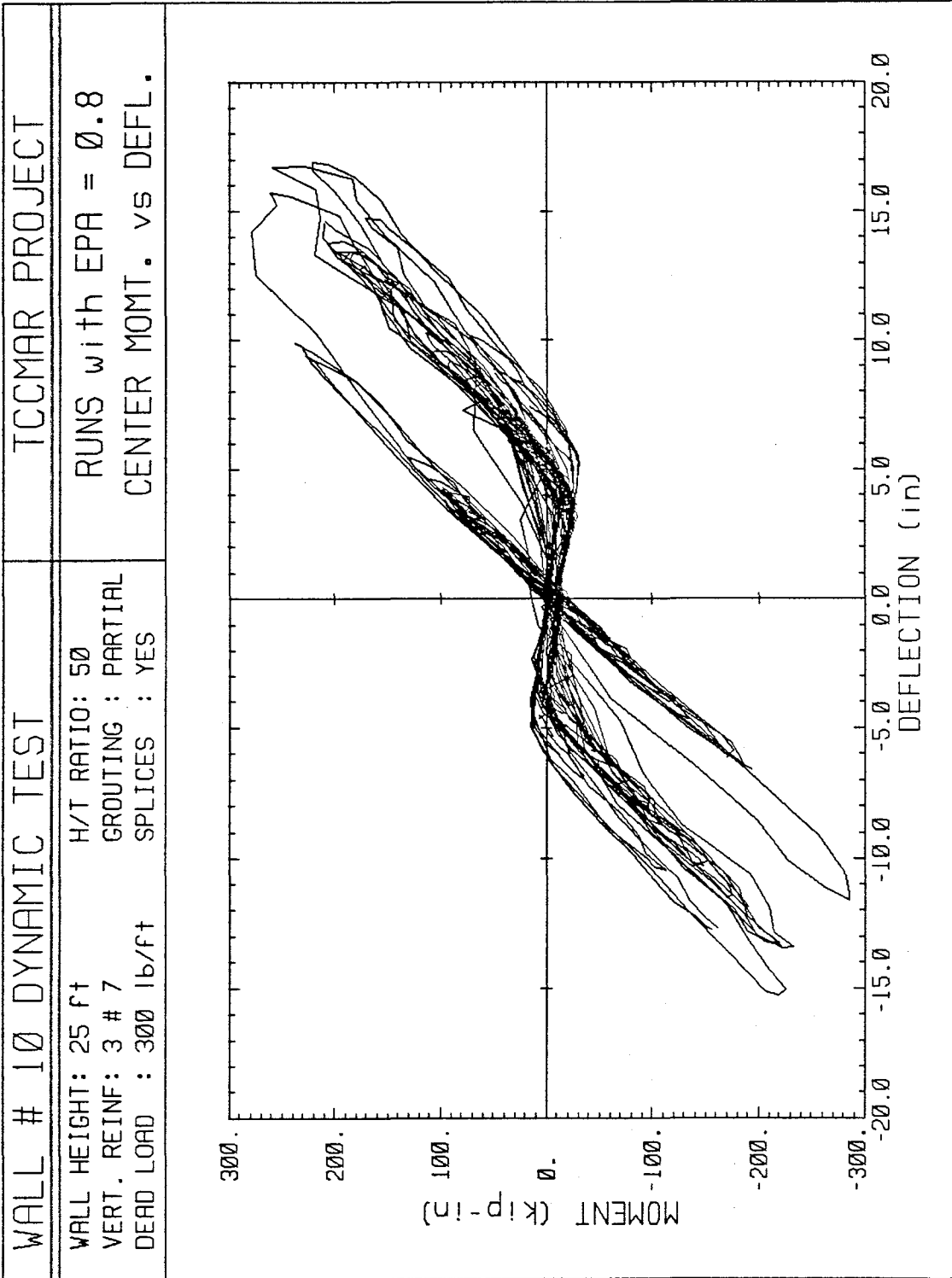
October 9, 1989

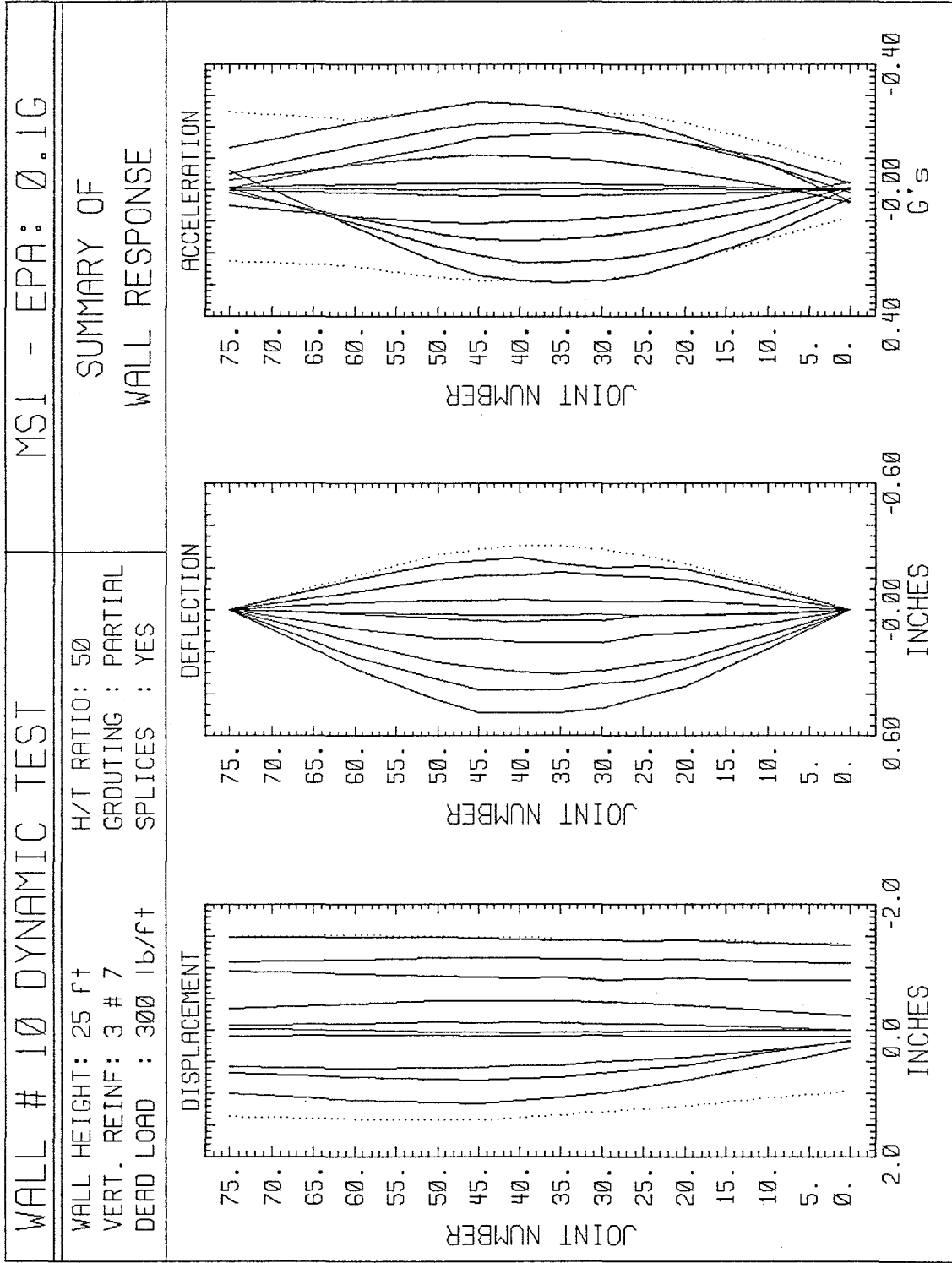
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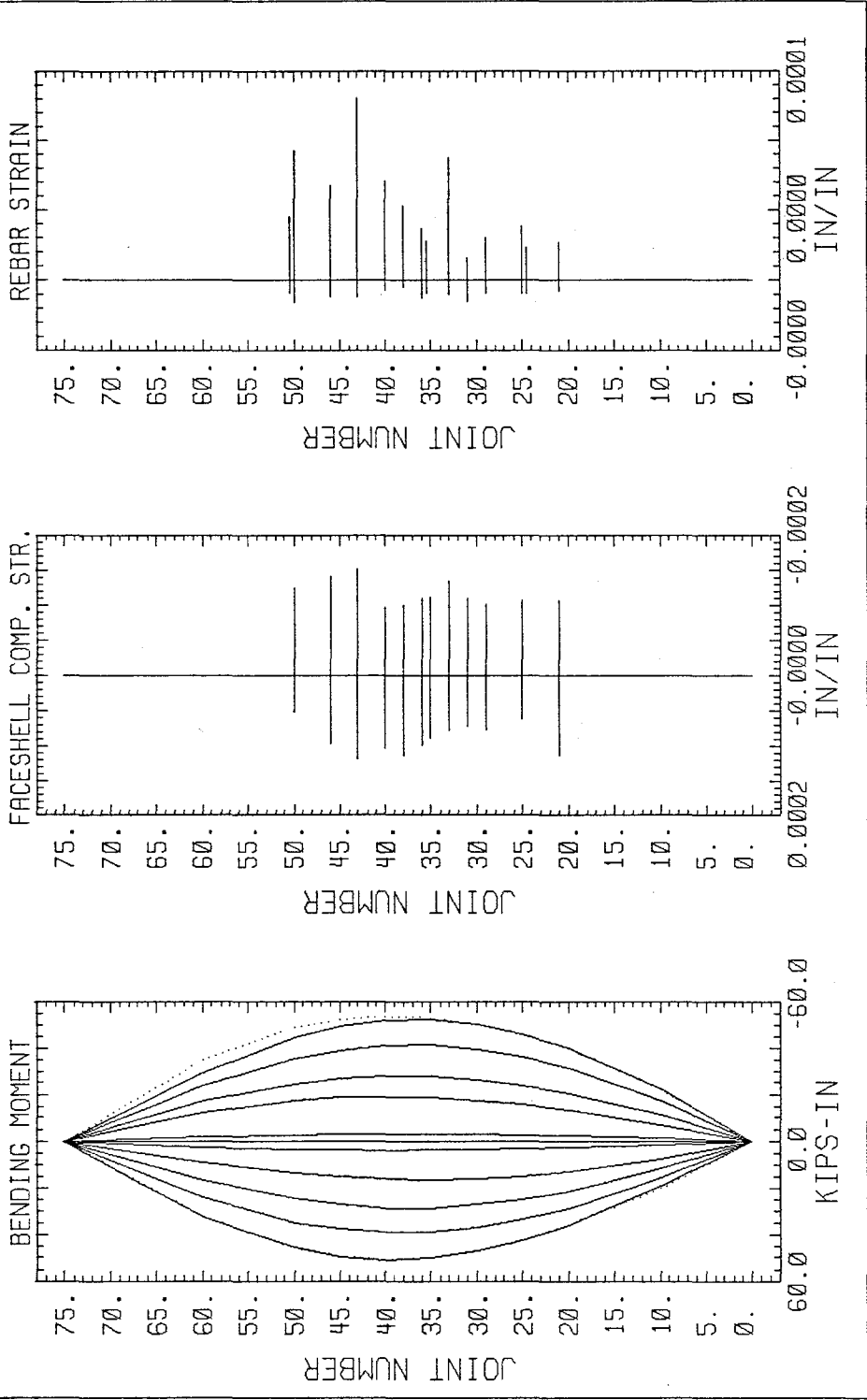
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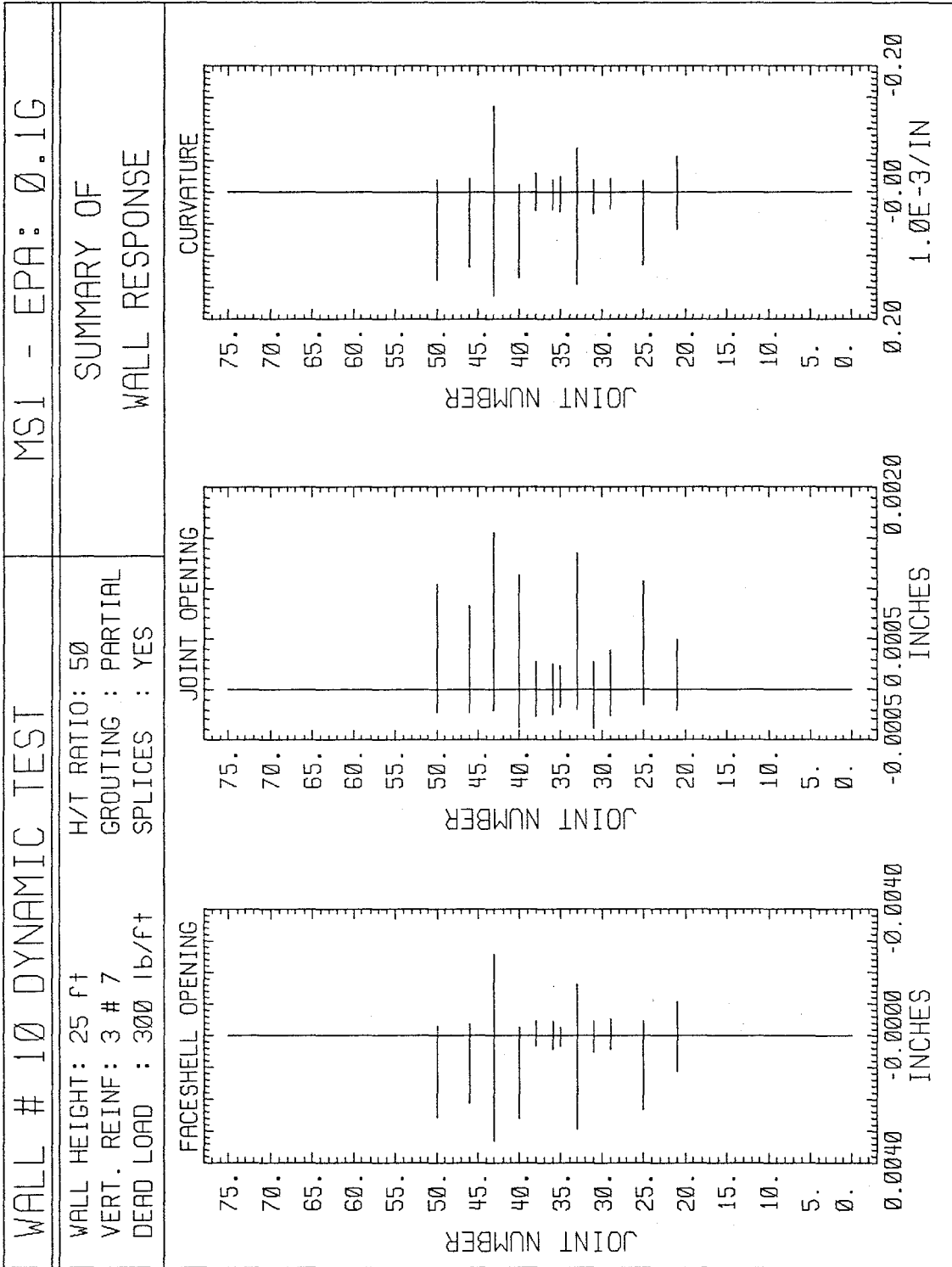
MSI - EPA: 0.1G

WALL HEIGHT: 25 FT  
VERT. REINF: 3 # 7  
DEAD LOAD : 300 lb/ft

H/T RATIO: 50  
GROUTING : PARTIAL  
SPLICES : YES

SUMMARY OF WALL RESPONSE



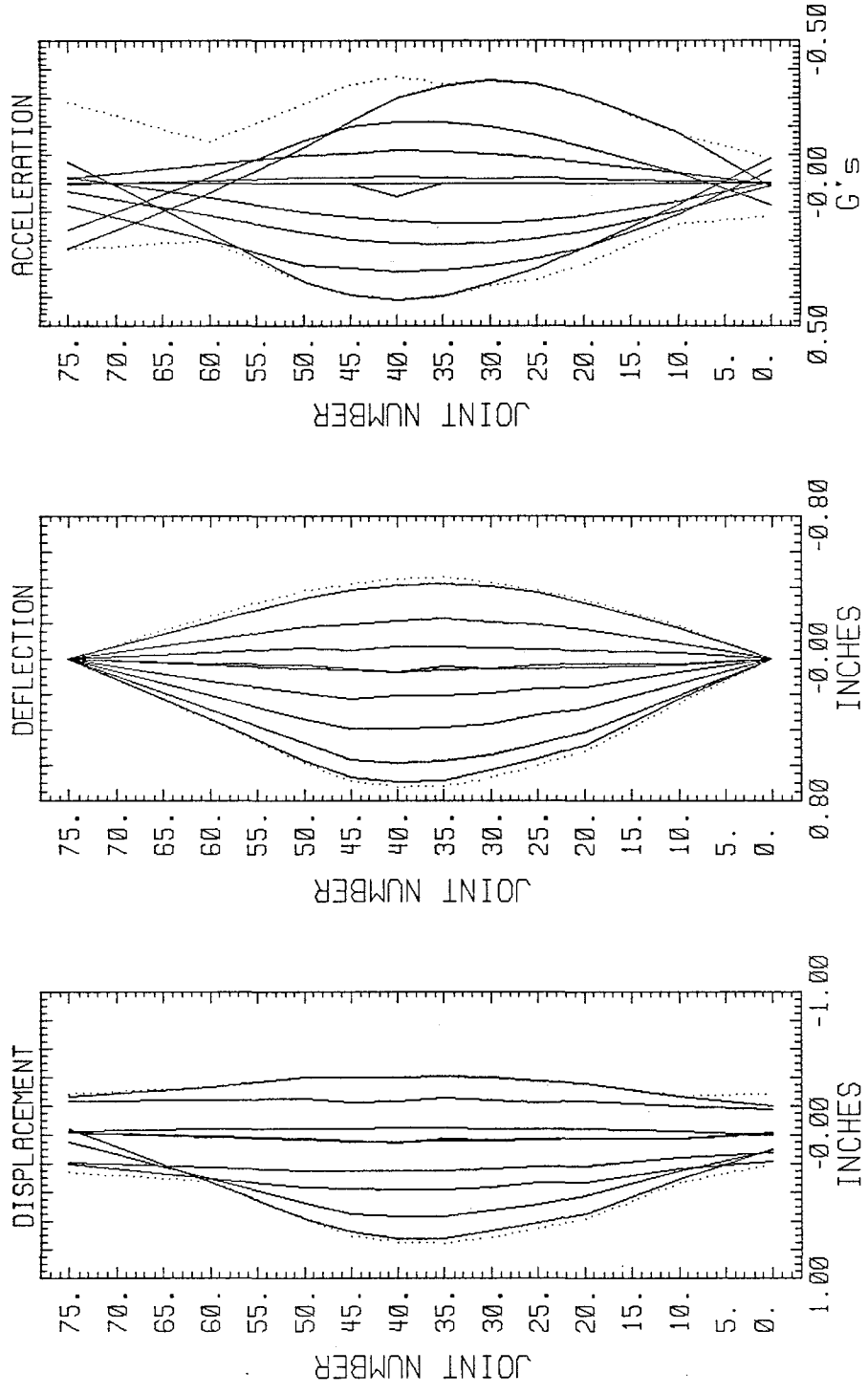


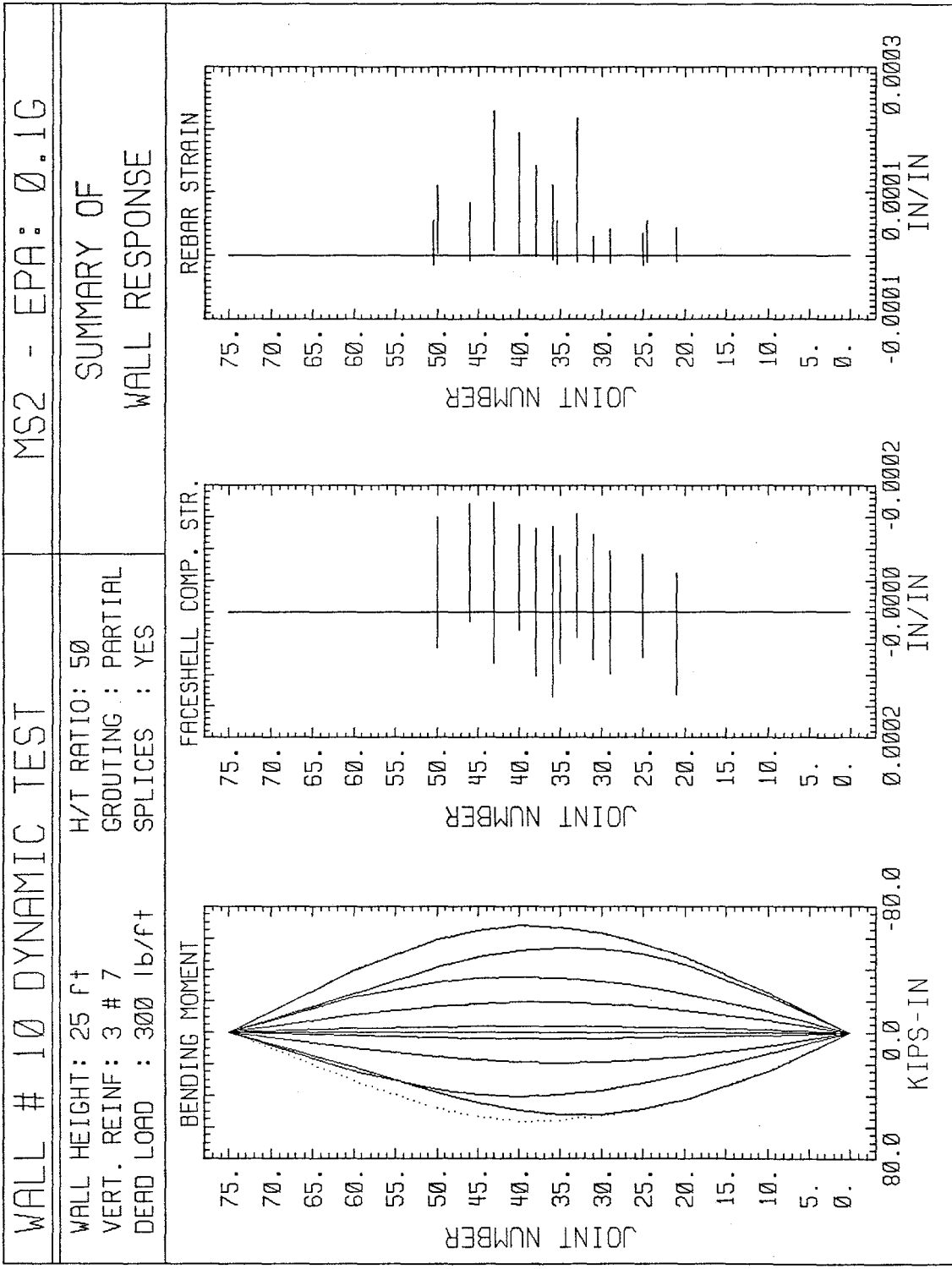
WALL # 10 DYNAMIC TEST

MS2 - EPA: 0.1G

WALL HEIGHT: 25 FT H/T RATIO: 50  
 VERT. REINF: 3 # 7 GROUTING : PARTIAL  
 DEAD LOAD : 300 lb/ft+ SPICES : YES

SUMMARY OF WALL RESPONSE





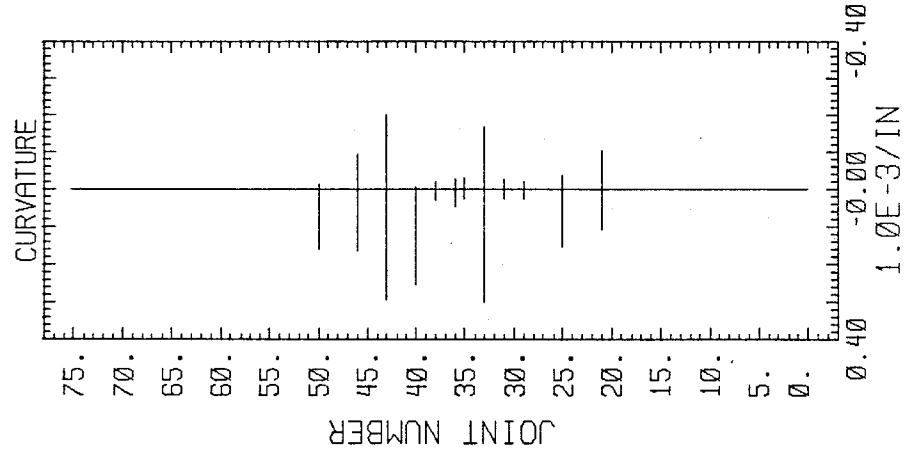
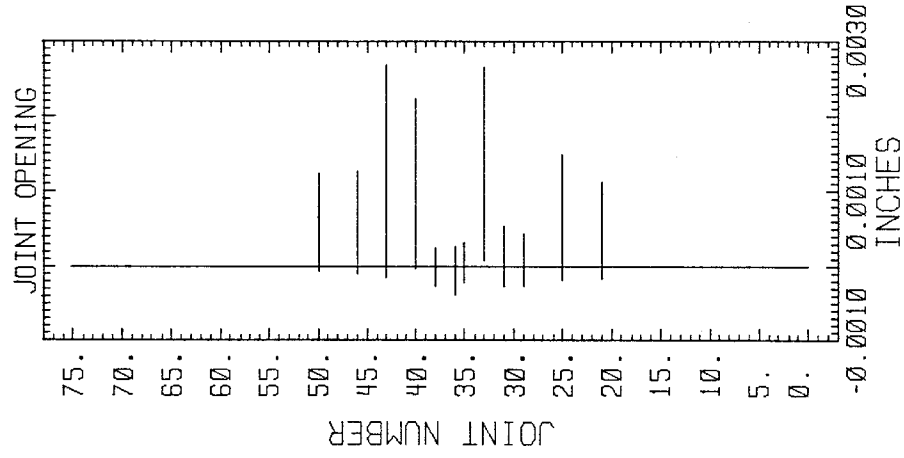
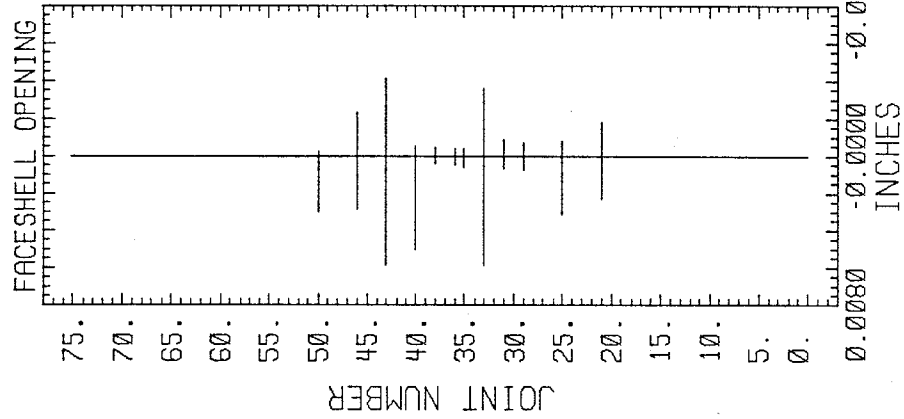
# WALL # 10 DYNAMIC TEST

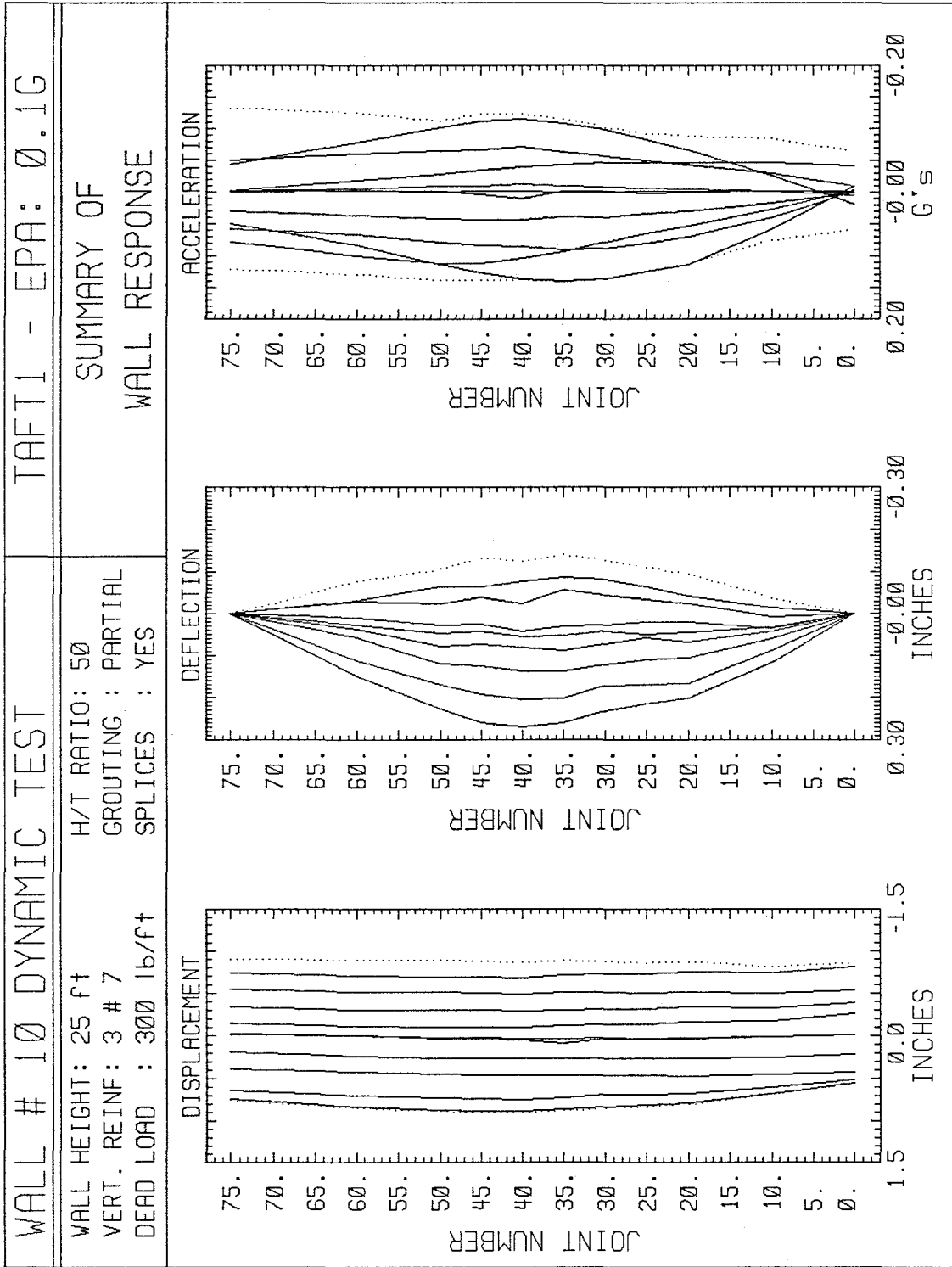
MS2 - EPA: 0.1G

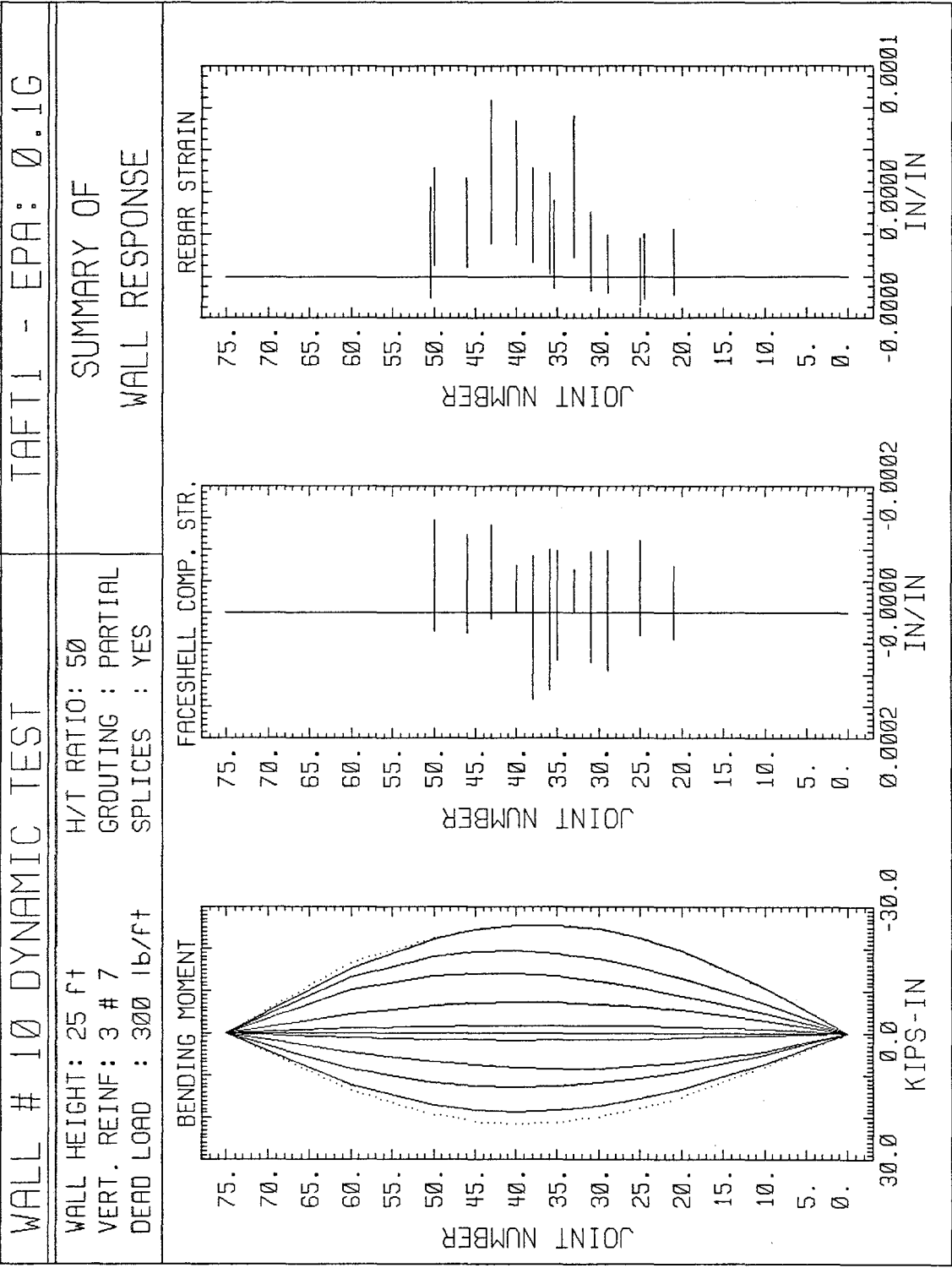
WALL HEIGHT: 25 ft  
 VERT. REINF: 3 # 7  
 DEAD LOAD : 300 lb/ft

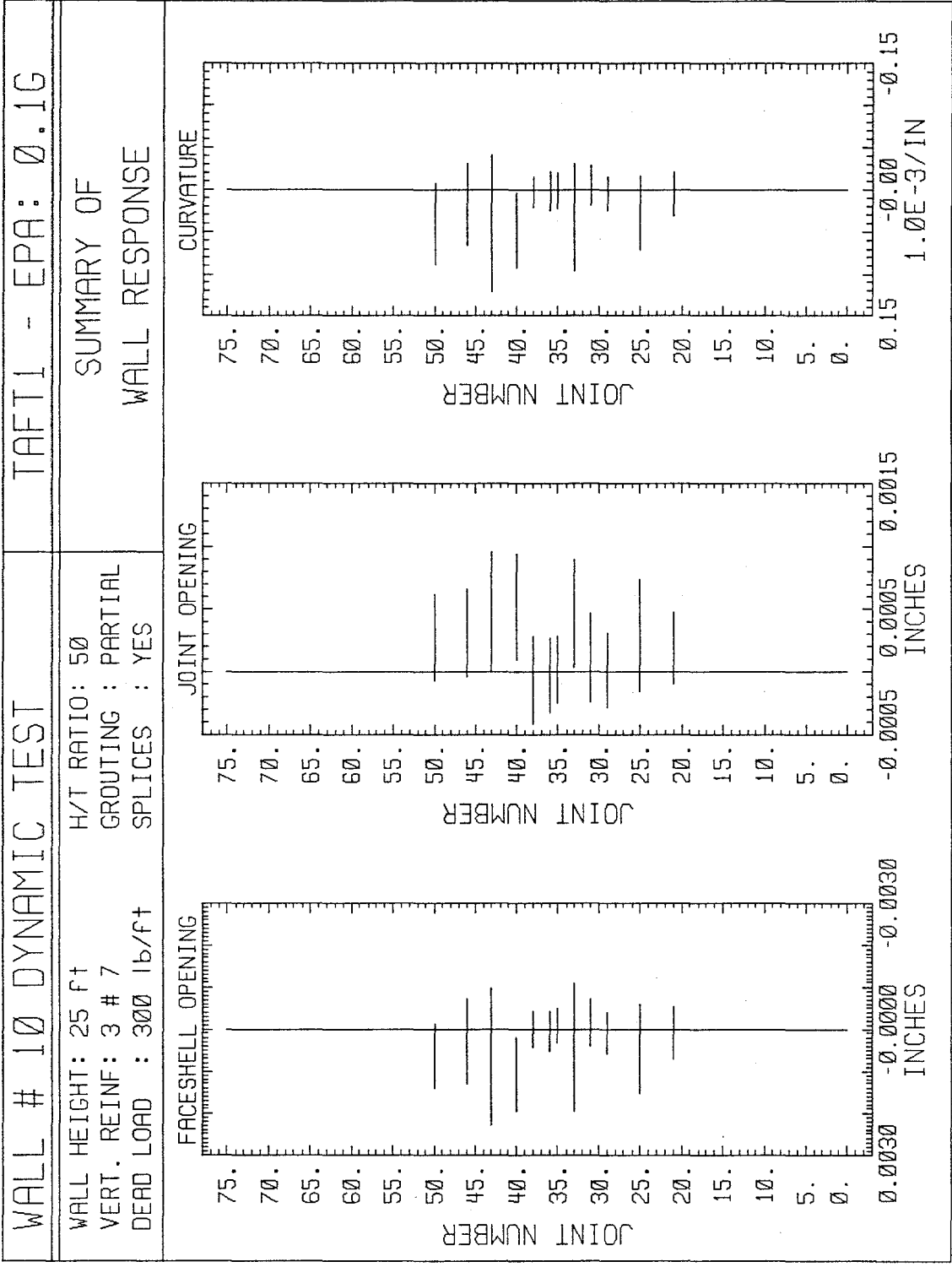
H/T RATIO: 50  
 GROUTING : PARTIAL  
 SPLICES : YES

## SUMMARY OF WALL RESPONSE

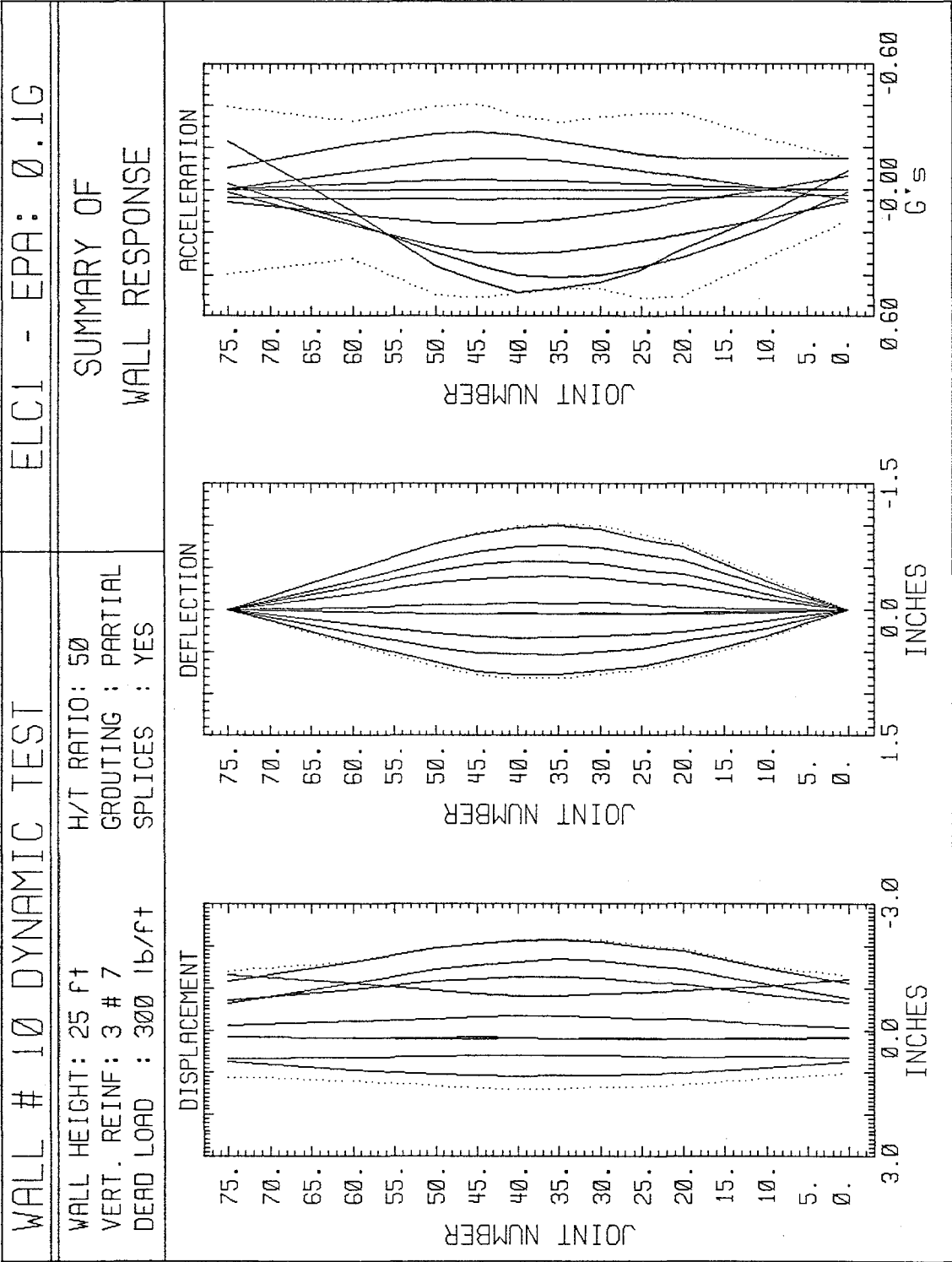


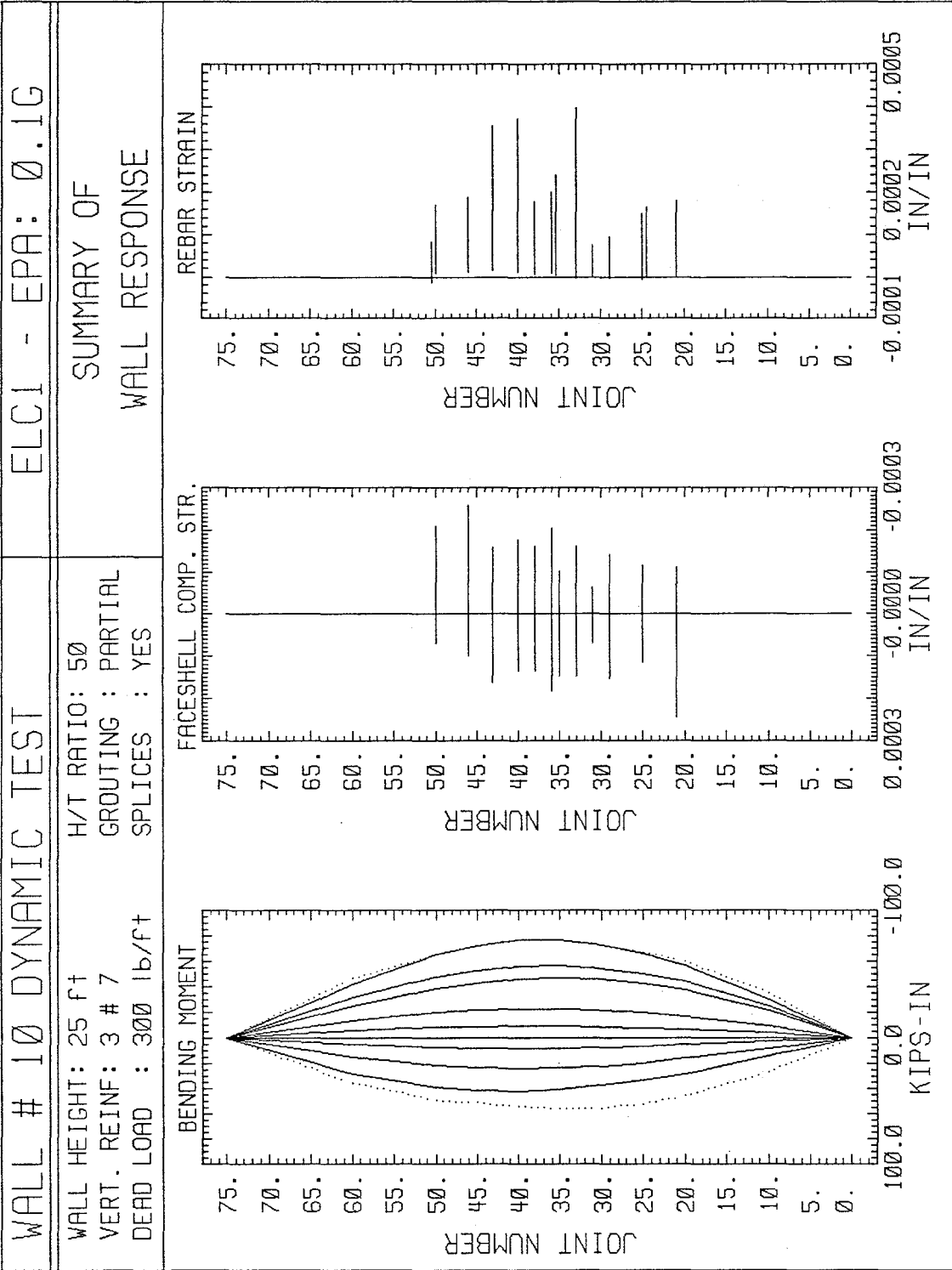




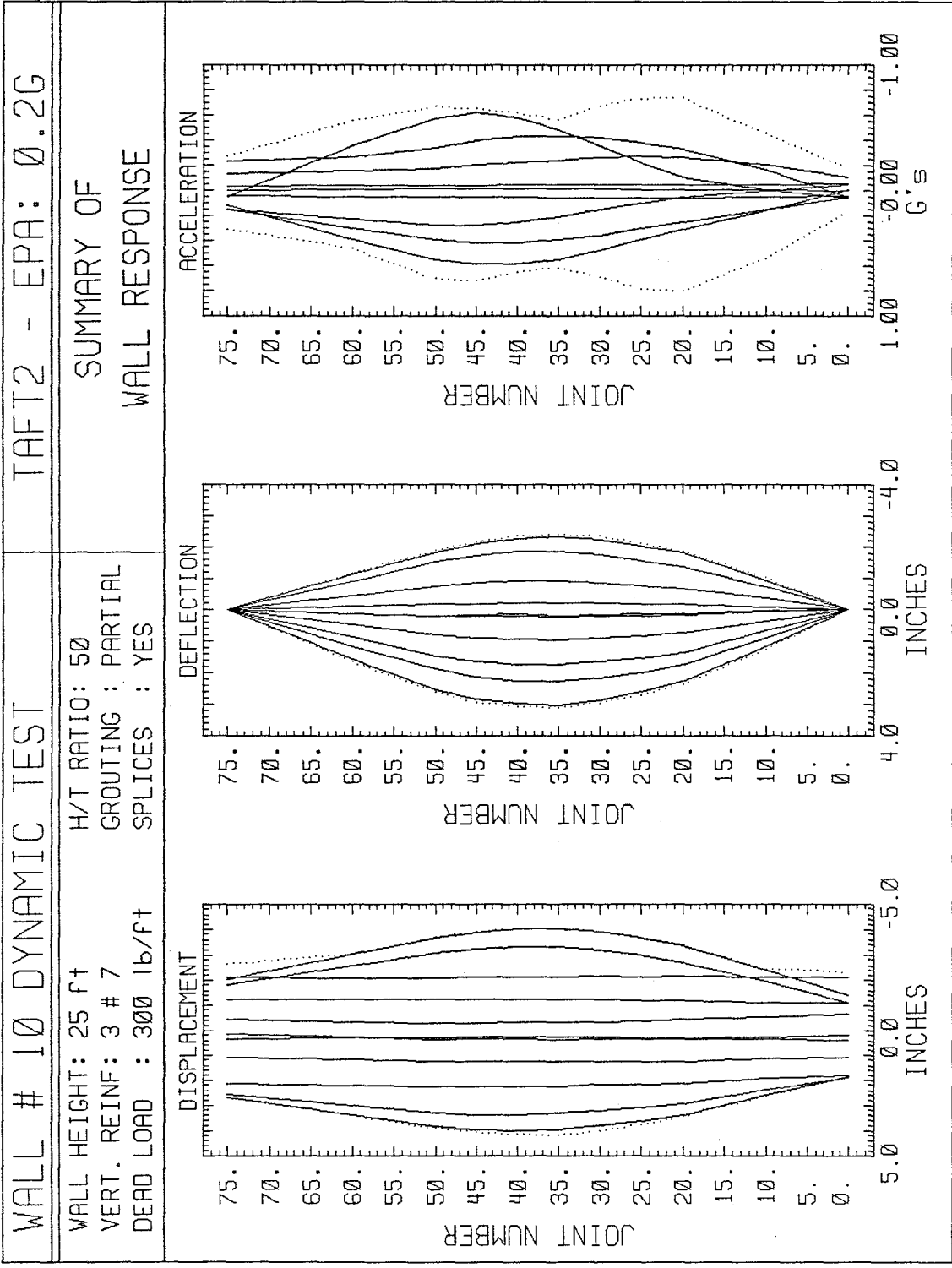


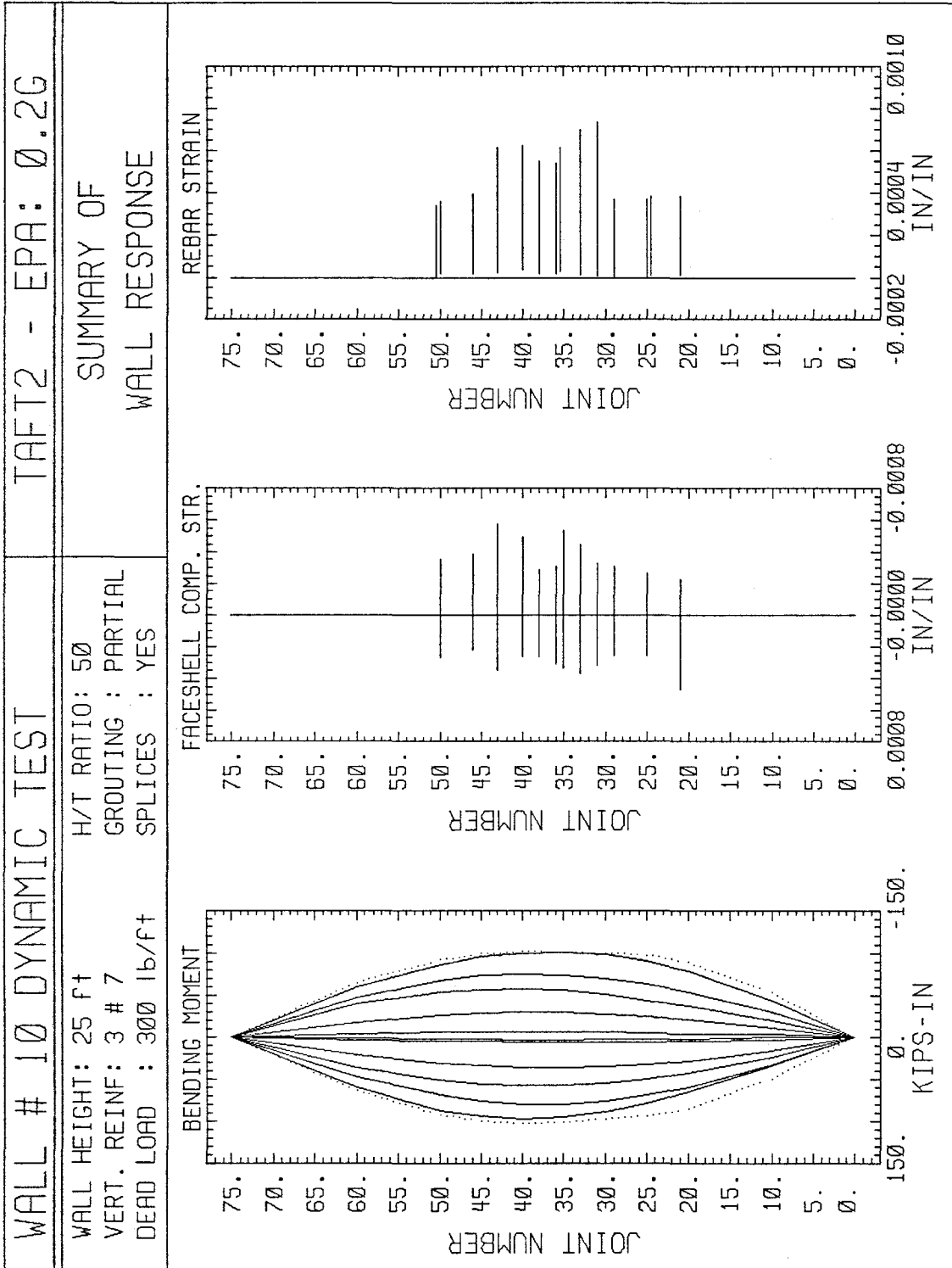


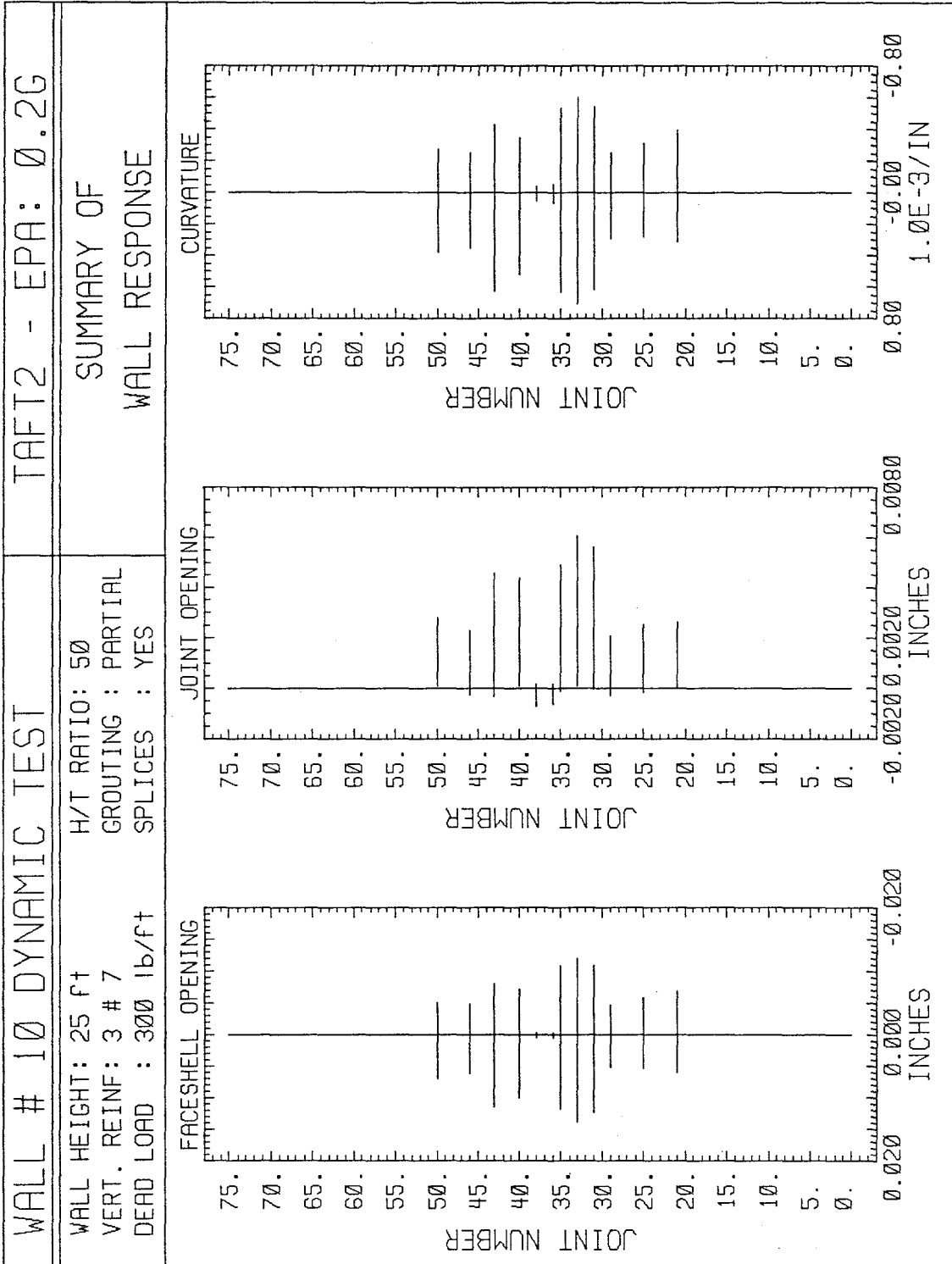




WALL # 10 DYNAMIC TEST		ELCI - EPA: 0.1G	
WALL HEIGHT: 25 FT+ VERT. REINF: 3 # 7 DEAD LOAD : 300 lb/ft+		H/T RATIO: 50 GROUTING : PARTIAL SPLICES : YES	
SUMMARY OF WALL RESPONSE			
FACESHELL OPENING 		JOINT OPENING 	
CURVATURE 			







