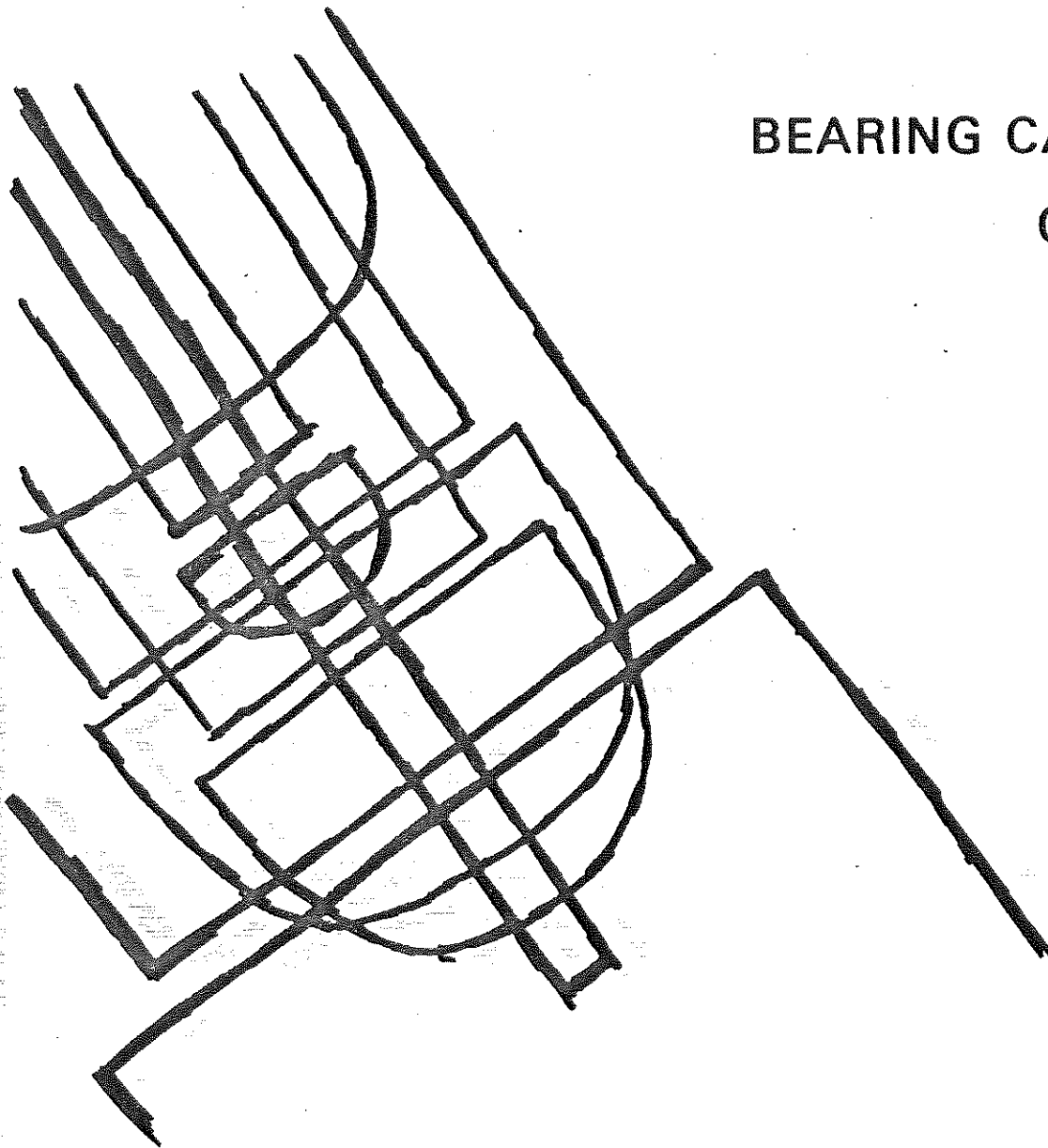


DIVISION OF
SOLID MECHANICS
STRUCTURES
AND
MECHANICAL DESIGN
REPORT NO. 31

DYNAMIC STUDIES
ON THE
BEARING CAPACITY
OF PILES
PHASE II
VOL. 2



SCHOOL OF ENGINEERING • CASE WESTERN RESERVE UNIVERSITY

DYNAMIC STUDIES ON THE BEARING CAPACITY OF PILES

Volume II

Final Project Report of Phase II

July 1, 1968

by

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INTRODUCTION TO EXPERIMENTAL RESULTS

During the course of this project a considerable number of piles of both reduced and full scale have been tested statically and dynamically. Some of these tests have been reported in Reference 1. The results of all of those test piles which are complete are presented here. A complete set of data is considered to be one which contains a static load test and a set of dynamic measurements made during driving. This rather extensive collection of static and dynamic measurements could be of use to other investigators.

The equipment used in driving the small scale piles and in making the dynamic measurements is described in Reference 1 and in Volume 1 of this report. The dynamic measurements were digitized manually and recorded on punched cards. The data was then analyzed by digital computer and the drawings included here were made automatically. The upper curves give the variation with time of acceleration, velocity and displacement at the top of the pile. The acceleration is the measured value obtained from the oscillograph record. Velocity and displacement were obtained by integration of the acceleration record by digital computer. The lower curves give the measured force at the top of the pile and the predicted static resistance calculated from equation 1, Volume I of this report. This calculation of the resistance neglects the velocity dependent terms and is not meaningful over the early portion of the record.

The digitized results are available on punched cards and, of course, in this form are more accurate than can be obtained on the curves given here.

LOADTEST AND DYNAMIC RESULTS
FOR MODEL PILES DRIVEN IN SAND

Test Site: W. 14 and Abbey Road in Cleveland, Ohio

Surface Elevation at 675.0 Feet

Sample No.	Description	Physical Characteristics in %						W.C.
		Agg.	C.S.	F.S.	Silt	Clay		
10	Brown Silty Gravelly Sand	16	1	58	16	9	17	
9	Brown Gravel	81	5	10	2	2	9	
8	Brown Gravelly Sand	42	2	44	5	7	9	
7	Brown Sand	13	10	67	0	10	17	
6	Brown Sand	8	9	75	4	4	12	
5	Brown Sandy Gravel	52	24	14	5	5	9	
4	Brown Sandy Gravel	48	26	16	5	5	6	
3	Brown Sandy Gravel	V	I	S	U	A	L	
2	Brown Sandy Gravel	V	I	S	U	A	L	
1	Brown Silty Gravelly Sand	33	23	29	7	8	8	