WALL # 10 DYNAMIC TEST

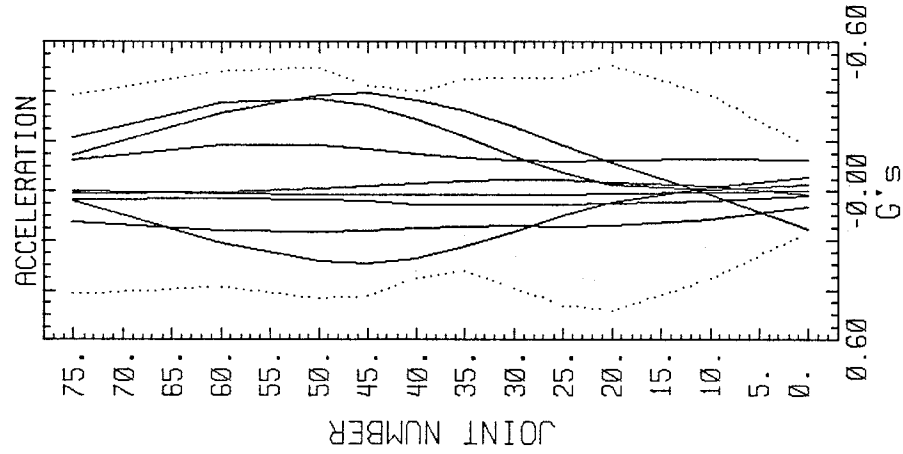
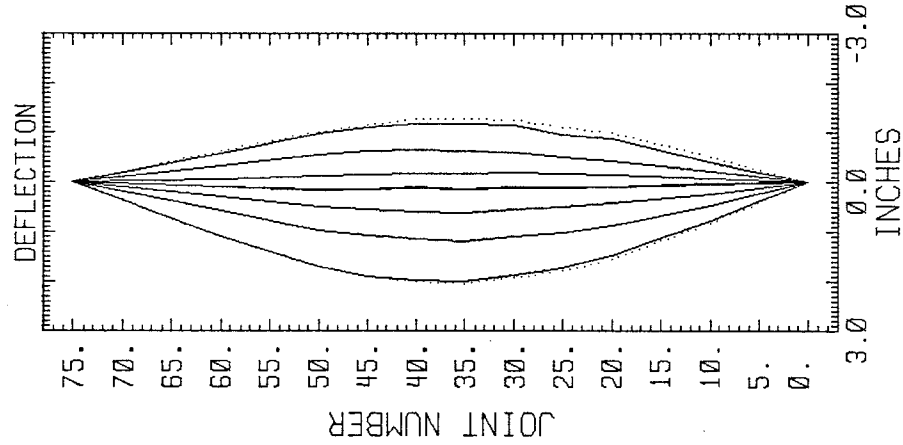
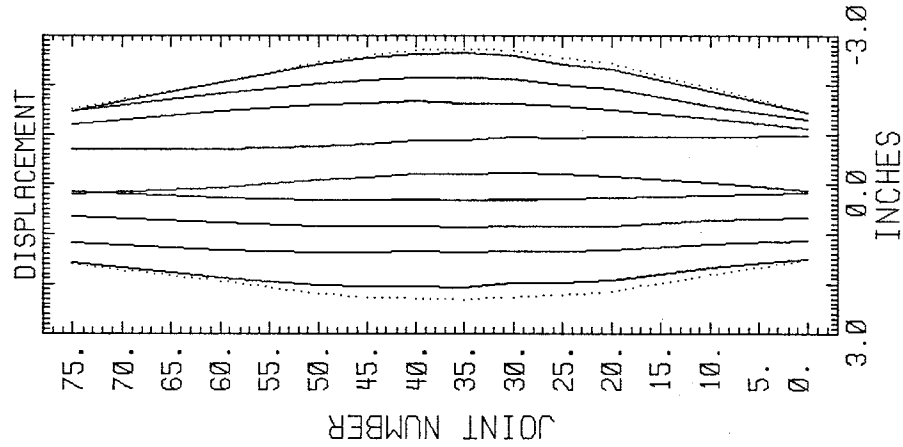
ELC2 - EPA: 0.2G

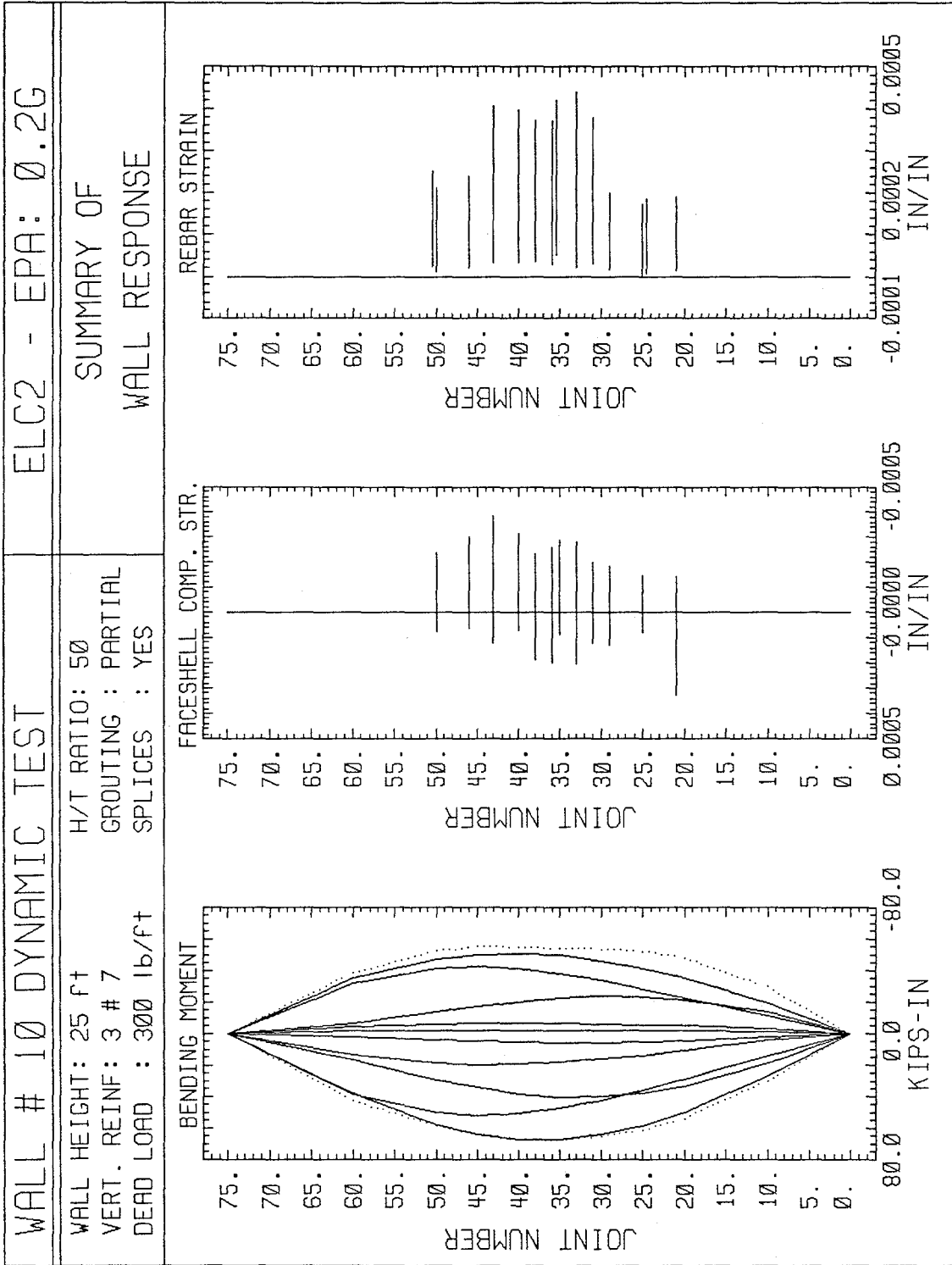
WALL HEIGHT: 25 ft  
 VERT. REINF: 3 # 7  
 DEAD LOAD : 300 lb/ft

H/T RATIO: 50  
 GROUTING : PARTIAL  
 SPLICES : YES

SUMMARY OF

WALL RESPONSE







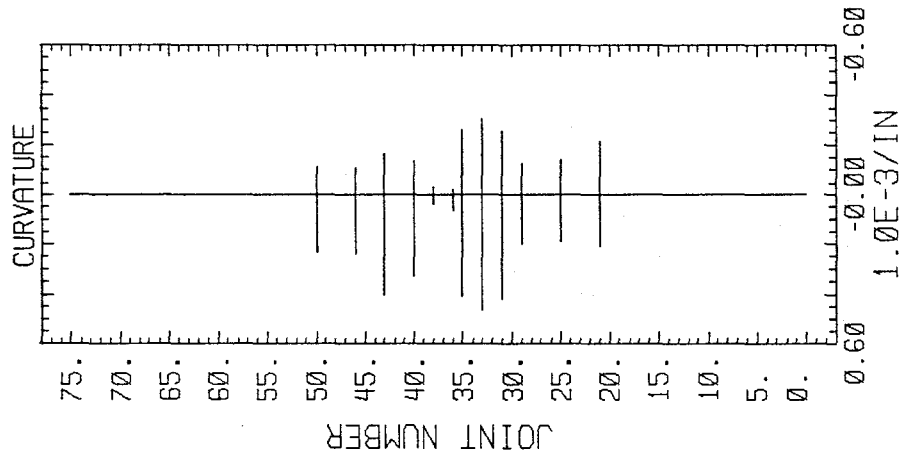
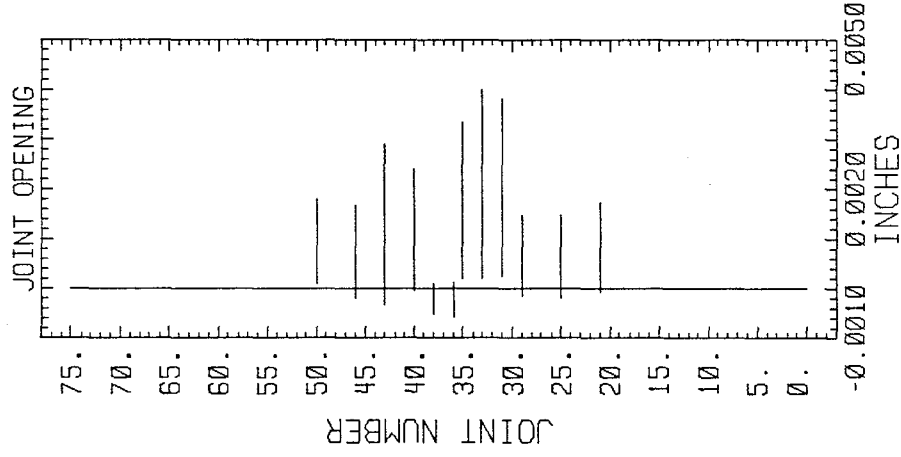
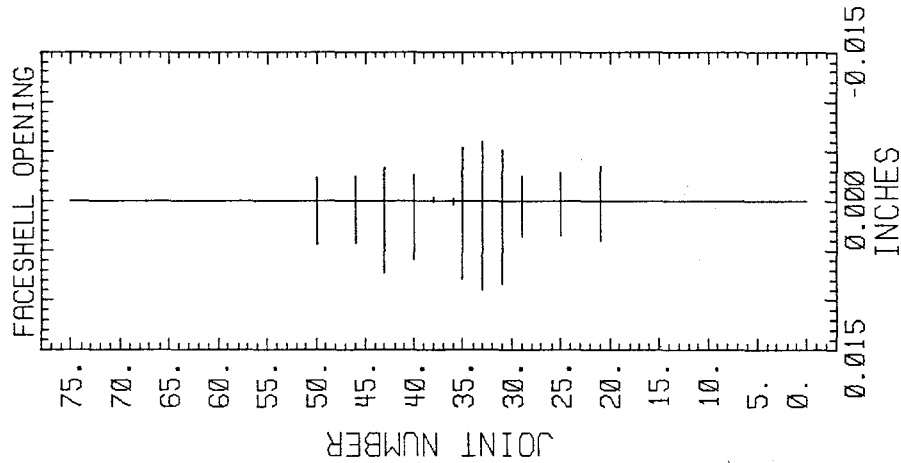
WALL # 10 DYNAMIC TEST

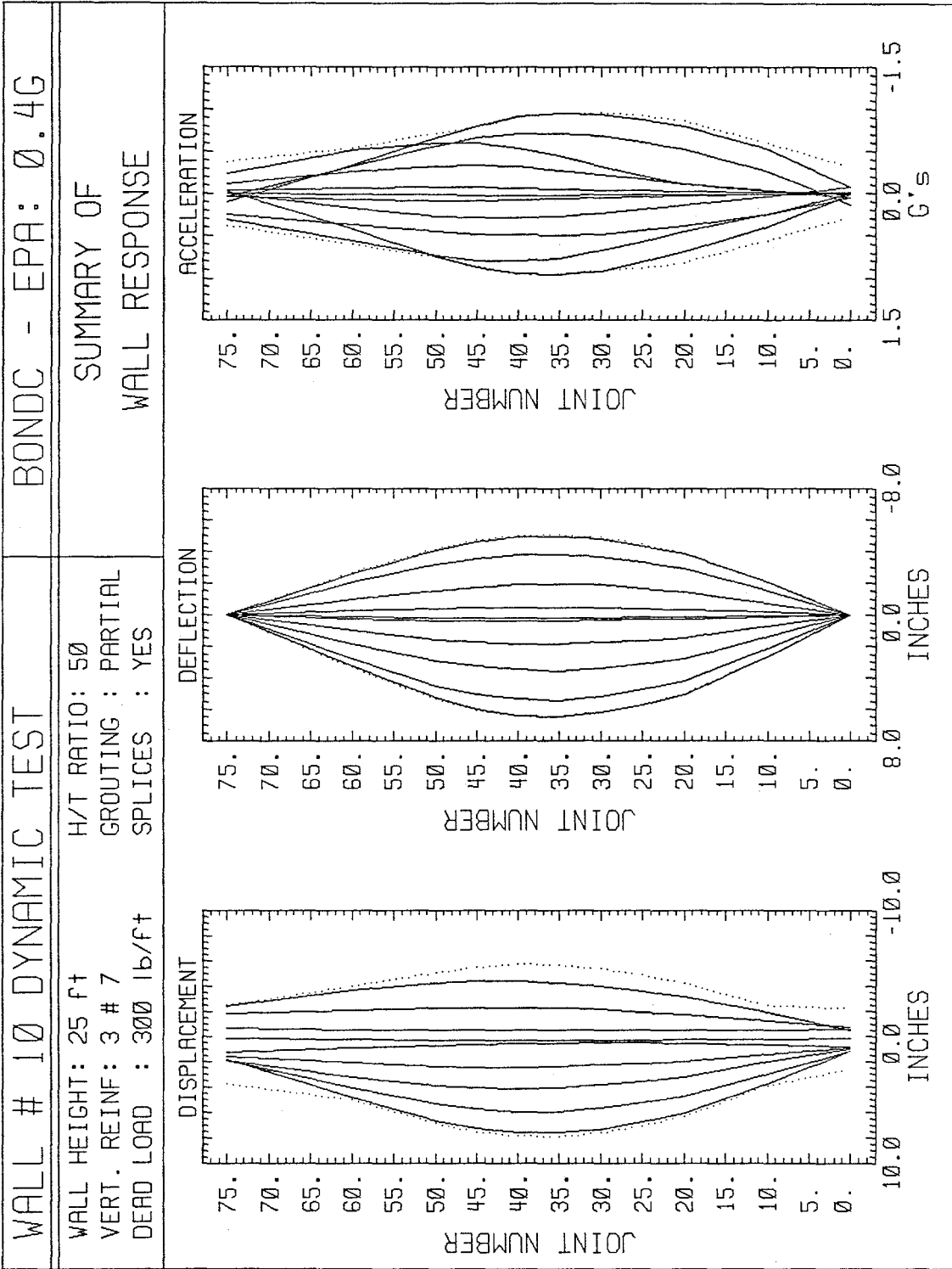
ELC2 - EPA: 0.2G

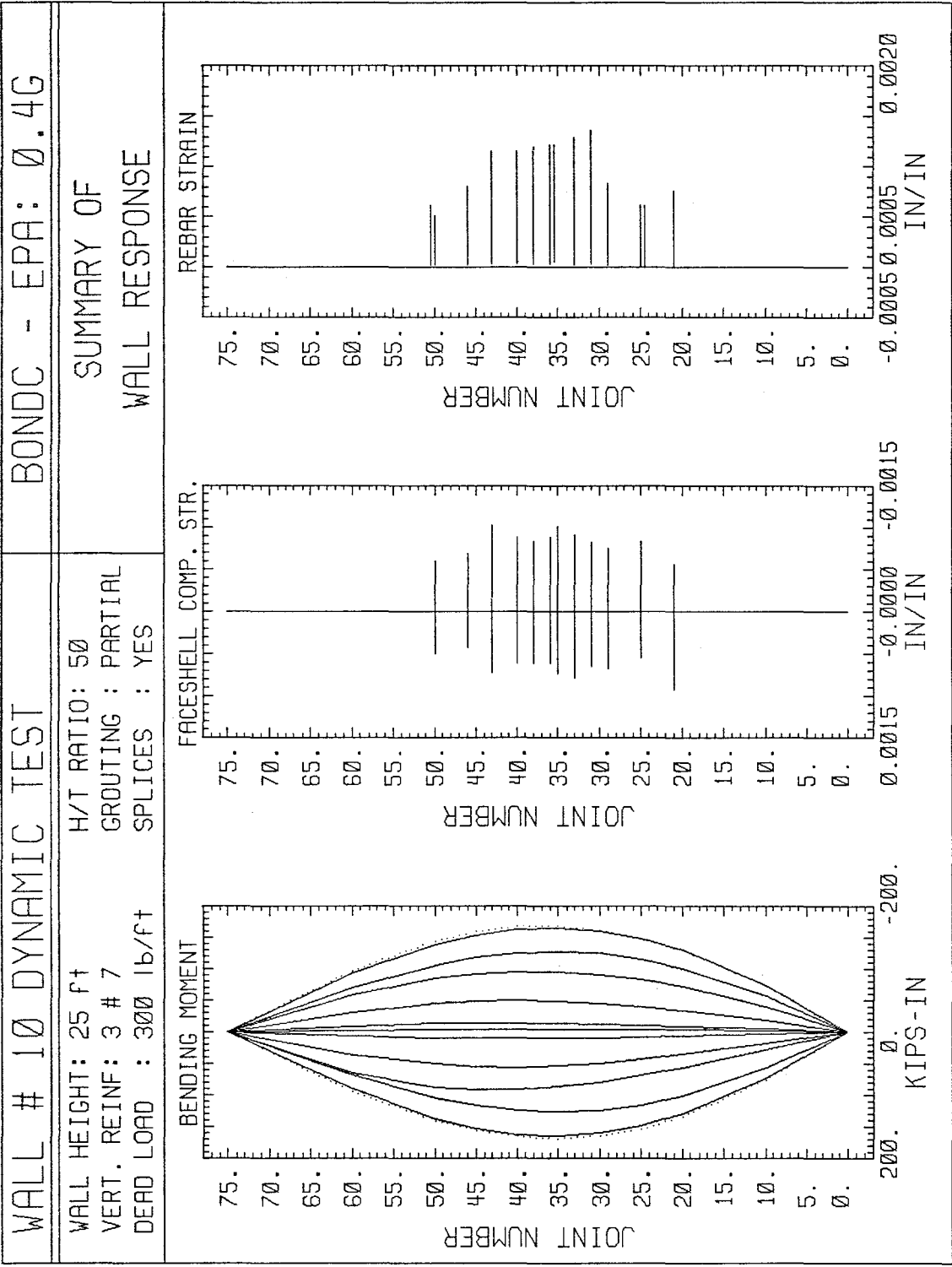
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 VERT. REINF: 3 # 7  
 DEAD LOAD : 300 lb/ft

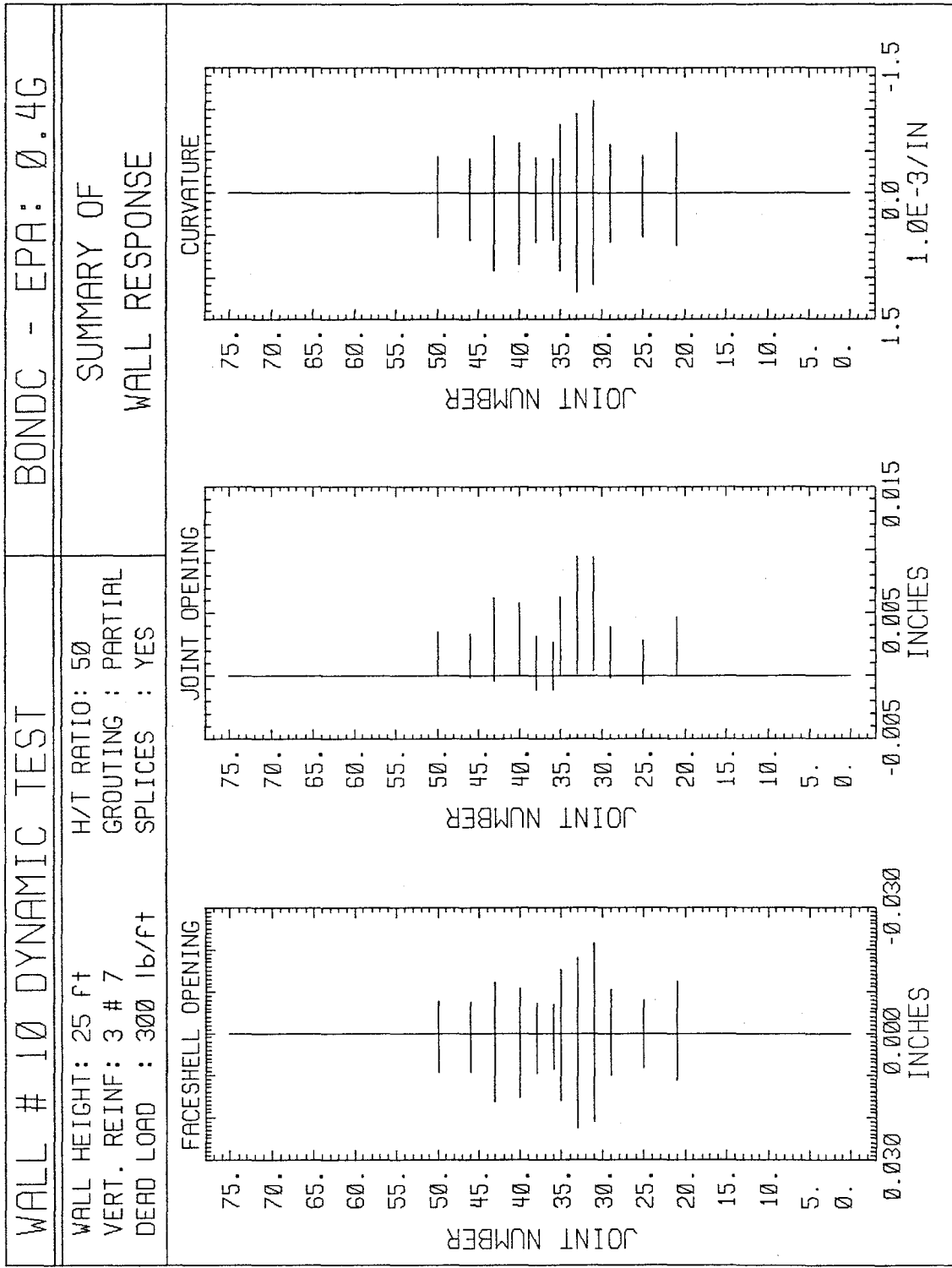
H/T RATIO: 50  
 GROUTING : PARTIAL  
 SPLICES : YES

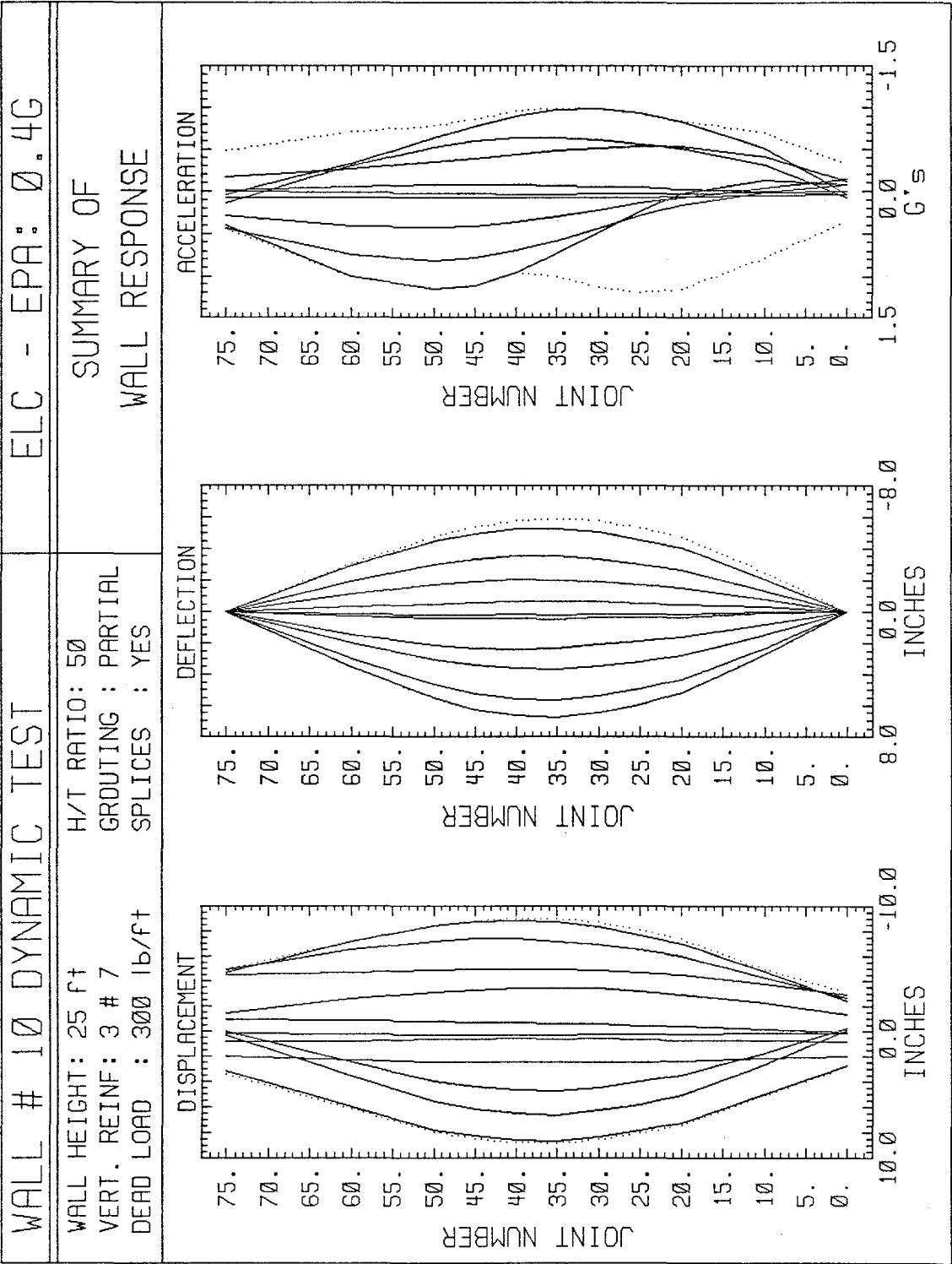
SUMMARY OF  
 WALL RESPONSE

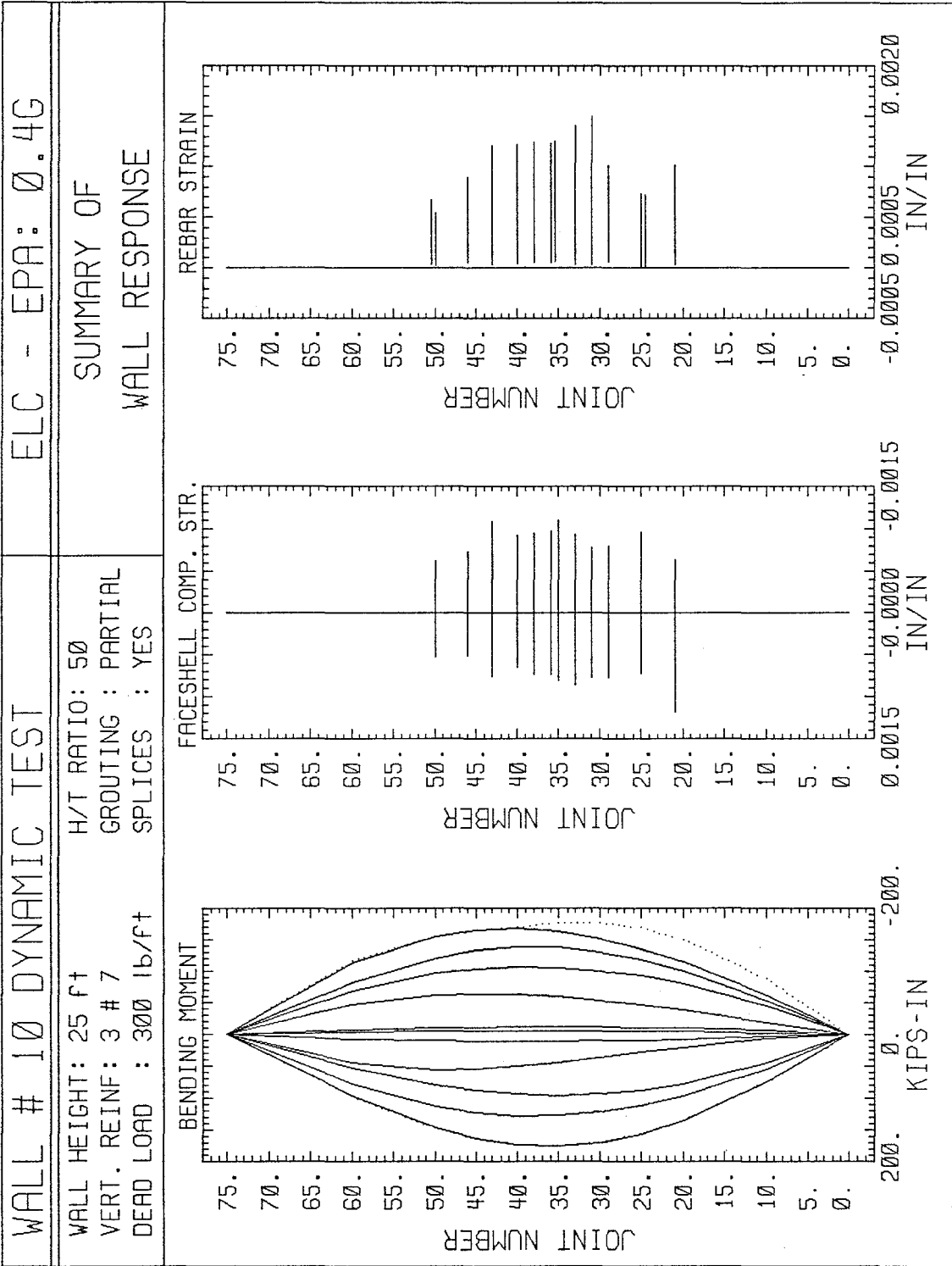


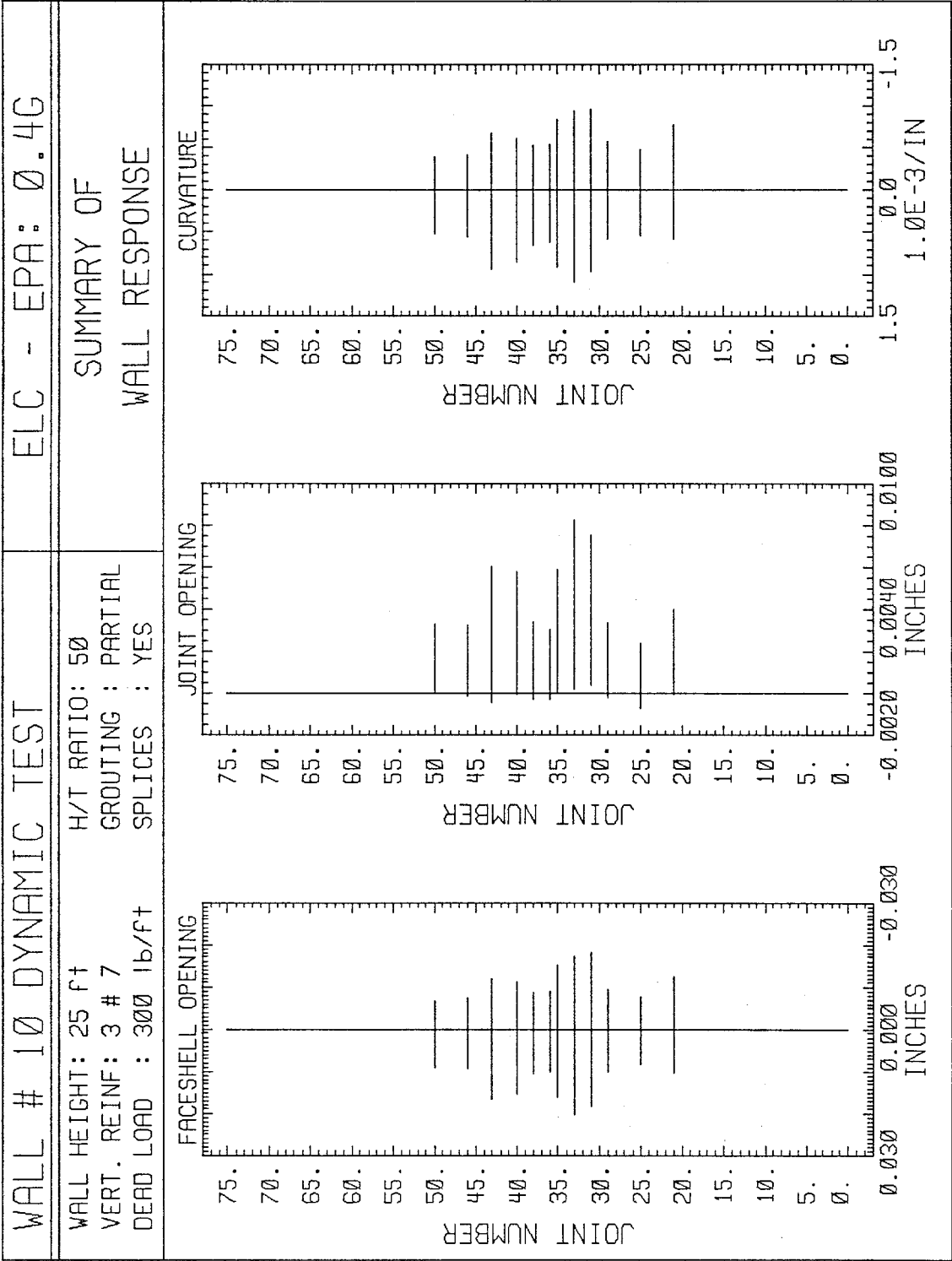


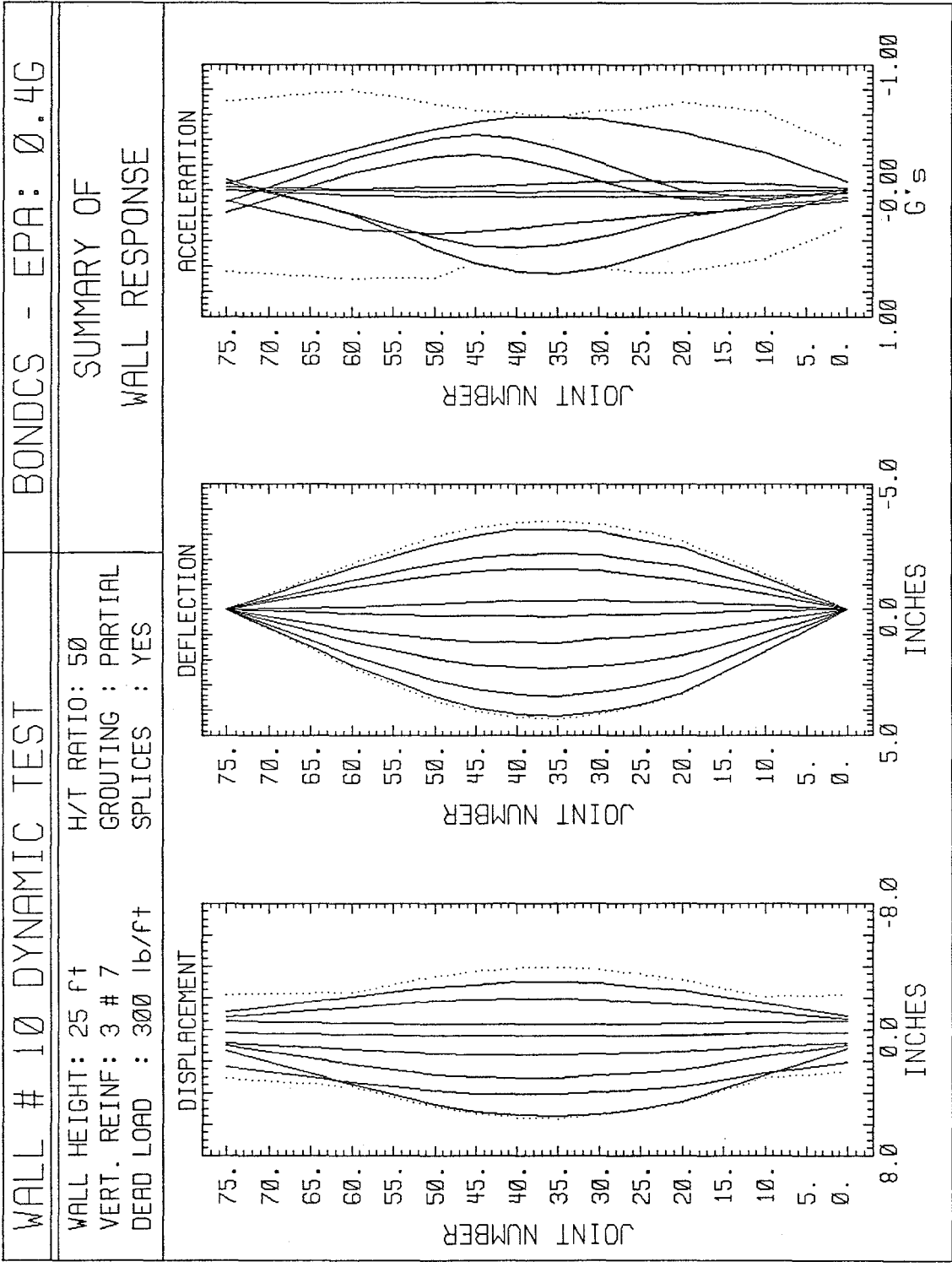




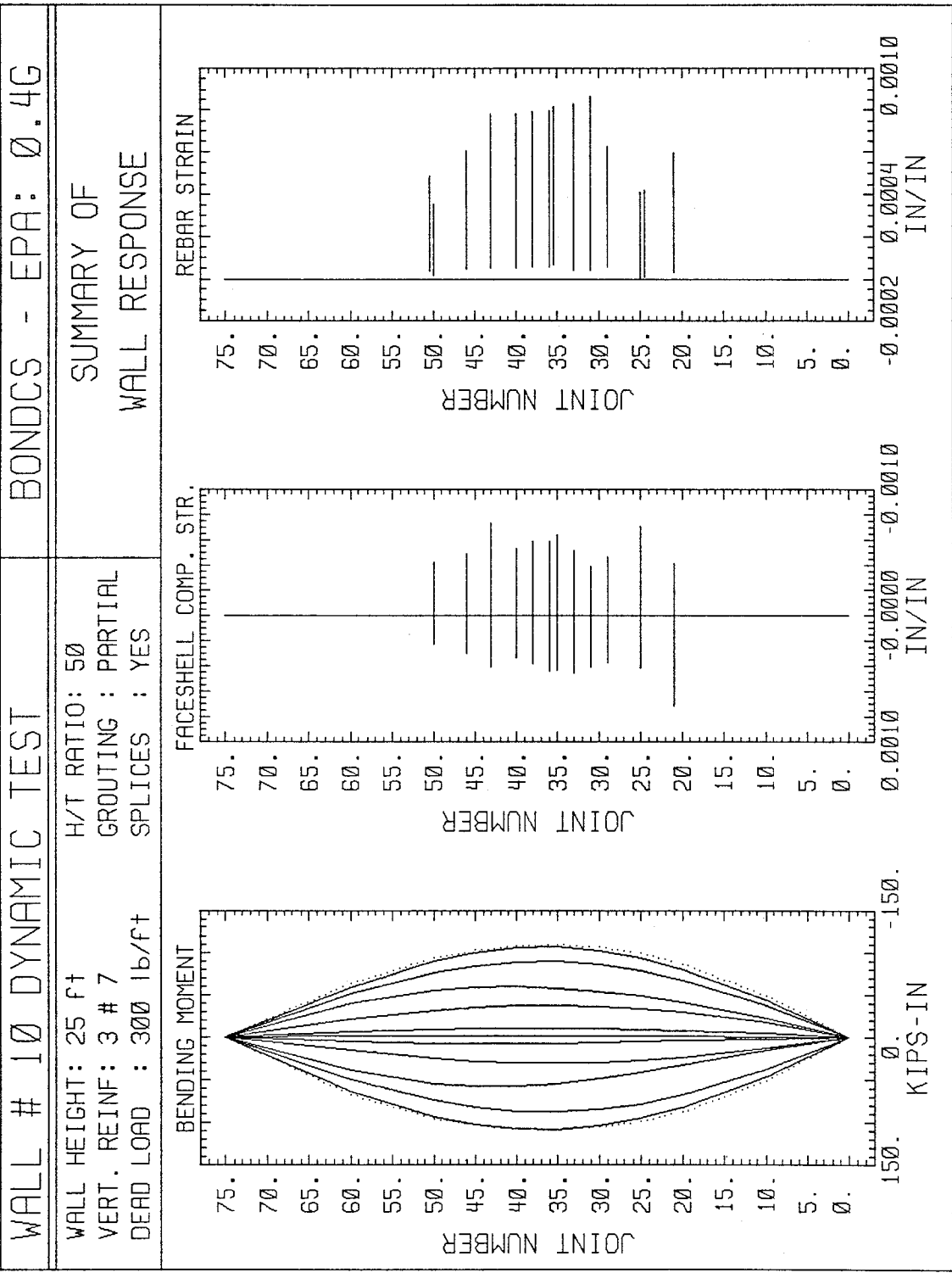


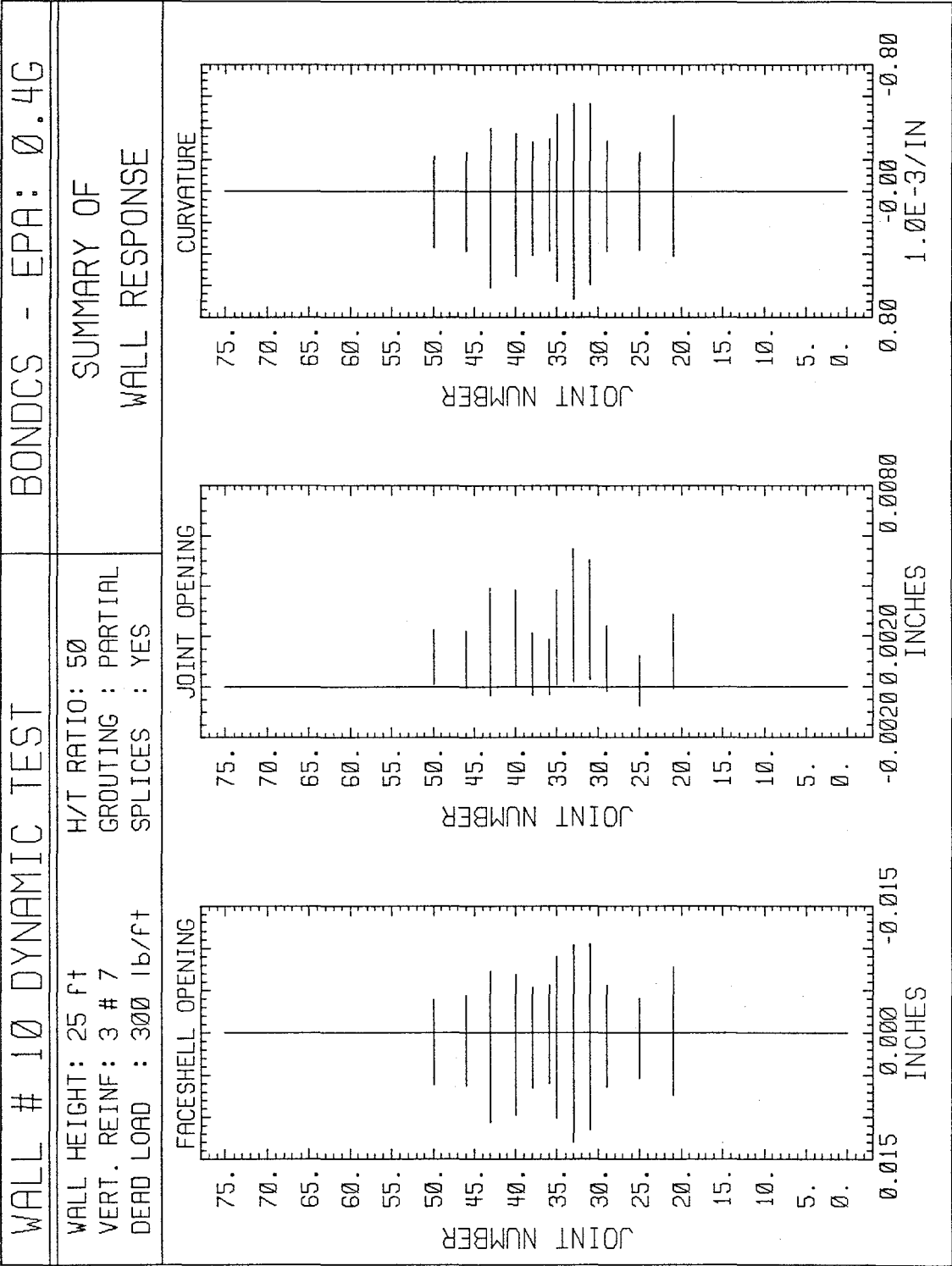










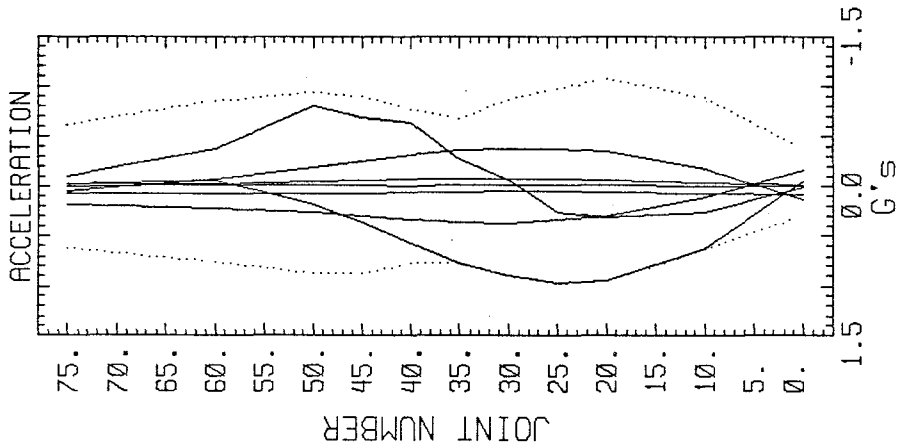
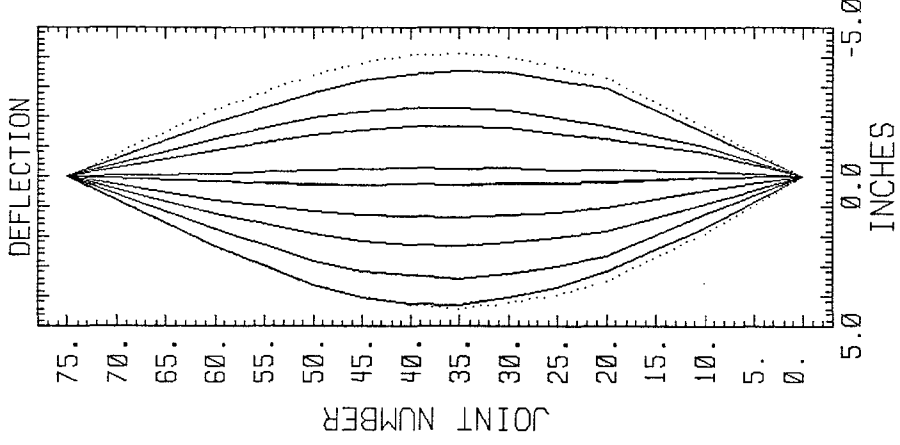
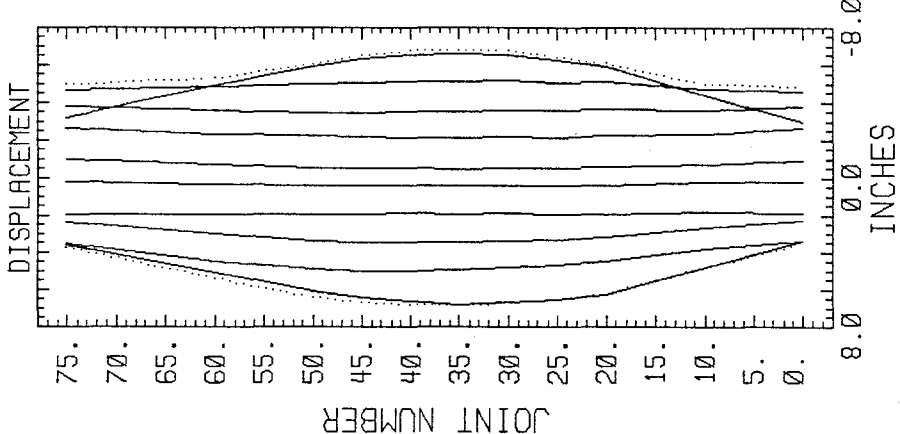


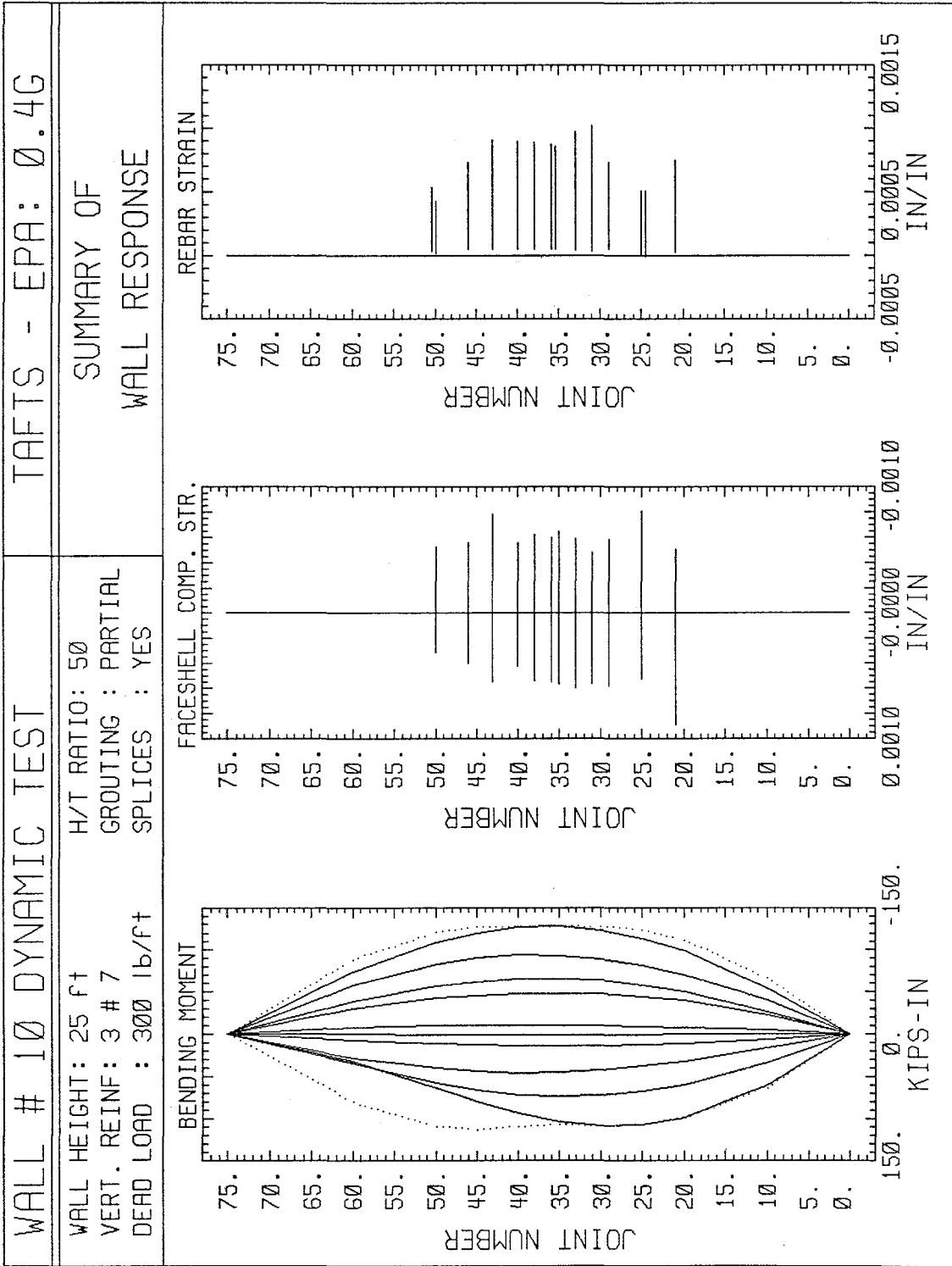
WALL # 10 DYNAMIC TEST

TAFTS - EPA: 0.4G

WALL HEIGHT: 25 ft  
 VERT. REINF: 3 # 7  
 DEAD LOAD : 300 lb/ft  
 H/T RATIO: 50  
 GROUTING : PARTIAL  
 SPLICES : YES