Figure 1 Soil Characteristics at West 14th and Abbey Road

MODEL PILE 15-3 SAND
 BLOW NO. 327 DATE AUGUST 19 1965

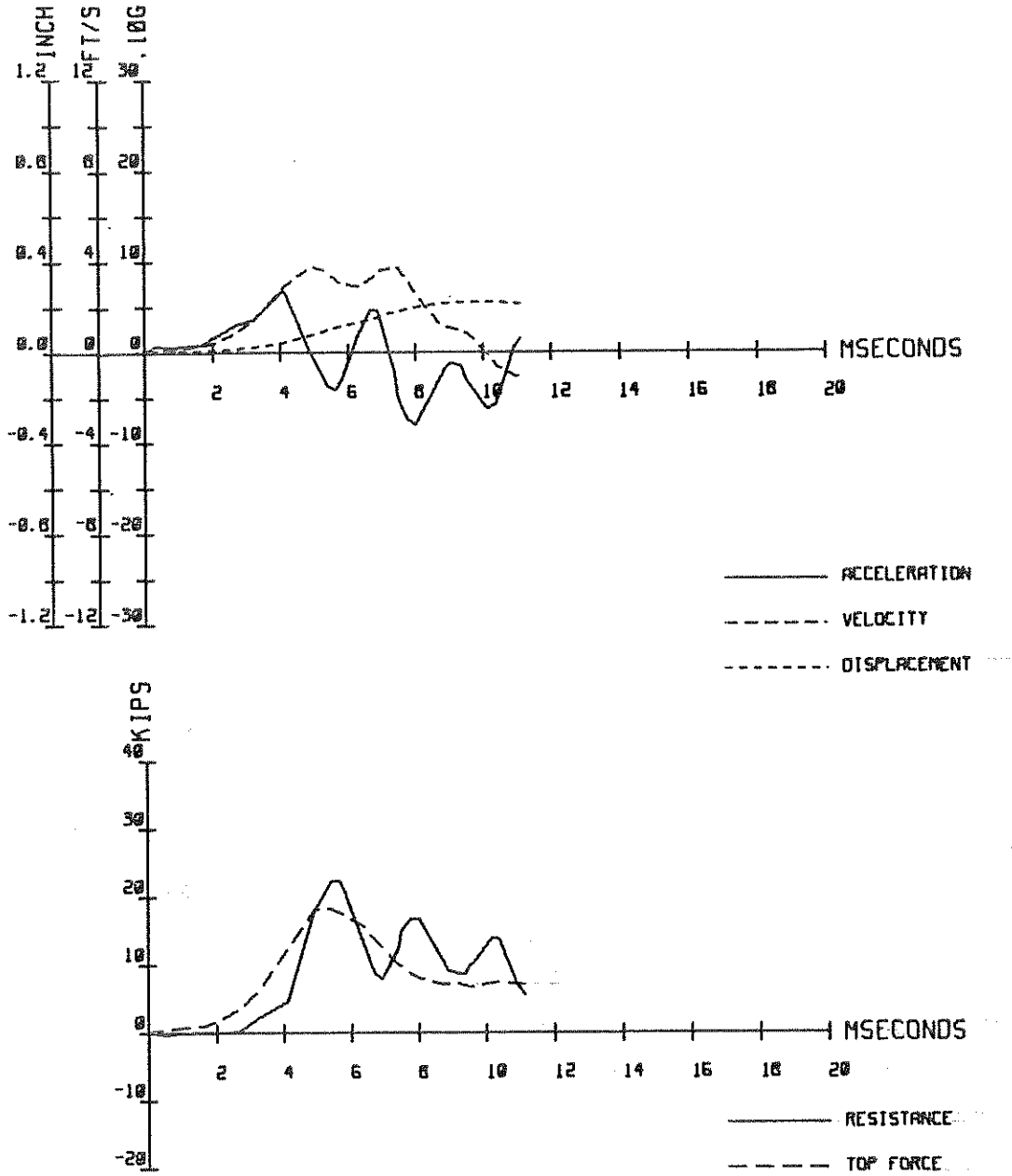


Figure 2 Dynamic Results of Reduced-Scale Pile 15-3 at the End of Driving, Blow No. 327

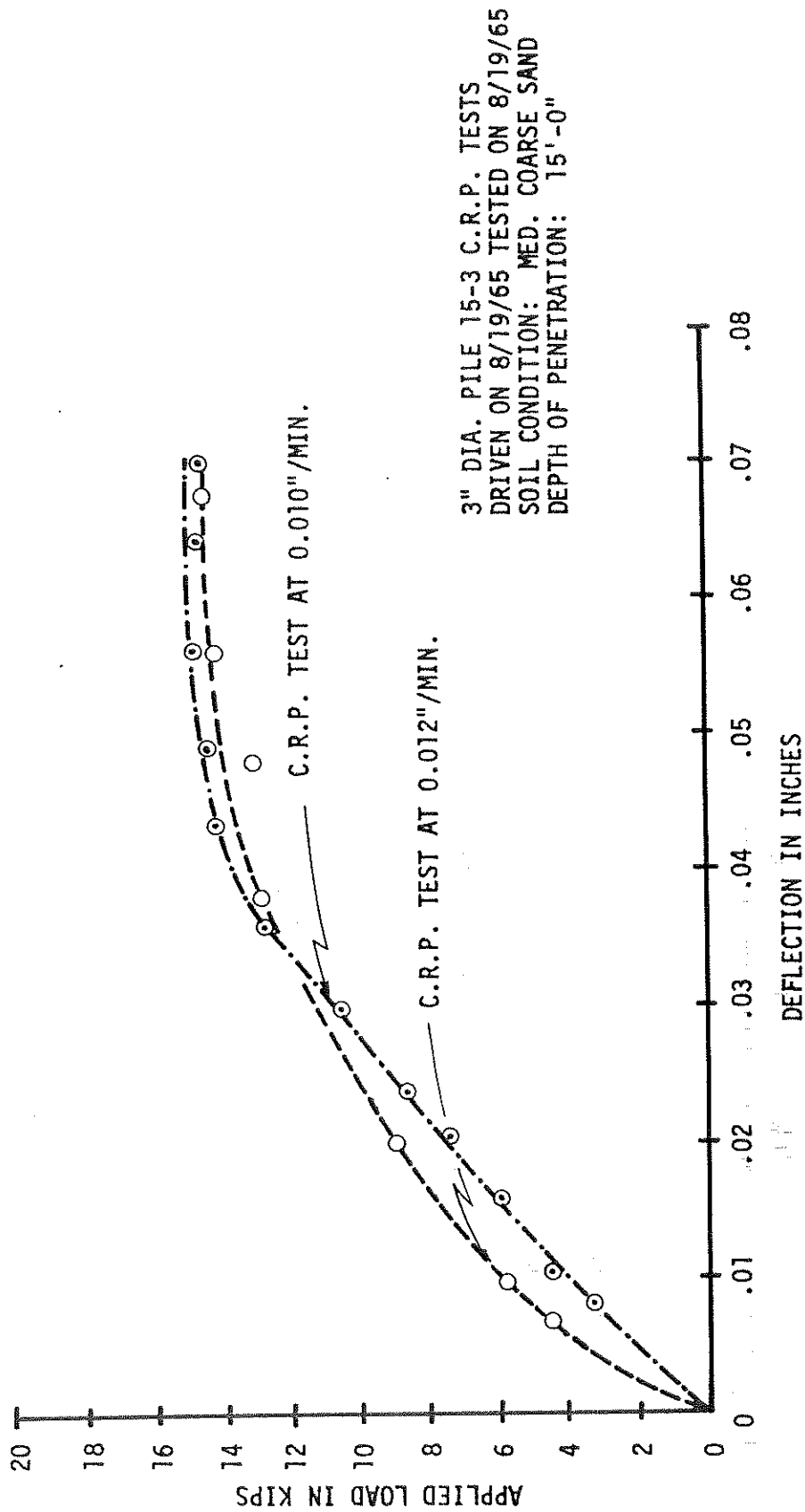


Figure 3 C.R.P. Test Results of Reduced-Scale Pile 15-3, 3 hours after Driving

MODEL PILE 15-3 SAND

BLOW NO. 1-A DATE AUG. 23 1965

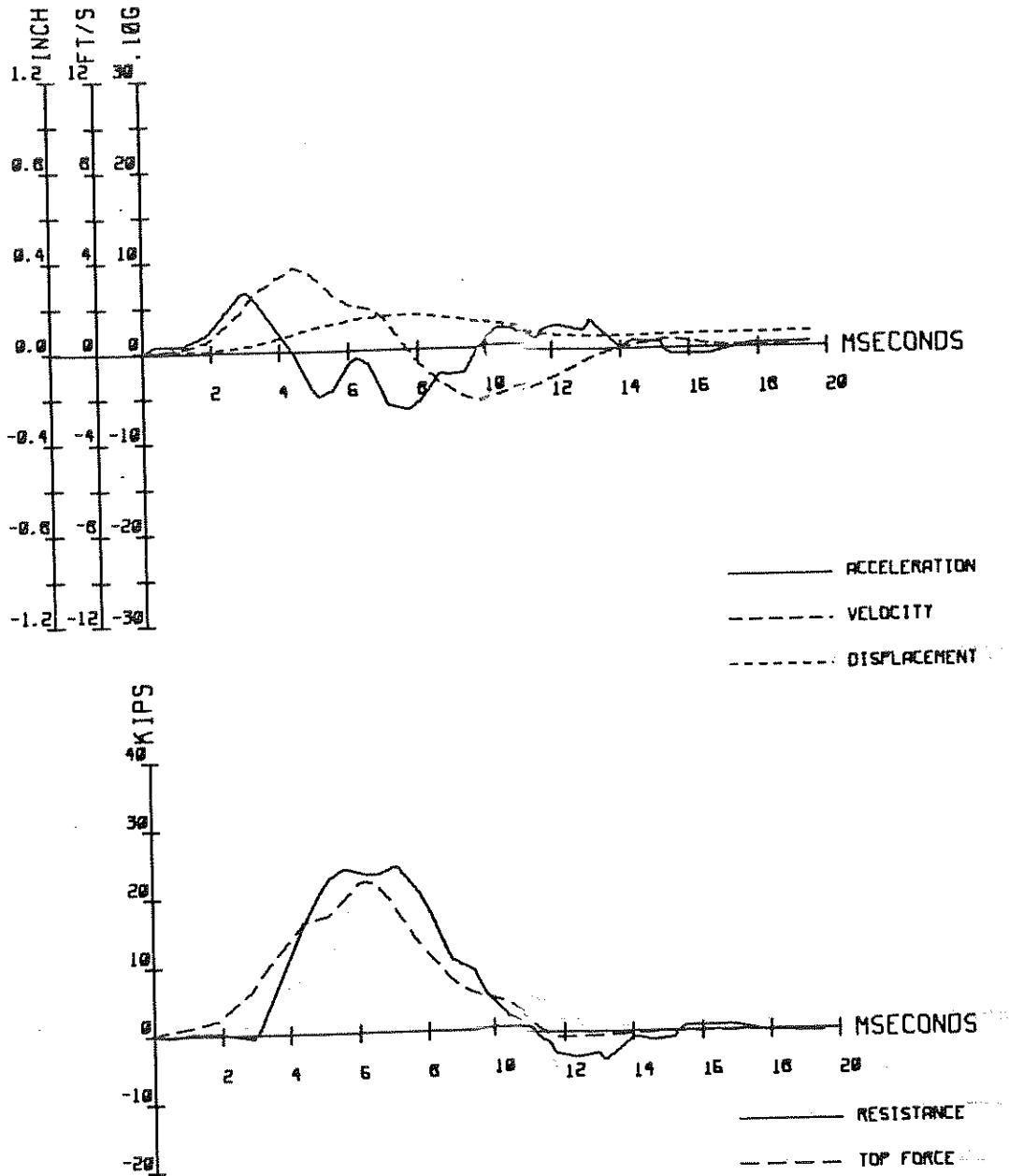