SUMMARY OF  
 WALL RESPONSE





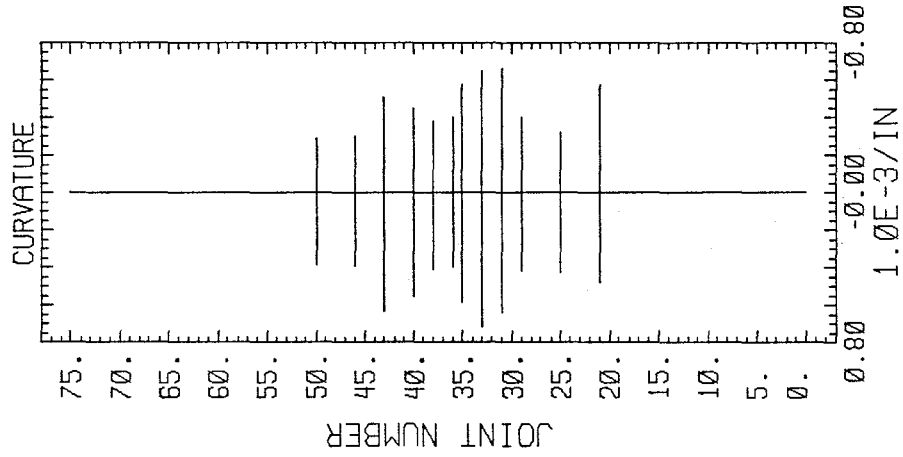
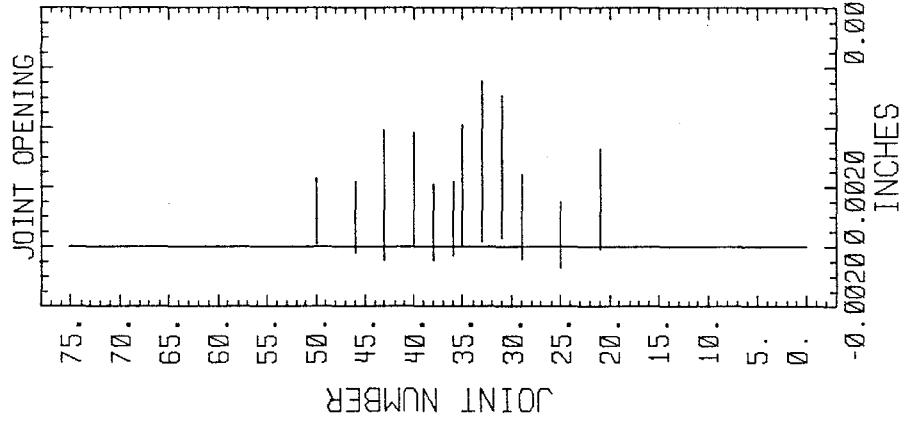
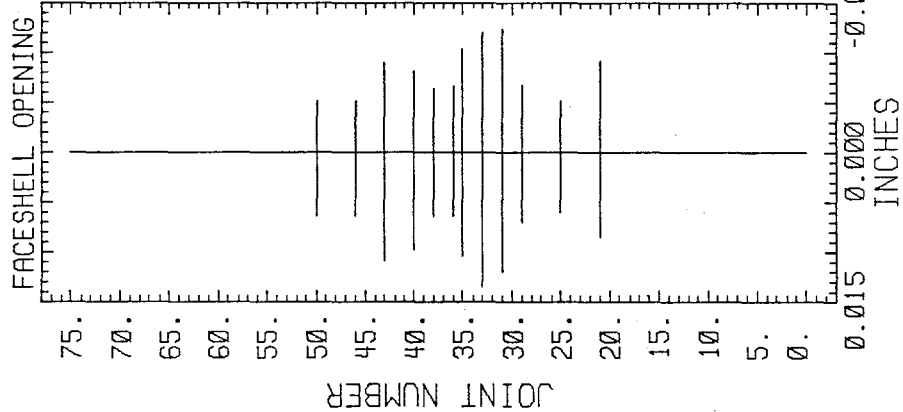
WALL # 10 DYNAMIC TEST

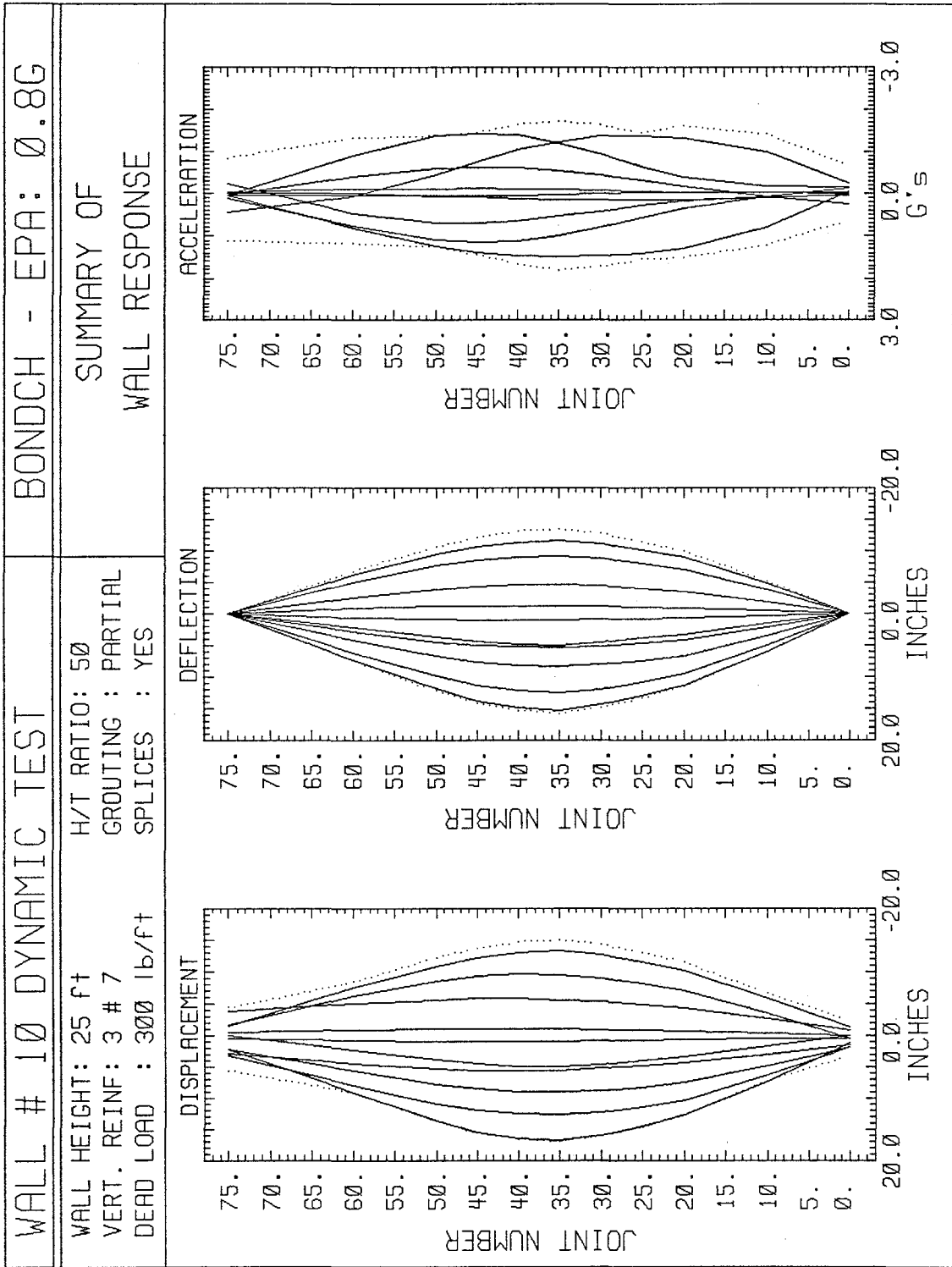
TAFTS - EPA: 0.4G

WALL HEIGHT: 25 FT  
 VERT. REINF: 3 # 7  
 DEAD LOAD : 300 lb/ft

H/T RATIO: 50  
 GROUTING : PARTIAL  
 SPLICES : YES

SUMMARY OF  
 WALL RESPONSE





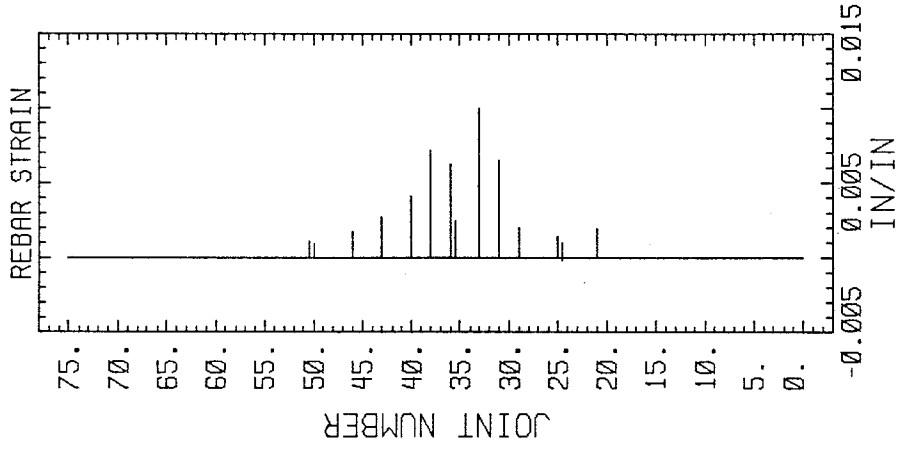
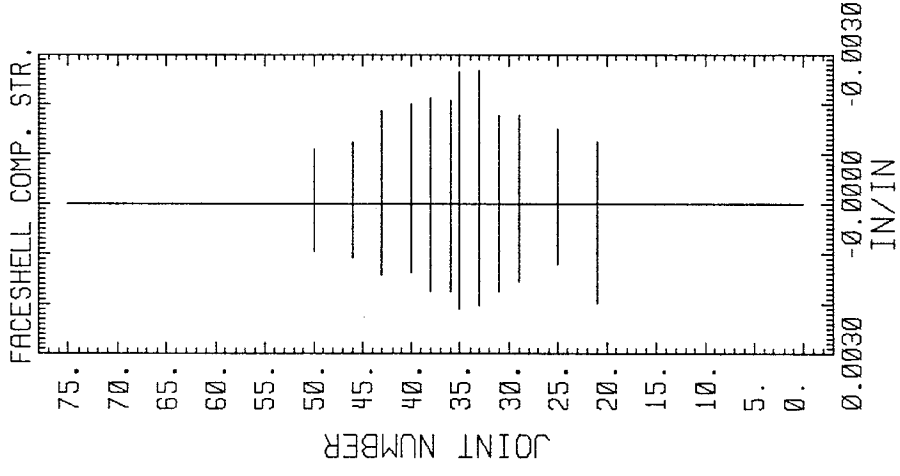
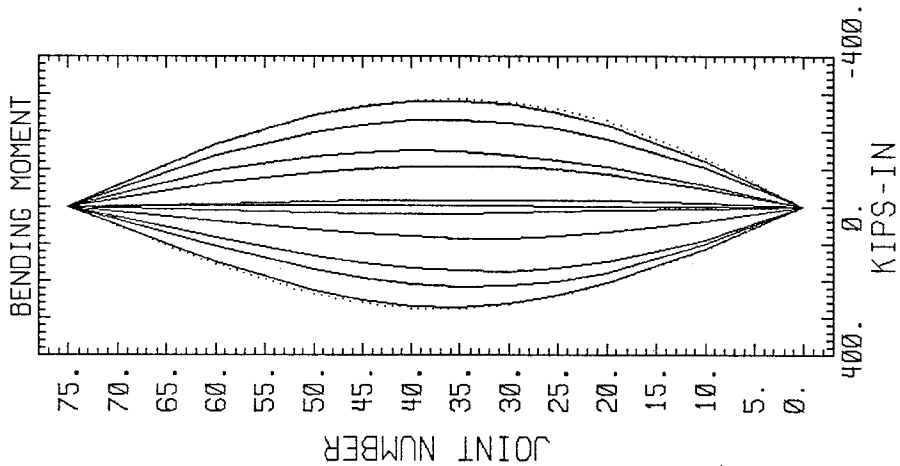
WALL # 10 DYNAMIC TEST

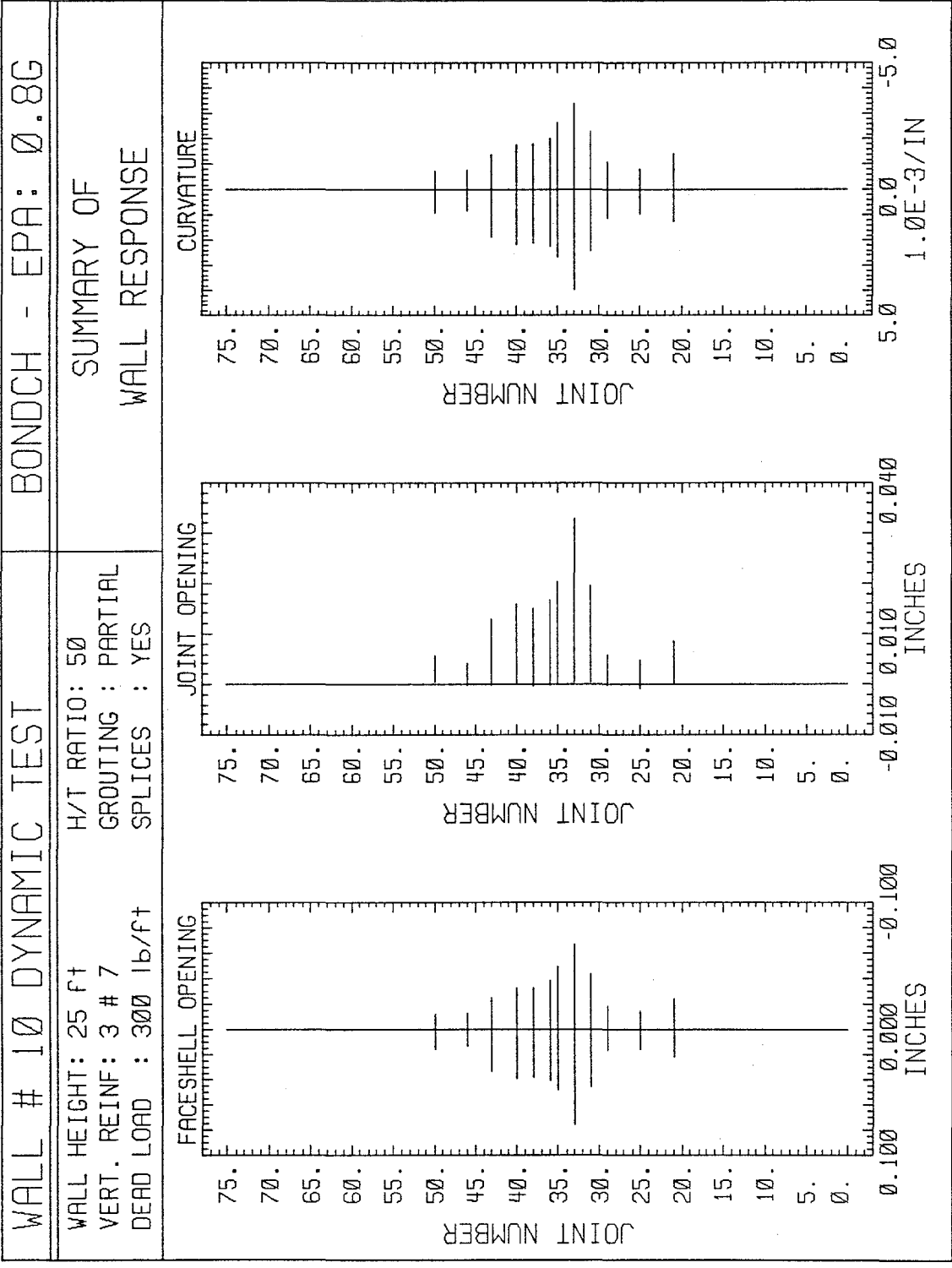
BONDCH - EPA: 0.8G

WALL HEIGHT: 25 FT  
 VERT. REINF: 3 # 7  
 DEAD LOAD : 300 lb/ft

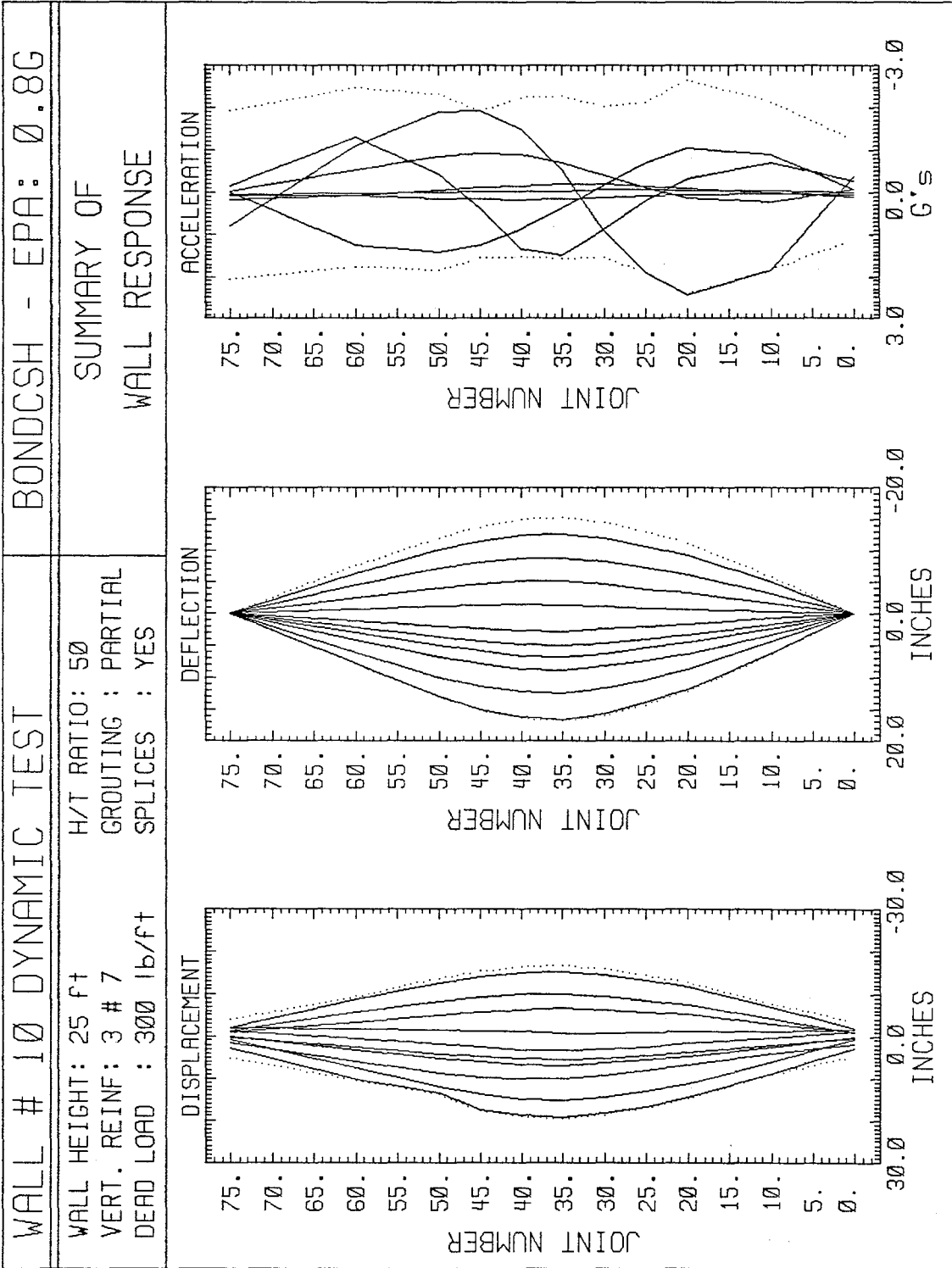
H/T RATIO: 50  
 GROUTING : PARTIAL  
 SPLICES : YES

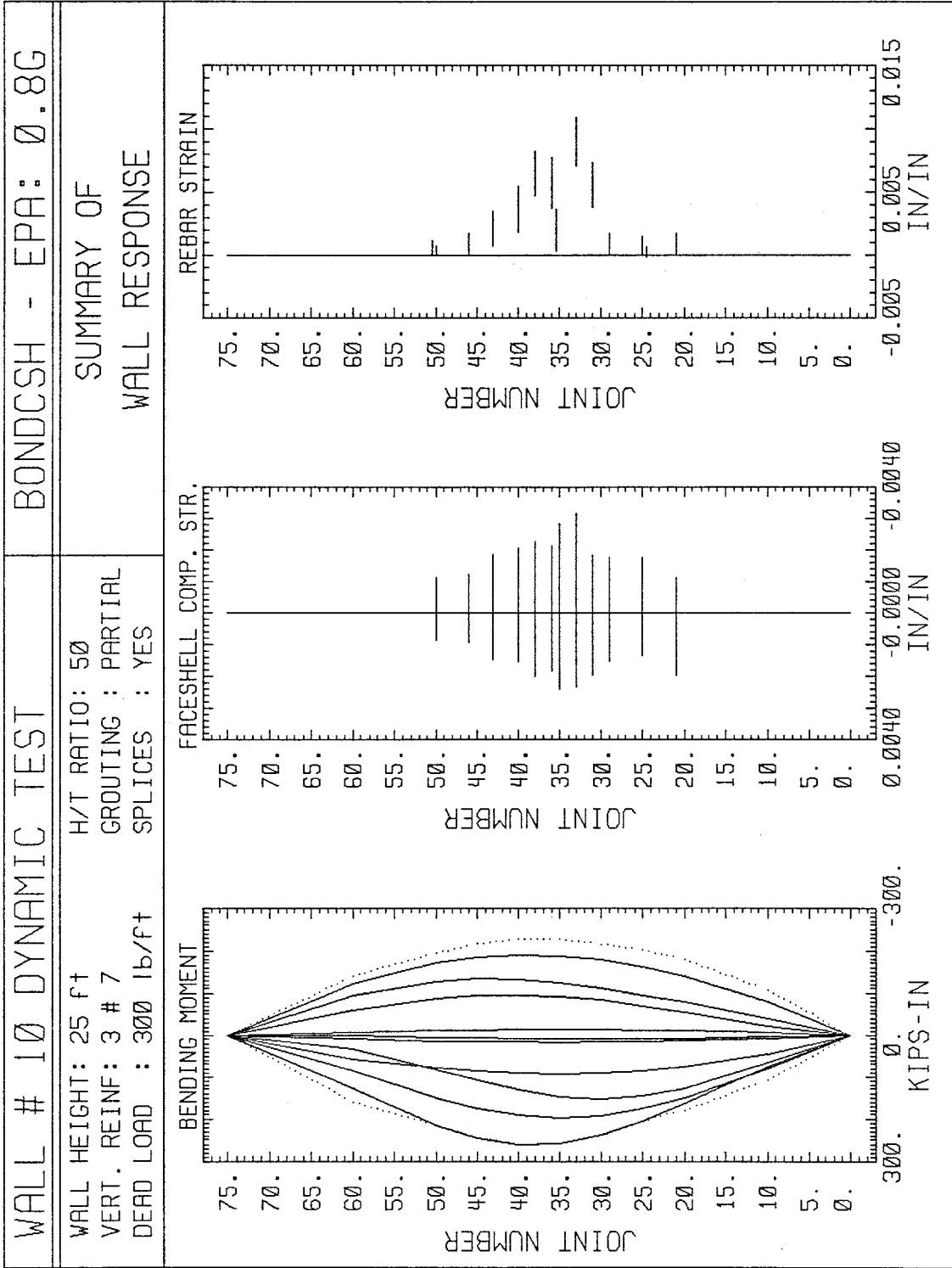
SUMMARY OF WALL RESPONSE

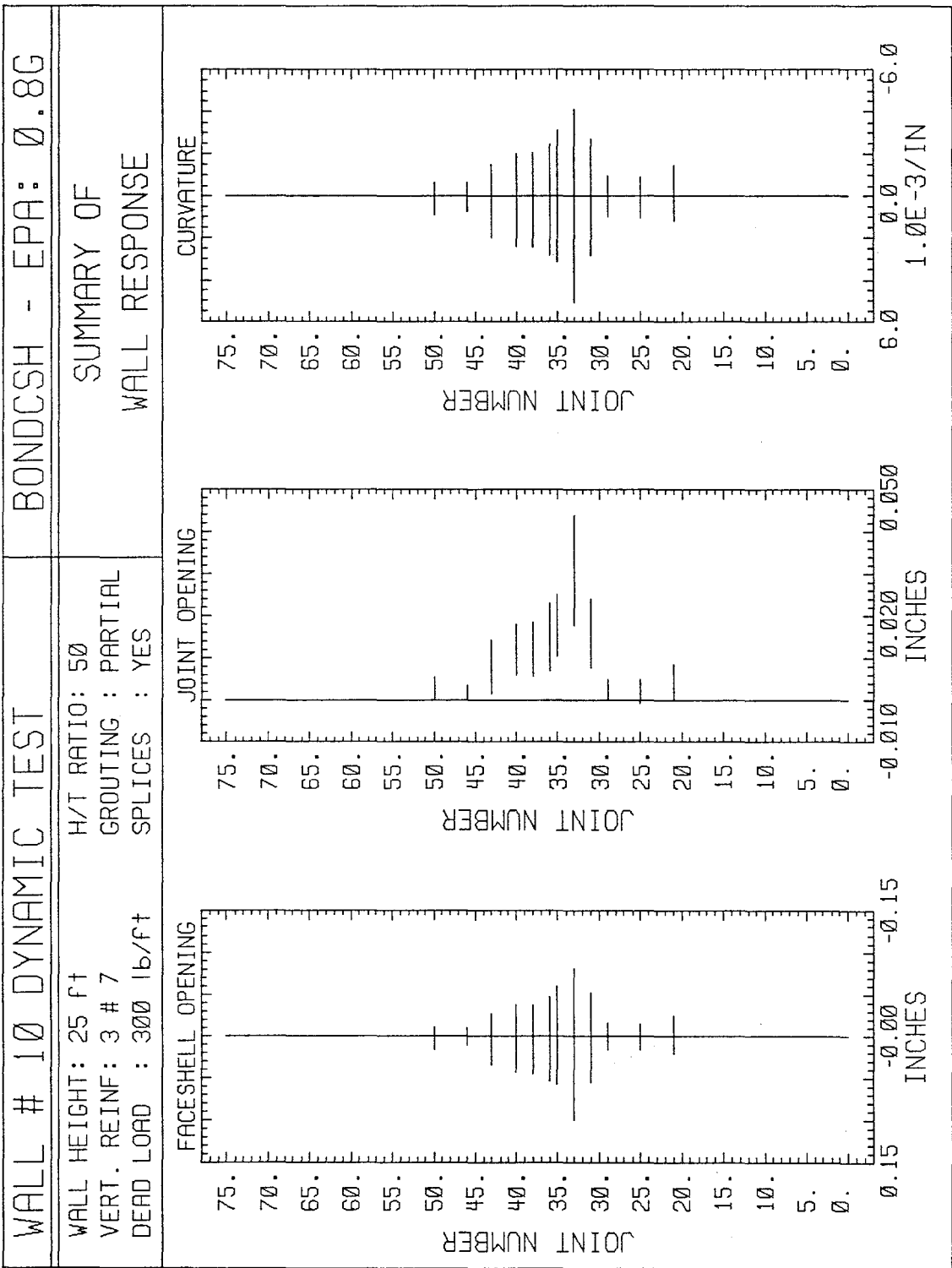


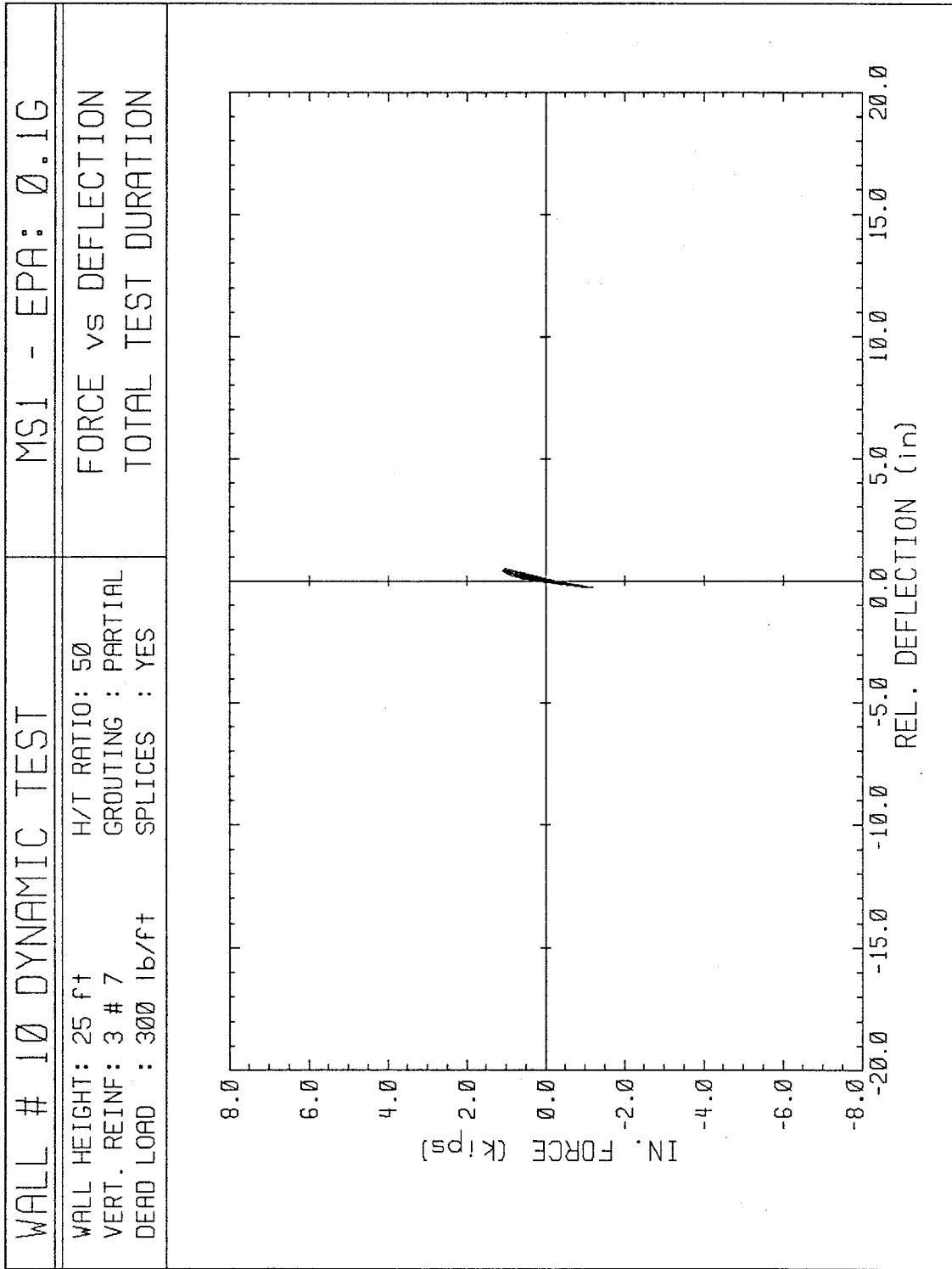


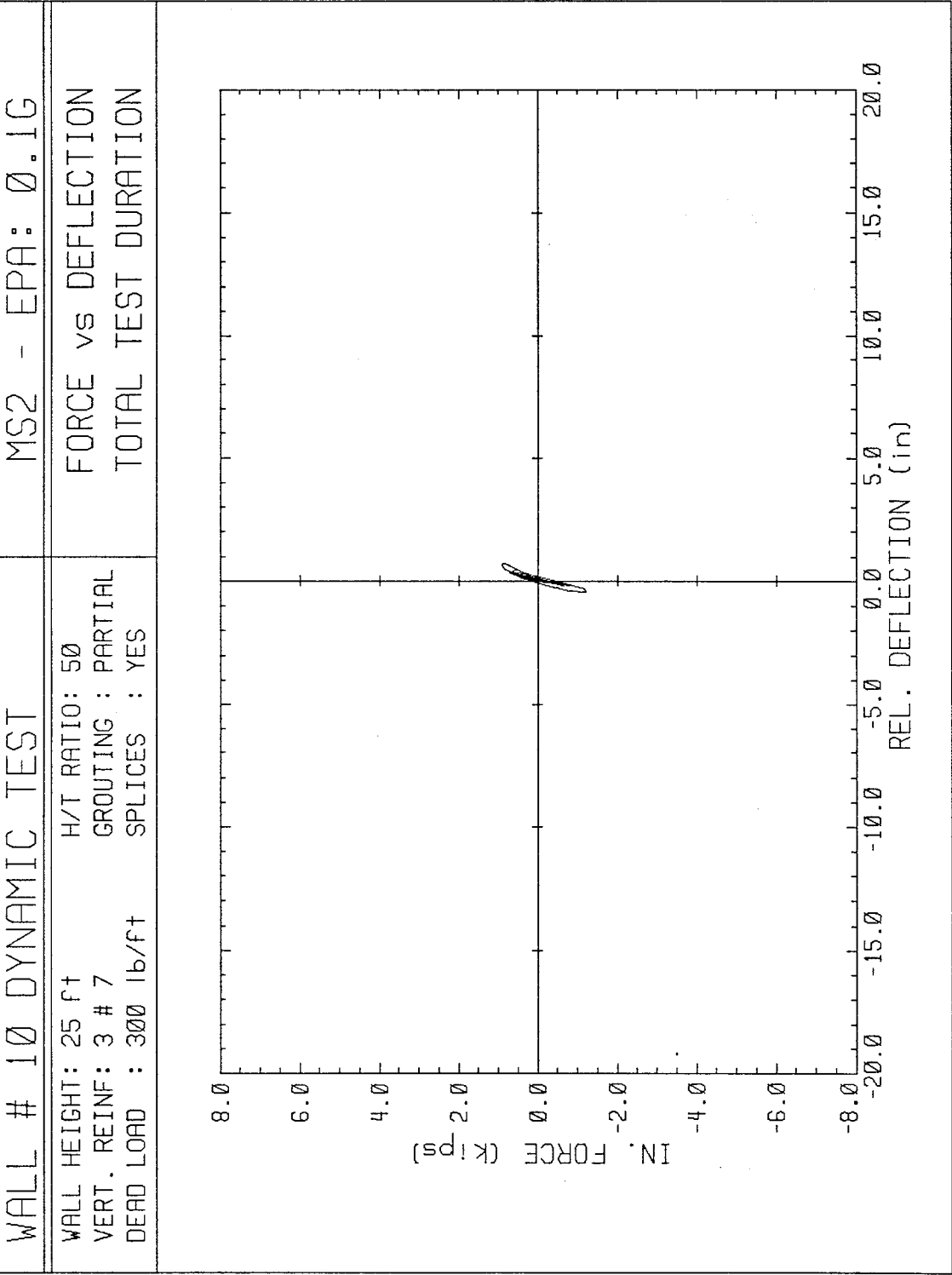


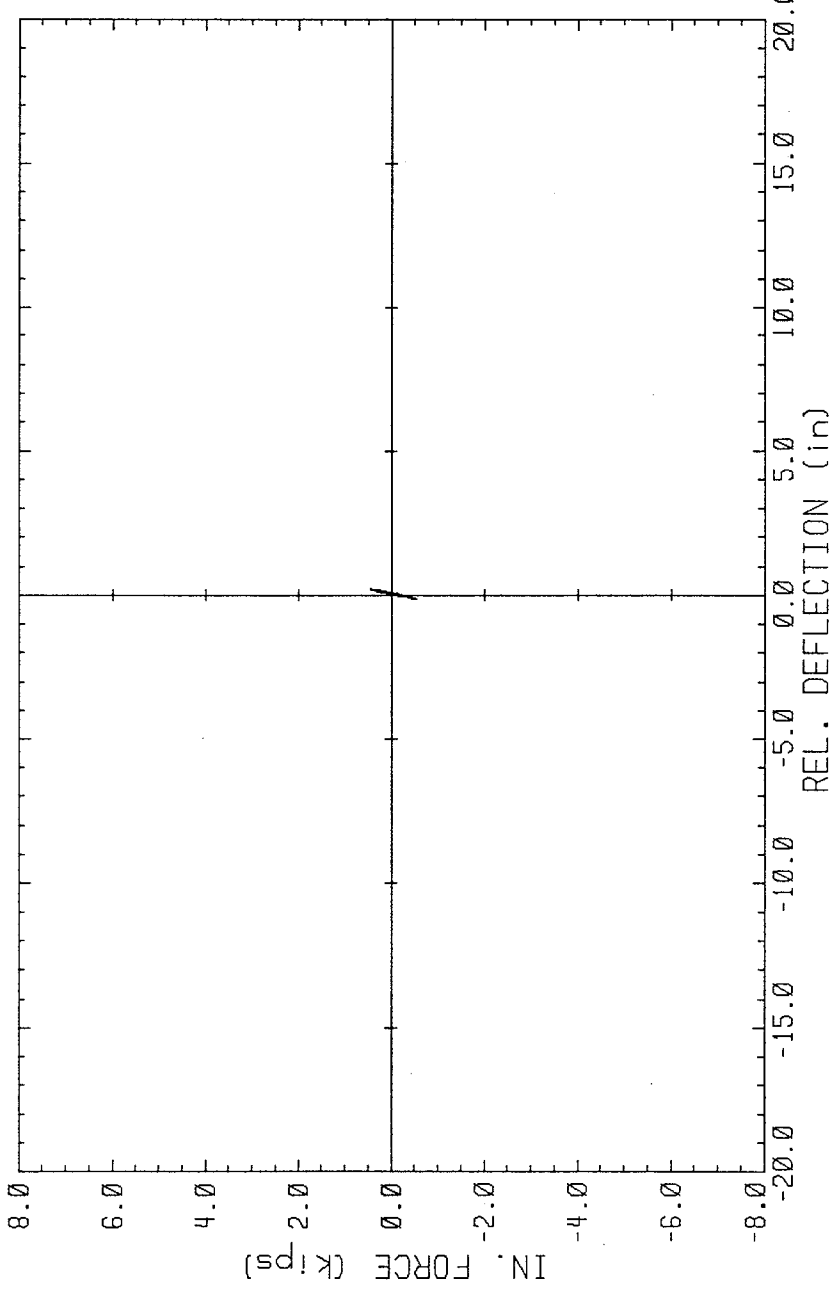


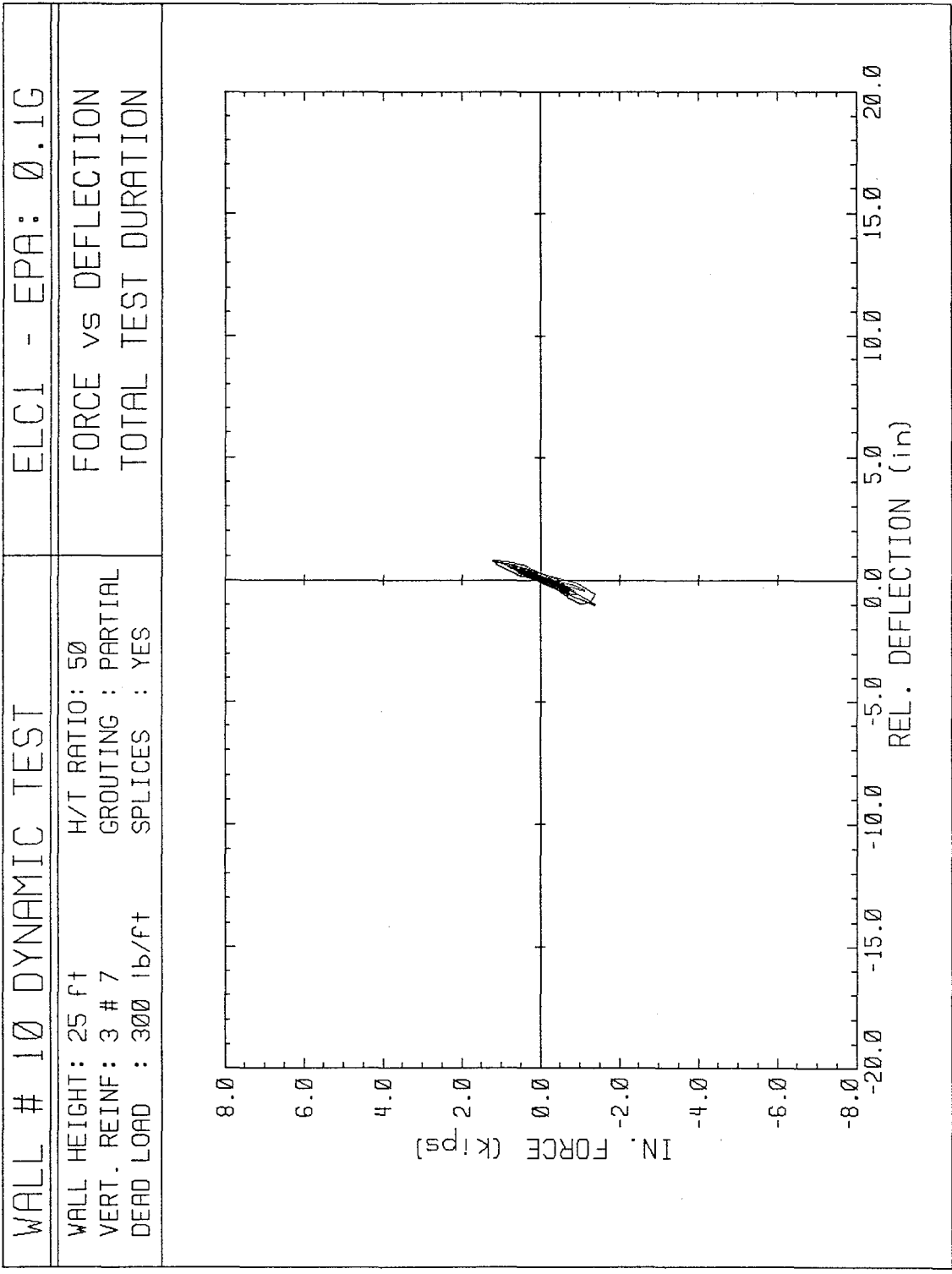


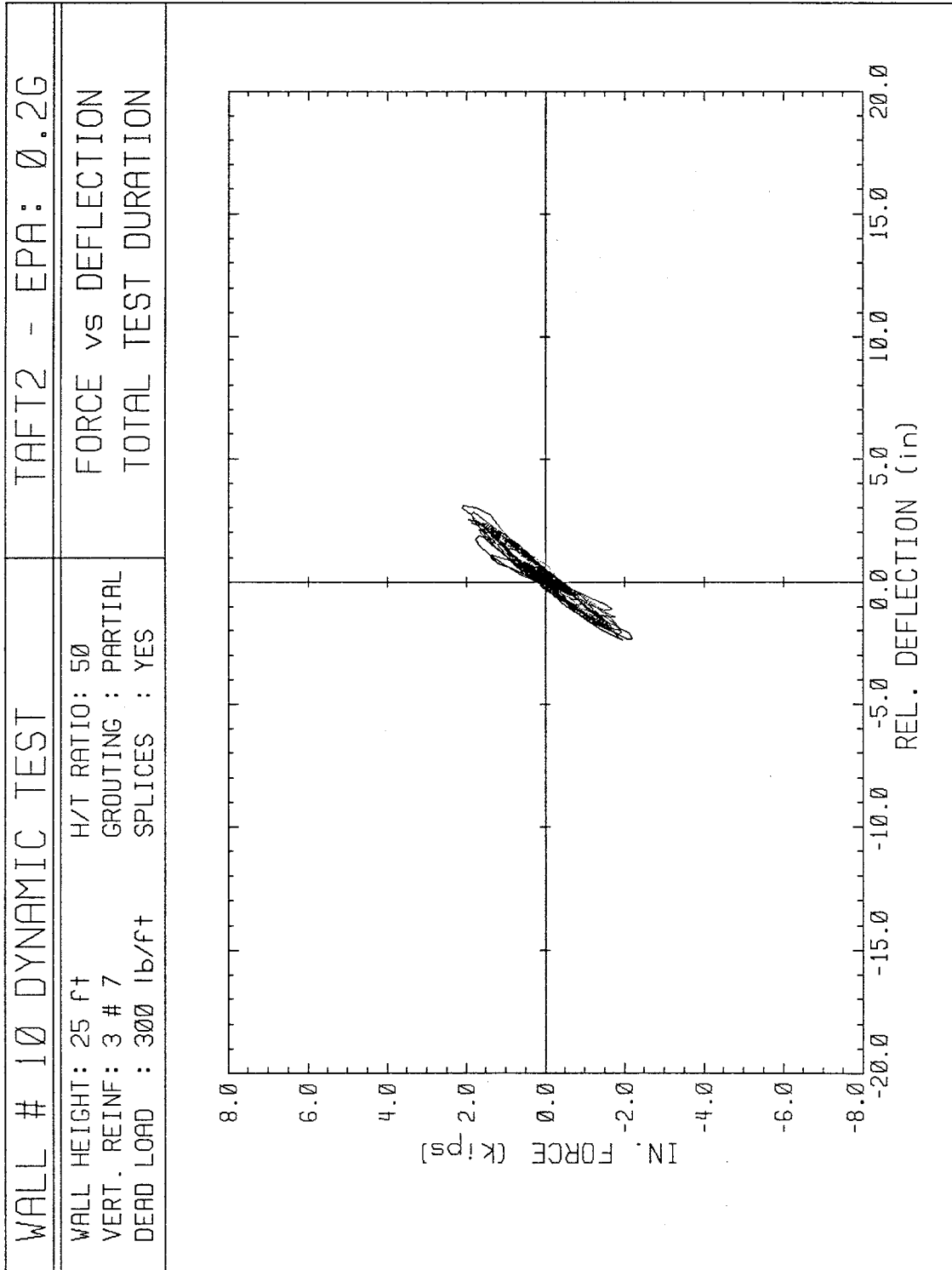






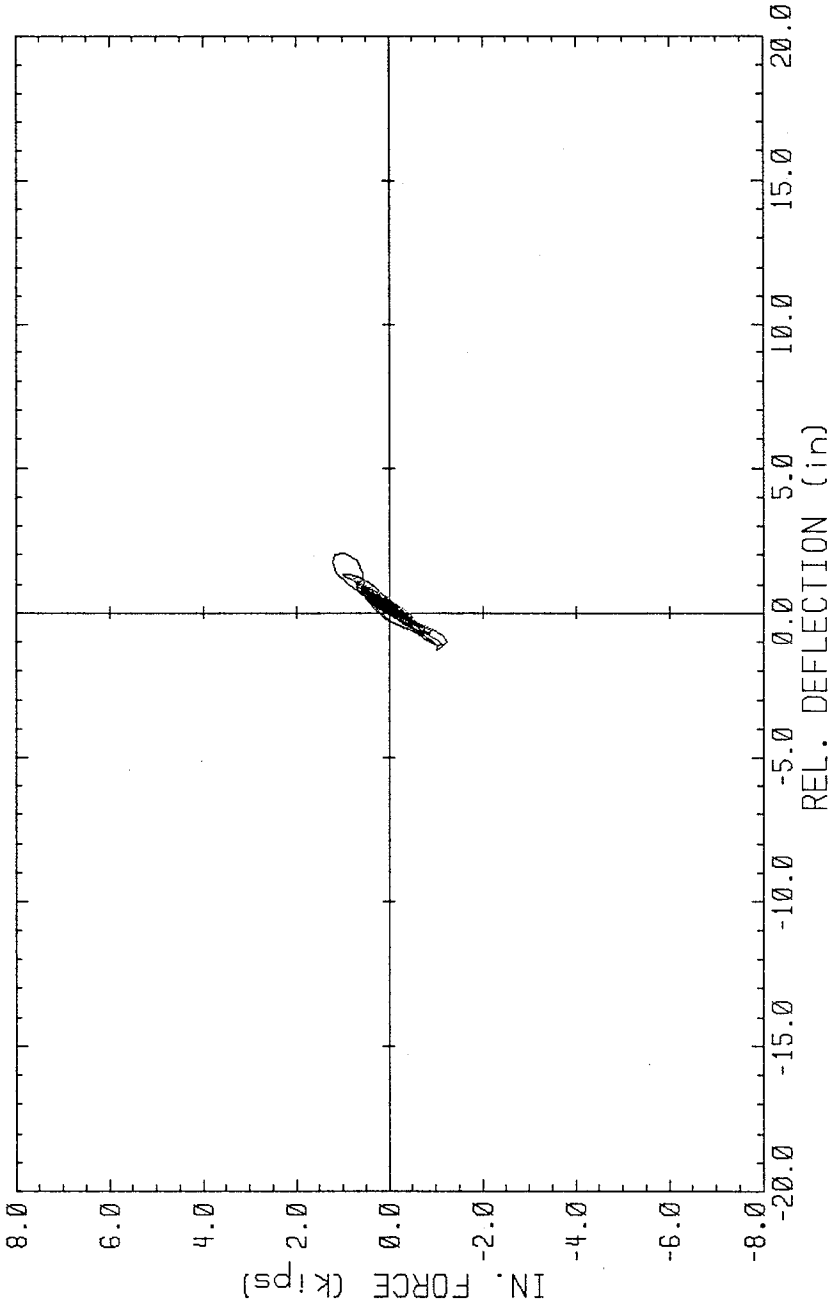
WALL # 10 DYNAMIC TEST	TAFT1 - EPA: 0.1G
WALL HEIGHT: 25 ft VERT. REINF: 3 # 7 DEAD LOAD : 300 lb/ft	H/T RATIO: 50 GROUTING : PARTIAL SPLICES : YES
FORCE vs DEFLECTION TOTAL TEST DURATION	
	

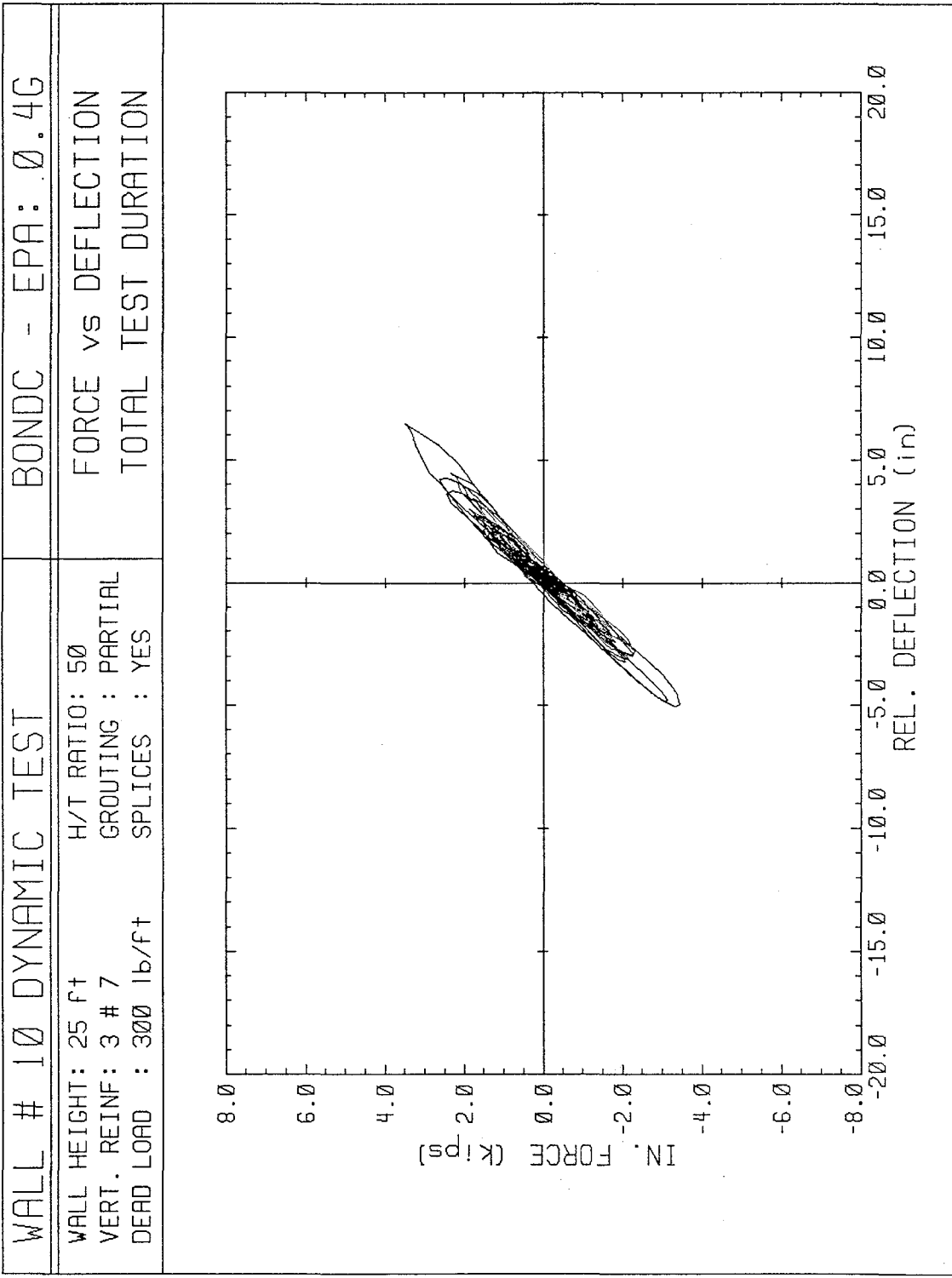


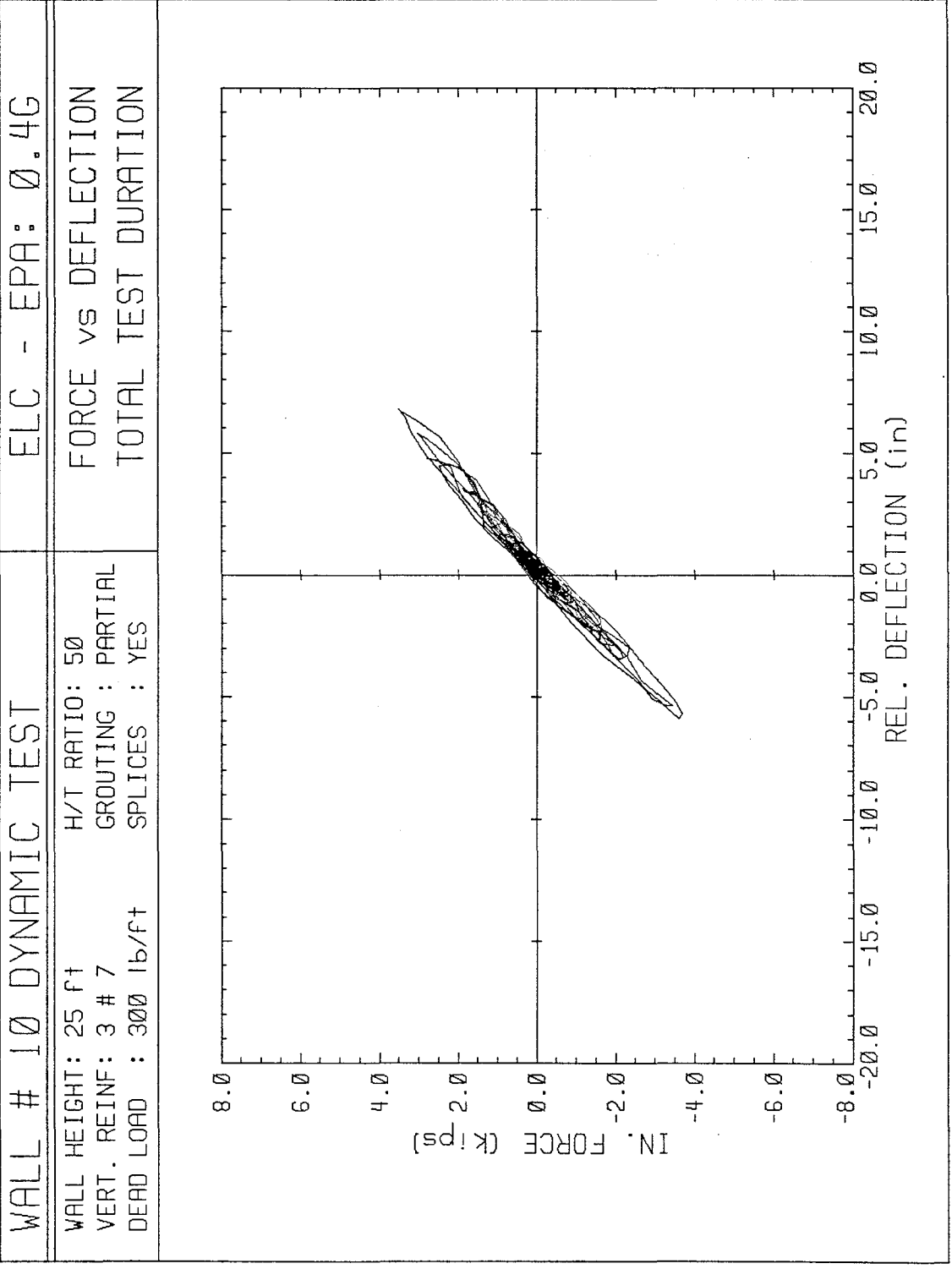


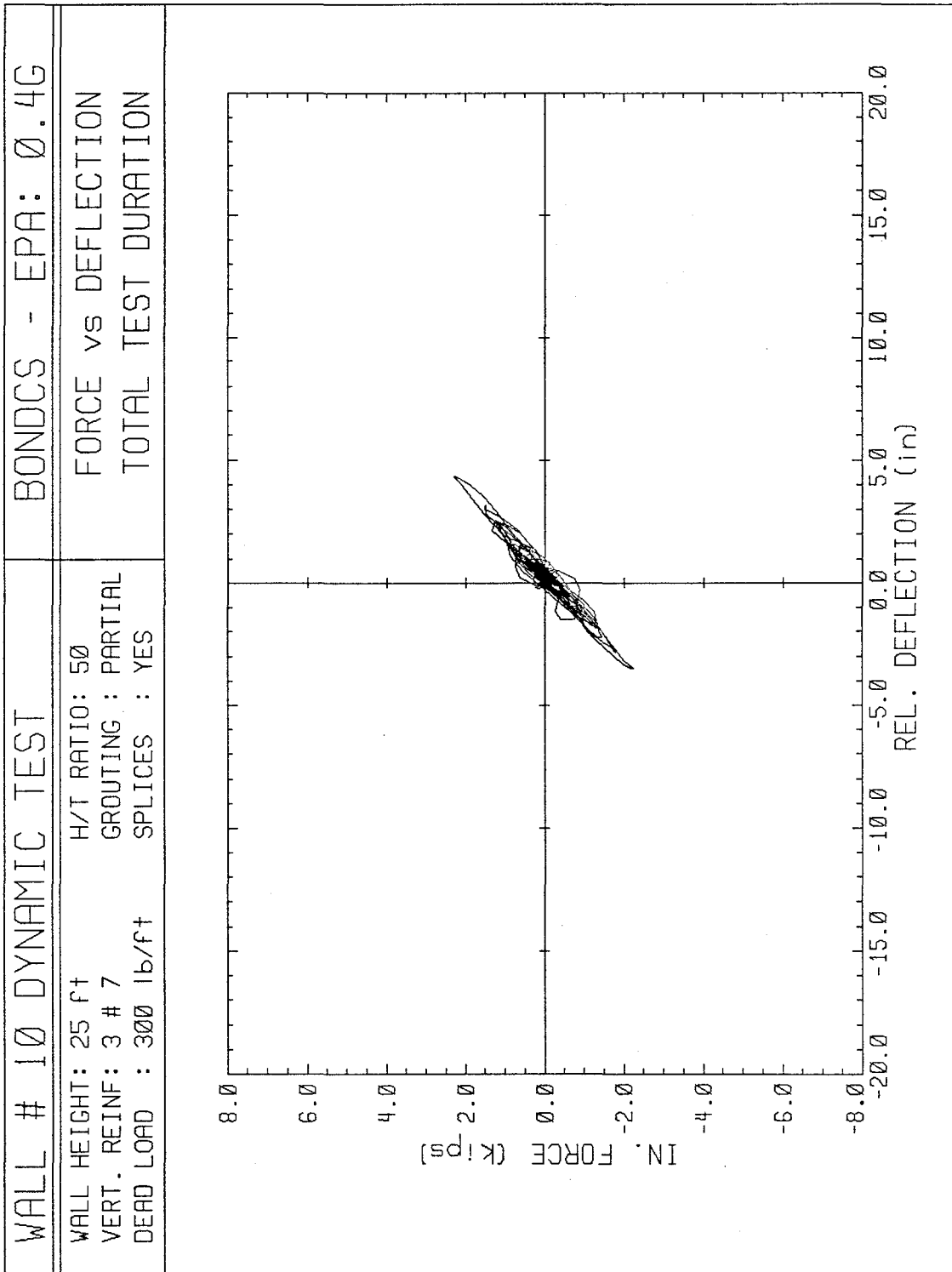


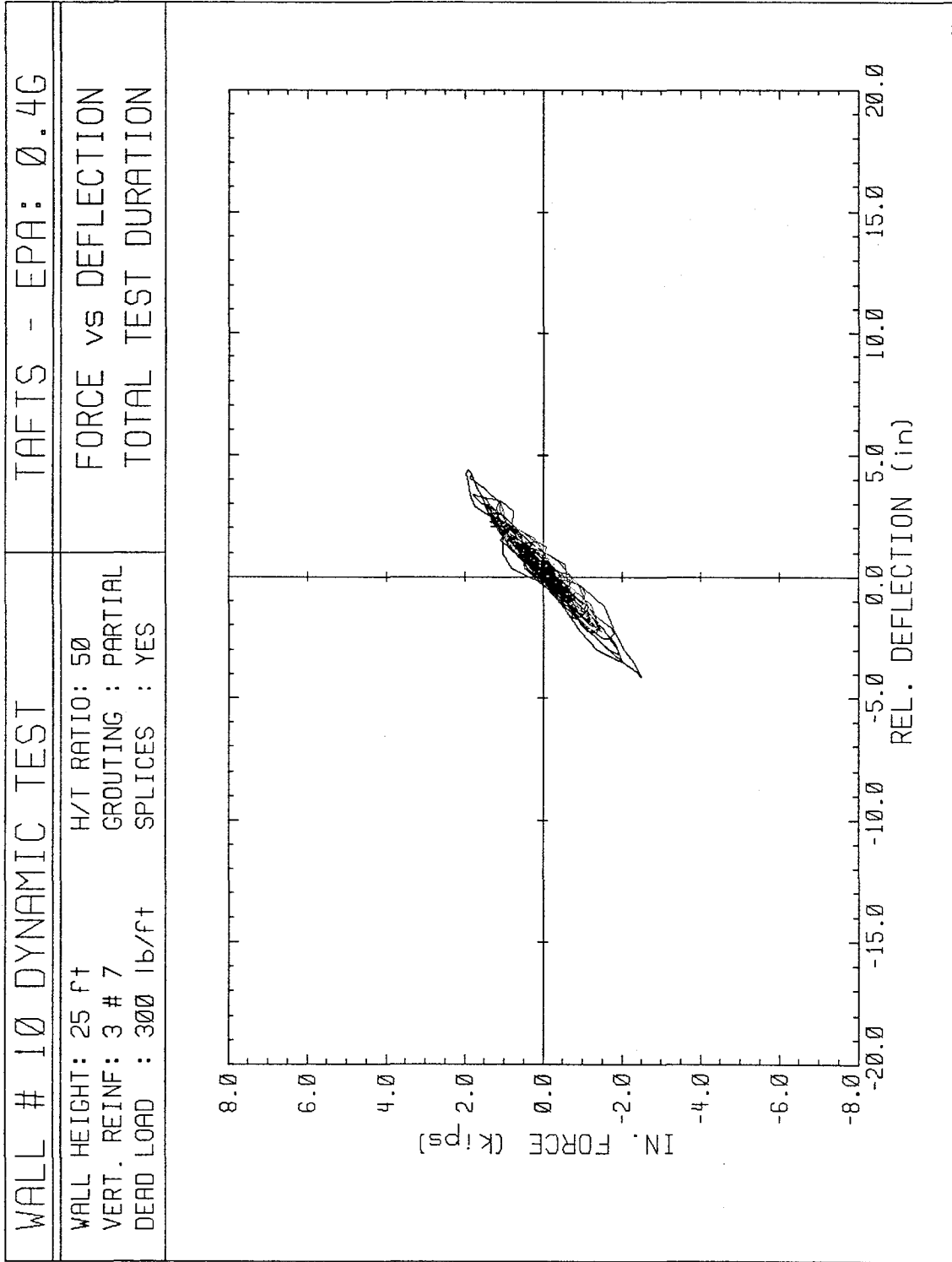
<p>WALL # 10 DYNAMIC TEST</p> <p>WALL HEIGHT: 25 FT  VERT. REINF: 3 # 7  DEAD LOAD : 300 lb/ft</p> <p>H/T RATIO: 50  GROUTING : PARTIAL  SPLICES : YES</p>	<p>ELC2 - EPA: 0.2G</p> <p>FORCE vs DEFLECTION  TOTAL TEST DURATION</p>
----------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------

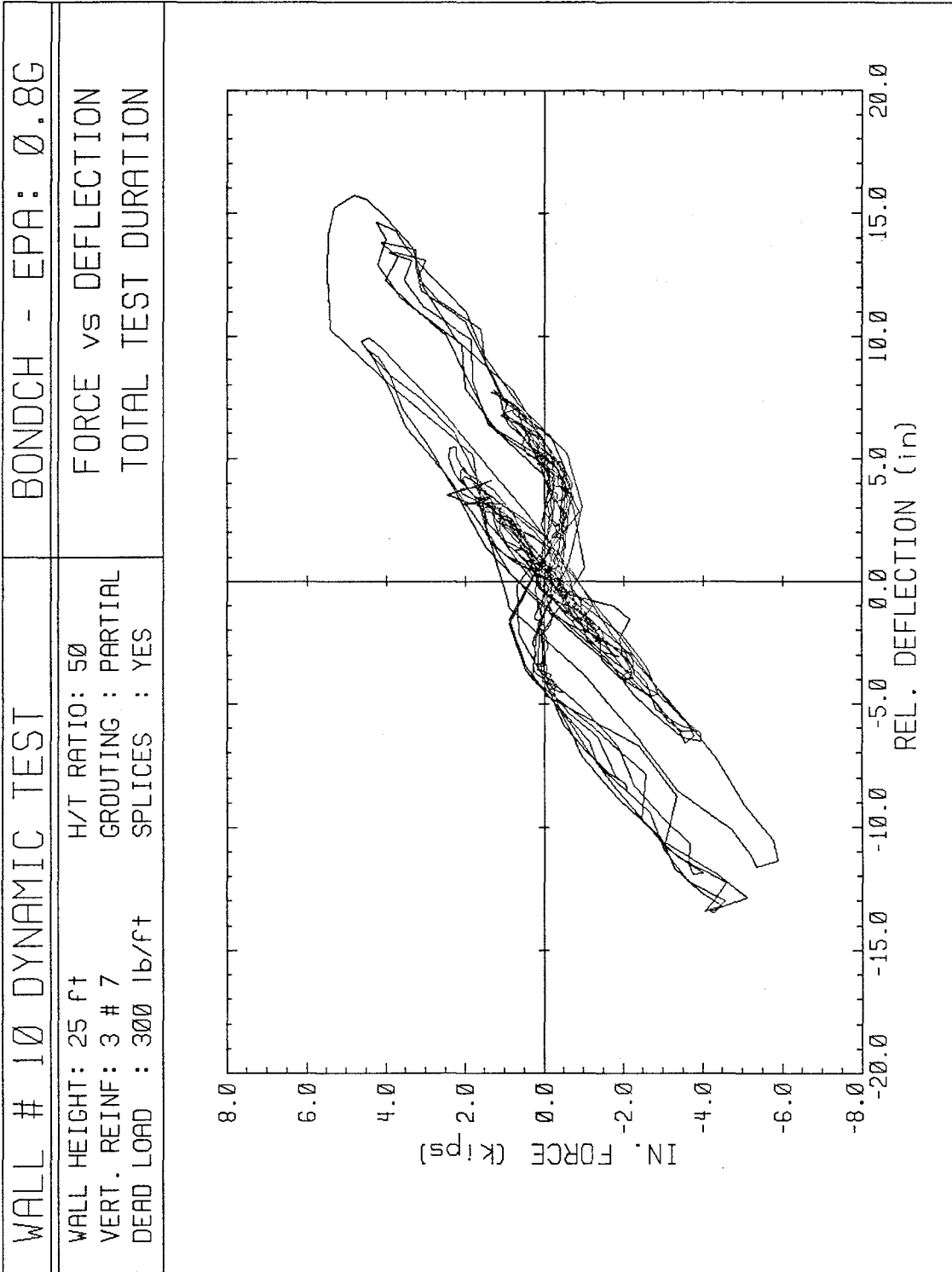


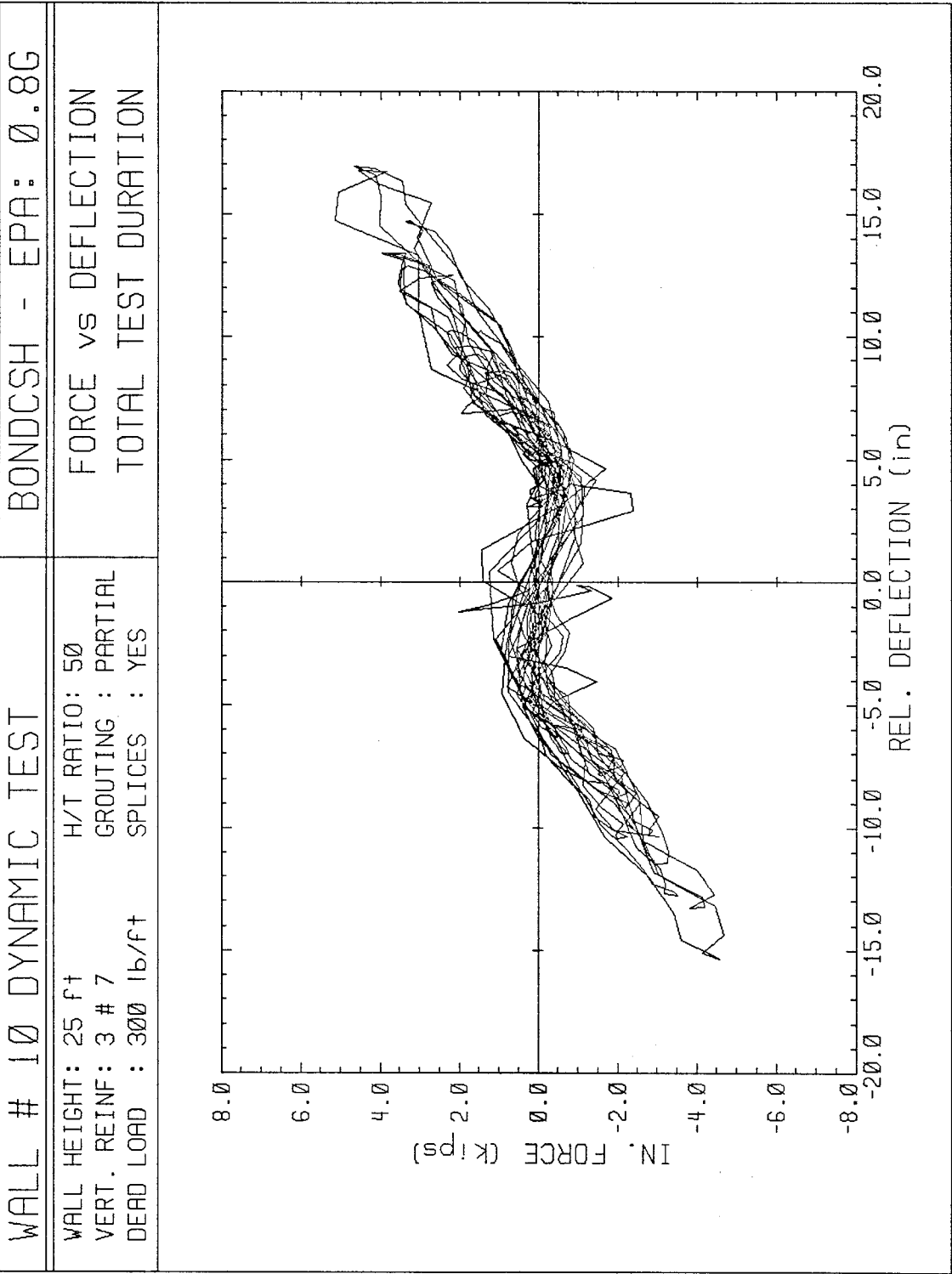


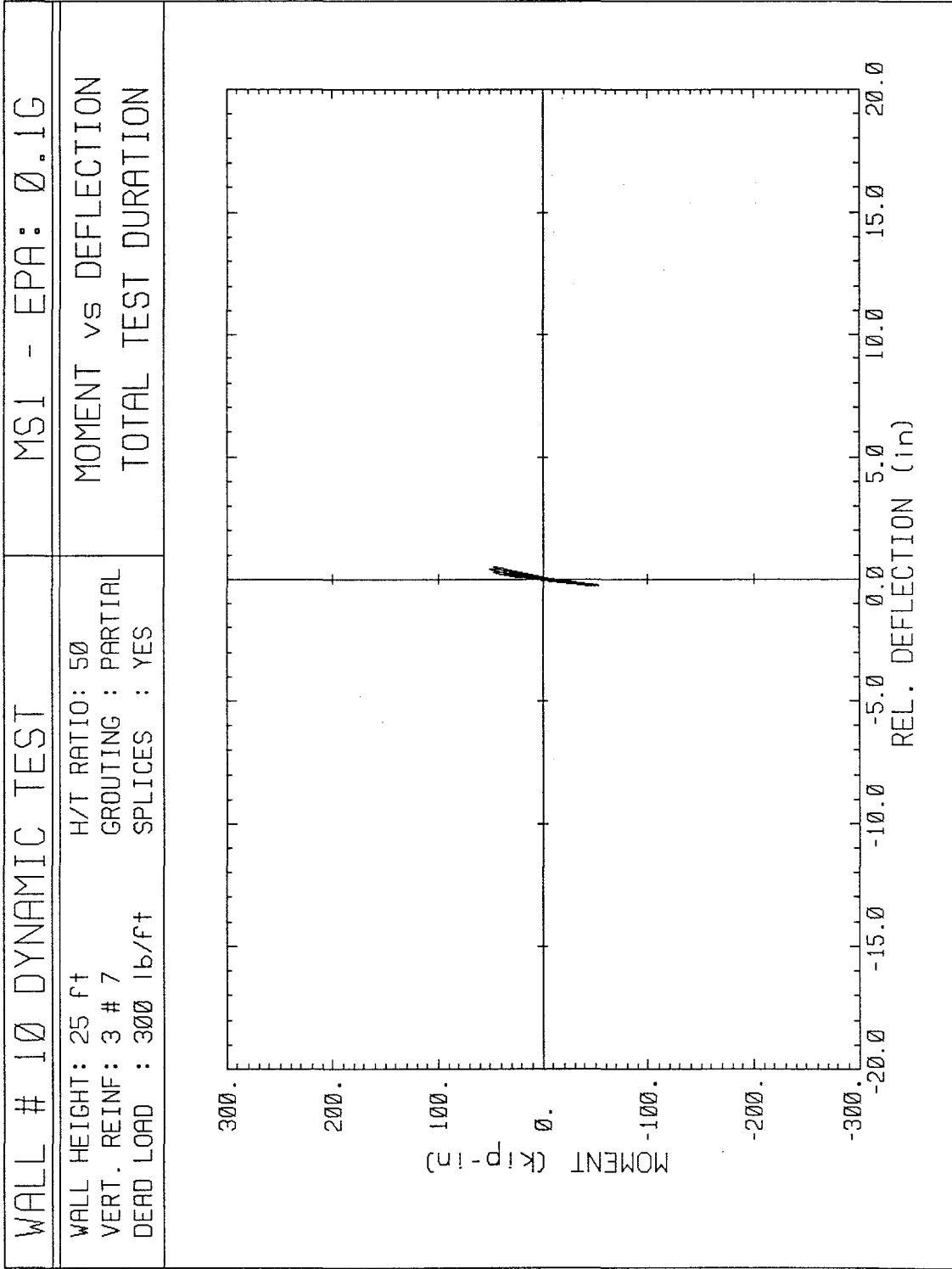




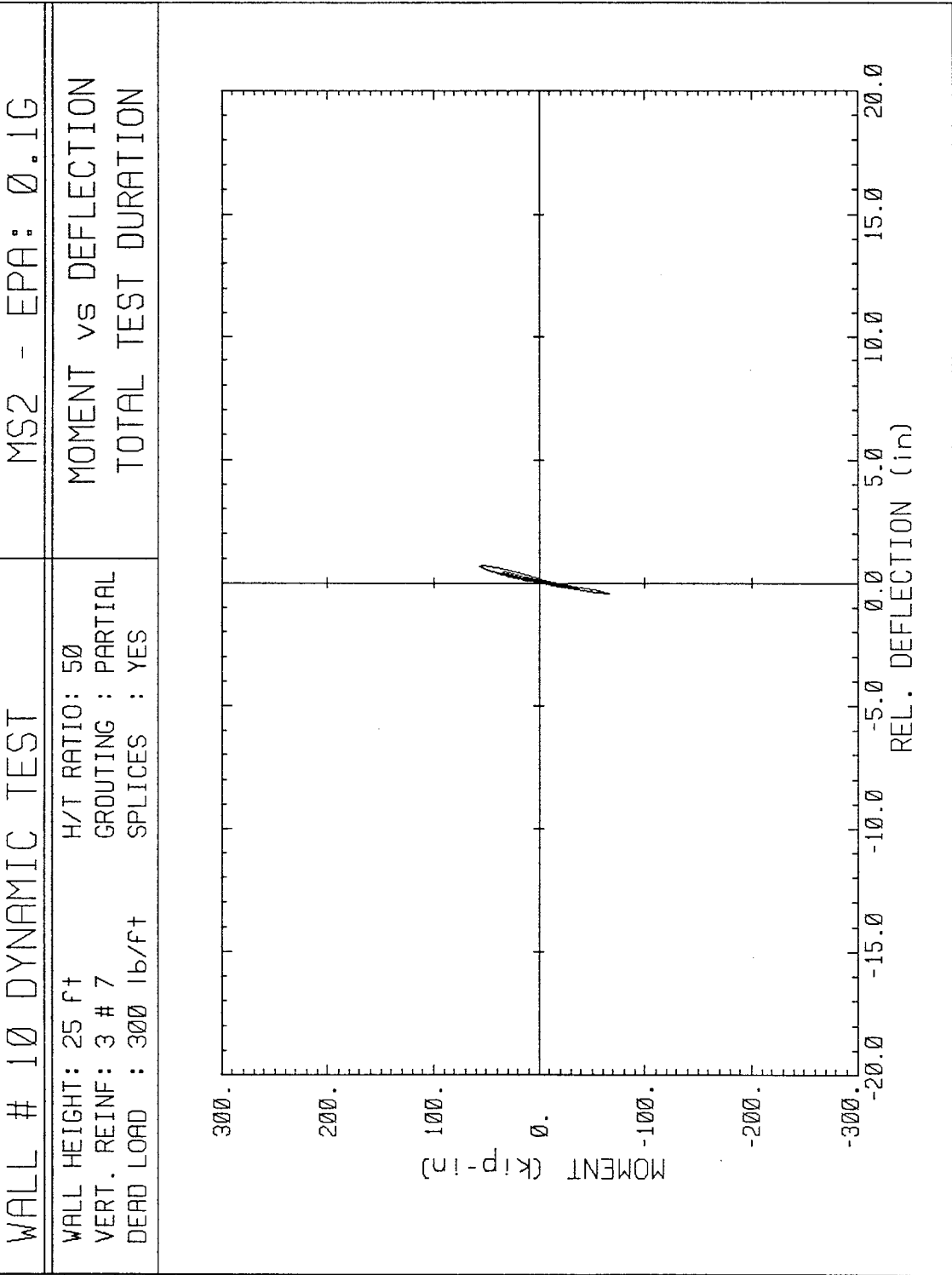


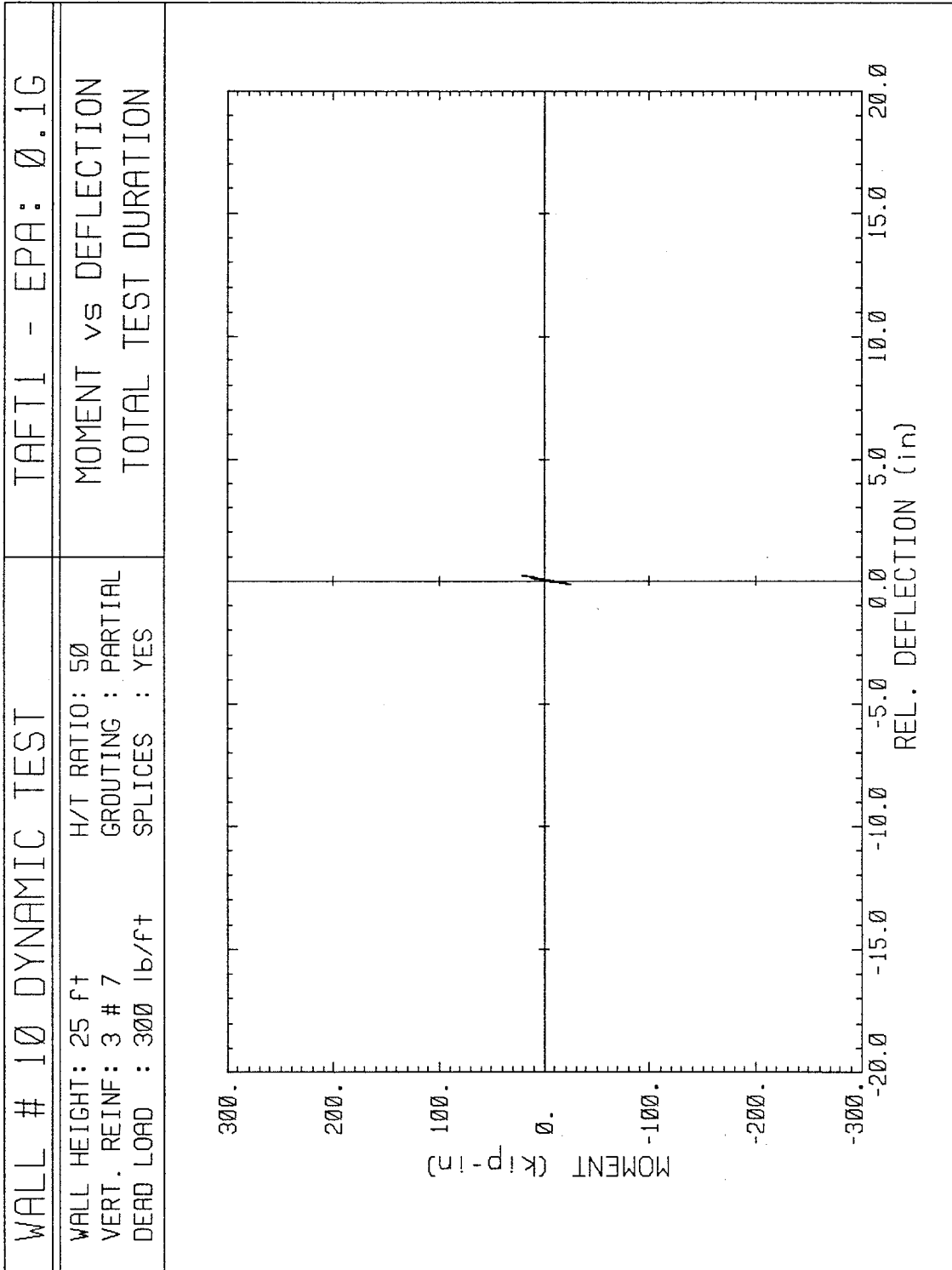


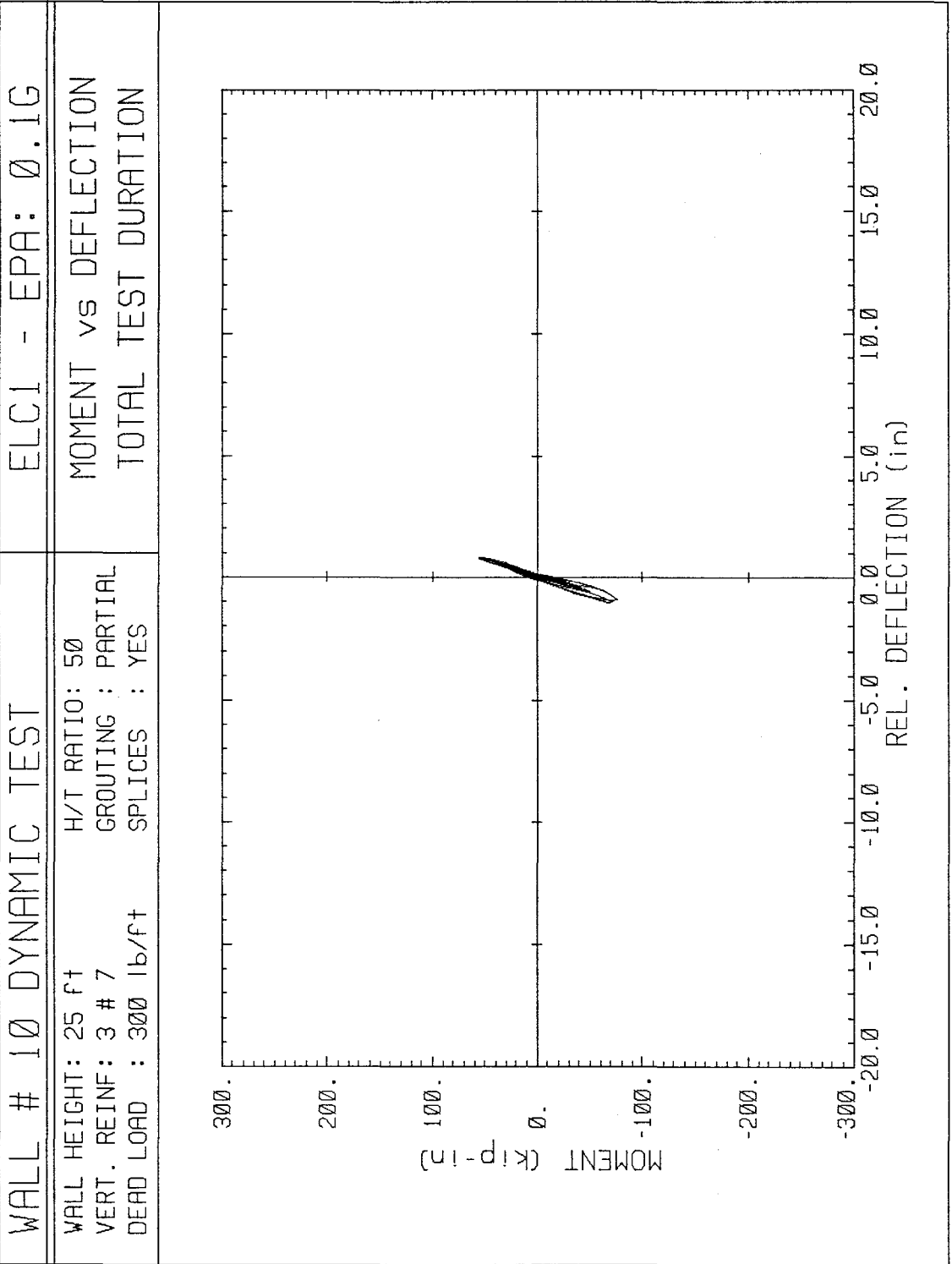


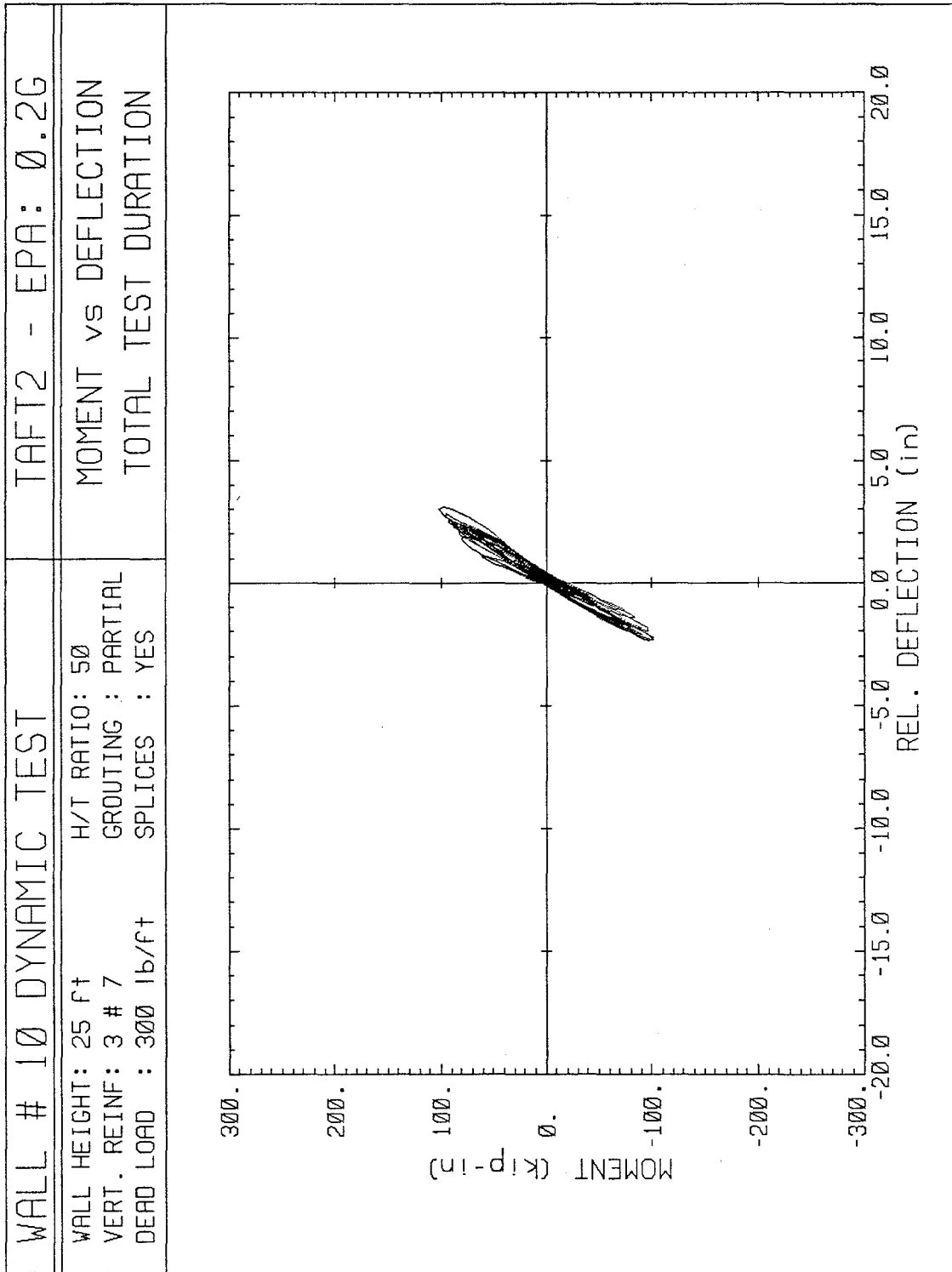


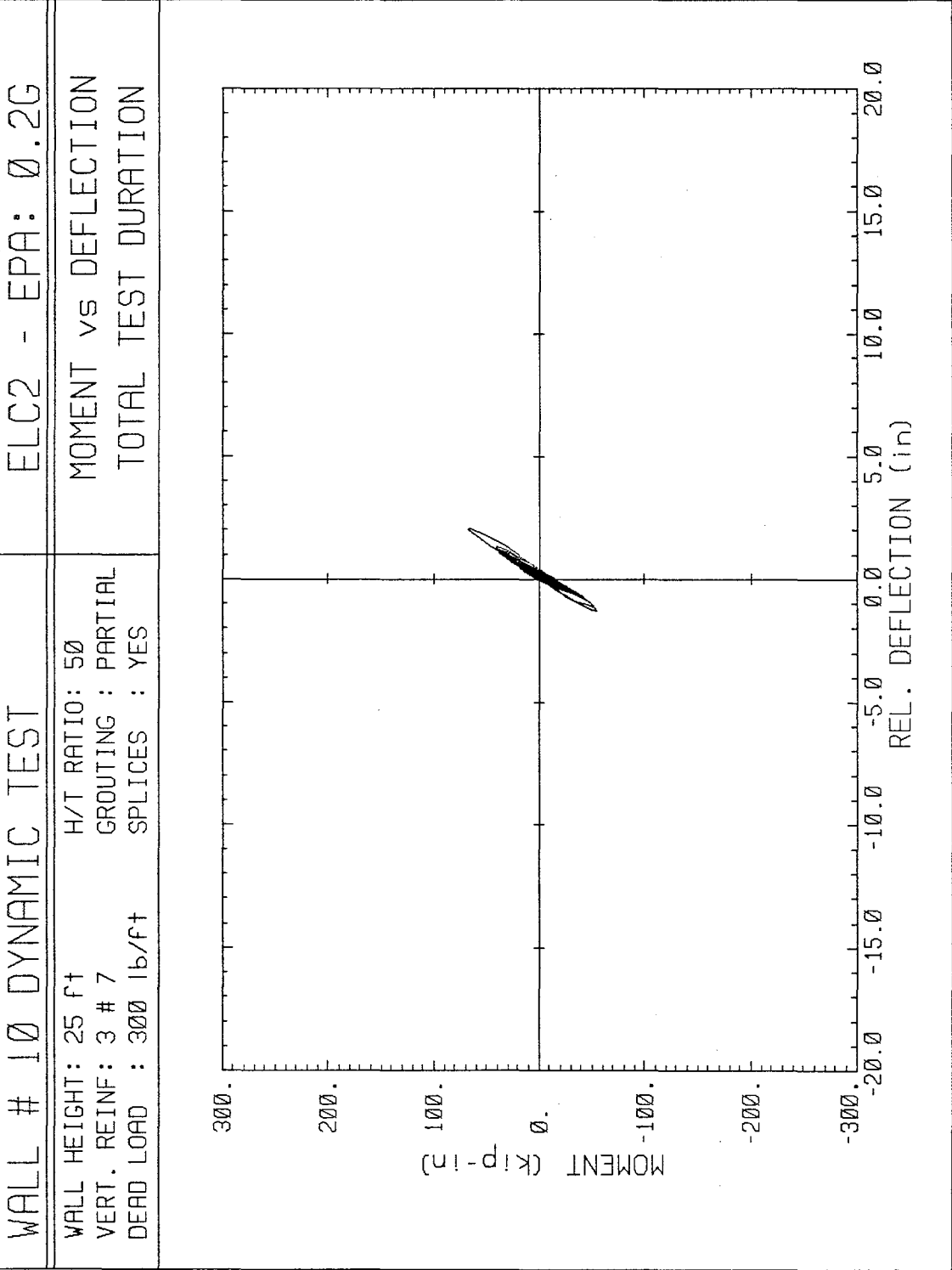


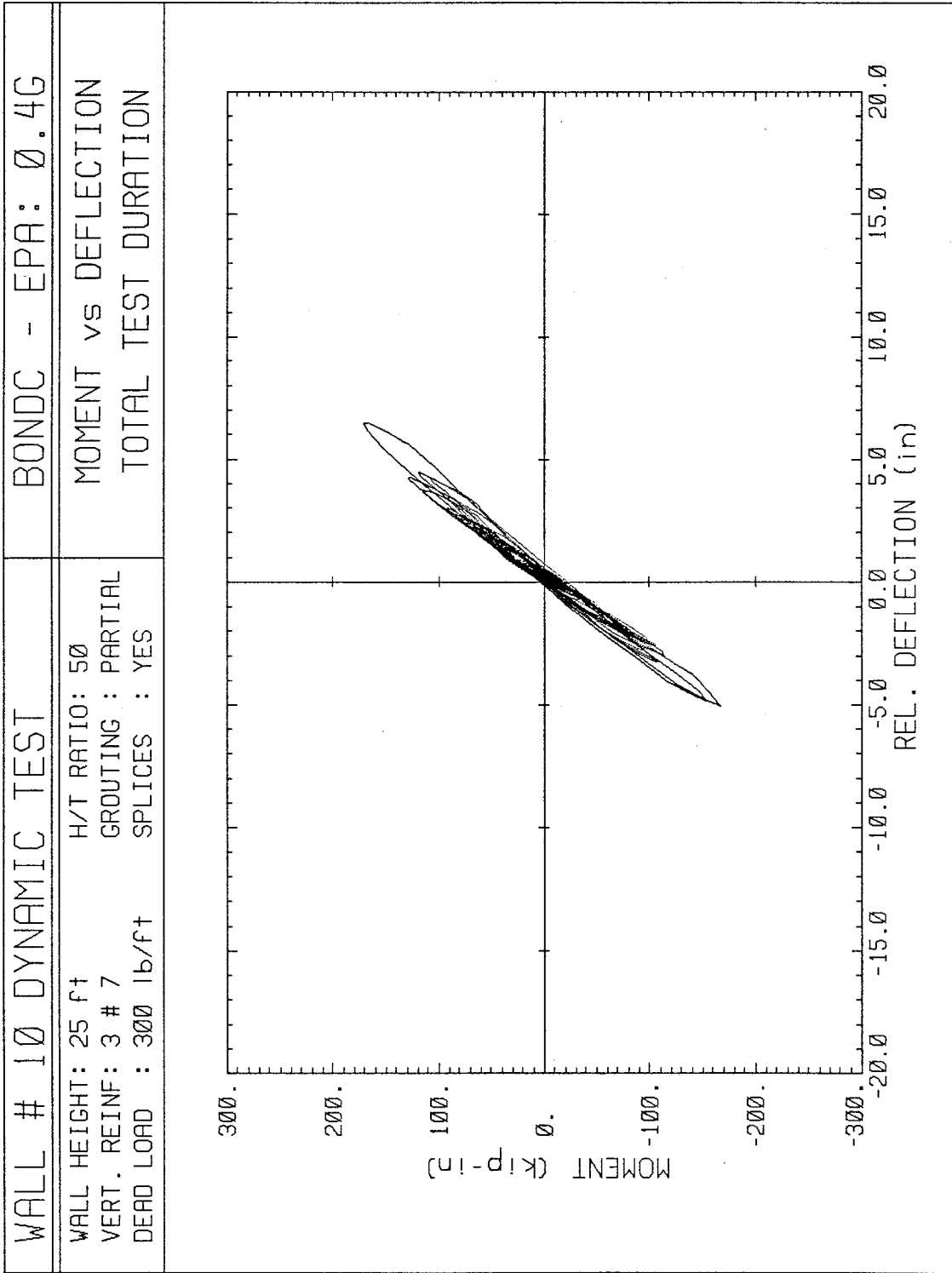


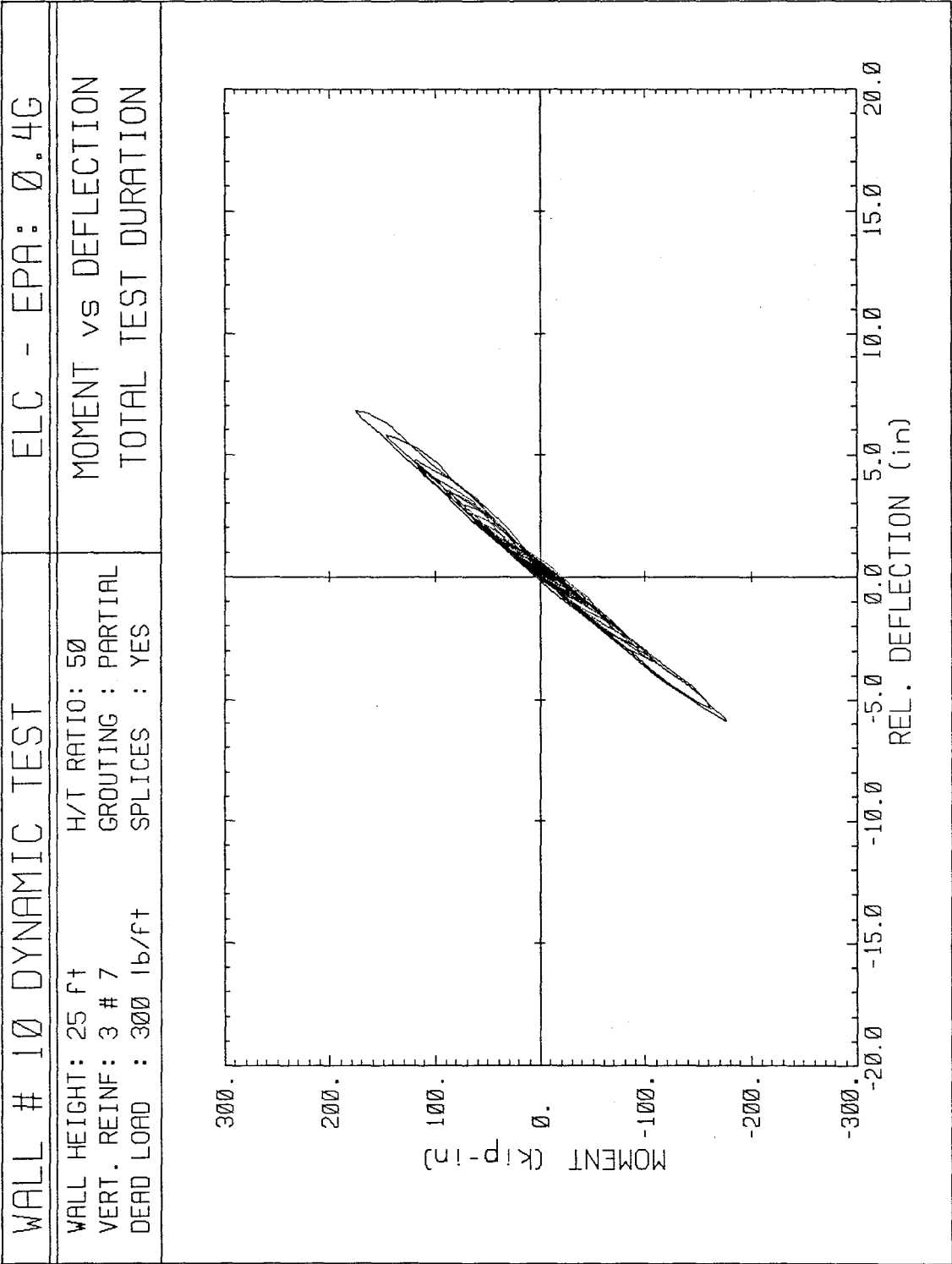


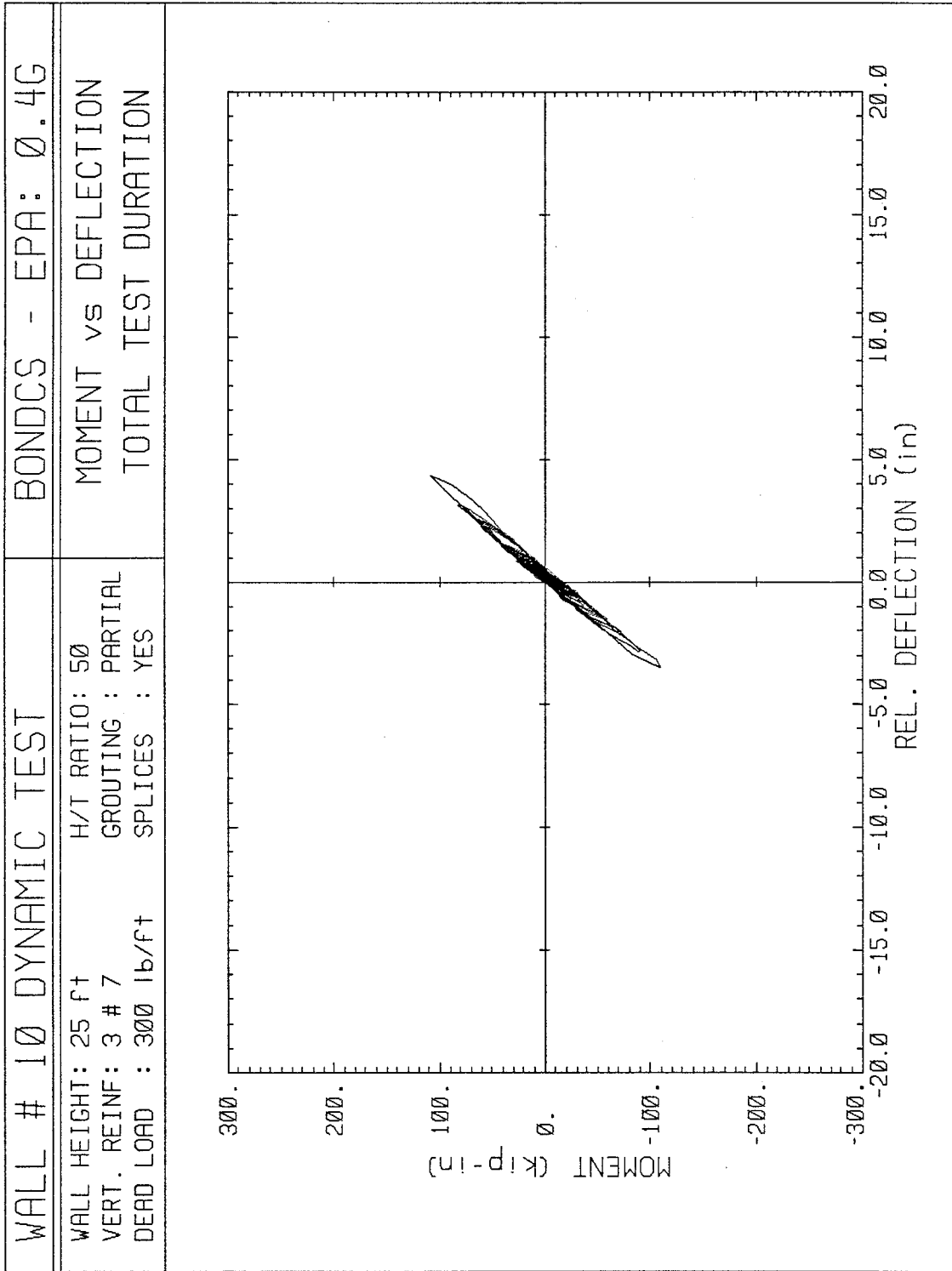




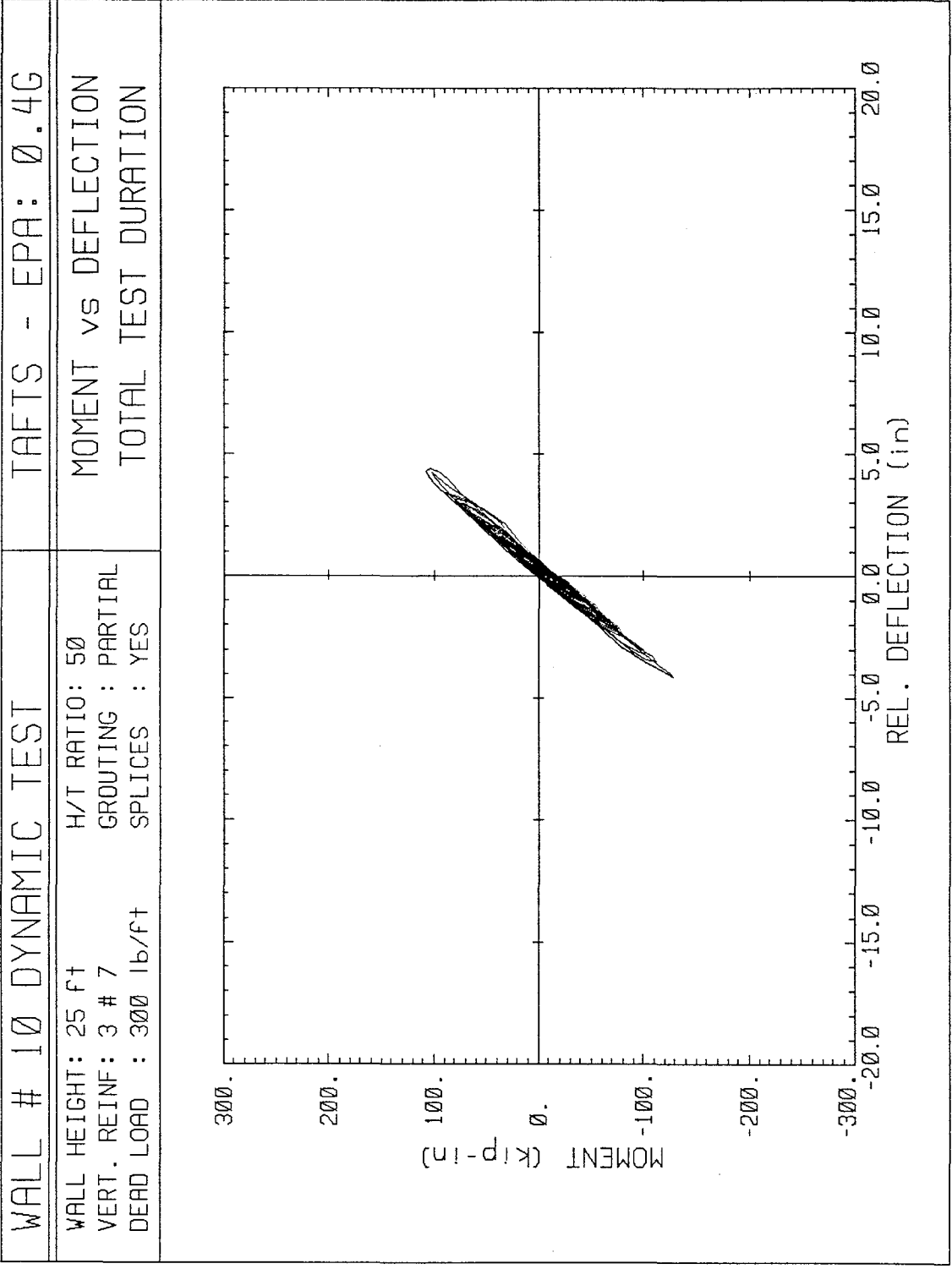


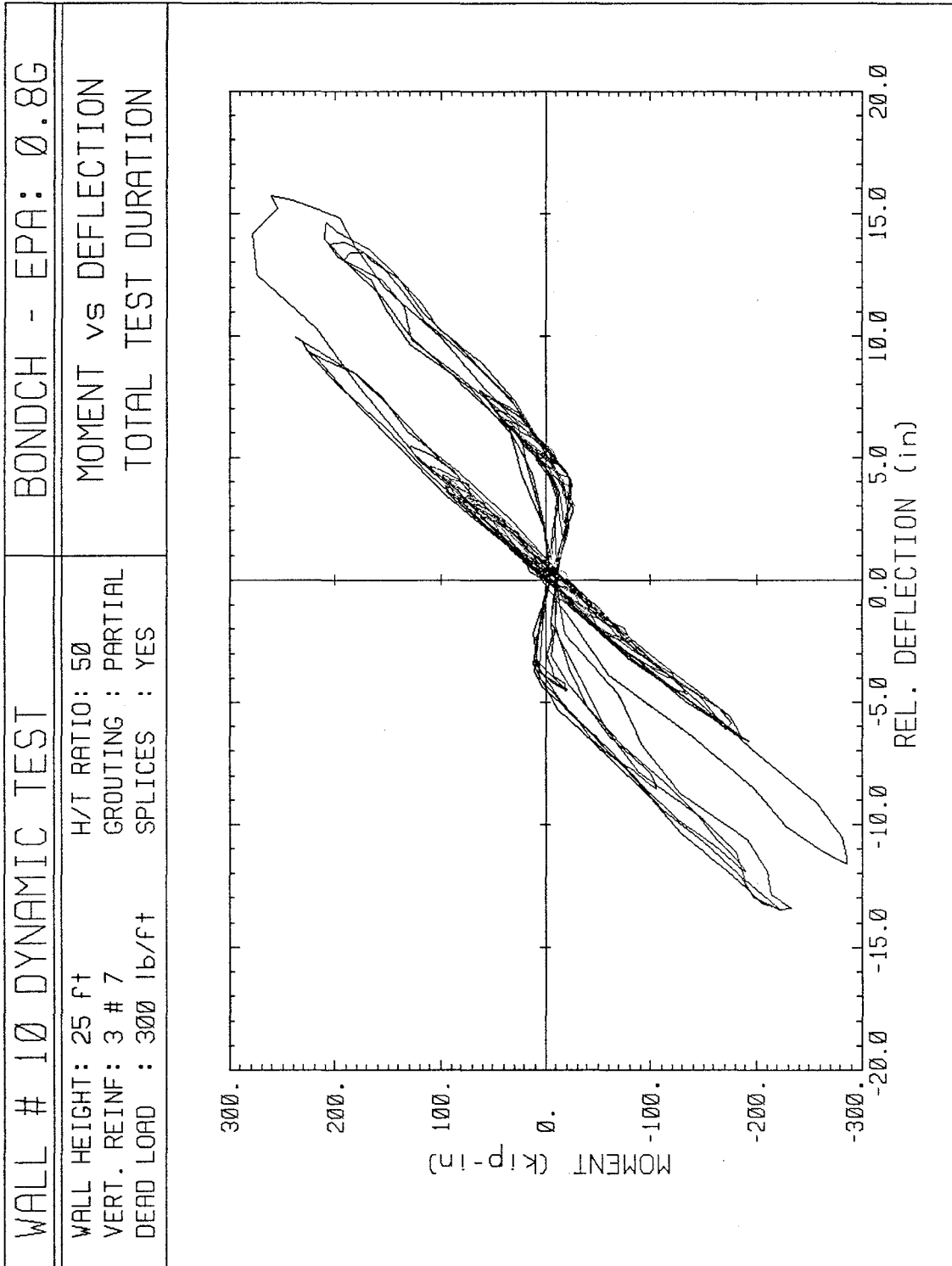










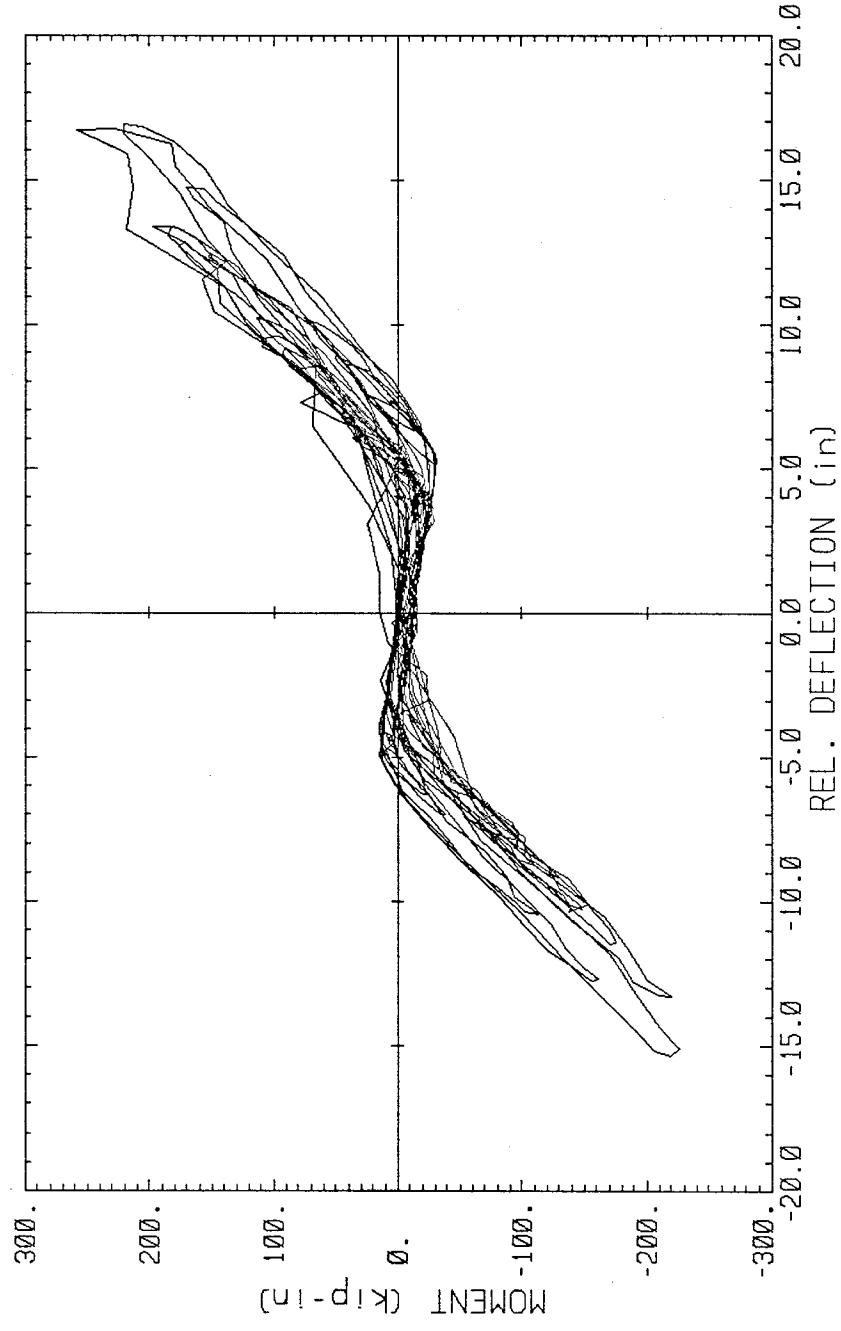


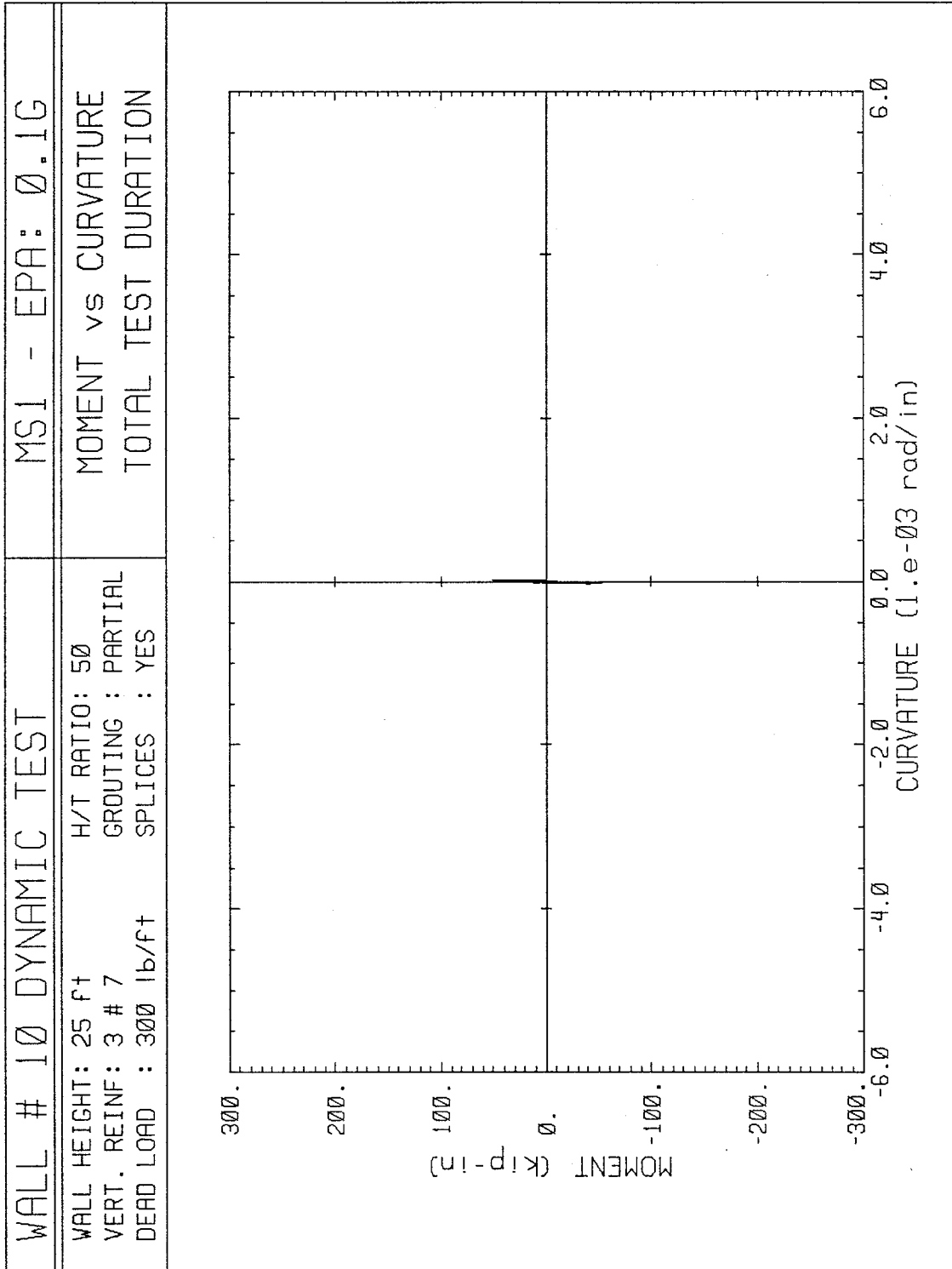
WALL # 10 DYNAMIC TEST

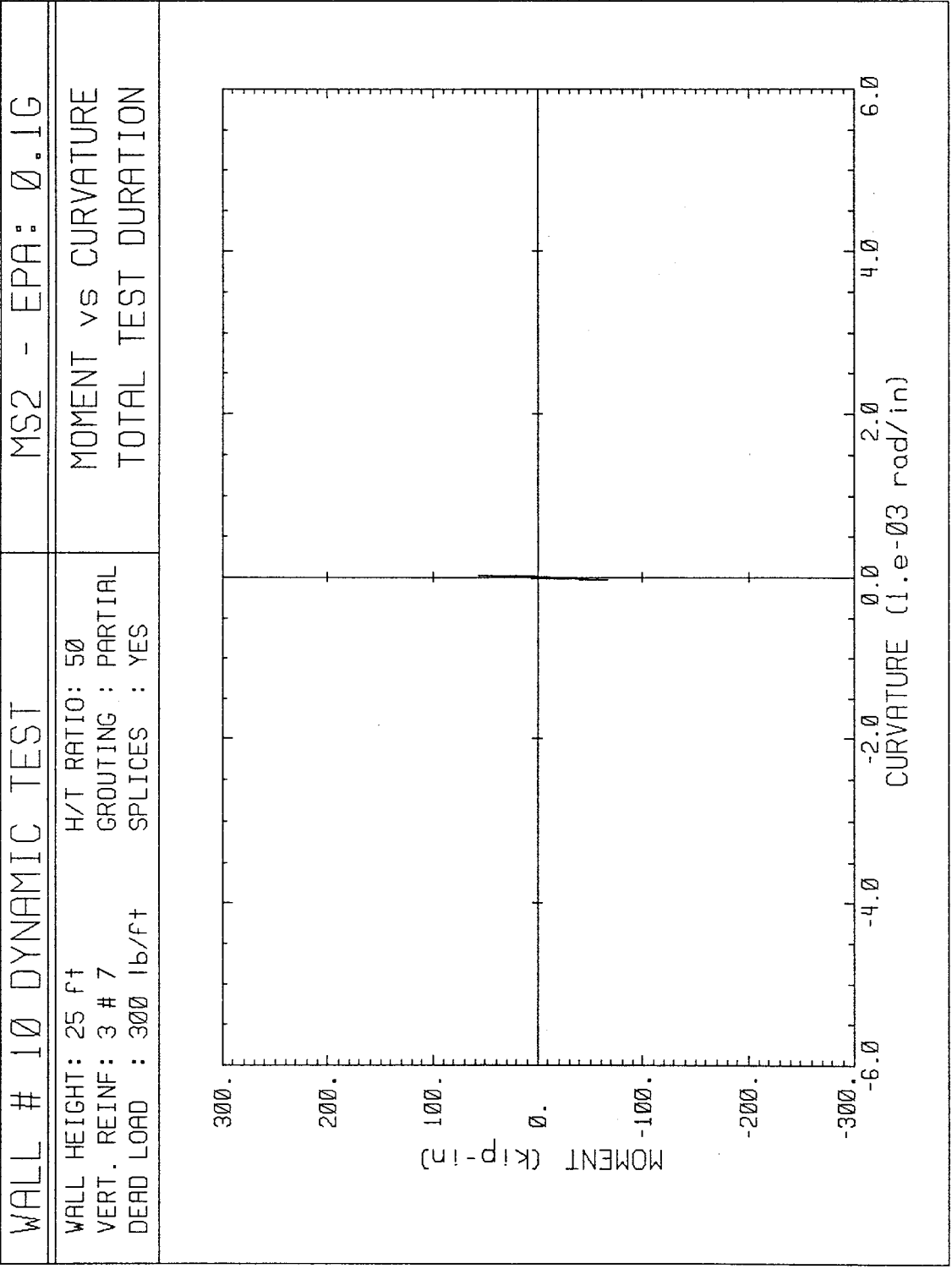
BONDCSH - EPA: 0.8G

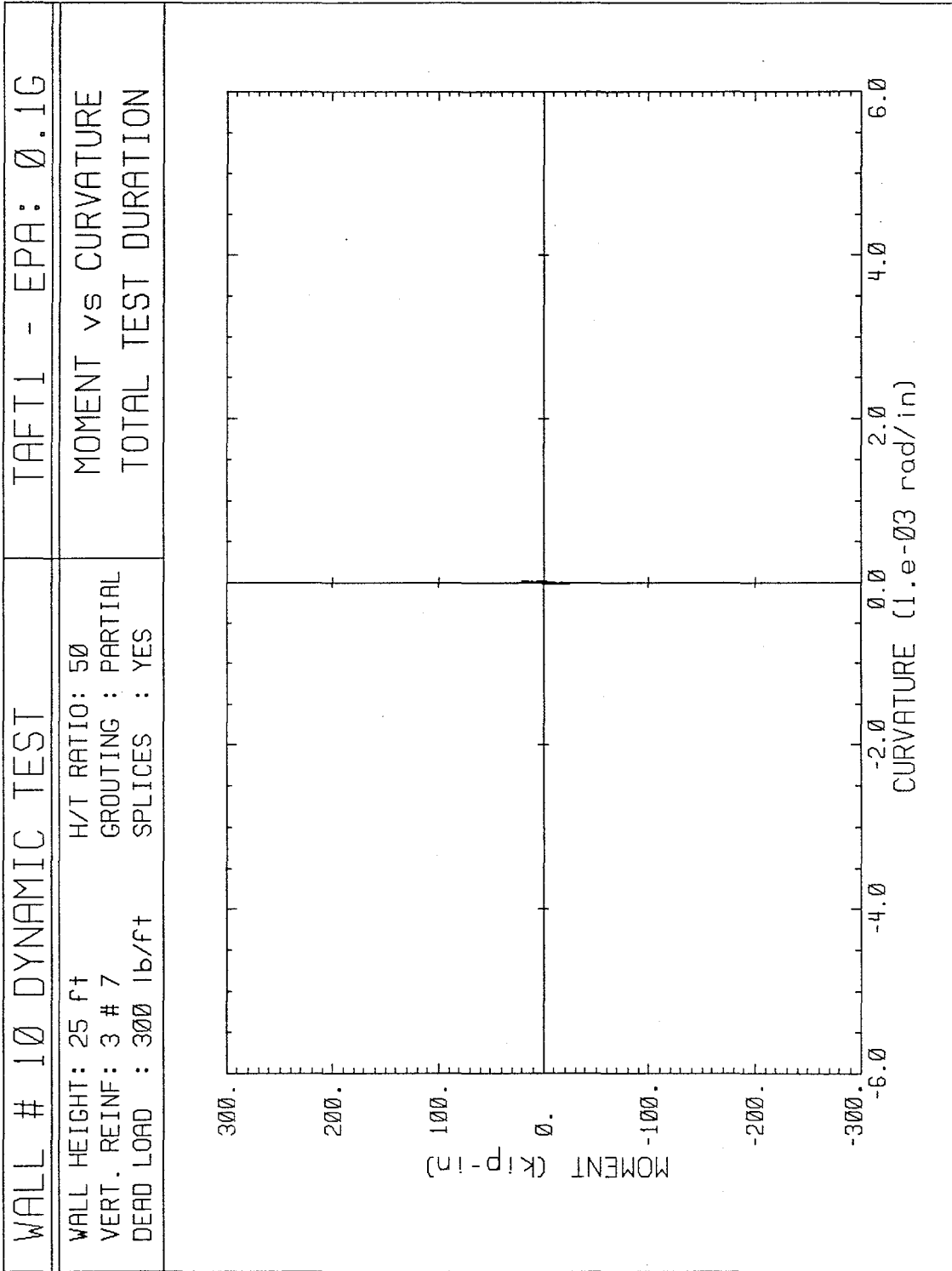
MOMENT vs DEFLECTION  
TOTAL TEST DURATION

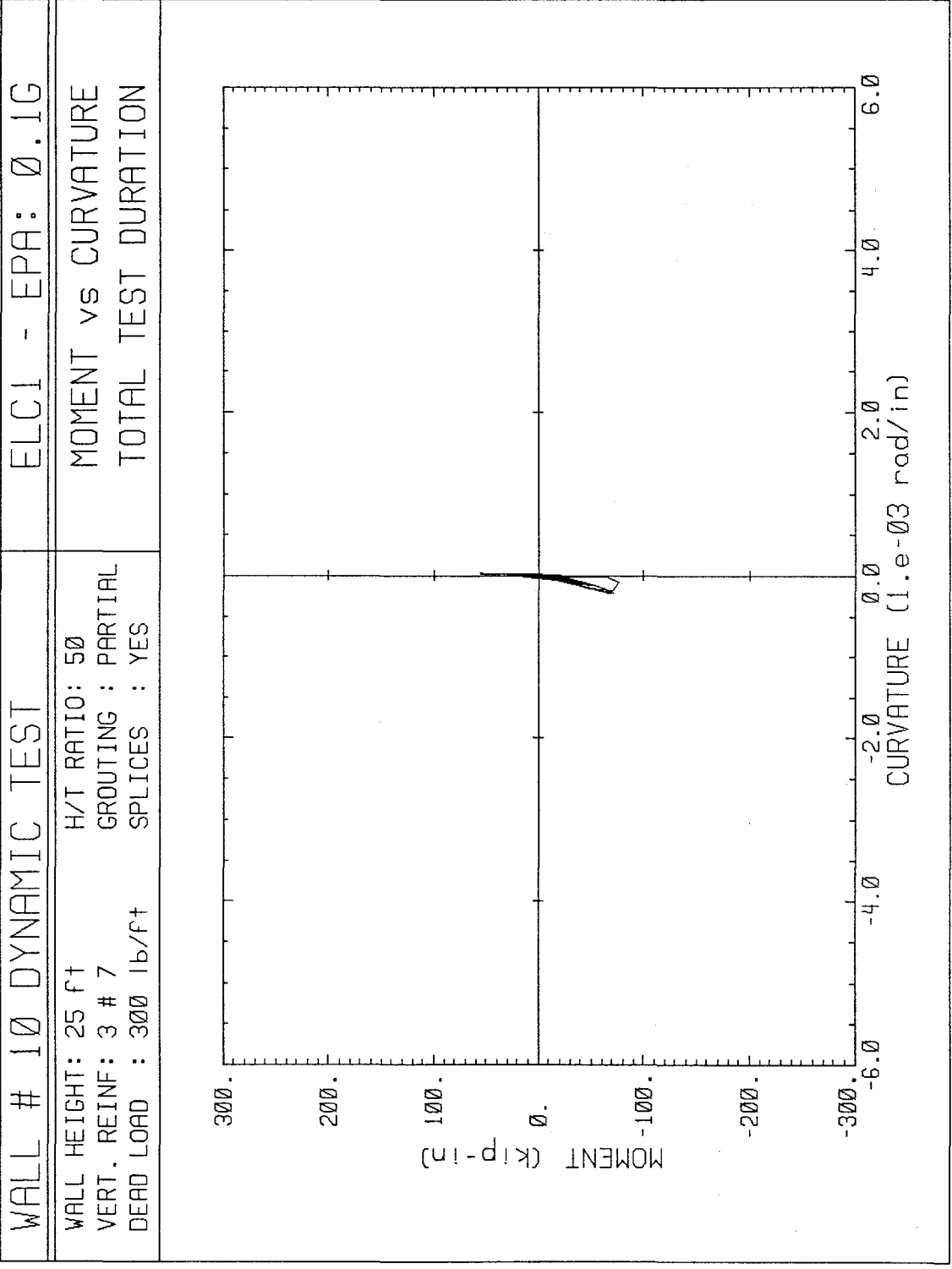
WALL HEIGHT: 25 ft  
H/T RATIO: 50  
VERT. REINF: 3 # 7  
GROUTING : PARTIAL  
DEAD LOAD : 300 lb/ft  
SPLICES : YES

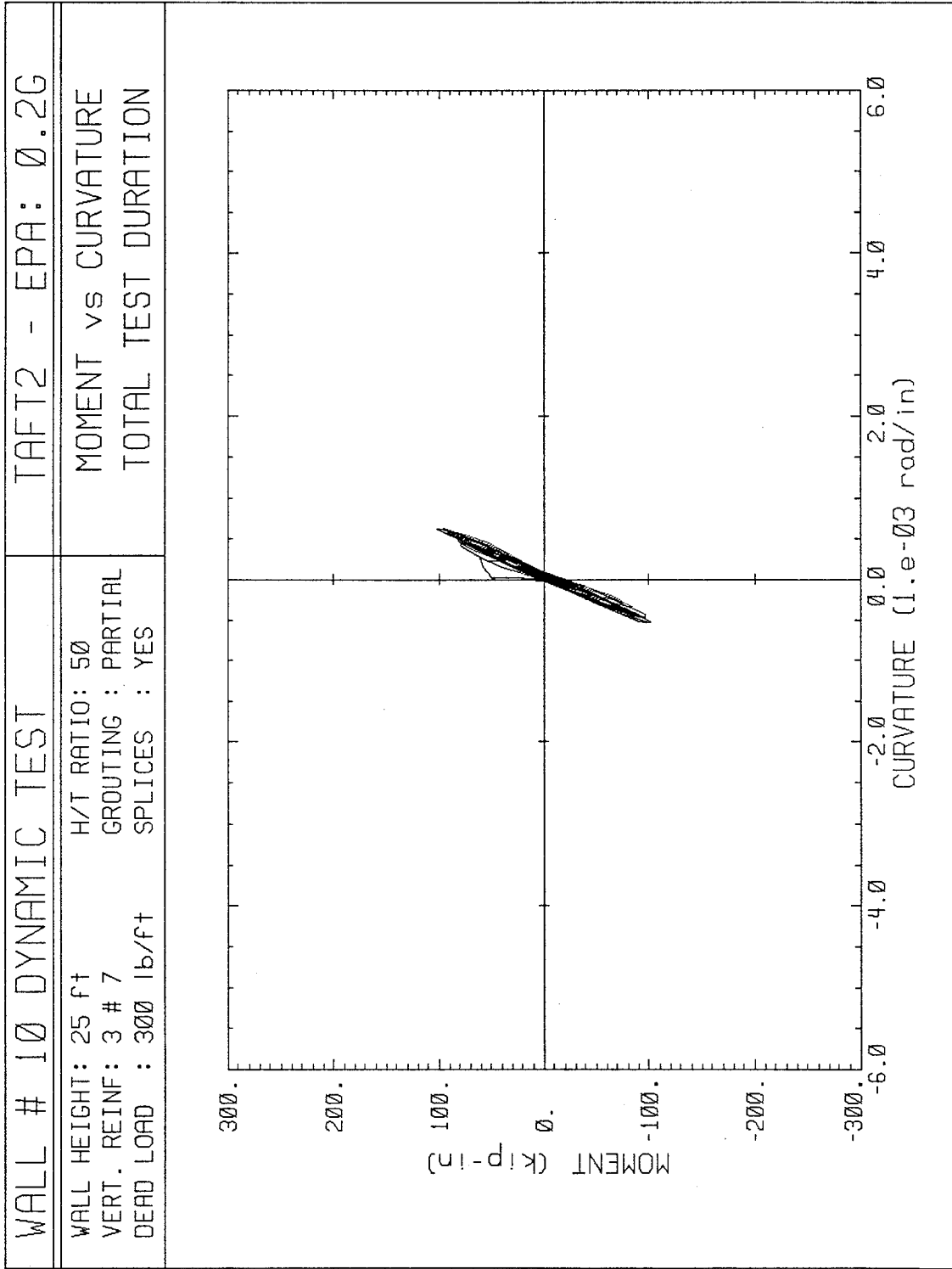




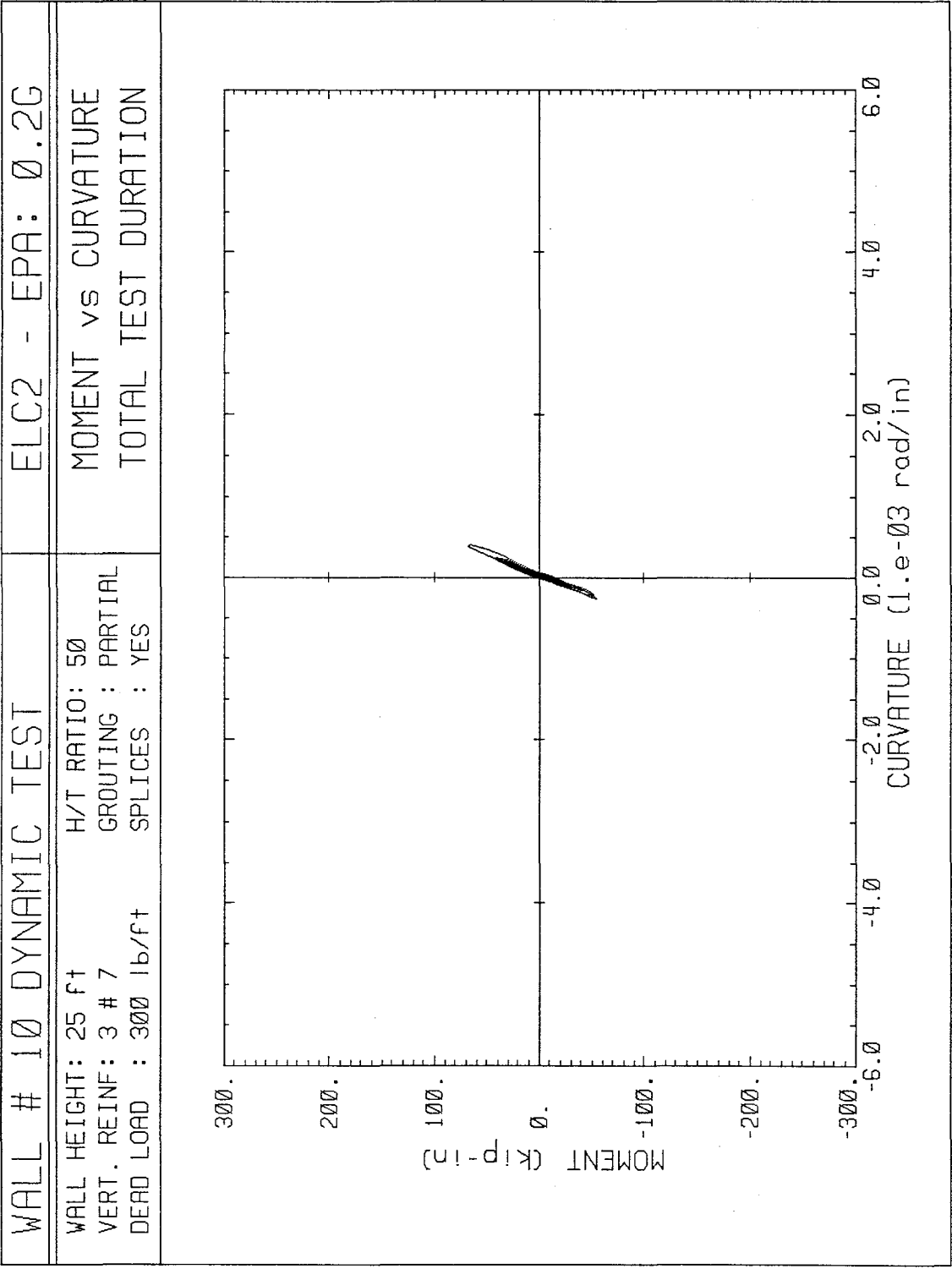


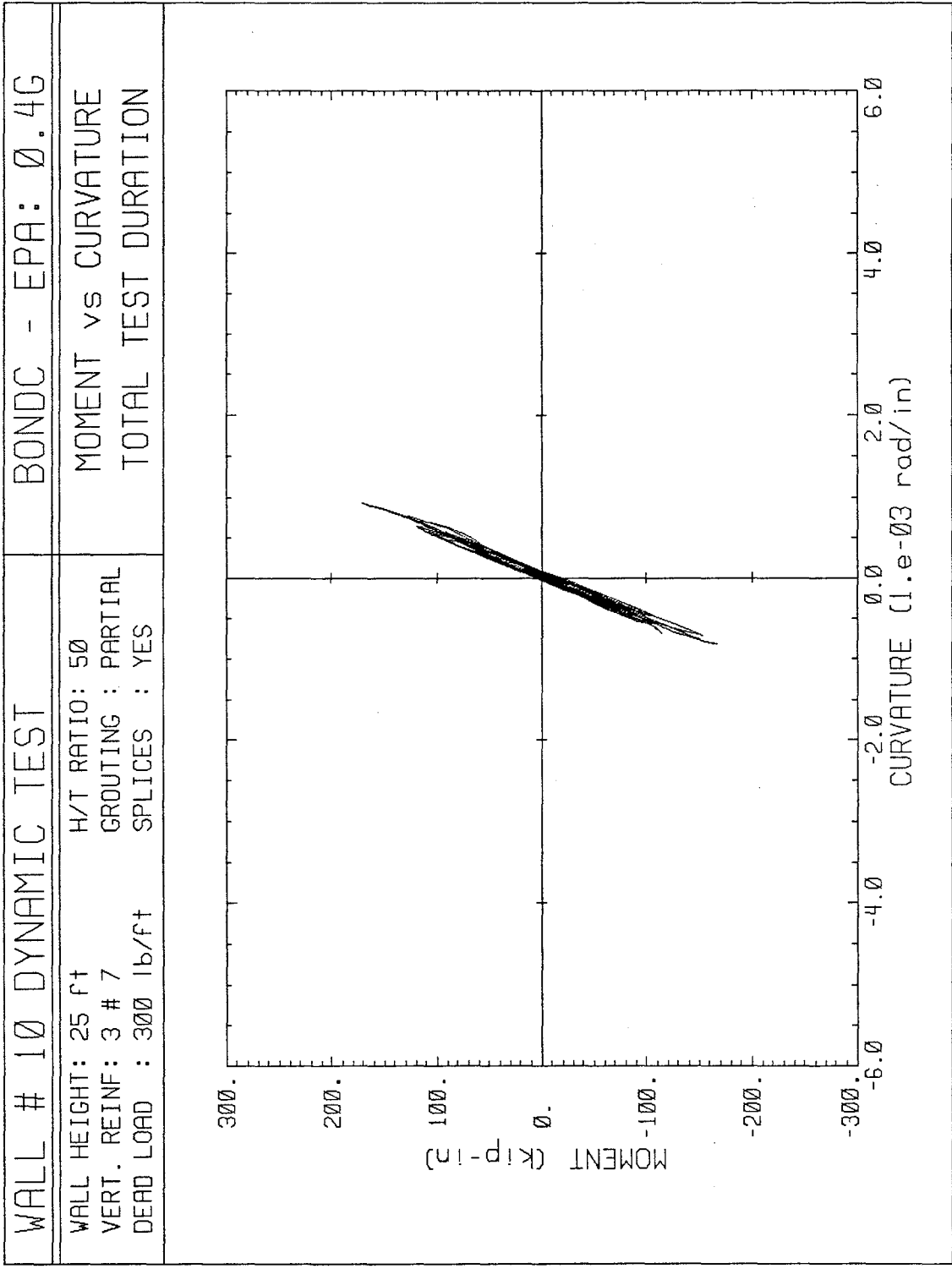


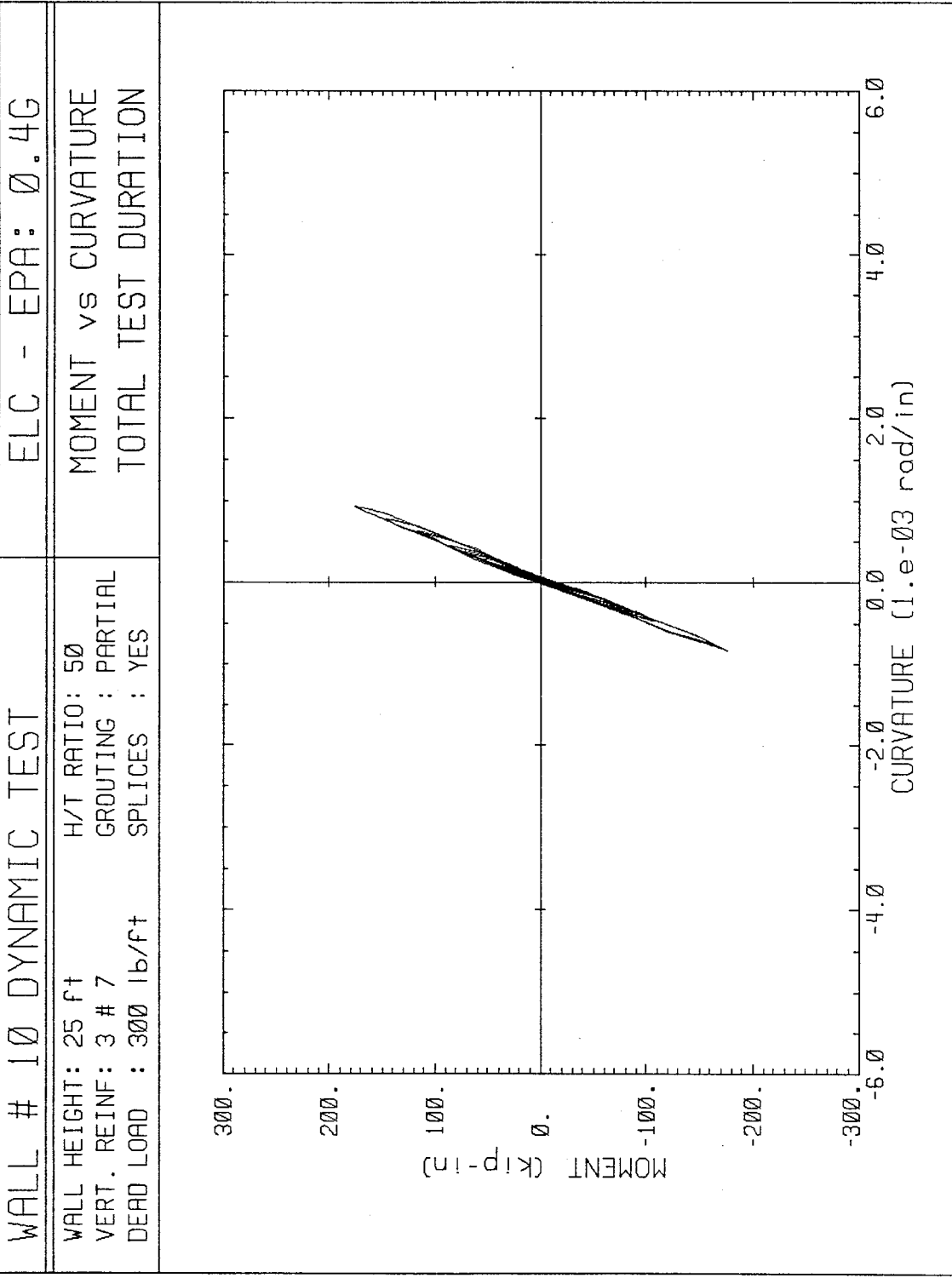


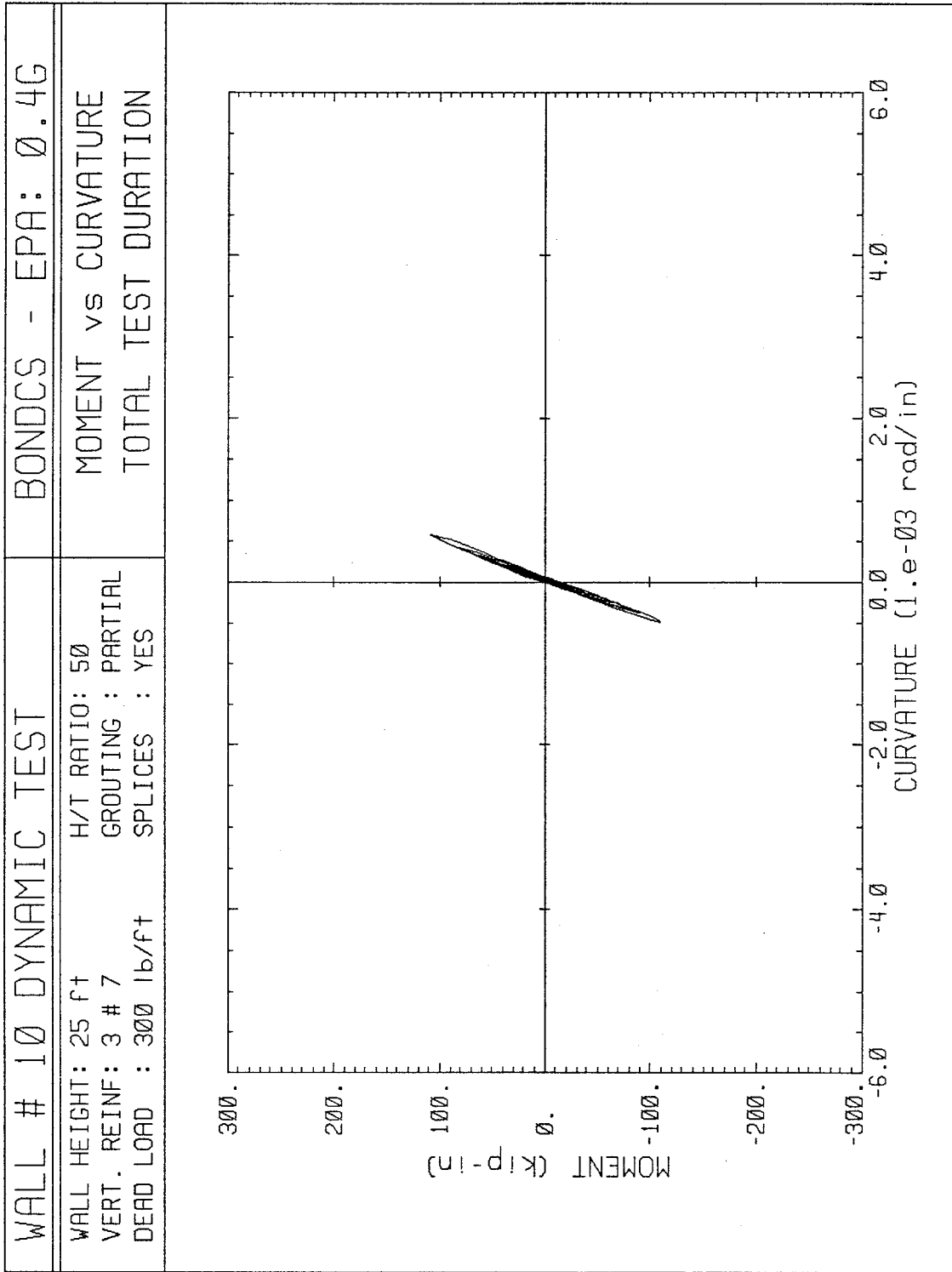


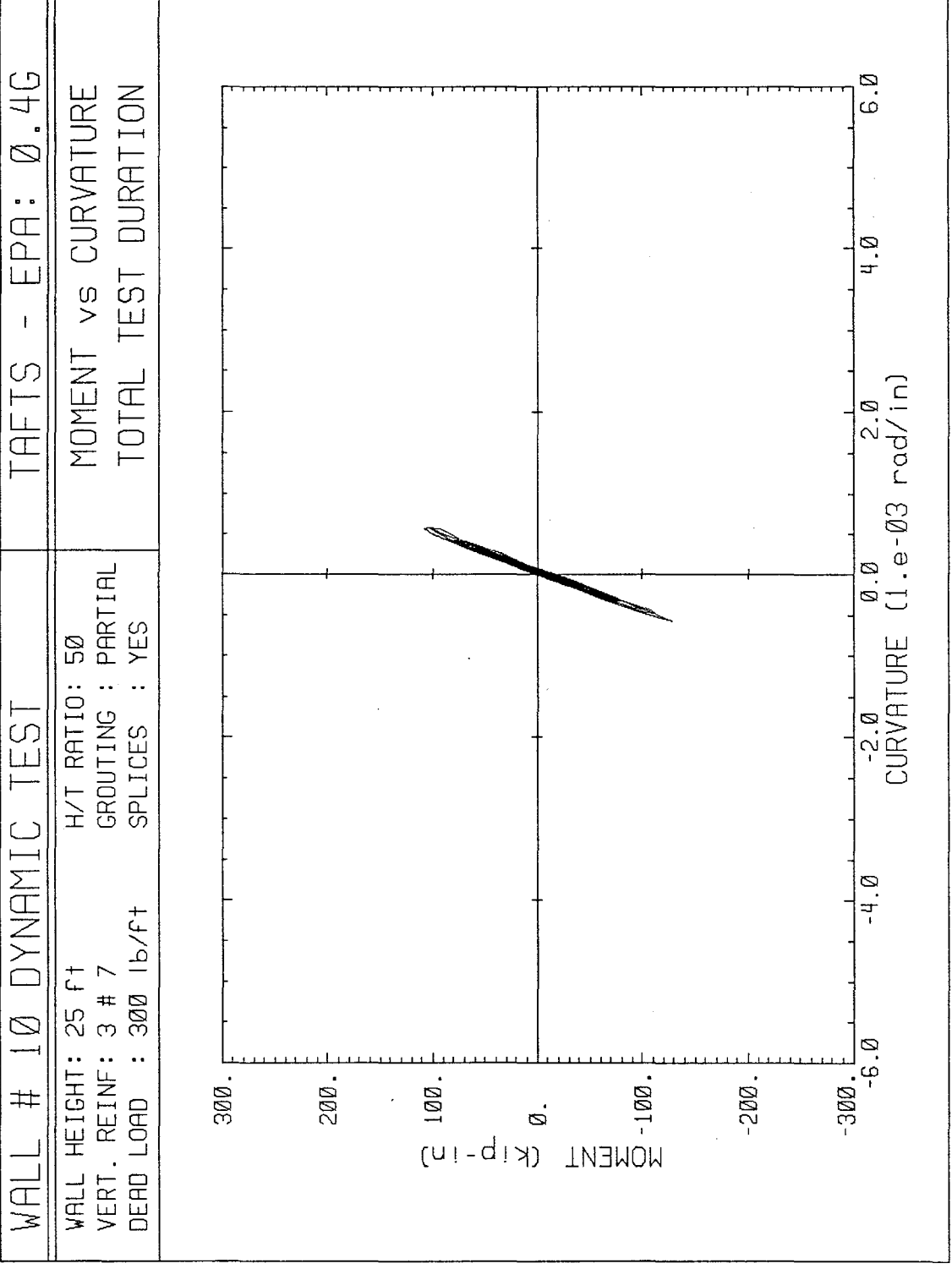


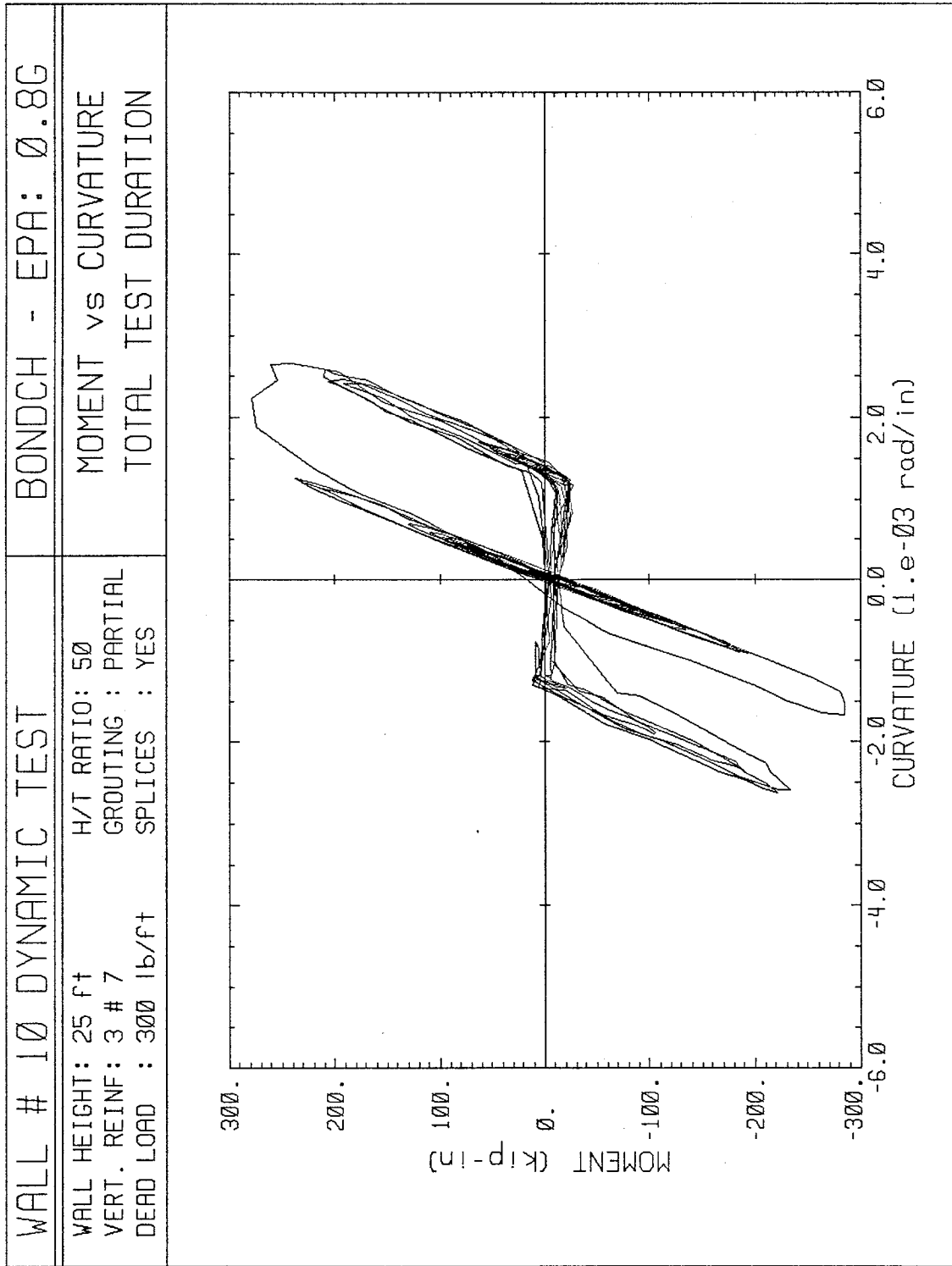


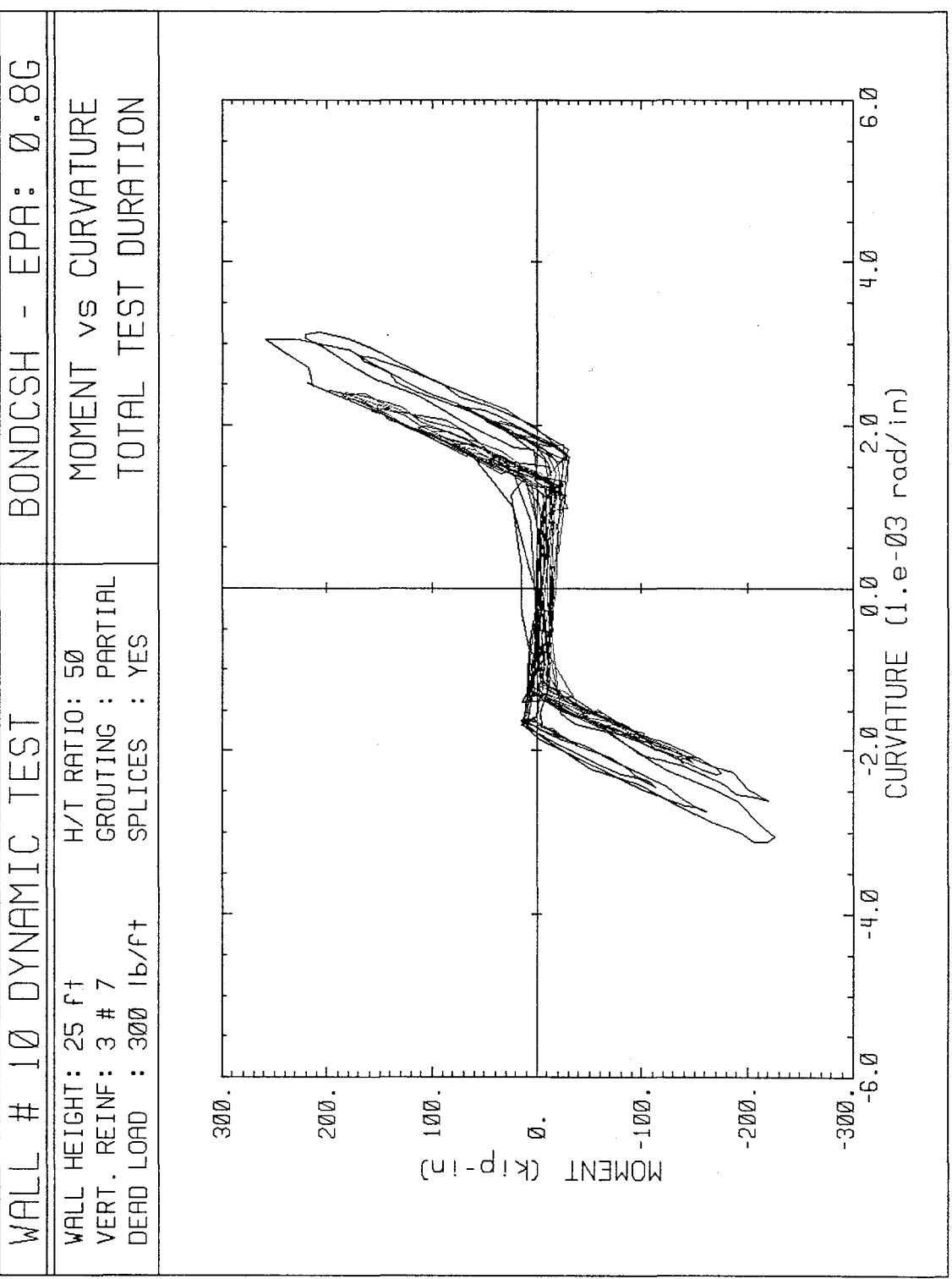


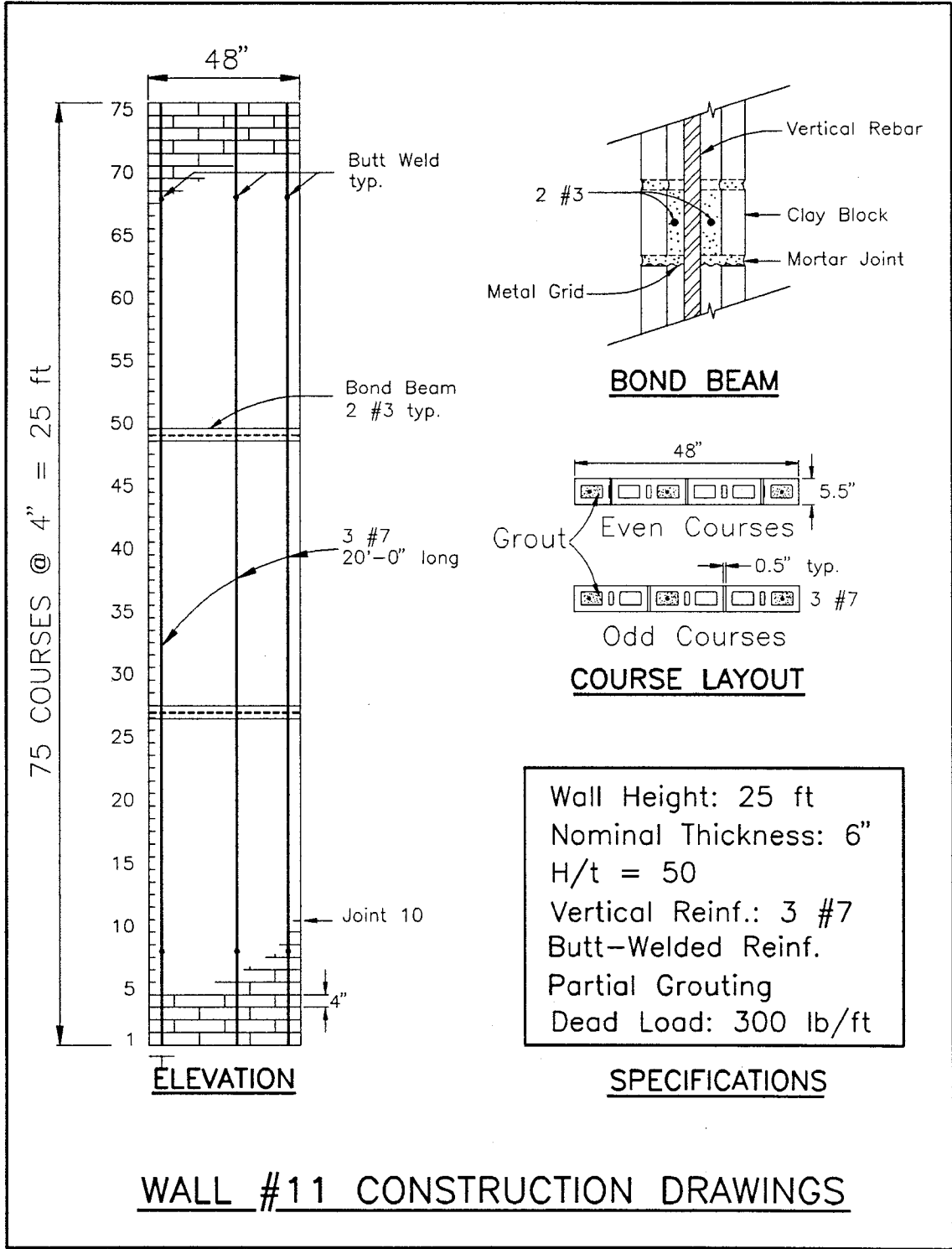




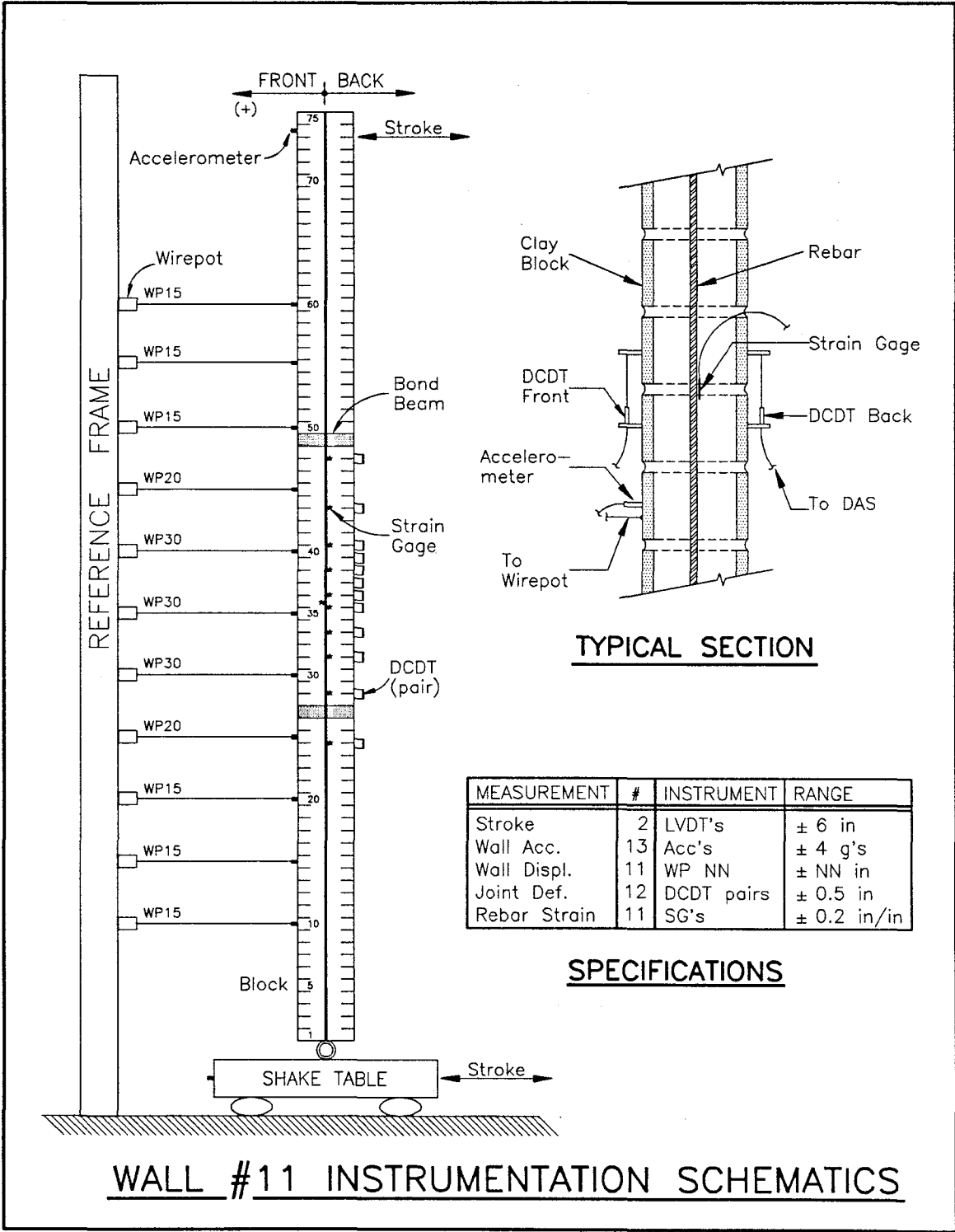












Wall No. 11: Test Sequence & Peak Measurements

Run		EPA	Diaphragm	Displacement (in)			Acceleration (g)			Rebar Strain (in/in)
No	ID			Bottom	Center	Top	Bottom	Center	Top	
1	MS1	0.10	Flexible	1.37	2.58	1.51	0.08	0.49	0.26	0.0007
2	MS2	0.10	Stiff	0.29	0.44	0.29	0.11	0.15	0.27	0.0002
3	TAFT1	0.10	Flexible	0.85	1.58	0.91	0.06	0.27	0.14	0.0003
4	ELC1	0.10	Stiff	1.30	2.19	1.41	0.15	0.47	0.42	0.0005
5	TAFT2	0.20	Flexible	2.35	4.99	2.68	0.19	0.68	0.31	0.0009
6	ELC2	0.20	Stiff	1.50	2.83	1.59	0.18	0.65	0.47	0.0005
7	BONDC	0.40	Flexible	2.62	8.21	3.78	0.33	1.06	0.39	0.0017
8	ELC	0.40	Flexible	3.09	10.00	4.96	0.35	1.26	0.52	0.0018
9	BONDCH	0.40	Stiff	2.73	5.41	3.10	0.33	0.87	0.69	0.0010
10	TAFTS	0.40	Stiff	4.76	6.77	5.09	0.37	0.87	0.62	0.0008
11	MS5	0.40	Flexible	3.42	5.84	5.51	0.39	0.86	0.61	0.0008
12	BONDCH	0.80	Flexible	3.34	14.91	5.64	0.69	1.82	1.11	0.0079
13	BONDCHSH	0.80	Stiff	4.79	14.67	5.22	1.32	2.91	1.96	0.0085
14	BONDCHSH2	0.80	Stiff	4.83	17.41	5.12	1.21	2.36	1.96	0.0082

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TCCMAR PROJECT

WALL No 11 DYNAMIC TEST Run No 1: MS1 0.10 EPA

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Wall Weight: 5.88 kips	H/t Ratio: 50
Vert. Reinf: 3 # 7	Grouting : Partial
Dead Load: 300 lb/ft	Splices : No

---

SUMMARY OF EXTREME VALUES

GLOBAL WALL RESPONSE

Disp Top	1.51 in	Acc Top	0.26 g
Disp Cent	2.58 in	Acc Cent	0.49 g
Disp Bot	1.37 in	Acc Bot	0.08 g
Peak Defl	2.14 in		
Inertia Force	1.60 kips	Eqv Load	80.0 lb/ft
Bending Mt	78.37 kip-in	Seismic C	0.36
		C/Acc Bot	4.32

MATERIAL & MECHANICAL PROPERTIES

f'm	4900 psi	Em (Code)	3680 ksi
Ig	666 in4	EmIg	2449000 kip-in2
Avg Freq	1.39 Hz	EIeqv	343000 kip-in2
		EmIg/EIeqv	7.14

LOCAL RESPONSE

Rebar Strain	Peak	Joint	35
Strain Ductility	0.0007	0.0006	in/in
	0.28	0.24	in
Avg Joint Opening	0.0042	0.0029	in
Faceshell Comp. Strain	0.0003	0.0002	in/in
Faceshell Opening	0.0094	0.0066	in
Curvature	0.4700	0.3400	(1/in)*10-3
EI joint		231000	kip-in2

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CES

October 9, 1989

10:26:12 am

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TCCMAR PROJECT

WALL No 11 DYNAMIC TEST Run No 2: MS2 0.10 EPA

---

Wall Weight: 5.88 kips	H/t Ratio: 50
Vert. Reinf: 3 # 7	Grouting : Partial
Dead Load: 300 lb/ft	Splices : No

---

SUMMARY OF EXTREME VALUES

GLOBAL WALL RESPONSE

Disp Top	0.29 in	Acc Top	0.27 g
Disp Cent	0.44 in	Acc Cent	0.15 g
Disp Bot	0.29 in	Acc Bot	0.11 g
Peak Defl	0.52 in		
Inertia Force	0.36 kips	Eqv Load	20.0 lb/ft
Bending Mt	21.32 kip-in	Seismic C	0.10
		C/Acc Bot	0.88

MATERIAL & MECHANICAL PROPERTIES

f'm	4900 psi	Em (Code)	3680 ksi
Ig	666 in4	EmIg	2449000 kip-in2
Avg Freq	2.27 Hz	EIeqv	384000 kip-in2
		EmIg/EIeqv	6.38

LOCAL RESPONSE

	Peak	Joint 35
Rebar Strain	0.0002	0.0002 in/in
Strain Ductility	0.08	0.08 in
Avg Joint Opening	0.0012	0.0008 in
Faceshell Comp. Strain	0.0002	0.0001 in/in
Faceshell Opening	0.0025	0.0018 in
Curvature	0.1200	0.0955 (1/in)*10-3
EI joint		215000 kip-in2

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CES

October 9, 1989

10:26:19 am

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TCCMAR PROJECT

WALL No 11 DYNAMIC TEST Run No 3: TAFT1 0.10 EPA

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Wall Weight: 5.88 kips	H/t Ratio: 50
Vert. Reinf: 3 # 7	Grouting : Partial
Dead Load: 300 lb/ft	Splices : No

---

SUMMARY OF EXTREME VALUES

GLOBAL WALL RESPONSE

Disp Top	0.91 in	Acc Top	0.14 g
Disp Cent	1.58 in	Acc Cent	0.27 g
Disp Bot	0.85 in	Acc Bot	0.06 g
Peak Defl	1.02 in		
Inertia Force	0.75 kips	Eqv Load	40.0 lb/ft
Bending Mt	37.11 kip-in	Seismic C	0.17
		C/Acc Bot	2.91

MATERIAL & MECHANICAL PROPERTIES

f'm	4900 psi	Em (Code)	3680 ksi
Ig	666 in <sup>4</sup>	EmIg	2449000 kip-in <sup>2</sup>
Avg Freq	1.83 Hz	EIEqv	341000 kip-in <sup>2</sup>
		EmIg/EIEqv	7.18

LOCAL RESPONSE

Rebar Strain	Peak	Joint	35
Strain Ductility	0.0003	0.0003	in/in
	0.12	0.12	in
Avg Joint Opening	0.0023	0.0014	in
Faceshell Comp. Strain	0.0002	0.0001	in/in
Faceshell Opening	0.0047	0.0032	in
Curvature	0.2300	0.1600	(1/in)*10 <sup>-3</sup>
EI joint		232000	kip-in <sup>2</sup>

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CES

October 9, 1989

10:26:27 am

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TCCMAR PROJECT

WALL No 11 DYNAMIC TEST Run No 4: ELC1 0.10 EPA

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Wall Weight: 5.88 kips	H/t Ratio: 50
Vert. Reinf: 3 # 7	Grouting : Partial
Dead Load: 300 lb/ft	Splices : No

---

SUMMARY OF EXTREME VALUES

GLOBAL WALL RESPONSE

Disp Top	1.41 in	Acc Top	0.42 g
Disp Cent	2.19 in	Acc Cent	0.47 g
Disp Bot	1.30 in	Acc Bot	0.15 g
Peak Defl	1.53 in		
Inertia Force	1.06 kips	Eqv Load	60.0 lb/ft
Bending Mt	56.71 kip-in	Seismic C	0.26
		C/Acc Bot	1.71

MATERIAL & MECHANICAL PROPERTIES

f'm	4900 psi	Em (Code)	3680 ksi
Ig	666 in4	EmIg	2449000 kip-in2
Avg Freq	1.77 Hz	EIeqv	348000 kip-in2
		EmIg/EIeqv	7.04

LOCAL RESPONSE

	Peak	Joint	35
Rebar Strain	0.0005	0.0004	in/in
Strain Ductility	0.20	0.16	in
Avg Joint Opening	0.0031	0.0021	in
Faceshell Comp. Strain	0.0002	0.0001	in/in
Faceshell Opening	0.0067	0.0048	in
Curvature	0.3300	0.2400	(1/in)*10-3
EI joint		230000	kip-in2

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CES

October 9, 1989

10:26:34 am

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TCCMAR PROJECT

WALL No 11 DYNAMIC TEST Run No 5: TAFT2 0.20 EPA

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Wall Weight: 5.88 kips	H/t Ratio: 50
Vert. Reinf: 3 # 7	Grouting : Partial
Dead Load: 300 lb/ft	Splices : No

---

SUMMARY OF EXTREME VALUES

GLOBAL WALL RESPONSE

Disp Top	2.68 in	Acc Top	0.31 g
Disp Cent	4.99 in	Acc Cent	0.68 g
Disp Bot	2.35 in	Acc Bot	0.19 g
Peak Defl	3.18 in		
Inertia Force	2.05 kips	Eqv Load	110.0 lb/ft
Bending Mt	100.68 kip-in	Seismic C	0.46
		C/Acc Bot	2.40

MATERIAL & MECHANICAL PROPERTIES

f'm	4900 psi	Em (Code)	3680 ksi
Ig	666 in4	EmIg	2449000 kip-in2
Avg Freq	1.22 Hz	EIeqv	297000 kip-in2
		EmIg/EIeqv	8.25

LOCAL RESPONSE

	Peak	Joint	35
Rebar Strain	0.0009	0.0008	in/in
Strain Ductility	0.36	0.32	in
Avg Joint Opening	0.0061	0.0039	in
Faceshell Comp. Strain	0.0005	0.0003	in/in
Faceshell Opening	0.0134	0.0092	in
Curvature	0.6700	0.4800	(1/in)*10-3
EI joint		210000	kip-in2

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CES

October 9, 1989

10:26:41 am

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TCCMAR PROJECT

WALL No 11 DYNAMIC TEST Run No 6: ELC2 0.20 EPA

---

Wall Weight: 5.88 kips H/t Ratio: 50  
Vert. Reinf: 3 # 7 Grouting : Partial  
Dead Load: 300 lb/ft Splices : No

---

SUMMARY OF EXTREME VALUES

GLOBAL WALL RESPONSE

Disp Top	1.59 in	Acc Top	0.47 g
Disp Cent	2.83 in	Acc Cent	0.65 g
Disp Bot	1.50 in	Acc Bot	0.18 g
Peak Defl	1.88 in		
Inertia Force	1.00 kips	Eqv Load	70.0 lb/ft
Bending Mt	62.71 kip-in	Seismic C	0.28
		C/Acc Bot	1.58

MATERIAL & MECHANICAL PROPERTIES

f'm	4900 psi	Em (Code)	3680 ksi
Ig	666 in <sup>4</sup>	EmIg	2449000 kip-in <sup>2</sup>
Avg Freq	1.77 Hz	EIeqv	313000 kip-in <sup>2</sup>
		EmIg/EIeqv	7.82

LOCAL RESPONSE

	Peak	Joint	35
Rebar Strain	0.0005	0.0005	in/in
Strain Ductility	0.20	0.20	in
Avg Joint Opening	0.0036	0.0023	in
Faceshell Comp. Strain	0.0003	0.0002	in/in
Faceshell Opening	0.0077	0.0052	in
Curvature	0.3700	0.2700	(1/in)*10 <sup>-3</sup>
EI joint		214000	kip-in <sup>2</sup>

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CES

October 9, 1989

10:26:49 am

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TCCMAR PROJECT

WALL No 11 DYNAMIC TEST Run No 7: BONDC 0.40 EPA

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Wall Weight: 5.88 kips H/t Ratio: 50  
Vert. Reinf: 3 # 7 Grouting : Partial  
Dead Load: 300 lb/ft Splices : No

---

SUMMARY OF EXTREME VALUES

GLOBAL WALL RESPONSE

Disp Top	3.78 in	Acc Top	0.39 g
Disp Cent	8.21 in	Acc Cent	1.06 g
Disp Bot	2.62 in	Acc Bot	0.33 g
Peak Defl	7.03 in		
Inertia Force	3.97 kips	Eqv Load	200.0 lb/ft
Bending Mt	187.67 kip-in	Seismic C	0.85
		C/Acc Bot	2.58

MATERIAL & MECHANICAL PROPERTIES

f'm	4900 psi	Em (Code)	3680 ksi
Ig	666 in <sup>4</sup>	EmIg	2449000 kip-in <sup>2</sup>
Avg Freq	1.07 Hz	EIeqv	250000 kip-in <sup>2</sup>
		EmIg/EIeqv	9.80

LOCAL RESPONSE

	Peak	Joint 35
Rebar Strain	0.0017	0.0016 in/in
Strain Ductility	0.68	0.64 in
Avg Joint Opening	0.0072	0.0058 in
Faceshell Comp. Strain	0.0009	0.0008 in/in
Faceshell Opening	0.0176	0.0146 in
Curvature	0.9500	0.8000 (1/in)*10 <sup>-3</sup>
EI joint		235000 kip-in <sup>2</sup>

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CES

October 9, 1989

10:26:56 am

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TCCMAR PROJECT

WALL No 11 DYNAMIC TEST Run No 8: ELC 0.40 EPA

---

Wall Weight: 5.88 kips H/t Ratio: 50  
Vert. Reinf: 3 # 7 Grouting : Partial  
Dead Load: 300 lb/ft Splices : No

---

SUMMARY OF EXTREME VALUES

GLOBAL WALL RESPONSE

Disp Top	4.96 in	Acc Top	0.52 g
Disp Cent	10.00 in	Acc Cent	1.26 g
Disp Bot	3.09 in	Acc Bot	0.35 g
Peak Defl	7.28 in		
Inertia Force	3.82 kips	Eqv Load	200.0 lb/ft
Bending Mt	189.58 kip-in	Seismic C	0.86
		C/Acc Bot	2.46

MATERIAL & MECHANICAL PROPERTIES

f'm	4900 psi	Em (Code)	3680 ksi
Ig	666 in <sup>4</sup>	EmIg	2449000 kip-in <sup>2</sup>
Avg Freq	1.01 Hz	EIeqv	244000 kip-in <sup>2</sup>
		EmIg/EIeqv	10.04

LOCAL RESPONSE

	Peak	Joint	35
Rebar Strain	0.0018	0.0016	in/in
Strain Ductility	0.72	0.64	in
Avg Joint Opening	0.0071	0.0059	in
Faceshell Comp. Strain	0.0010	0.0008	in/in
Faceshell Opening	0.0179	0.0150	in
Curvature	0.9900	0.8300	(1/in)*10 <sup>-3</sup>
EI joint		228000	kip-in <sup>2</sup>

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CES

October 9, 1989

10:27:04 am

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TCCMAR PROJECT

WALL No 11 DYNAMIC TEST Run No 9: BONDCS 0.40 EPA

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Wall Weight: 5.88 kips H/t Ratio: 50  
Vert. Reinf: 3 # 7 Grouting : Partial  
Dead Load: 300 lb/ft Splices : No

---

SUMMARY OF EXTREME VALUES

GLOBAL WALL RESPONSE

Disp Top	3.10 in	Acc Top	0.69 g
Disp Cent	5.41 in	Acc Cent	0.87 g
Disp Bot	2.73 in	Acc Bot	0.33 g
Peak Defl	4.18 in		
Inertia Force	2.16 kips	Eqv Load	110.0 lb/ft
Bending Mt	104.72 kip-in	Seismic C	0.47
		C/Acc Bot	1.44

MATERIAL & MECHANICAL PROPERTIES

f'm	4900 psi	Em (Code)	3680 ksi
Ig	666 in <sup>4</sup>	EmIg	2449000 kip-in <sup>2</sup>
Avg Freq	1.04 Hz	EIeqv	235000 kip-in <sup>2</sup>
		EmIg/EIeqv	10.42

LOCAL RESPONSE

Rebar Strain	Peak 0.0010	Joint 35 0.0009	in/in
Strain Ductility	0.40	0.36	in
Avg Joint Opening	0.0042	0.0035	in
Faceshell Comp. Strain	0.0005	0.0004	in/in
Faceshell Opening	0.0101	0.0086	in
Curvature	0.5300	0.4600	(1/in)*10 <sup>-3</sup>
EI joint		228000	kip-in <sup>2</sup>

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CES

October 9, 1989

10:27:11 am

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TCCMAR PROJECT

WALL No 11 DYNAMIC TEST Run No 10: TAFTS 0.40 EPA

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Wall Weight: 5.88 kips H/t Ratio: 50  
Vert. Reinf: 3 # 7 Grouting : Partial  
Dead Load: 300 lb/ft Splices : No

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SUMMARY OF EXTREME VALUES

GLOBAL WALL RESPONSE

Disp Top	5.09 in	Acc Top	0.62 g
Disp Cent	6.77 in	Acc Cent	0.87 g
Disp Bot	4.76 in	Acc Bot	0.37 g
Peak Defl	4.41 in		
Inertia Force	2.28 kips	Eqv Load	110.0 lb/ft
Bending Mt	104.03 kip-in	Seismic C	0.47
		C/Acc Bot	1.28

MATERIAL & MECHANICAL PROPERTIES

f'm	4900 psi	Em (Code)	3680 ksi
Ig	666 in4	EmIg	2449000 kip-in2
Avg Freq	1.13 Hz	EIeqv	221000 kip-in2
		EmIg/EIeqv	11.08

LOCAL RESPONSE

	Peak	Joint	35
Rebar Strain	0.0008	0.0008	in/in
Strain Ductility	0.32	0.32	in
Avg Joint Opening	0.0045	0.0031	in
Faceshell Comp. Strain	0.0007	0.0004	in/in
Faceshell Opening	0.0089	0.0076	in
Curvature	0.6400	0.4100	(1/in)*10-3
EI joint		251000	kip-in2

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CES

October 9, 1989

10:27:18 am

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TCCMAR PROJECT

WALL No 11 DYNAMIC TEST Run No 11: MS5 0.40 EPA

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Wall Weight: 5.88 kips H/t Ratio: 50  
Vert. Reinf: 3 # 7 Grouting : Partial  
Dead Load: 300 lb/ft Splices : No

---

SUMMARY OF EXTREME VALUES

GLOBAL WALL RESPONSE

Disp Top	5.51 in	Acc Top	0.61 g
Disp Cent	5.84 in	Acc Cent	0.86 g
Disp Bot	3.42 in	Acc Bot	0.39 g
Peak Defl	3.33 in		
Inertia Force	1.90 kips	Eqv Load	100.0 lb/ft
Bending Mt	90.24 kip-in	Seismic C	0.41
		C/Acc Bot	1.05

MATERIAL & MECHANICAL PROPERTIES

f'm	4900 psi	Em (Code)	3680 ksi
Ig	666 in <sup>4</sup>	EmIg	2449000 kip-in <sup>2</sup>
Avg Freq	1.22 Hz	EIeqv	254000 kip-in <sup>2</sup>
		EmIg/EIeqv	9.64

LOCAL RESPONSE

	Peak	Joint	35
Rebar Strain	0.0008	0.0007	in/in
Strain Ductility	0.32	0.28	in
Avg Joint Opening	0.0036	0.0030	in
Faceshell Comp. Strain	0.0005	0.0003	in/in
Faceshell Opening	0.0085	0.0070	in
Curvature	0.4600	0.3600	(1/in)*10 <sup>-3</sup>
EI joint		224000	kip-in <sup>2</sup>

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CES

October 9, 1989

10:27:26 am

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TCCMAR PROJECT

WALL No 11 DYNAMIC TEST Run No 12: BONDCH 0.80 EPA

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Wall Weight: 5.88 kips	H/t Ratio: 50
Vert. Reinf: 3 # 7	Grouting : Partial
Dead Load: 300 lb/ft	Splices : No

---

SUMMARY OF EXTREME VALUES

GLOBAL WALL RESPONSE

Disp Top	5.64 in	Acc Top	1.11 g
Disp Cent	14.91 in	Acc Cent	1.82 g
Disp Bot	3.34 in	Acc Bot	0.69 g
Peak Defl	13.63 in		
Inertia Force	6.27 kips	Eqv Load	320.0 lb/ft
Bending Mt	299.50 kip-in	Seismic C	1.36
		C/Acc Bot	1.97

MATERIAL & MECHANICAL PROPERTIES

f'm	4900 psi	Em (Code)	3680 ksi
Ig	666 in4	EmIg	2449000 kip-in2
Avg Freq	0.92 Hz	EIEqv	206000 kip-in2
		EmIg/EIEqv	11.89

LOCAL RESPONSE

	Peak	Joint	35
Rebar Strain	0.0079	0.0050	in/in
Strain Ductility	3.16	2.00	in
Avg Joint Opening	0.0177	0.0161	in
Faceshell Comp. Strain	0.0019	0.0017	in/in
Faceshell Opening	0.0422	0.0391	in
Curvature	2.2400	2.0900	(1/in)*10-3
EI joint		115000	kip-in2

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CES

October 9, 1989

10:27:33 am

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TCCMAR PROJECT

WALL No 11 DYNAMIC TEST Run No 13: BONDCSH 0.80 EPA

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Wall Weight: 5.88 kips	H/t Ratio: 50
Vert. Reinf: 3 # 7	Grouting : Partial
Dead Load: 300 lb/ft	Splices : No

---

SUMMARY OF EXTREME VALUES

GLOBAL WALL RESPONSE

Disp Top	5.22 in	Acc Top	1.96 g
Disp Cent	14.67 in	Acc Cent	2.91 g
Disp Bot	4.79 in	Acc Bot	1.32 g
Peak Defl	15.03 in		
Inertia Force	5.15 kips	Eqv Load	280.0 lb/ft
Bending Mt	258.48 kip-in	Seismic C	1.17
		C/Acc Bot	0.89

MATERIAL & MECHANICAL PROPERTIES

f'm	4900 psi	Em (Code)	3680 ksi
Ig	666 in <sup>4</sup>	EmIg	2449000 kip-in <sup>2</sup>
Avg Freq	0.89 Hz	EIeqv	161000 kip-in <sup>2</sup>
		EmIg/EIeqv	15.21

LOCAL RESPONSE

Rebar Strain	Peak	Joint	35
Strain Ductility	0.0085	0.0059	in/in
	3.40	2.36	in
Avg Joint Opening	0.0190	0.0190	in
Faceshell Comp. Strain	0.0020	0.0017	in/in
Faceshell Opening	0.0507	0.0446	in
Curvature	2.6500	2.3200	(1/in)*10 <sup>-3</sup>
EI joint		111000	kip-in <sup>2</sup>

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CES

October 9, 1989

10:27:40 am

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TCCMAR PROJECT

WALL No 11 DYNAMIC TEST Run No 14: BOND-CSH 0.80 EPA

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Wall Weight: 5.88 kips	H/t Ratio: 50
Vert. Reinf: 3 # 7	Grouting : Partial
Dead Load: 300 lb/ft	Splices : No

---

SUMMARY OF EXTREME VALUES

GLOBAL WALL RESPONSE

Disp Top	5.12 in	Acc Top	1.96 g
Disp Cent	17.41 in	Acc Cent	2.36 g
Disp Bot	4.83 in	Acc Bot	1.21 g
Peak Defl	15.70 in		
Inertia Force	4.55 kips	Eqv Load	240.0 lb/ft
Bending Mt	220.60 kip-in	Seismic C	1.00
		C/Acc Bot	0.83

MATERIAL & MECHANICAL PROPERTIES

f'm	4900 psi	Em (Code)	3680 ksi
Ig	666 in <sup>4</sup>	EmIg	2449000 kip-in <sup>2</sup>
Avg Freq	0.89 Hz	EIeqv	132000 kip-in <sup>2</sup>
		EmIg/EIeqv	18.55

LOCAL RESPONSE

	Peak	Joint	35
Rebar Strain	0.0082	0.0059	in/in
Strain Ductility	3.28	2.36	in
Avg Joint Opening	0.0192	0.0170	in
Faceshell Comp. Strain	0.0046	0.0037	in/in
Faceshell Opening	0.0566	0.0487	in
Curvature	3.4000	2.8800	(1/in)*10 <sup>-3</sup>
EI joint		77000	kip-in <sup>2</sup>

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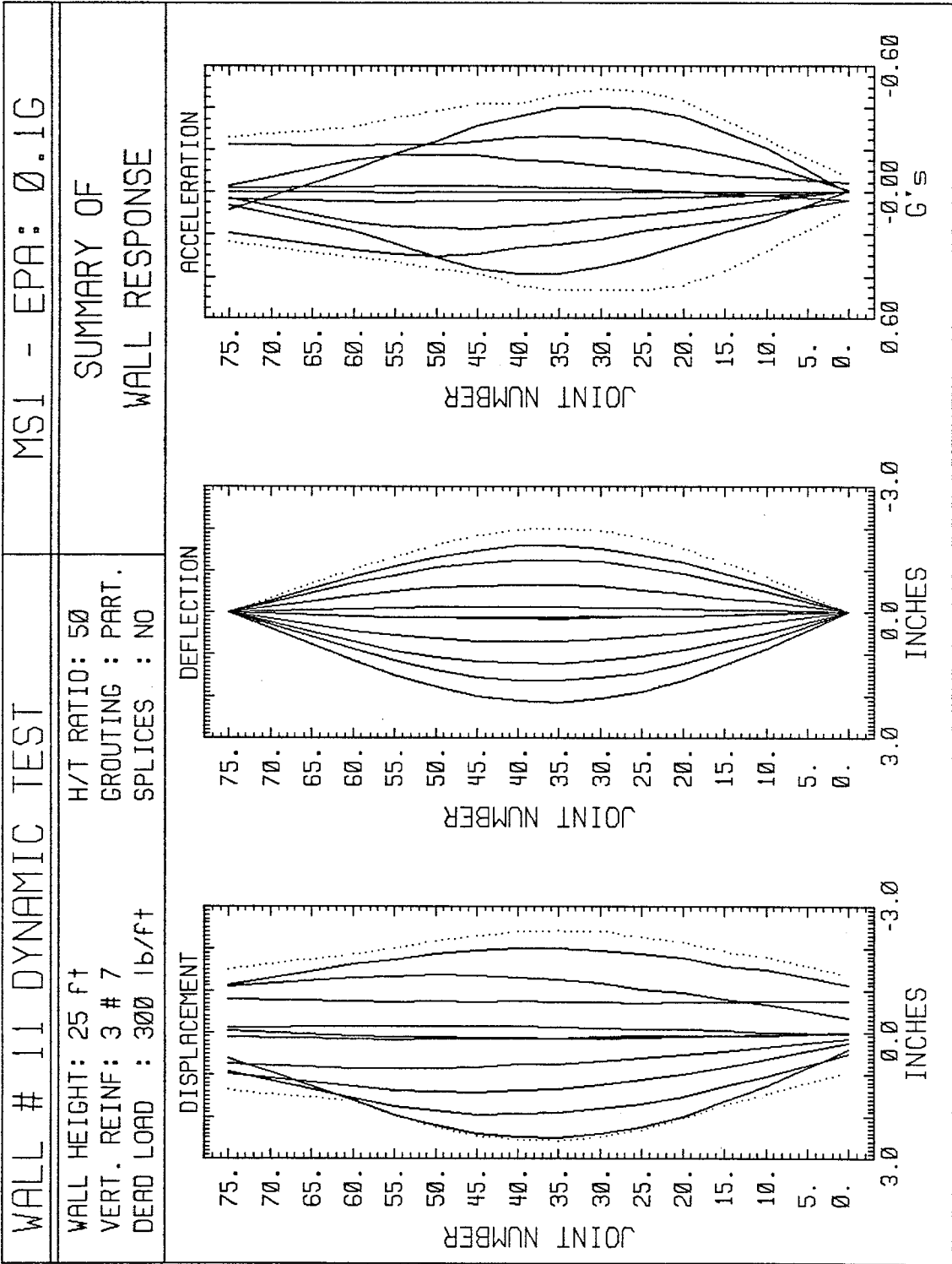
CES

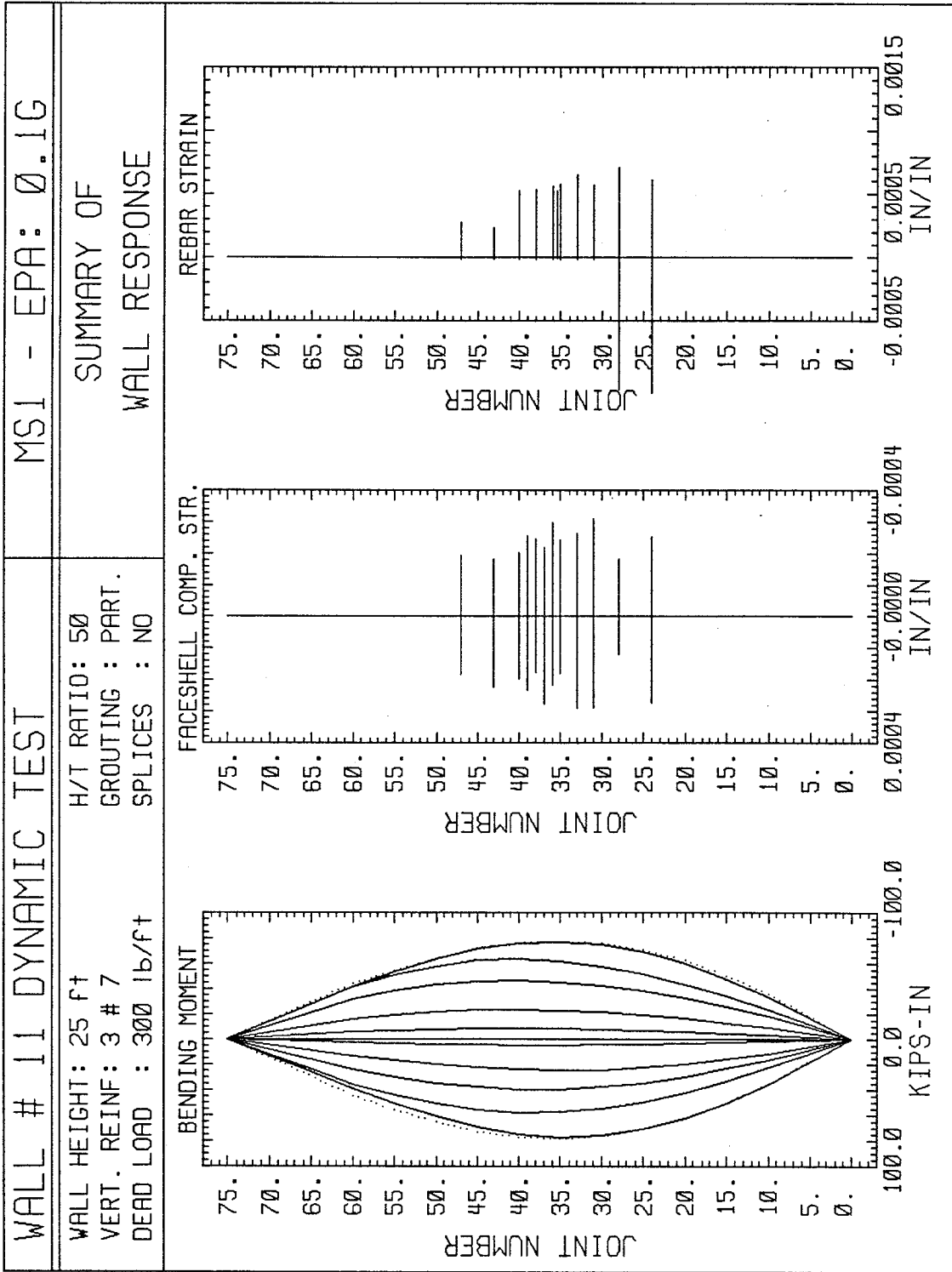
October 9, 1989

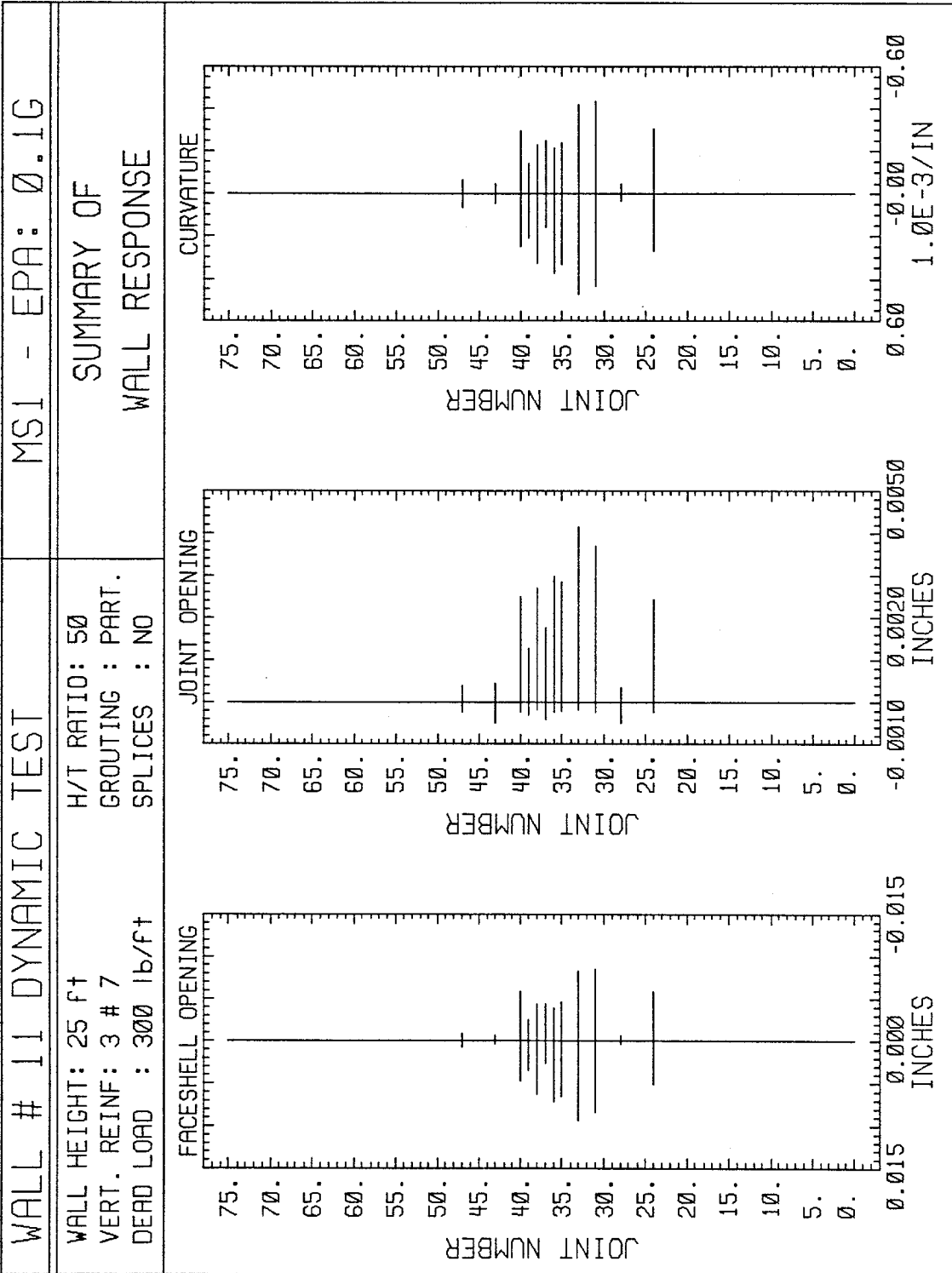
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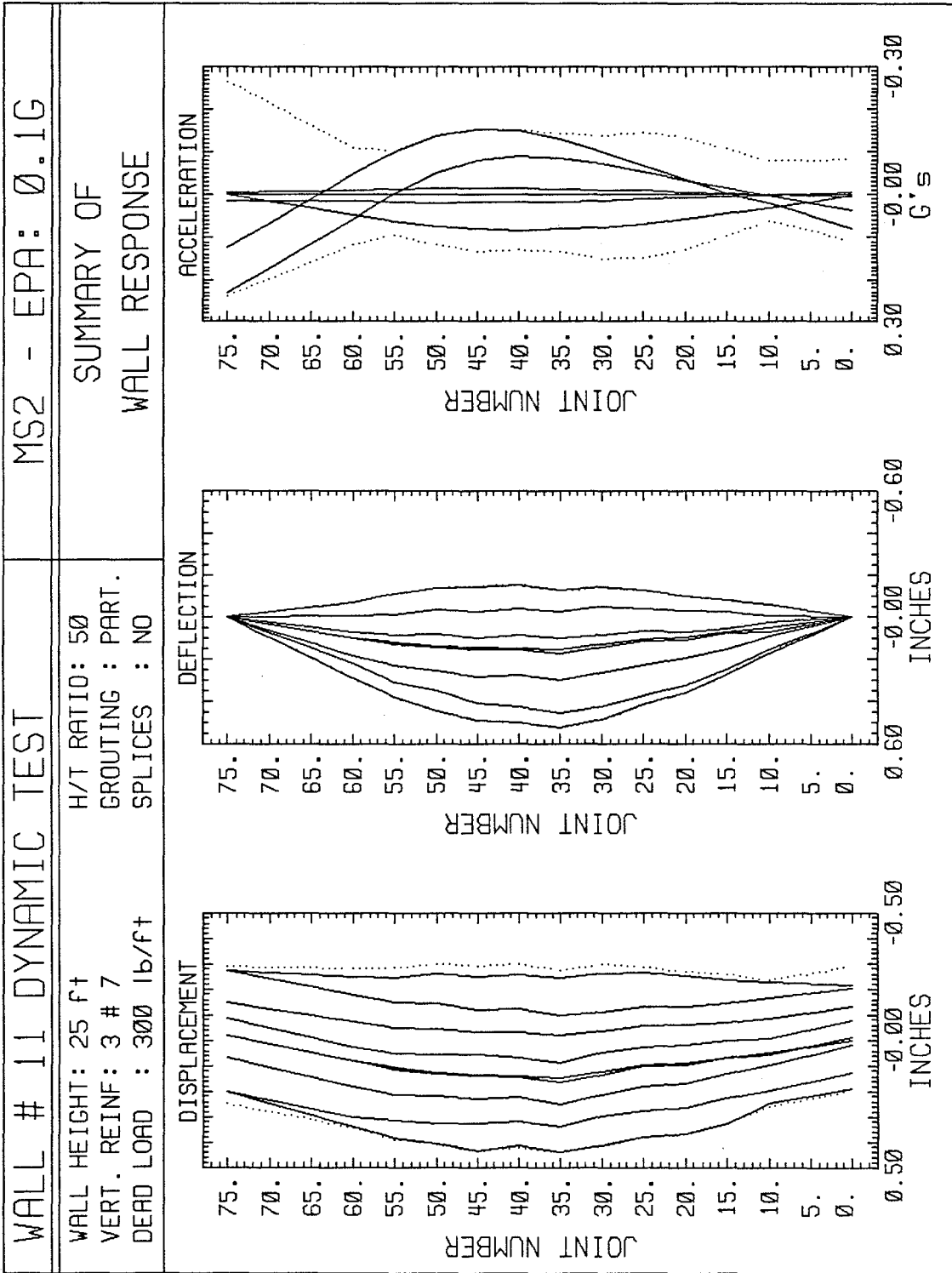
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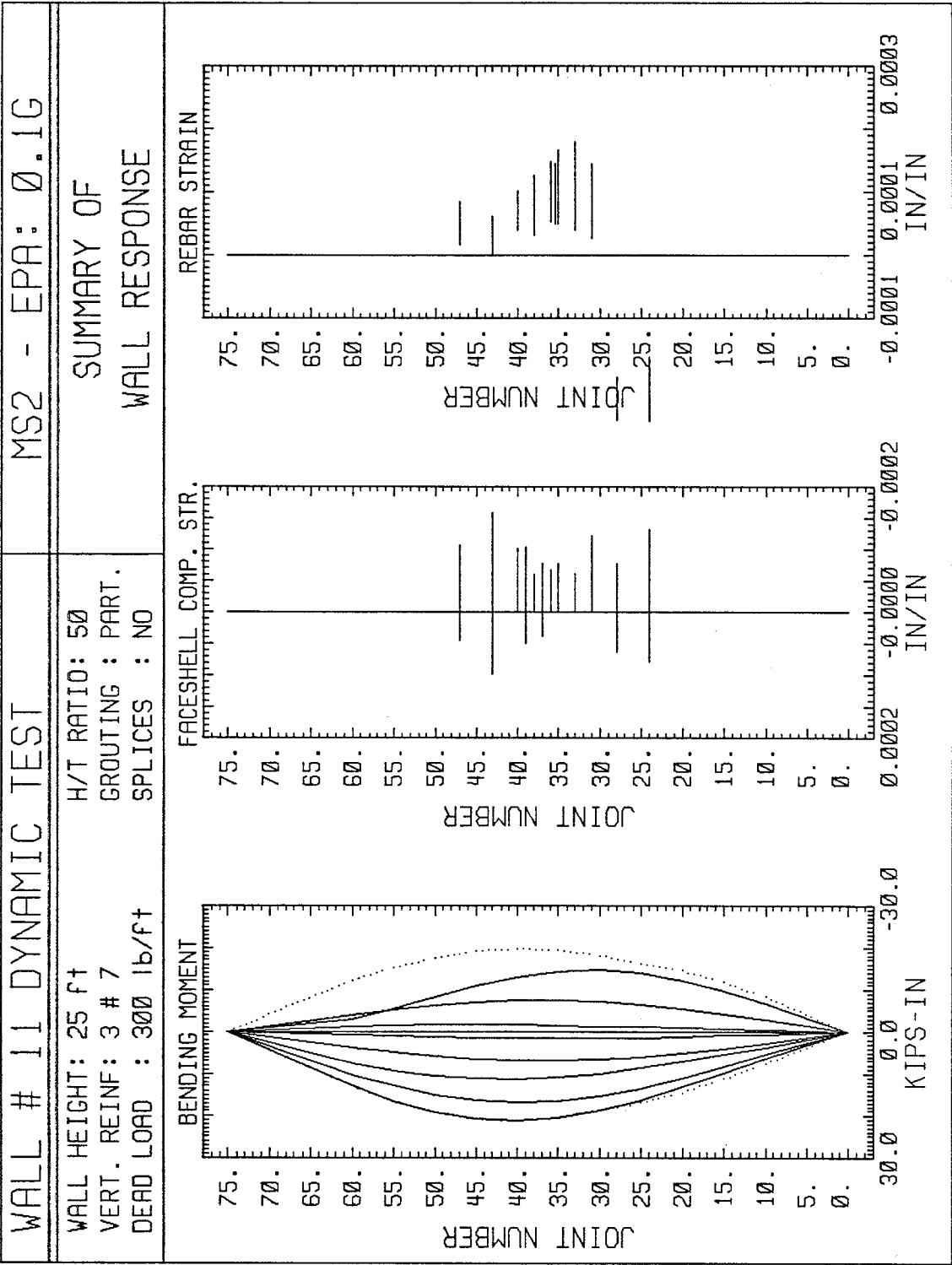


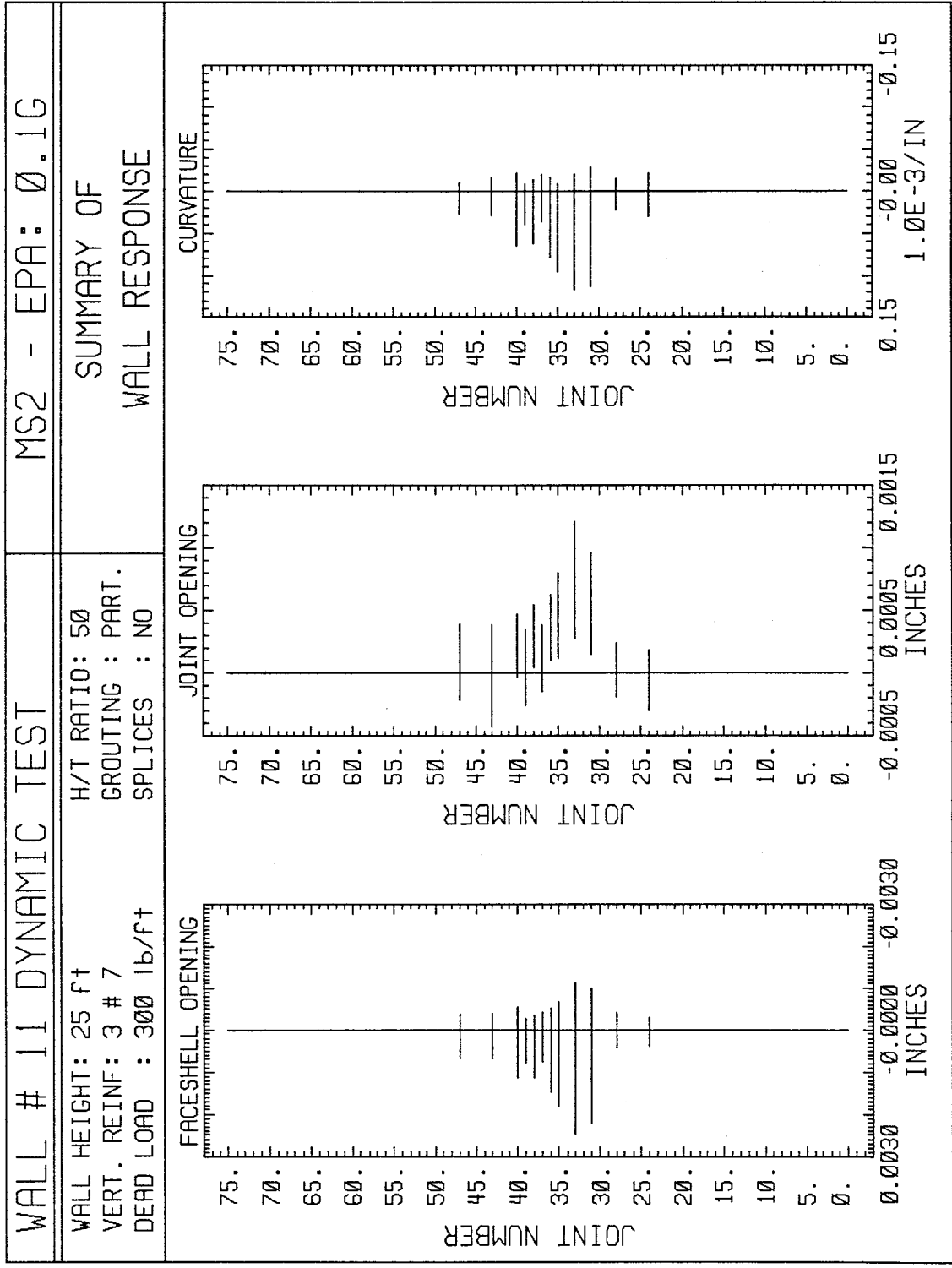


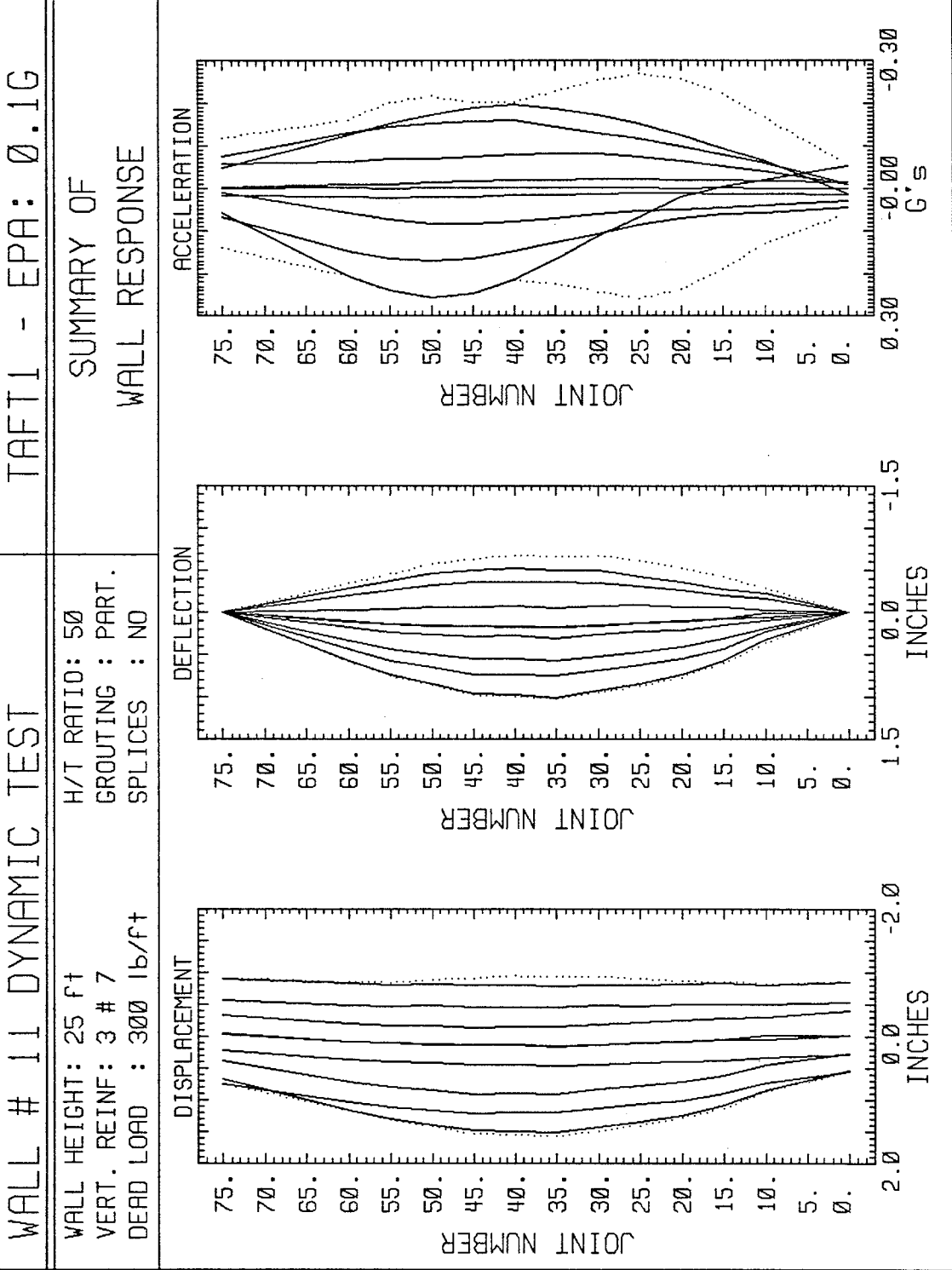


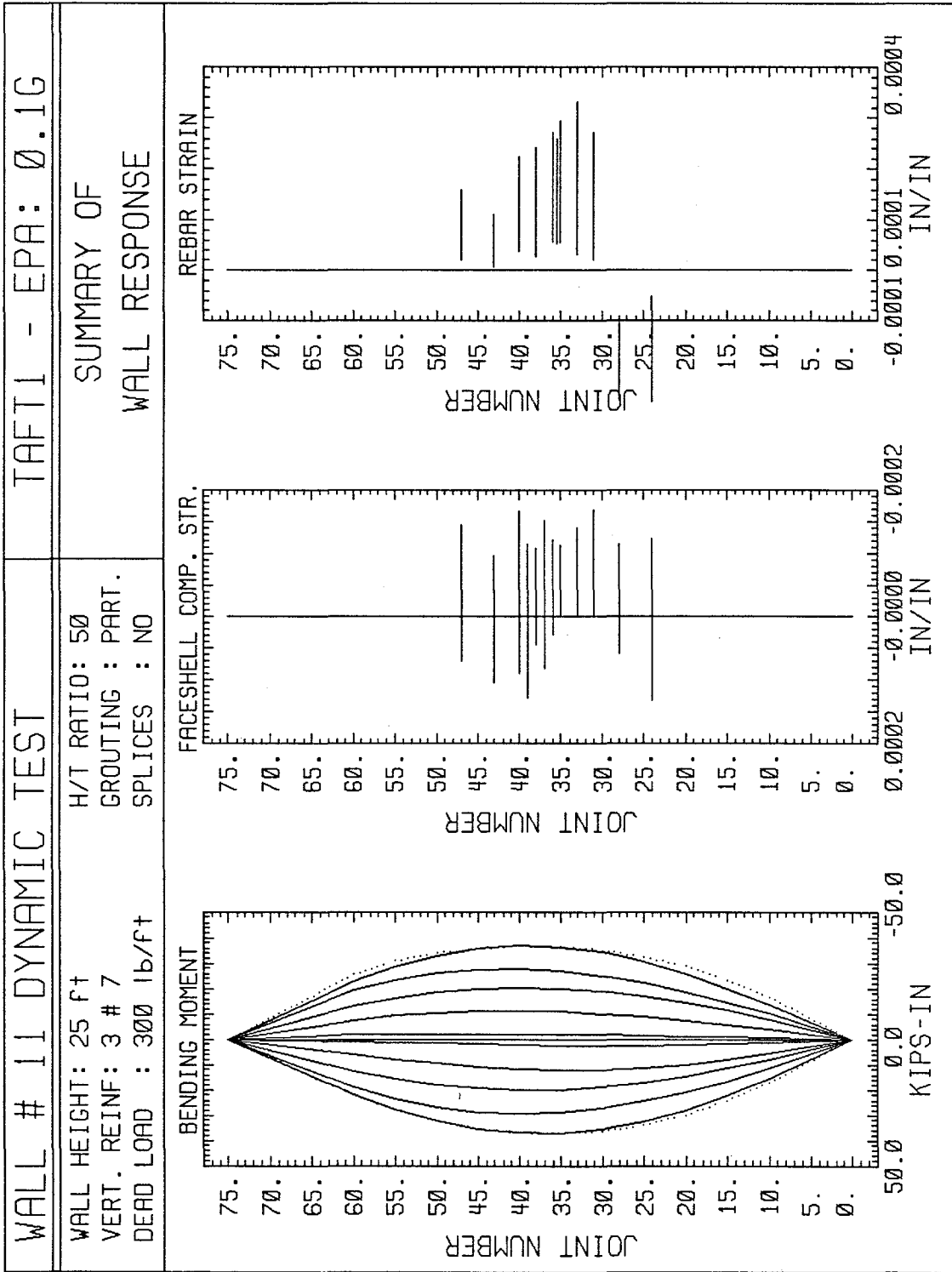














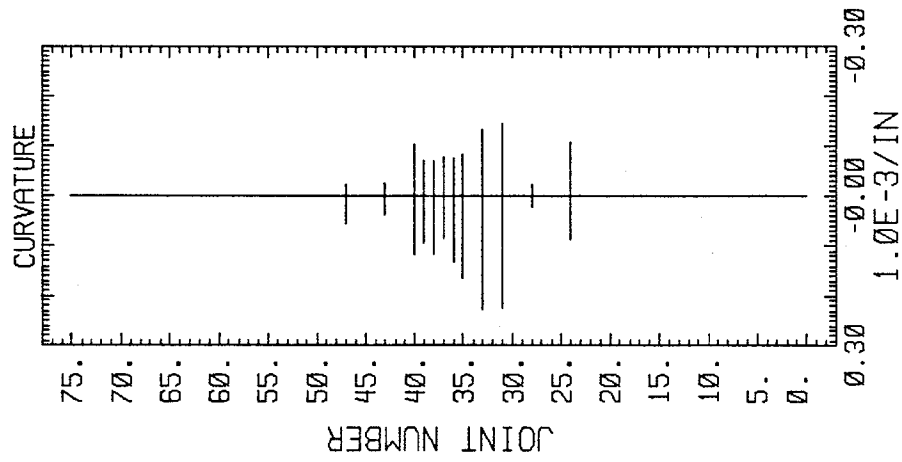
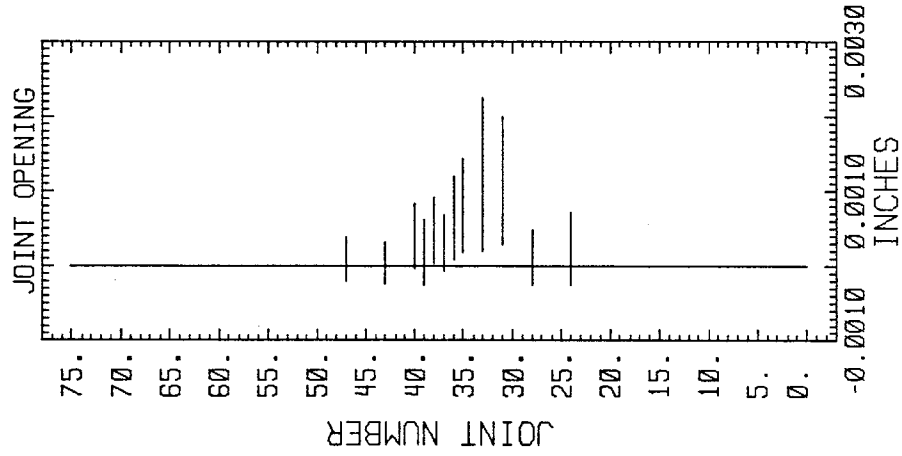
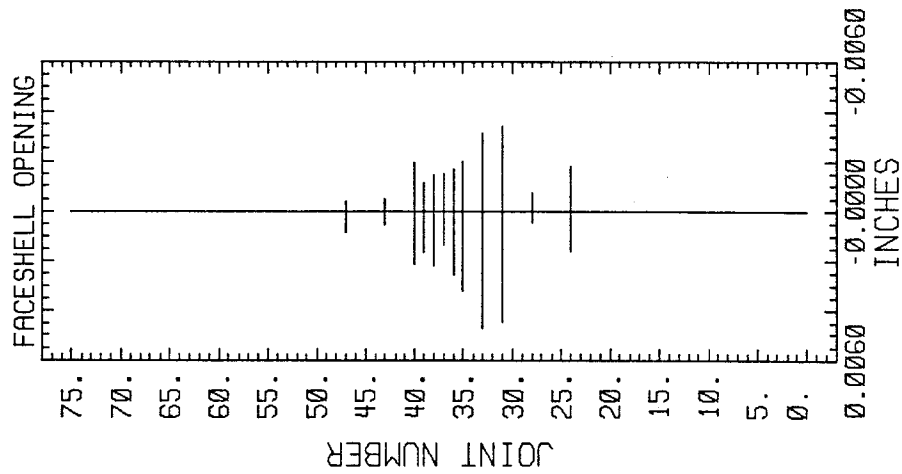
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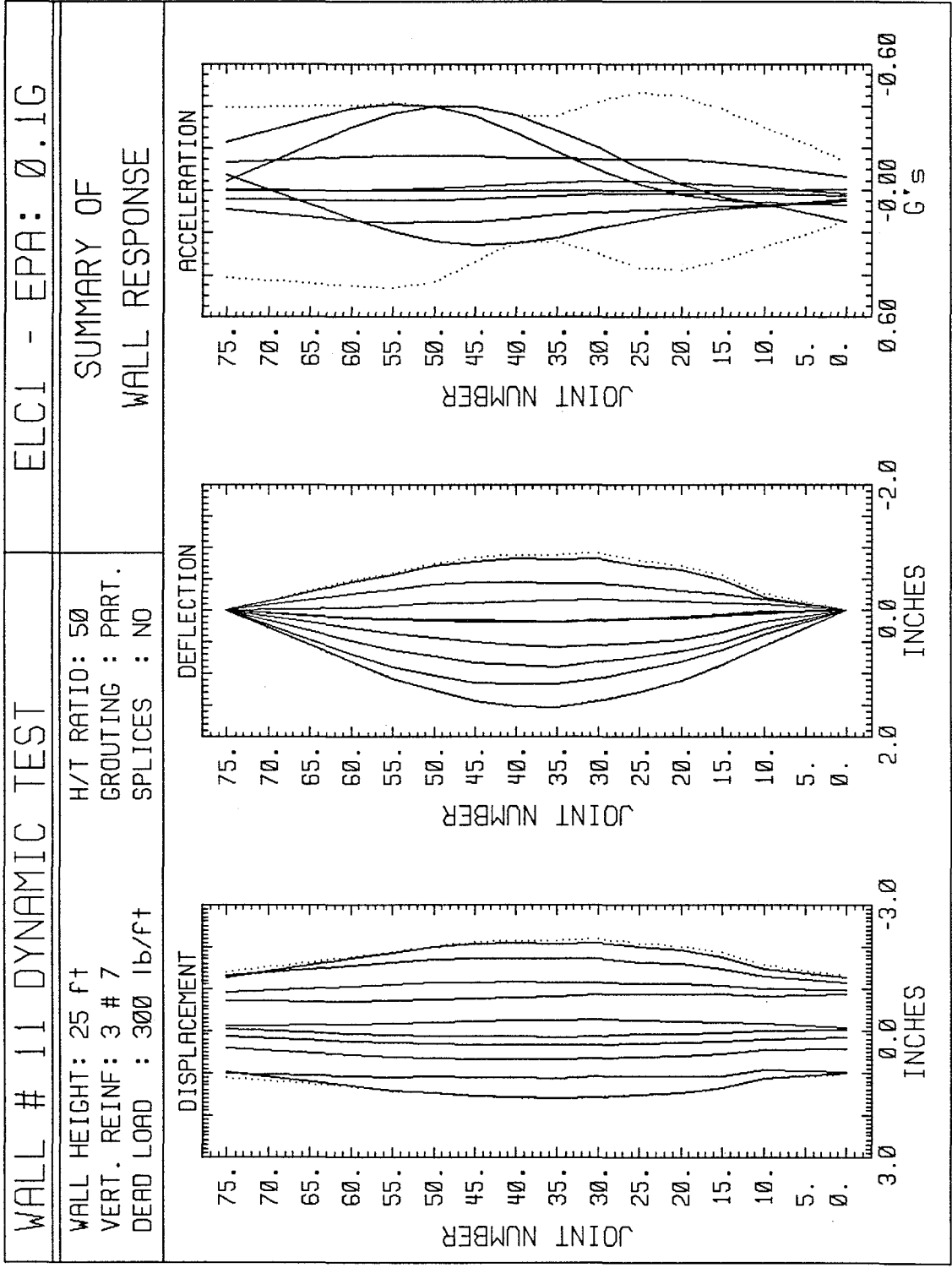
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WALL HEIGHT: 25 ft  
 VERT. REINF: 3 # 7  
 DEAD LOAD : 300 lb/ft

H/T RATIO: 50  
 GROUTING : PART.  
 SPLICES : NO

SUMMARY OF  
 WALL RESPONSE





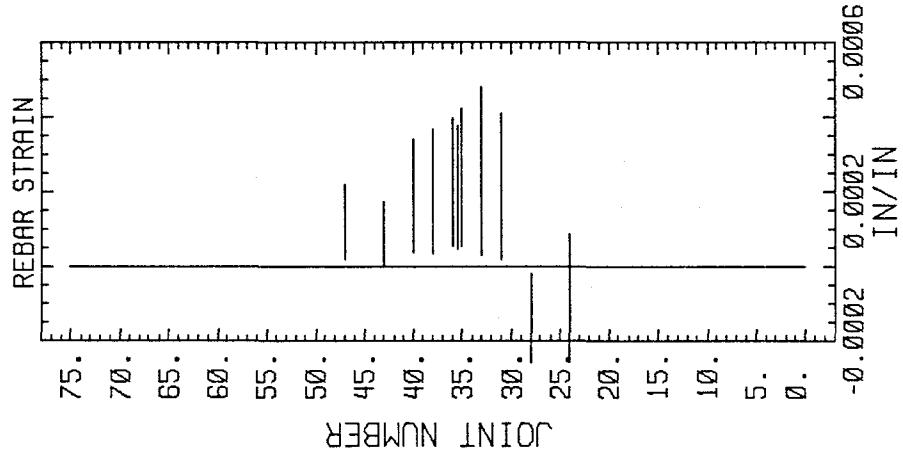
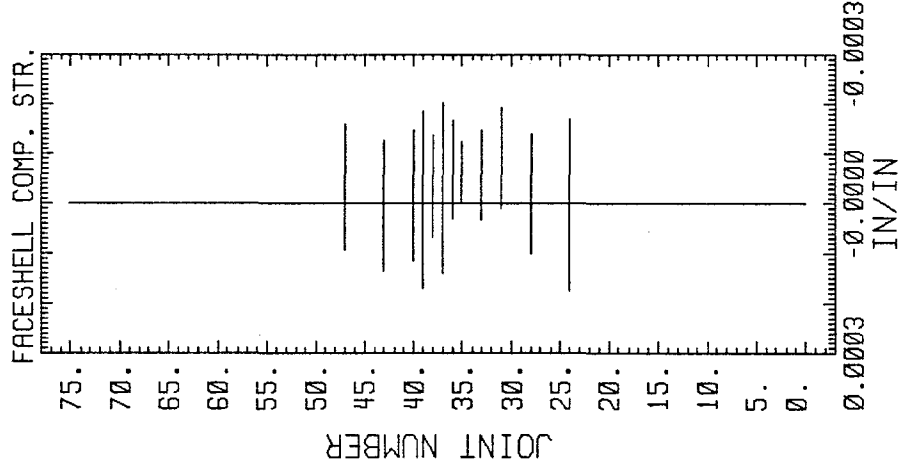
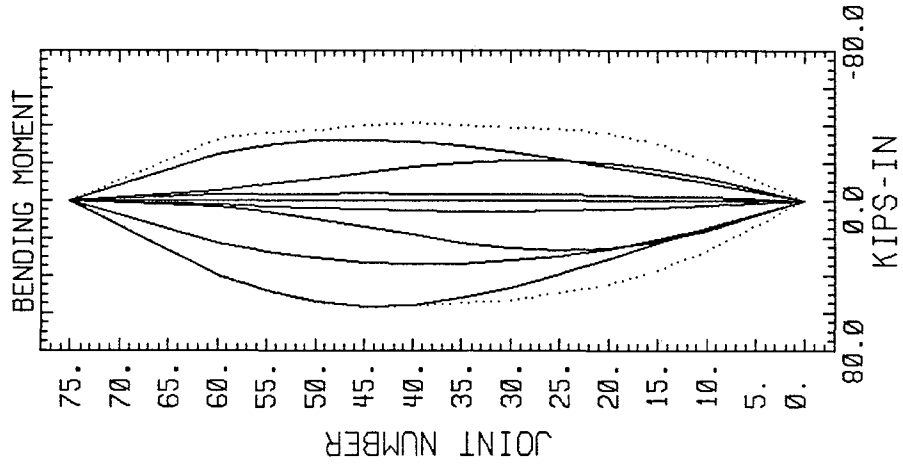
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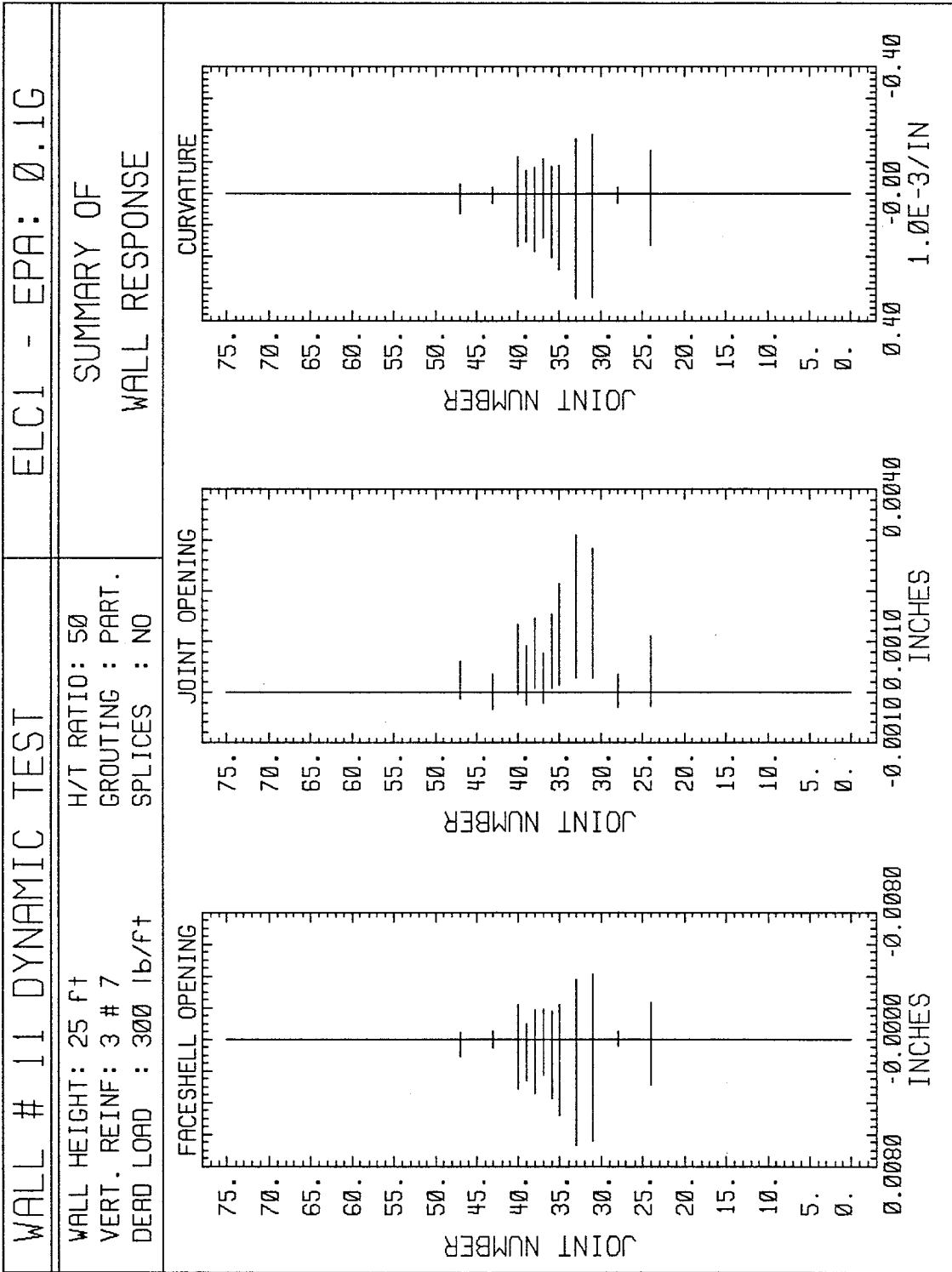
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WALL HEIGHT: 25 FT  
 VERT. REINF: 3 # 7  
 DEAD LOAD : 300 lb/ft

H/T RATIO: 50  
 GROUTING : PART.  
 SPLICES : NO

SUMMARY OF  
 WALL RESPONSE





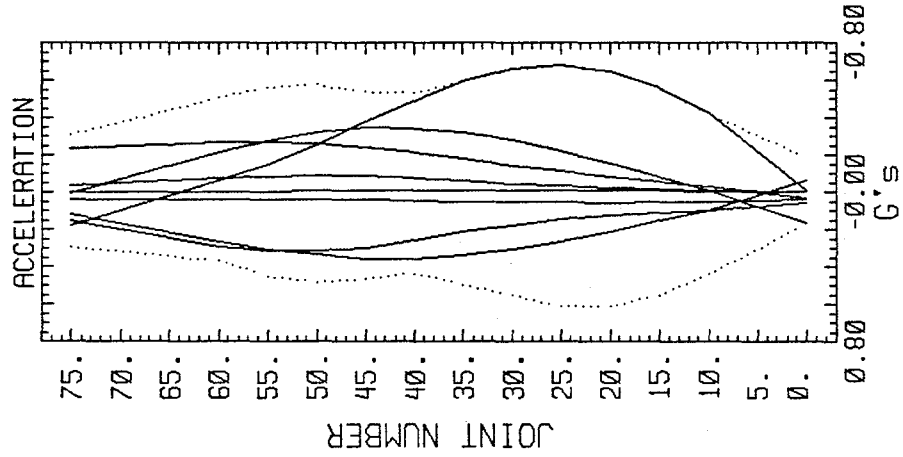
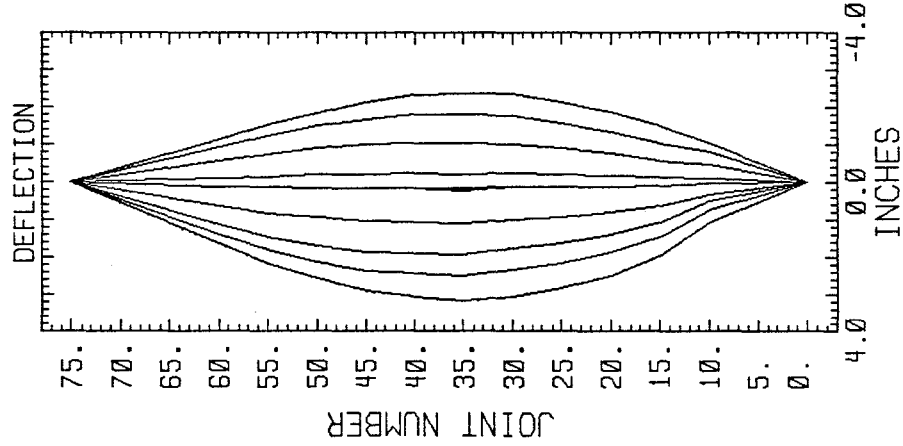
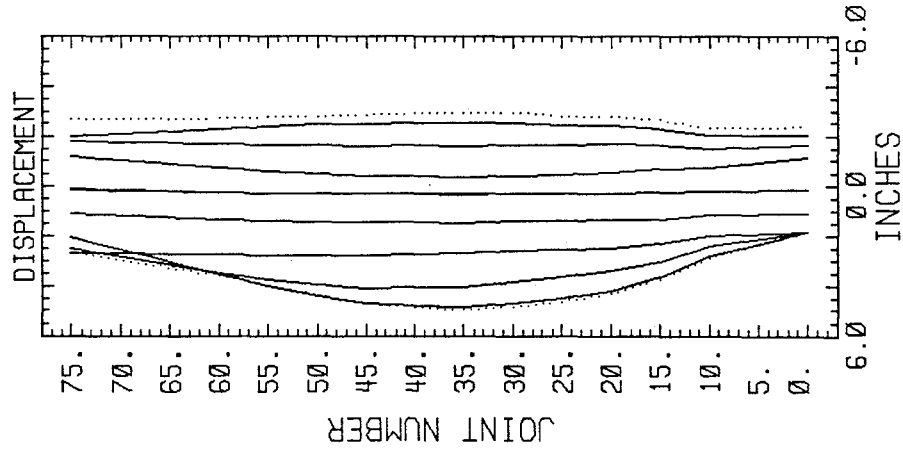
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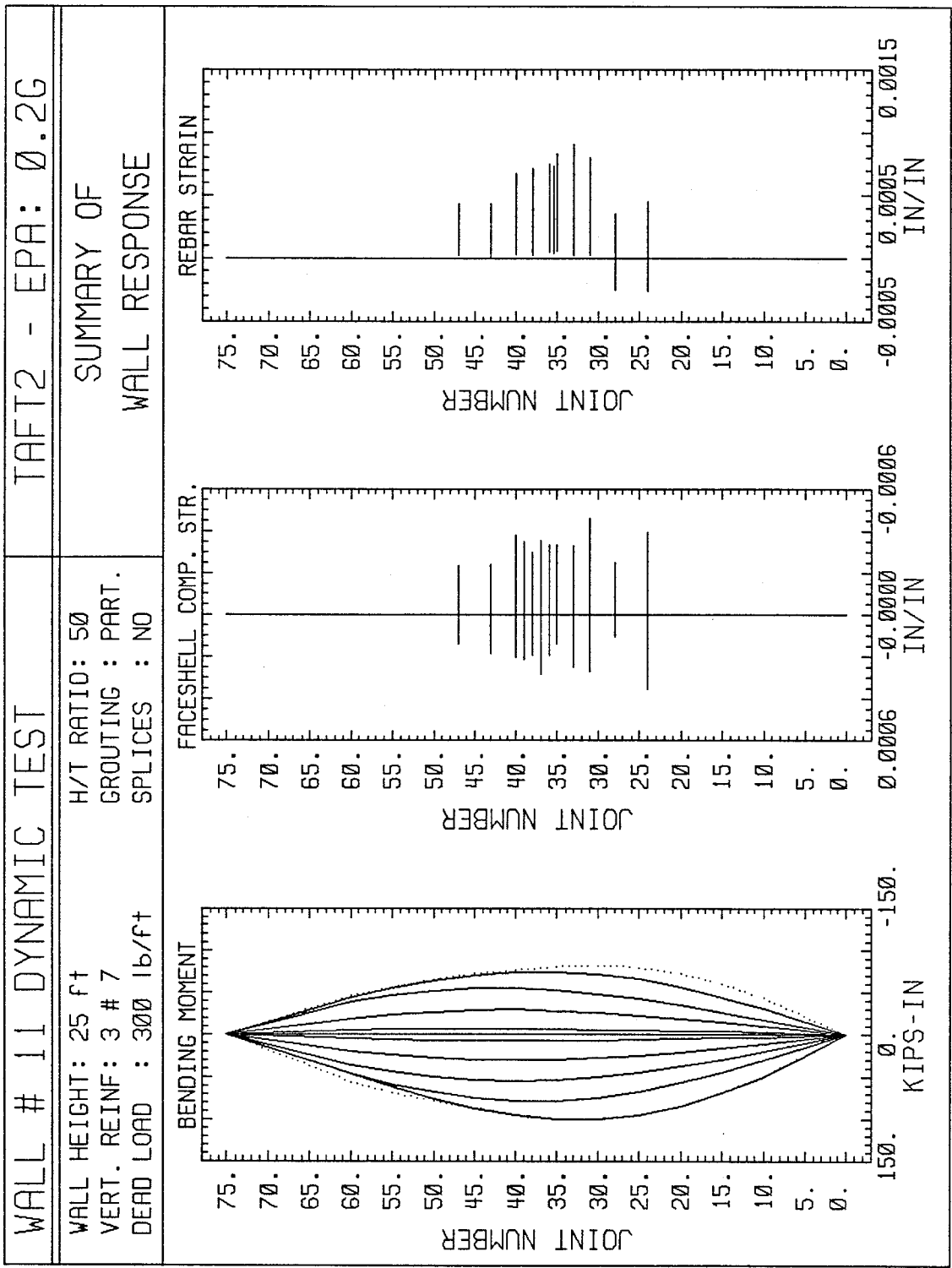
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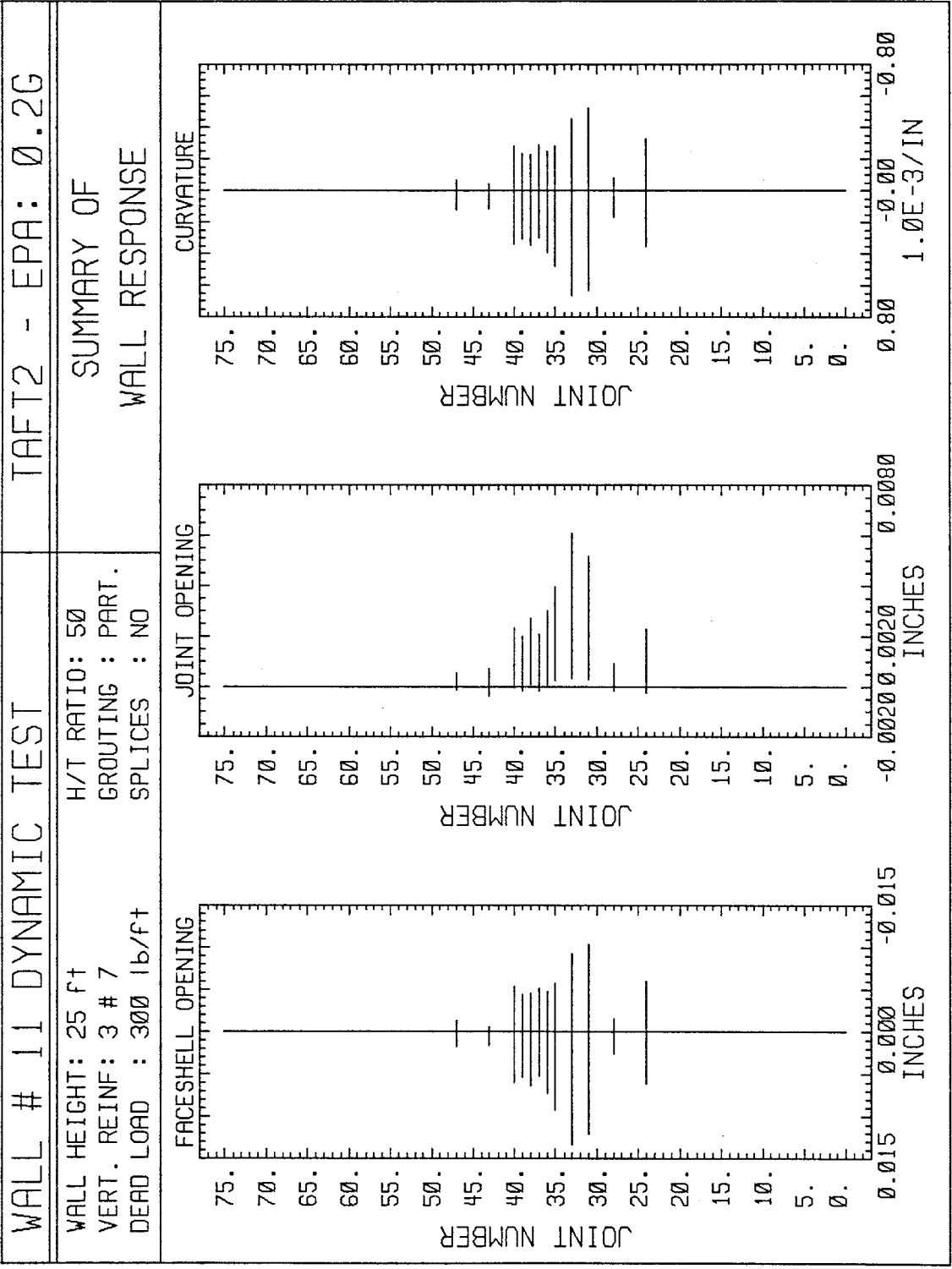
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 VERT. REINF: 3 # 7  
 DEAD LOAD : 300 lb/ft

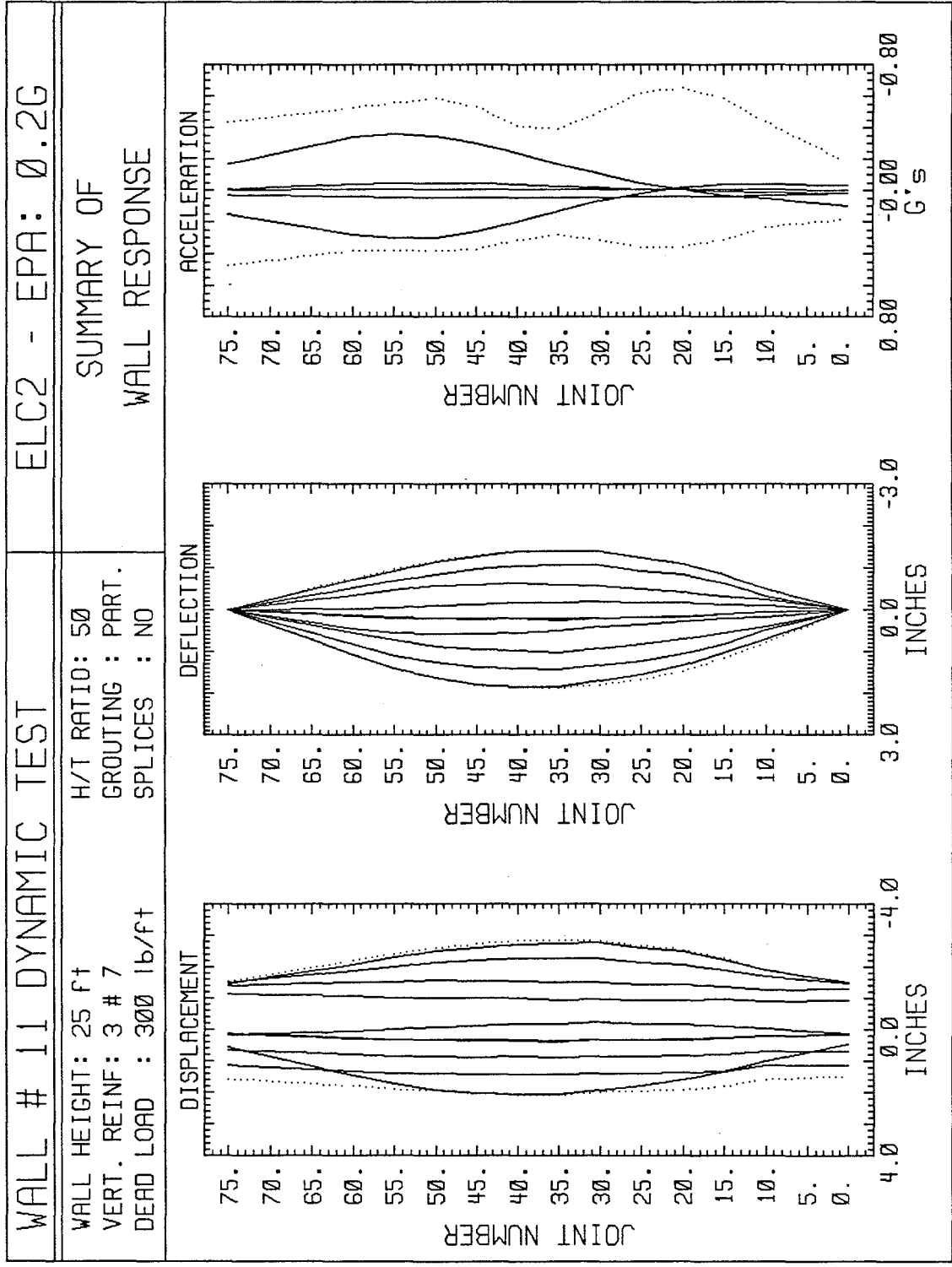
H/T RATIO: 50  
 GROUTING : PART.  
 SPLICES : NO

SUMMARY OF  
 WALL RESPONSE

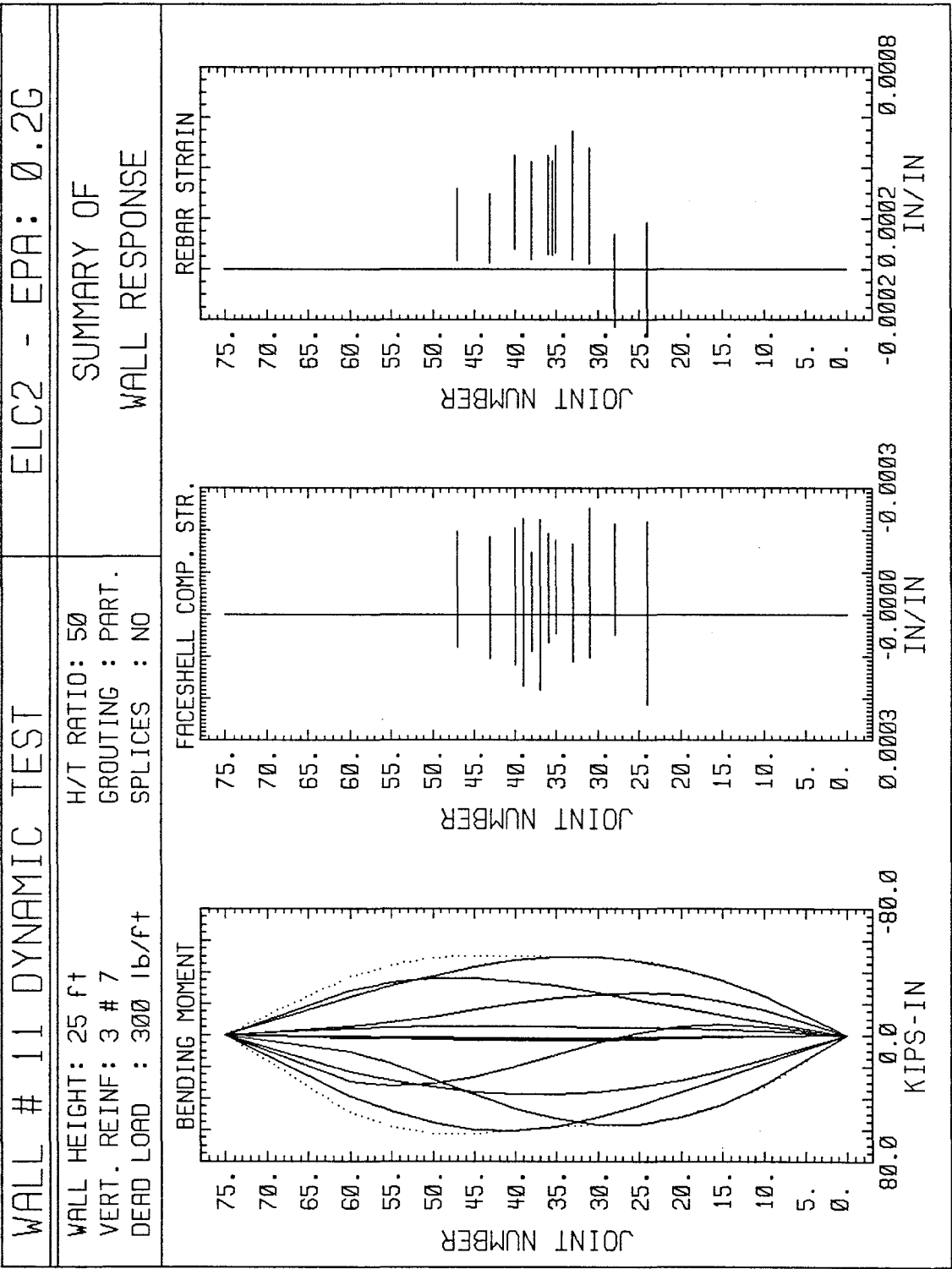


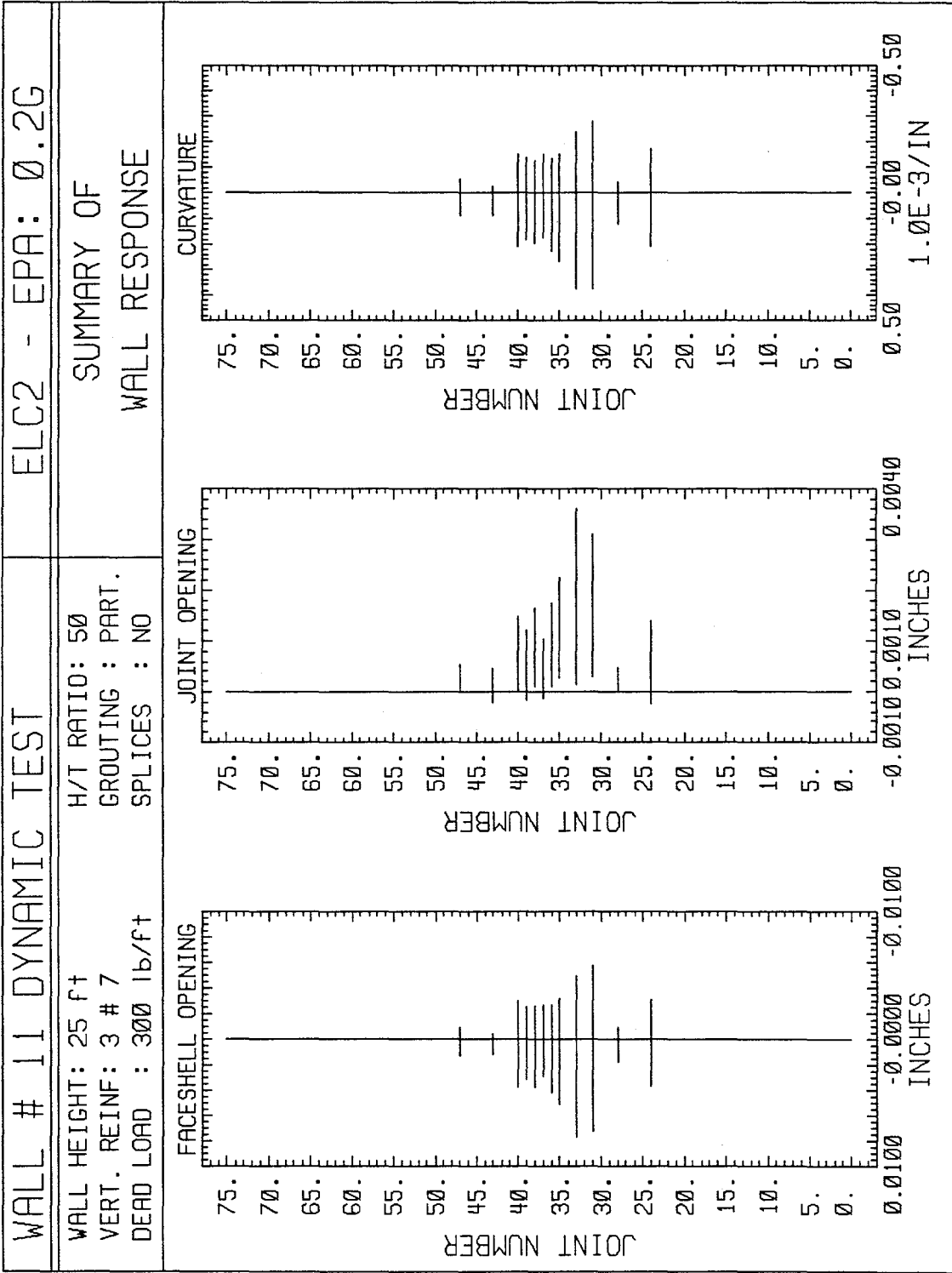


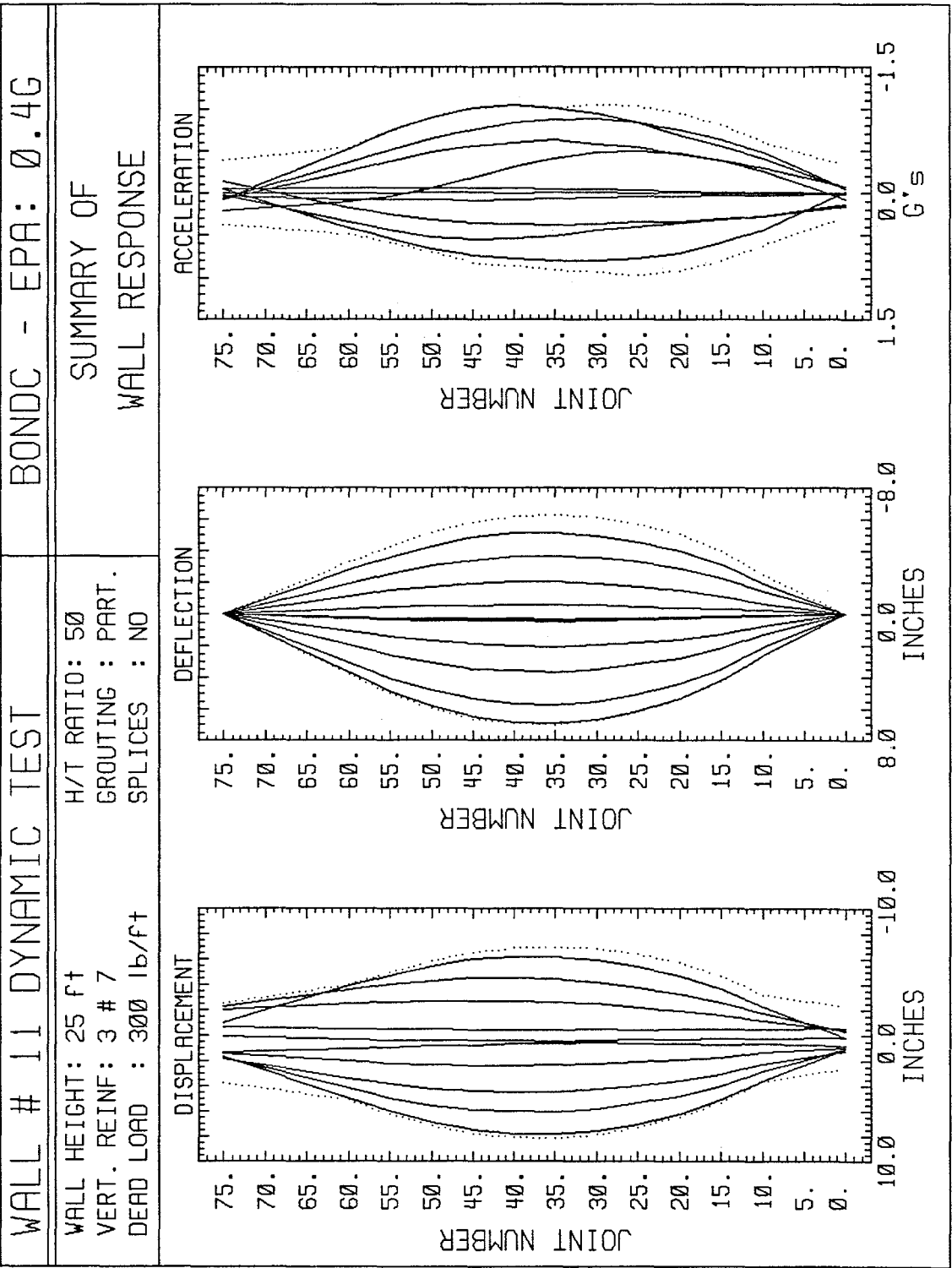


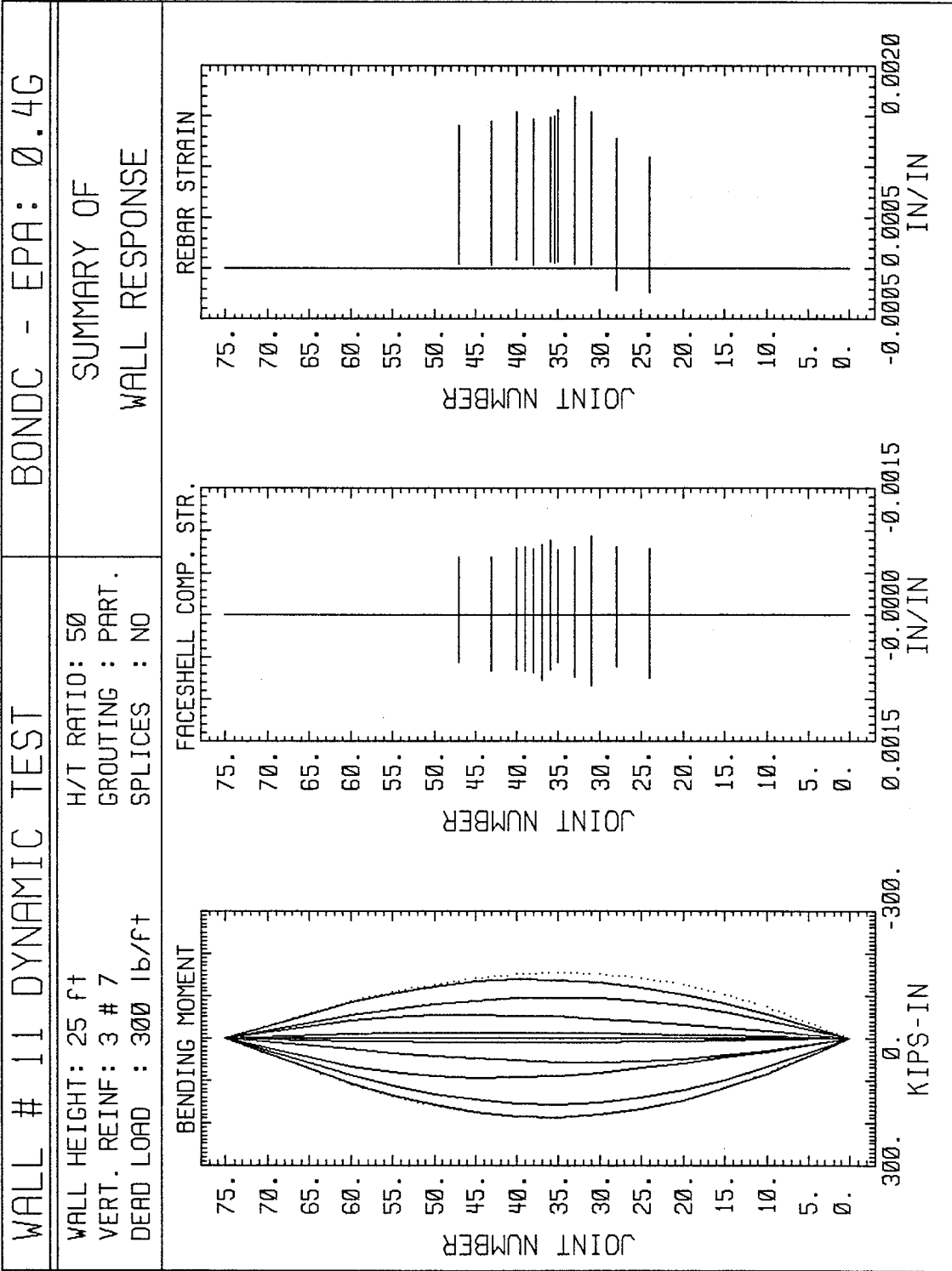












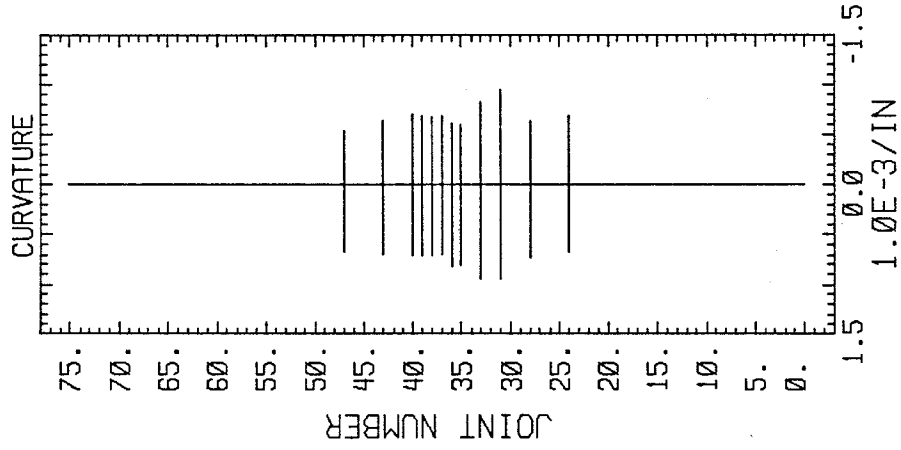
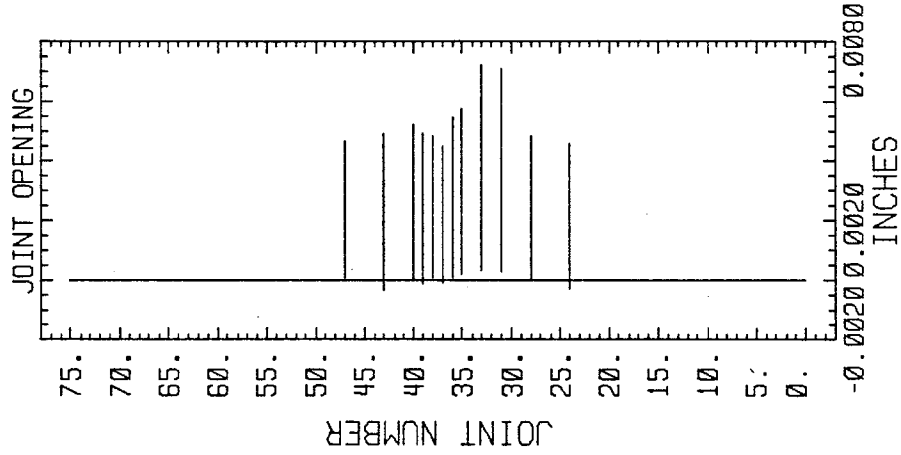
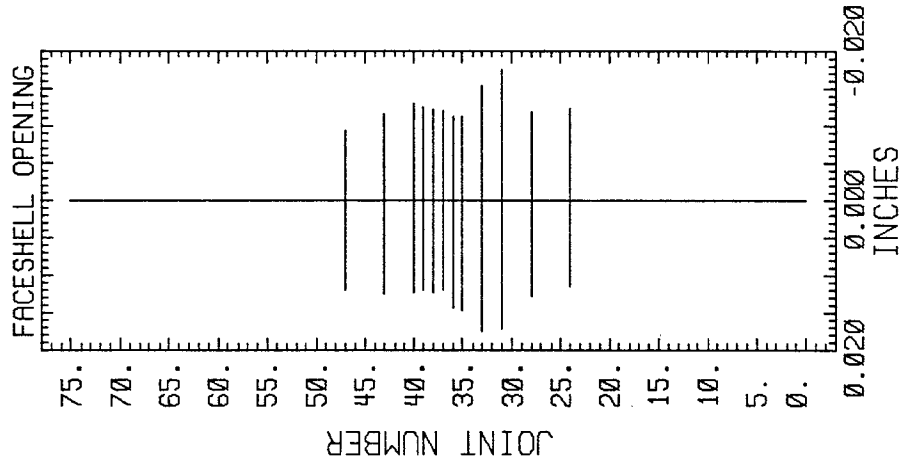
WALL # 11 DYNAMIC TEST

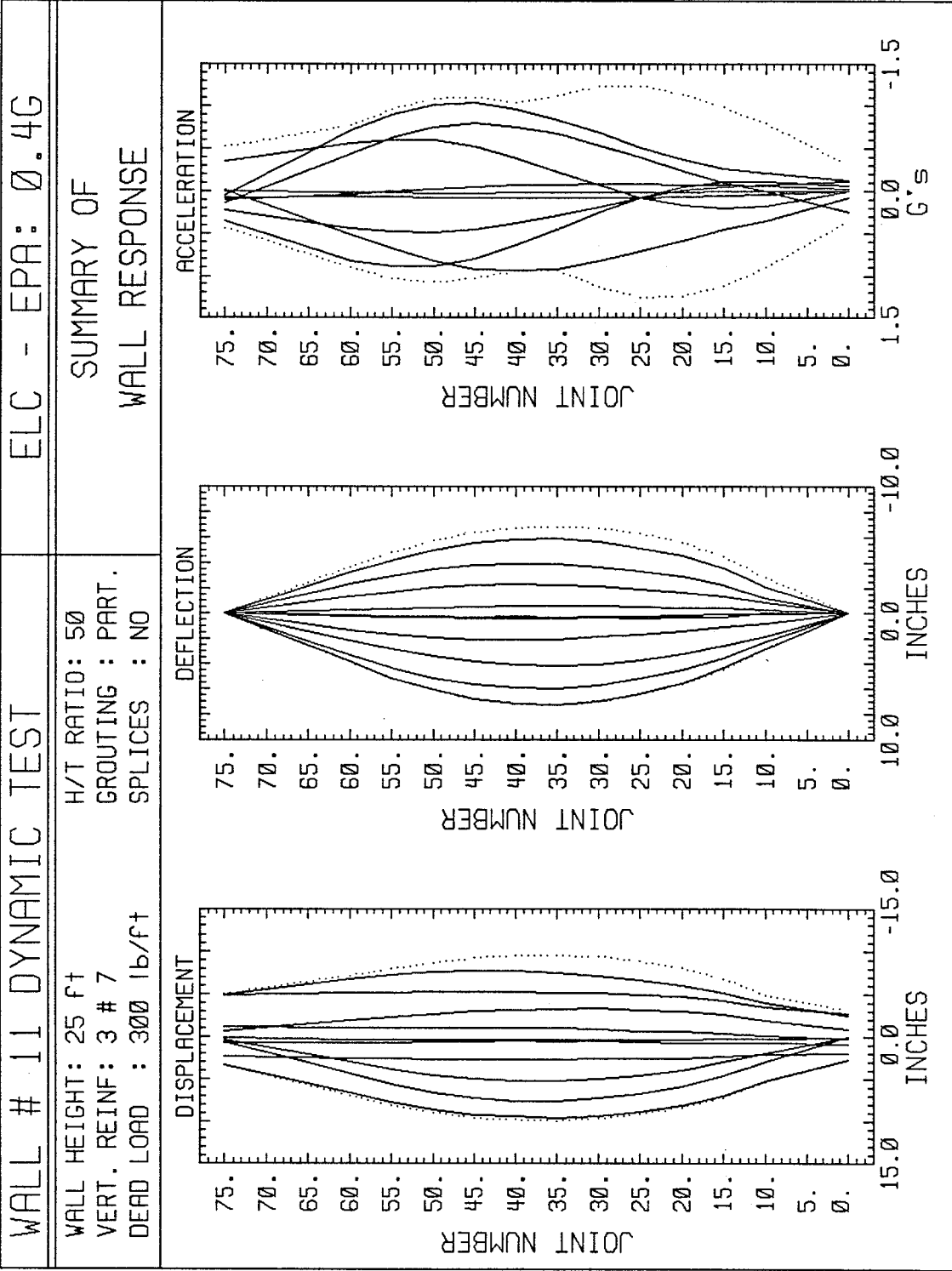
BOND - EPA: 0.4G

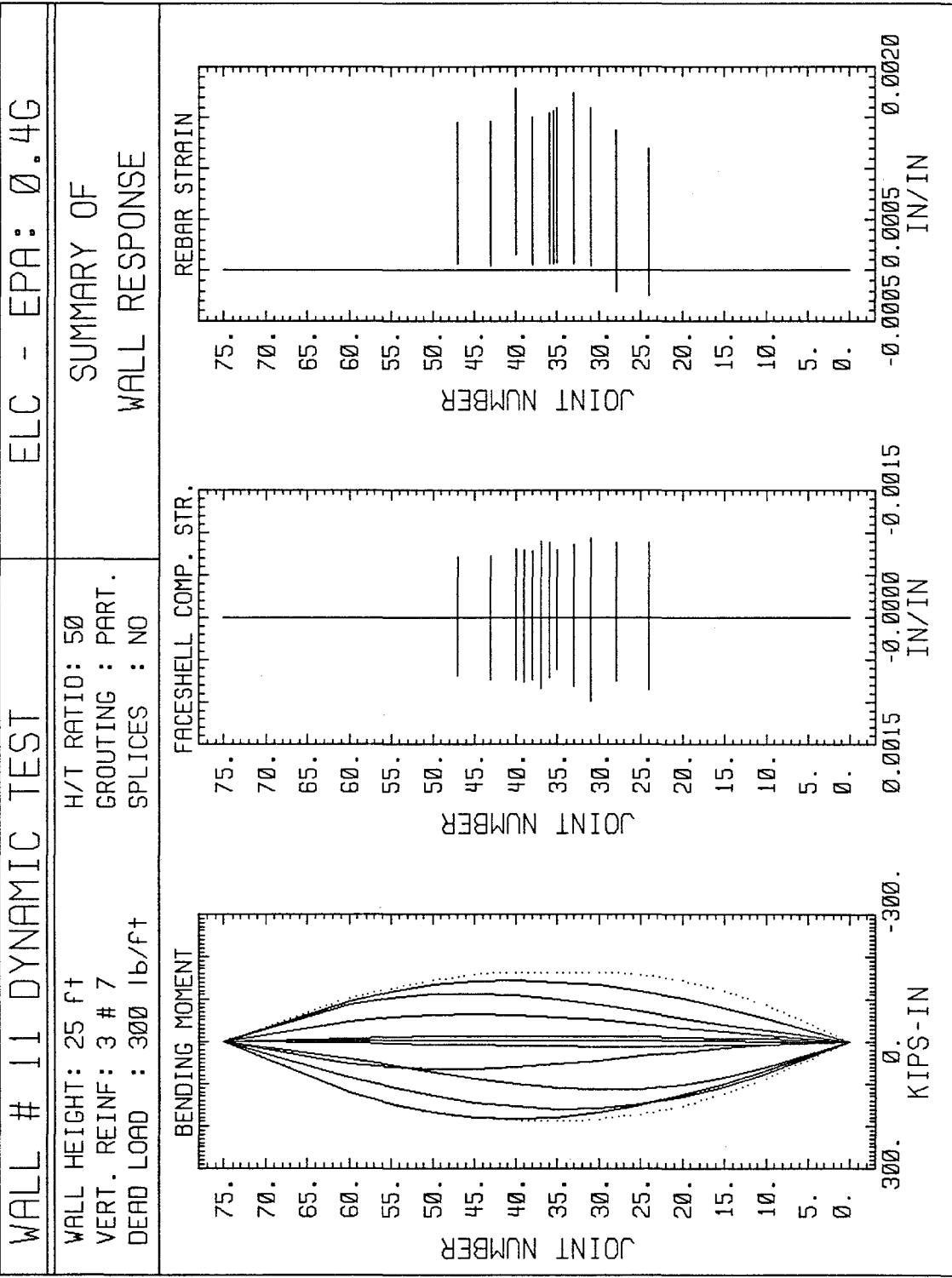
WALL HEIGHT: 25 FT  
 VERT. REINF: 3 # 7  
 DEAD LOAD : 300 lb/ft

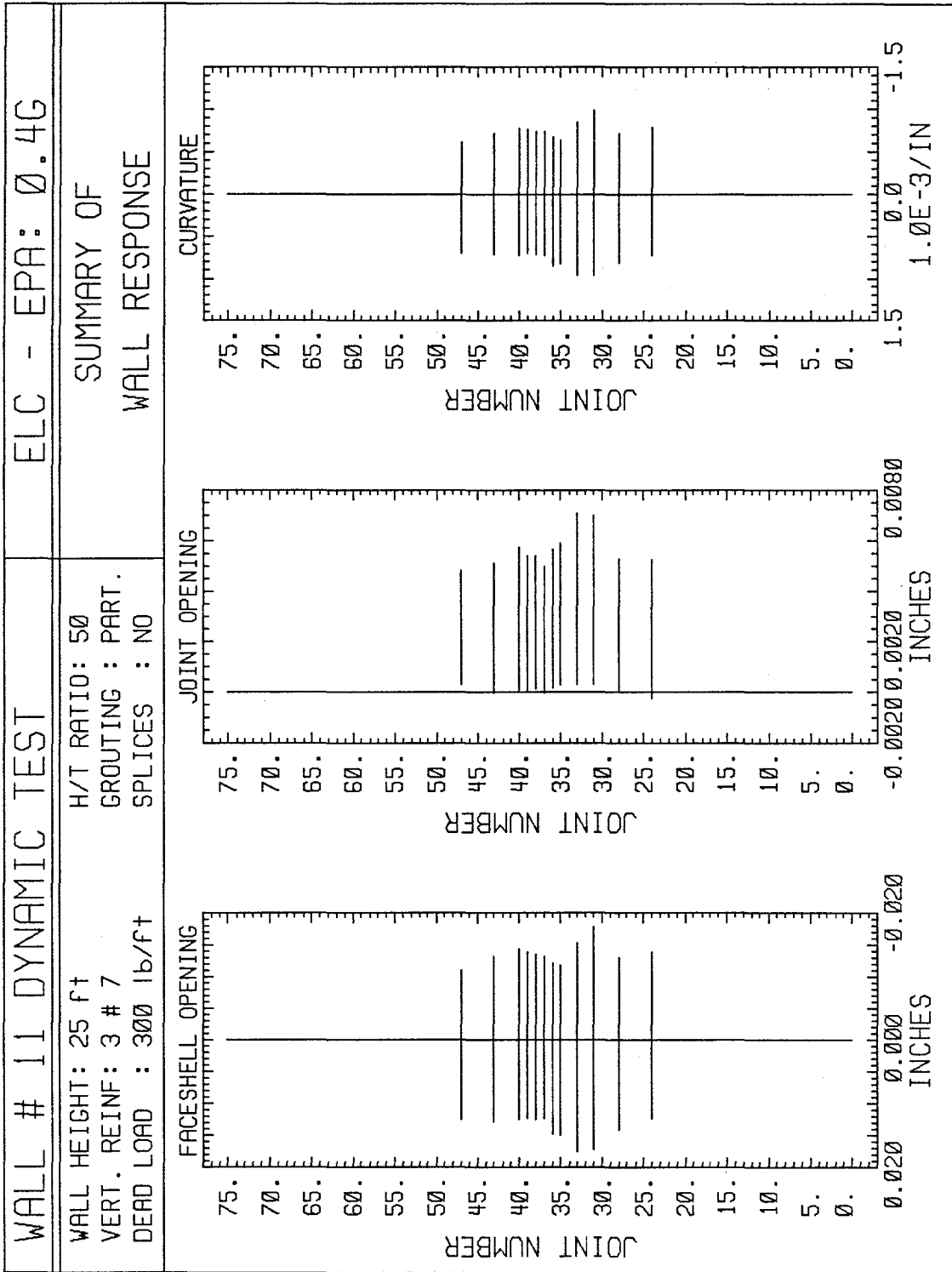
H/T RATIO: 50  
 GROUTING : PART.  
 SPLICES : NO

SUMMARY OF  
 WALL RESPONSE

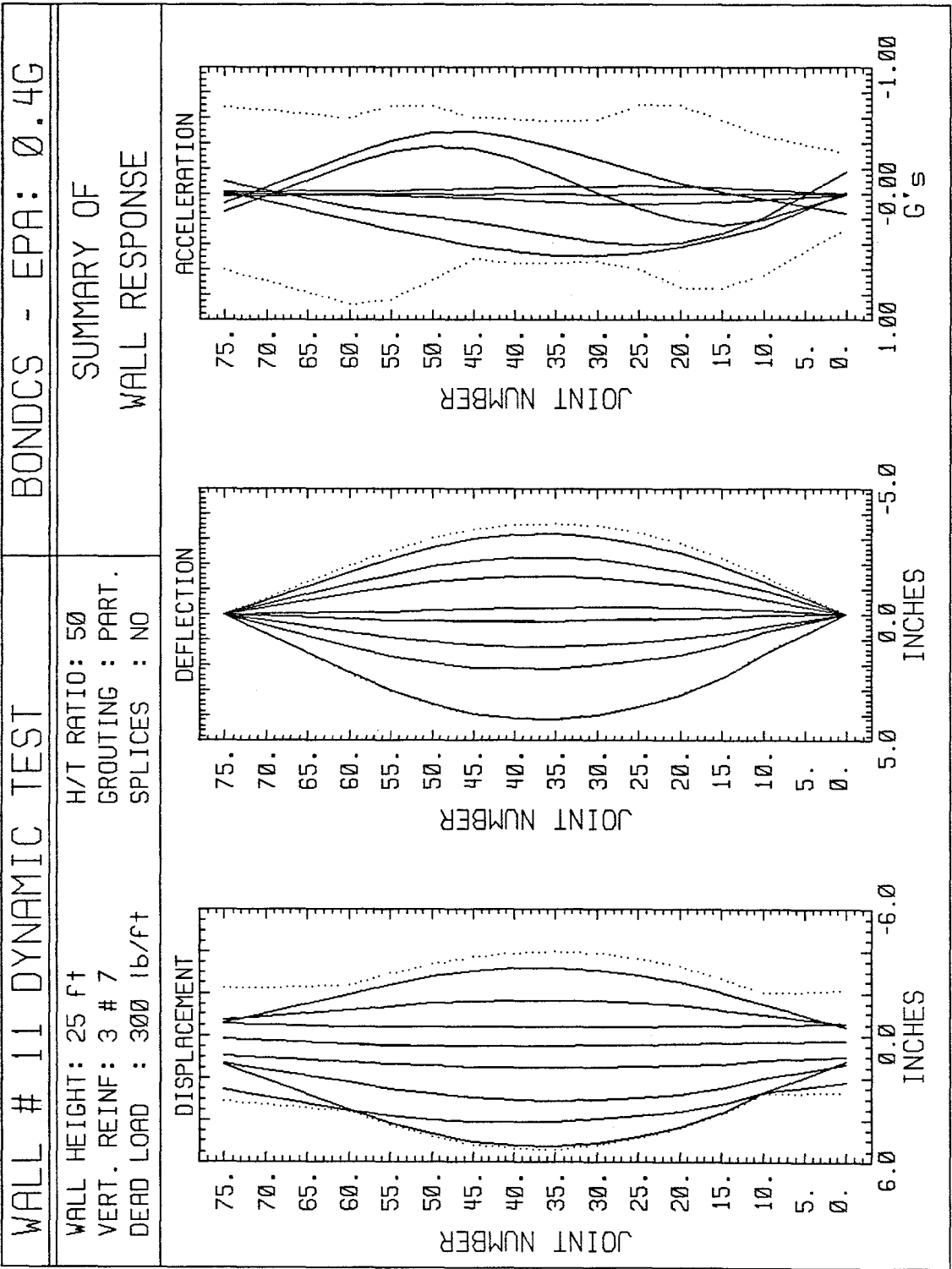


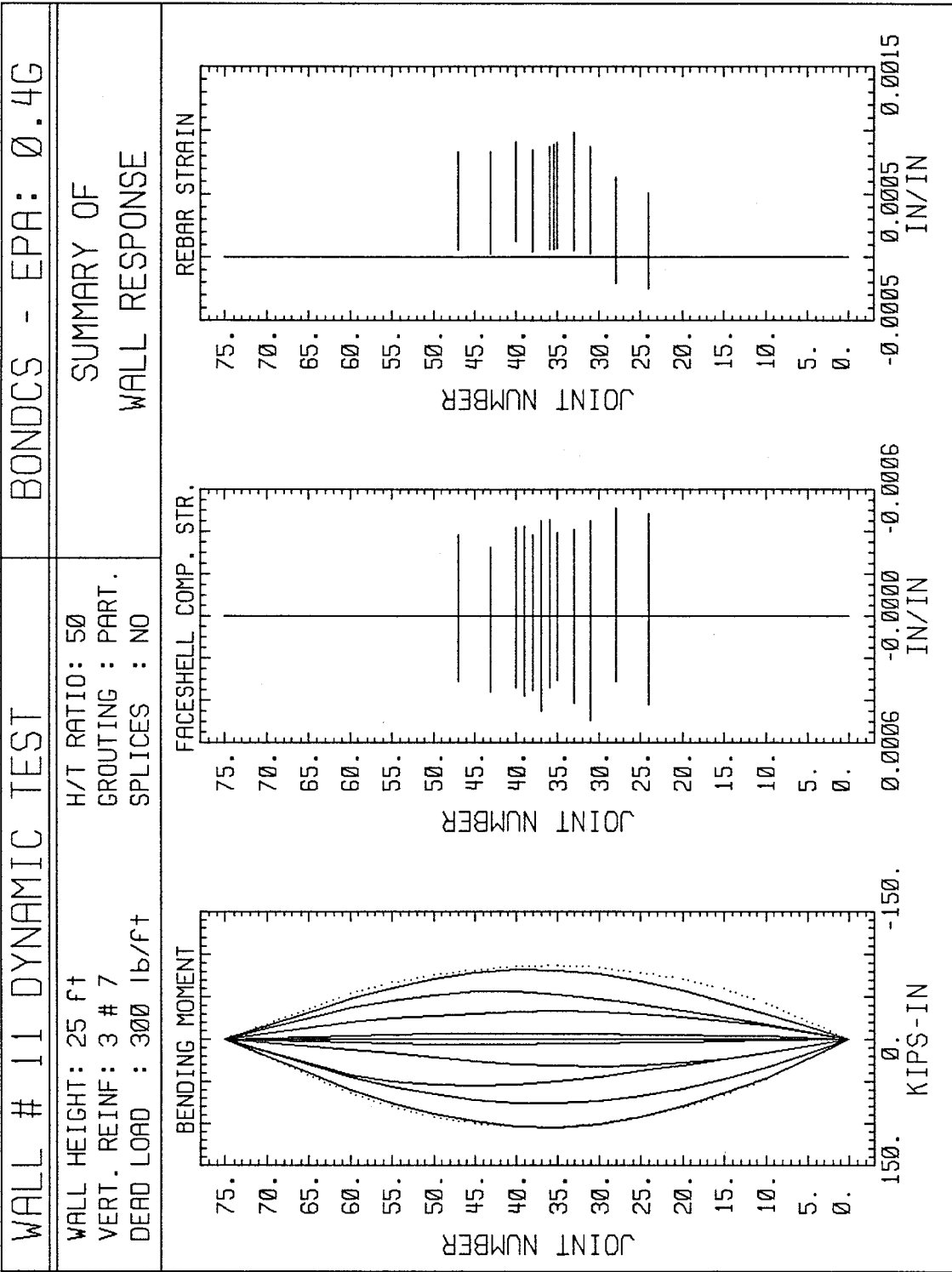












WALL # 11 DYNAMIC TEST

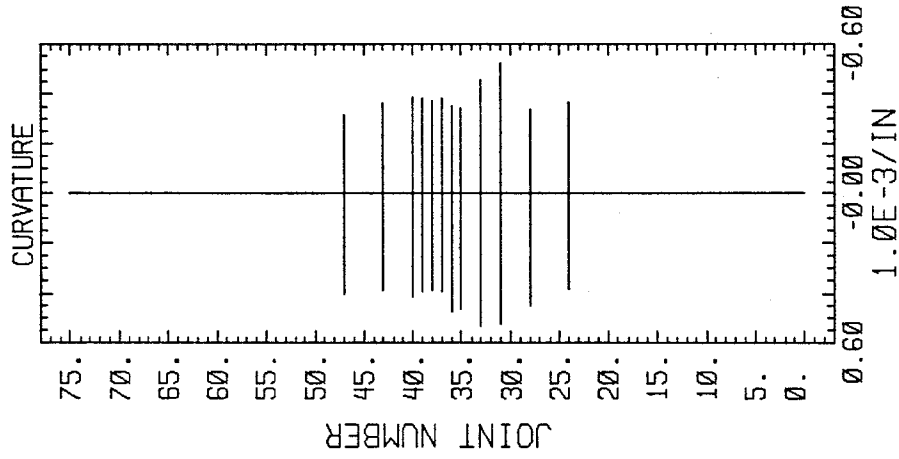
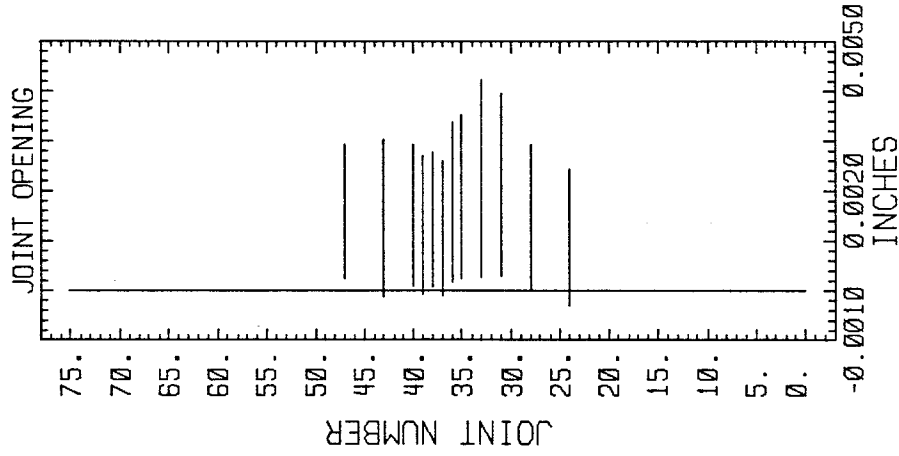
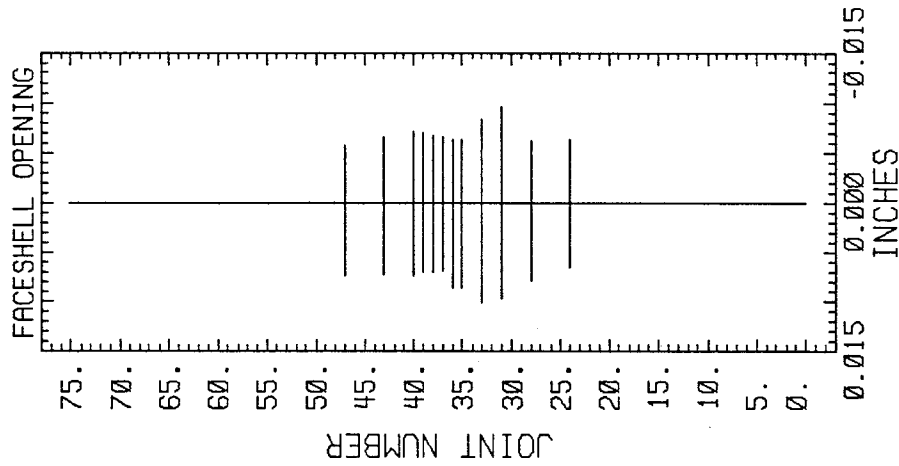
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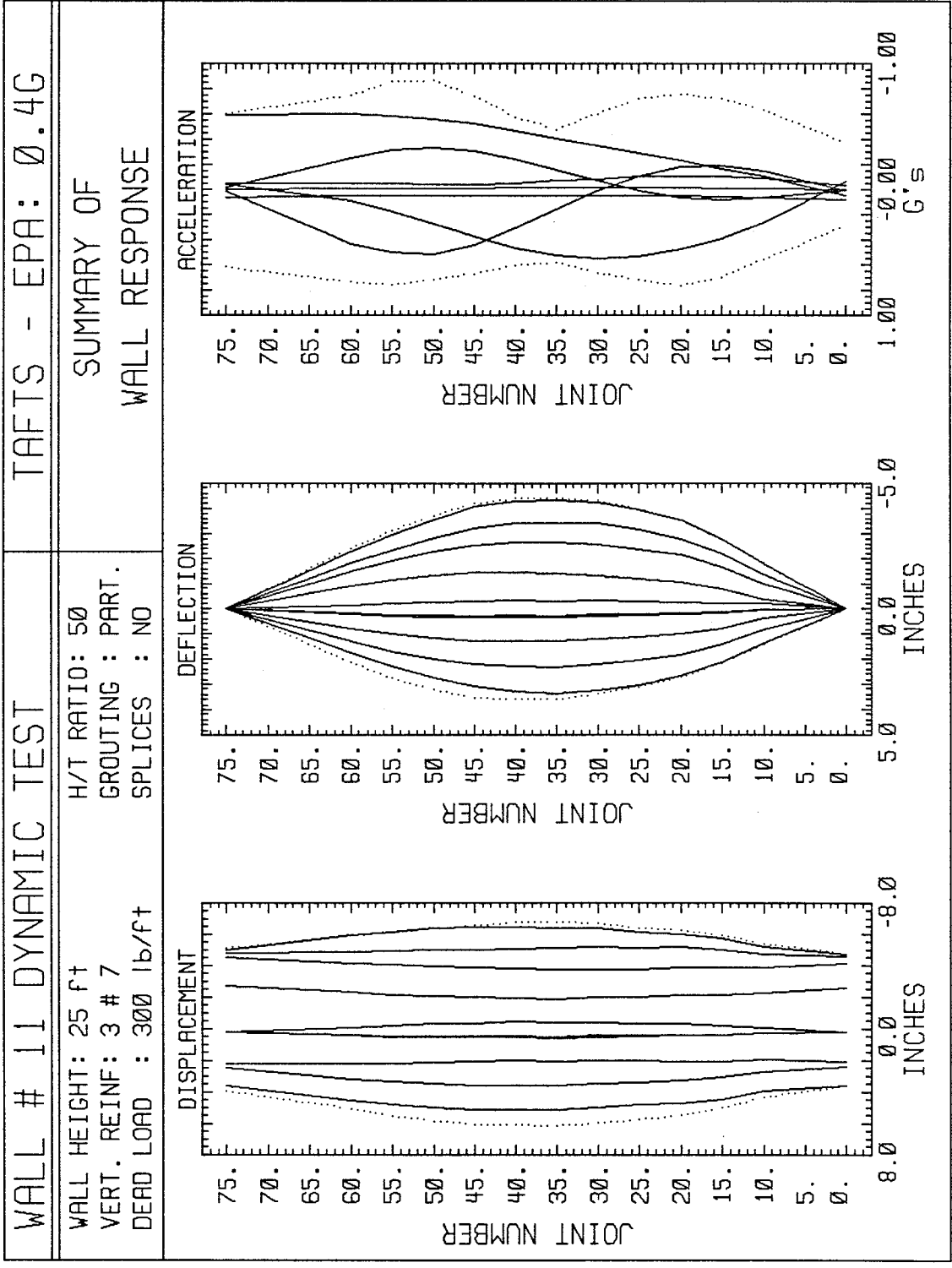
WALL HEIGHT: 25 FT  
 VERT. REINF: 3 # 7  
 DEAD LOAD : 300 lb/ft

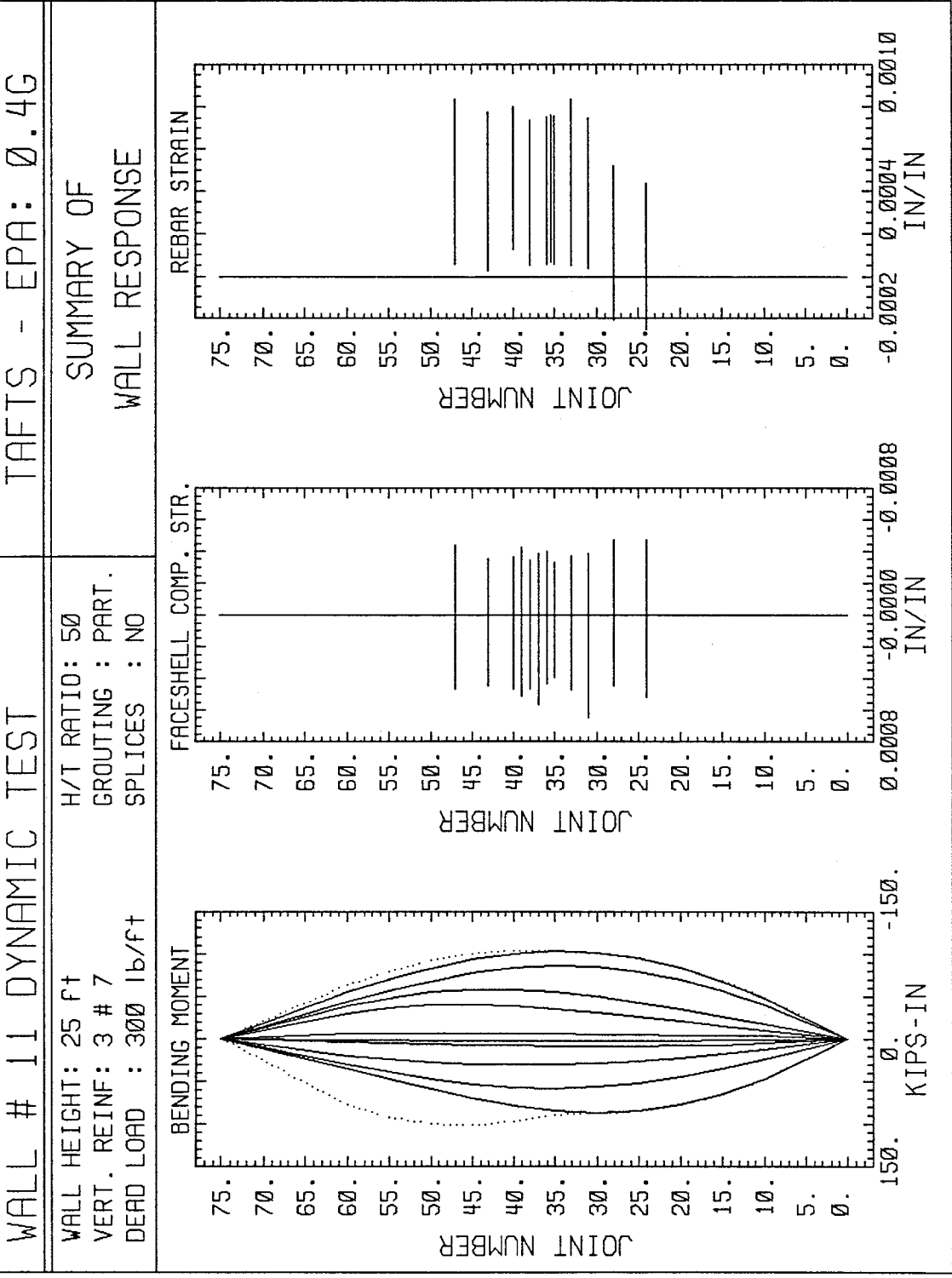
H/T RATIO: 50  
 GROUTING : PART.  
 SPLICES : NO

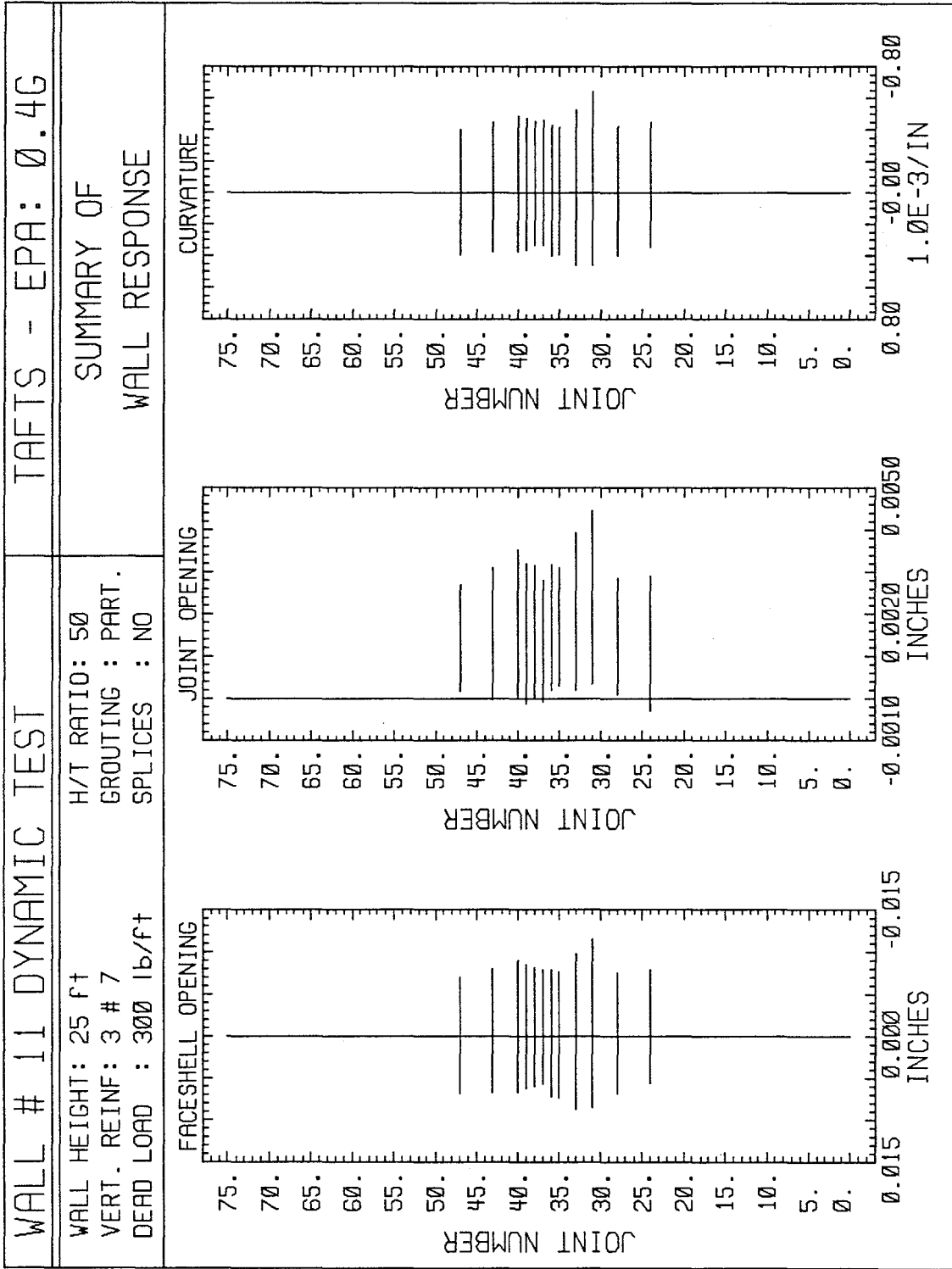
SUMMARY OF

WALL RESPONSE









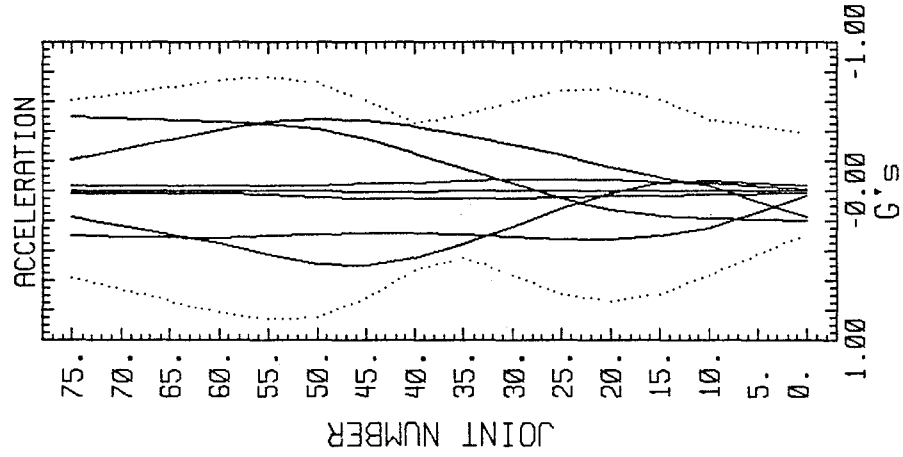
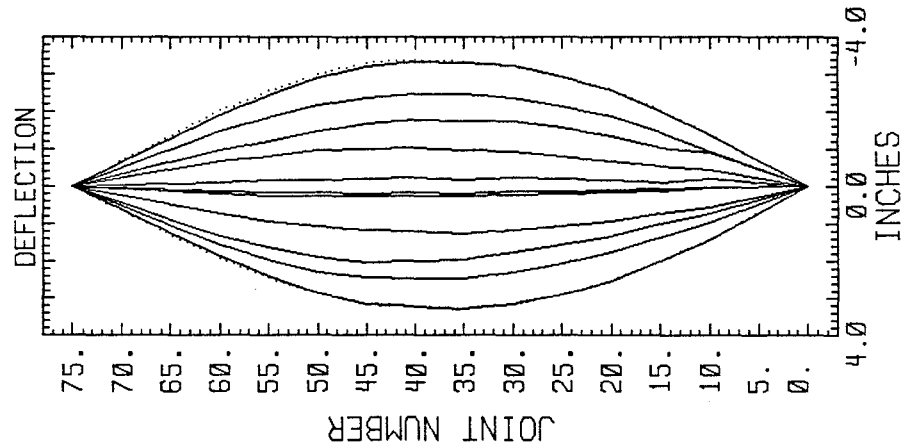
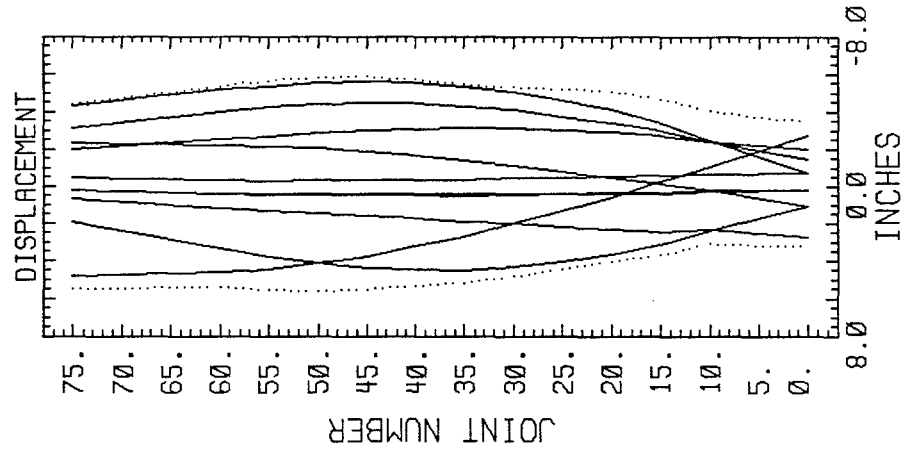
WALL # 11 DYNAMIC TEST

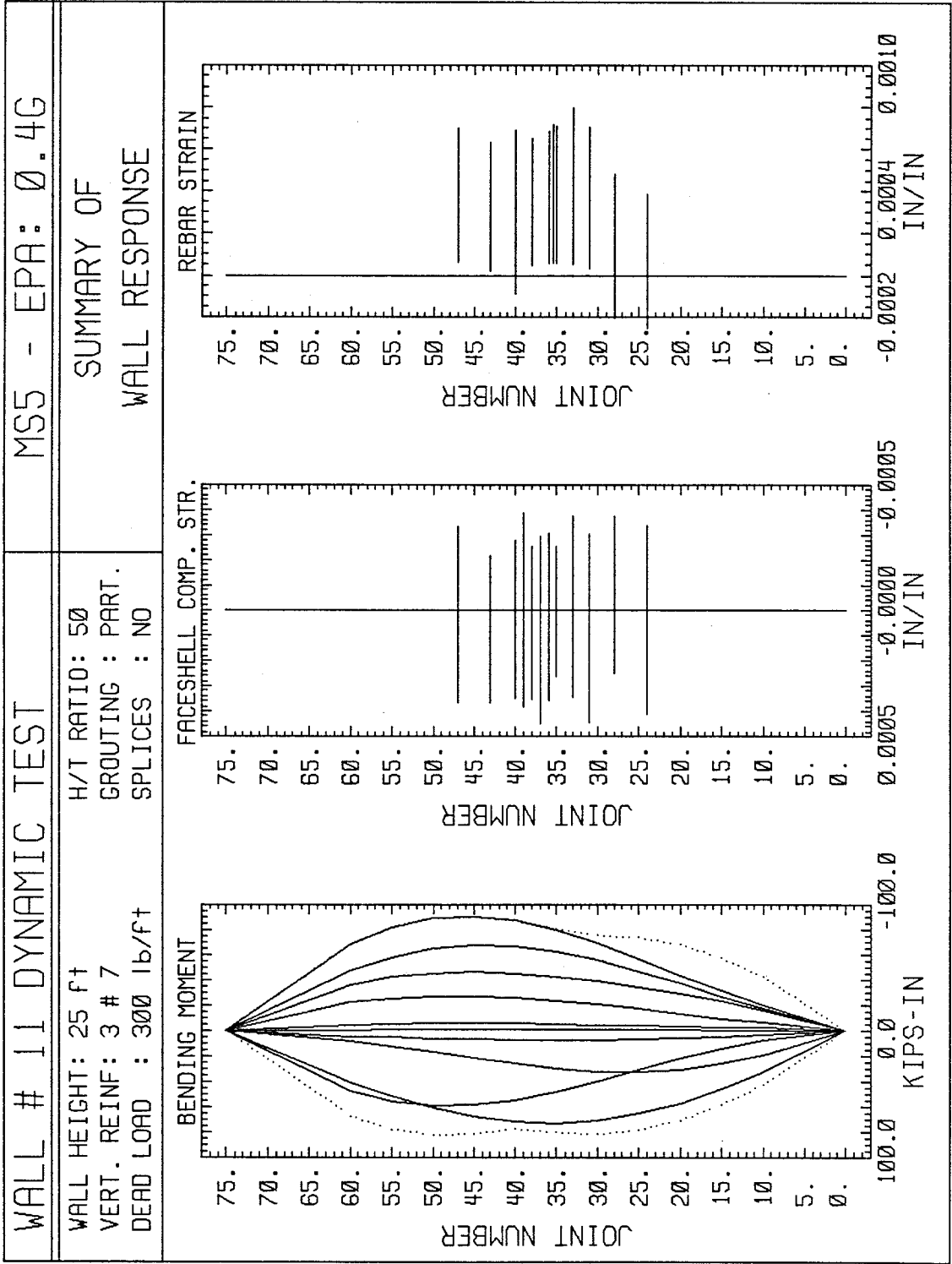
MS5 - EPA: 0.4G

WALL HEIGHT: 25 ft  
 VERT. REINF: 3 # 7  
 DEAD LOAD : 300 lb/ft

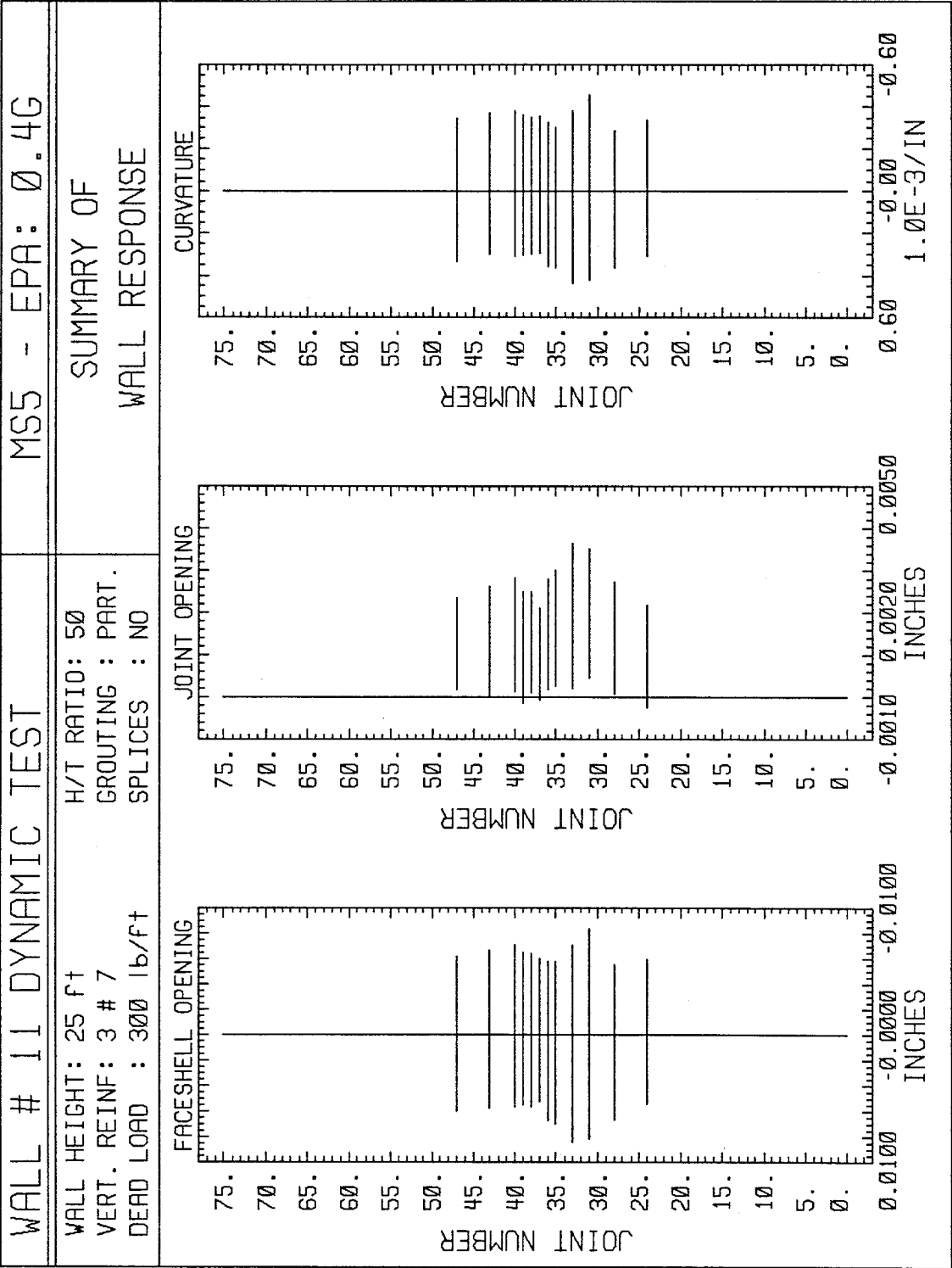
H/T RATIO: 50  
 GROUTING : PART.  
 SPLICES : NO

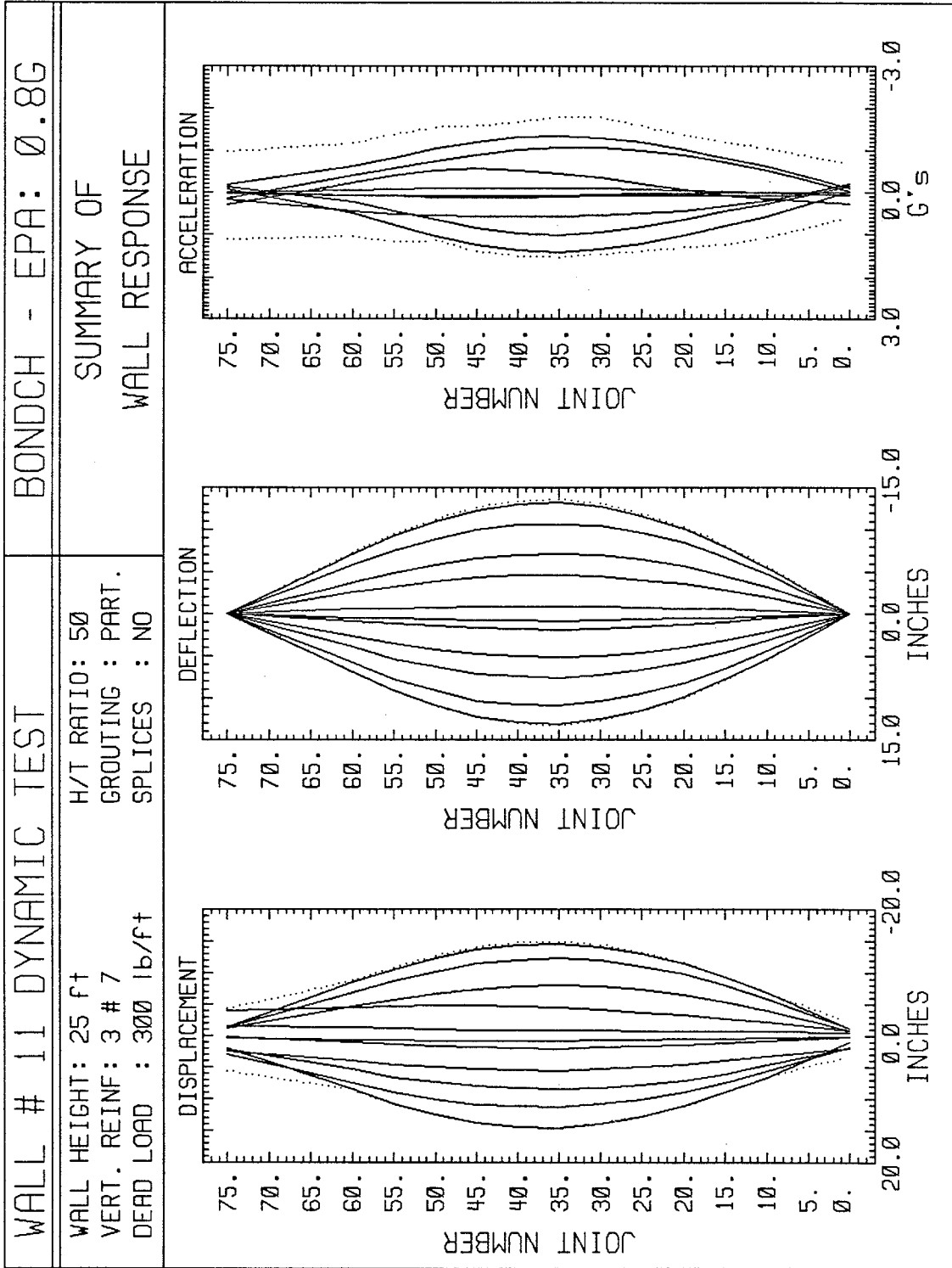
SUMMARY OF  
 WALL RESPONSE

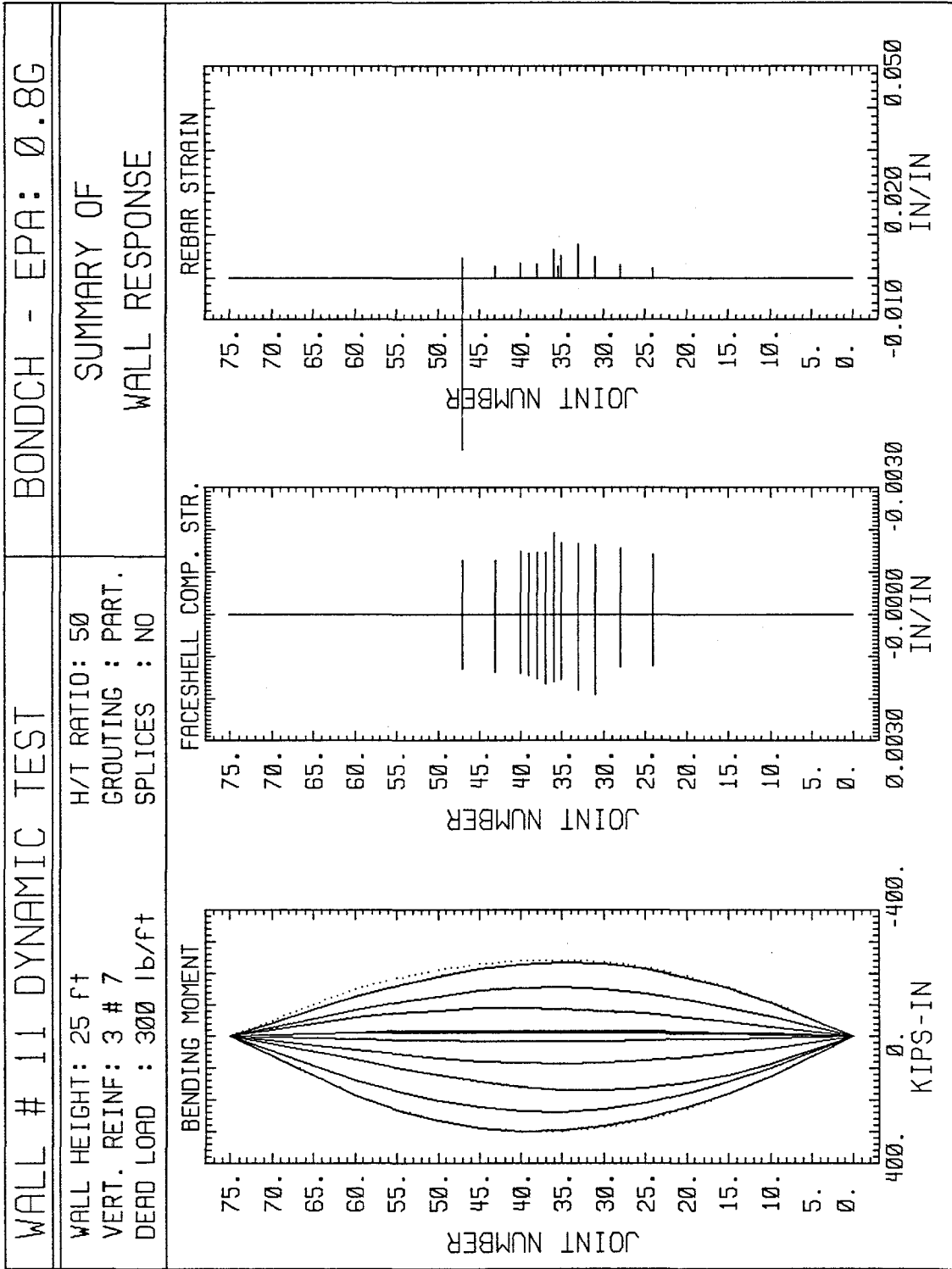


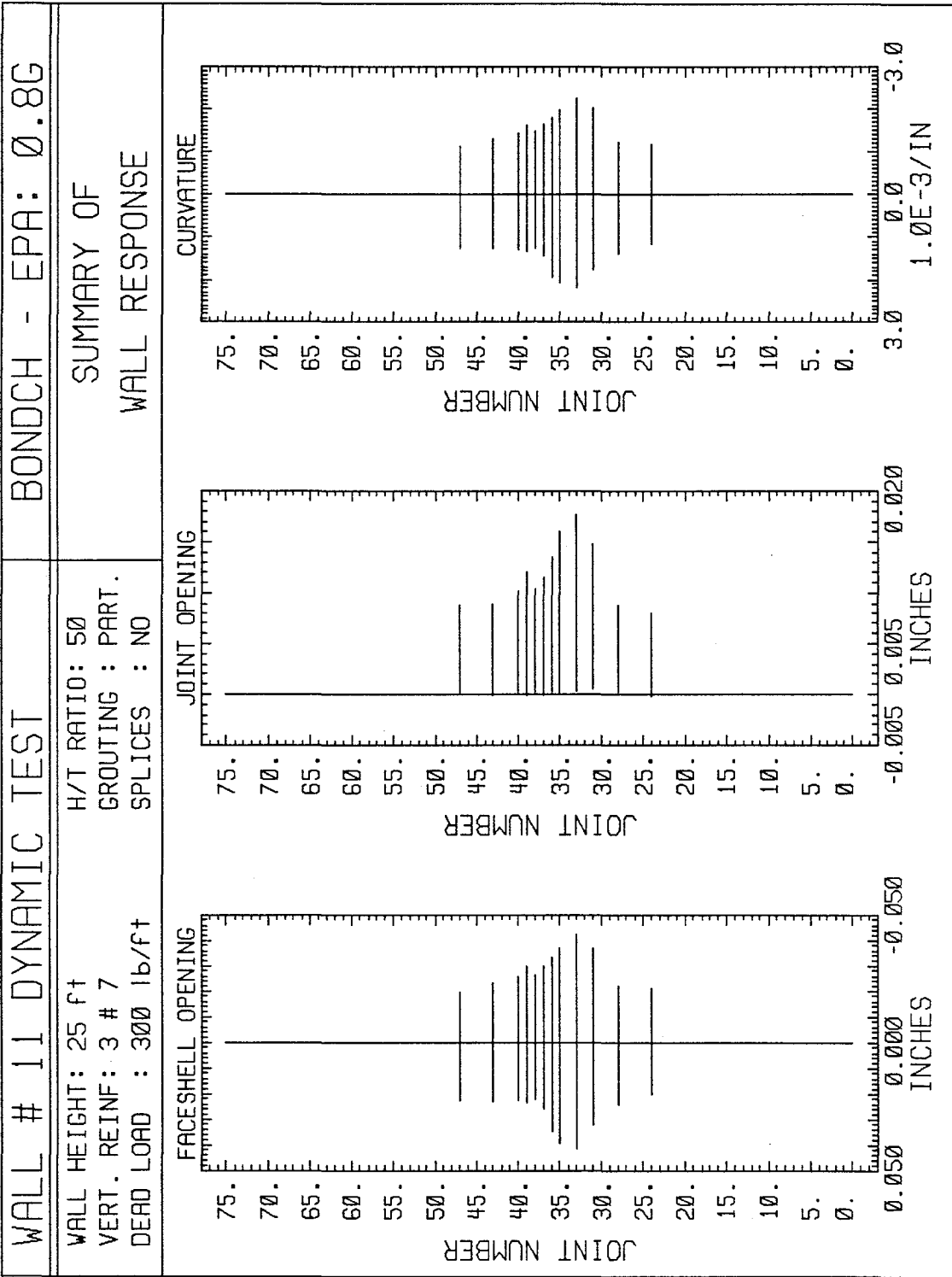












WALL # 11 DYNAMIC TEST

BOND-CSH - EPA: 0.8G

WALL HEIGHT: 25 ft  
 VERT. REINF: 3 # 7  
 DEAD LOAD : 300 lb/ft

H/T RATIO: 50  
 GROUTING : PART.  
 SPLICES : NO

SUMMARY OF  
 WALL RESPONSE