Figure 4 Dynamic Results of Reduced-Scale Pile 15-3,
Blow 1A

MODEL PILE 15-3 SAND

BLOW NO. 2-A DATE AUG. 23 1965

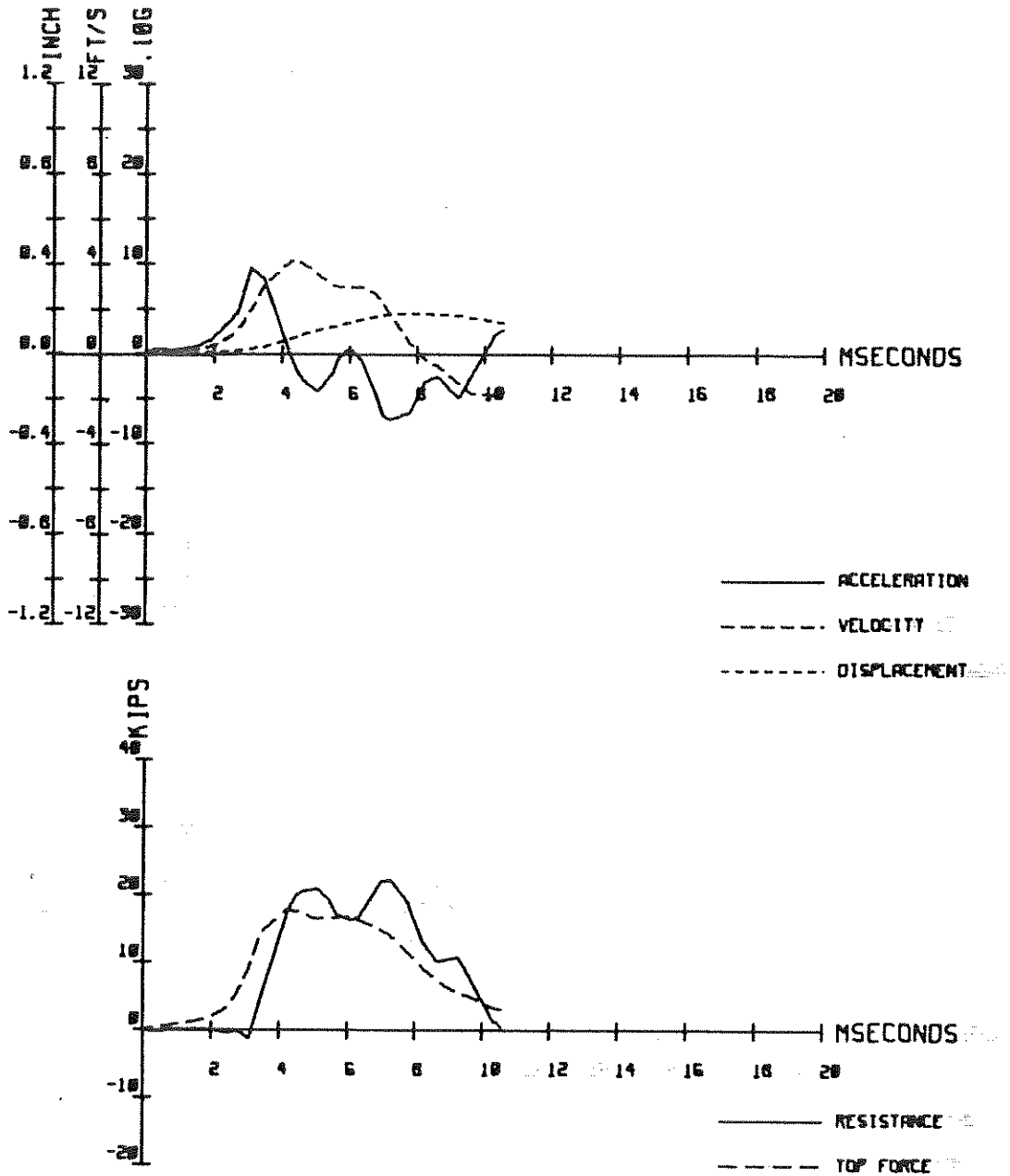


Figure 5 Dynamic Results of Reduced-Scale Pile 15-3,
Blow 2A

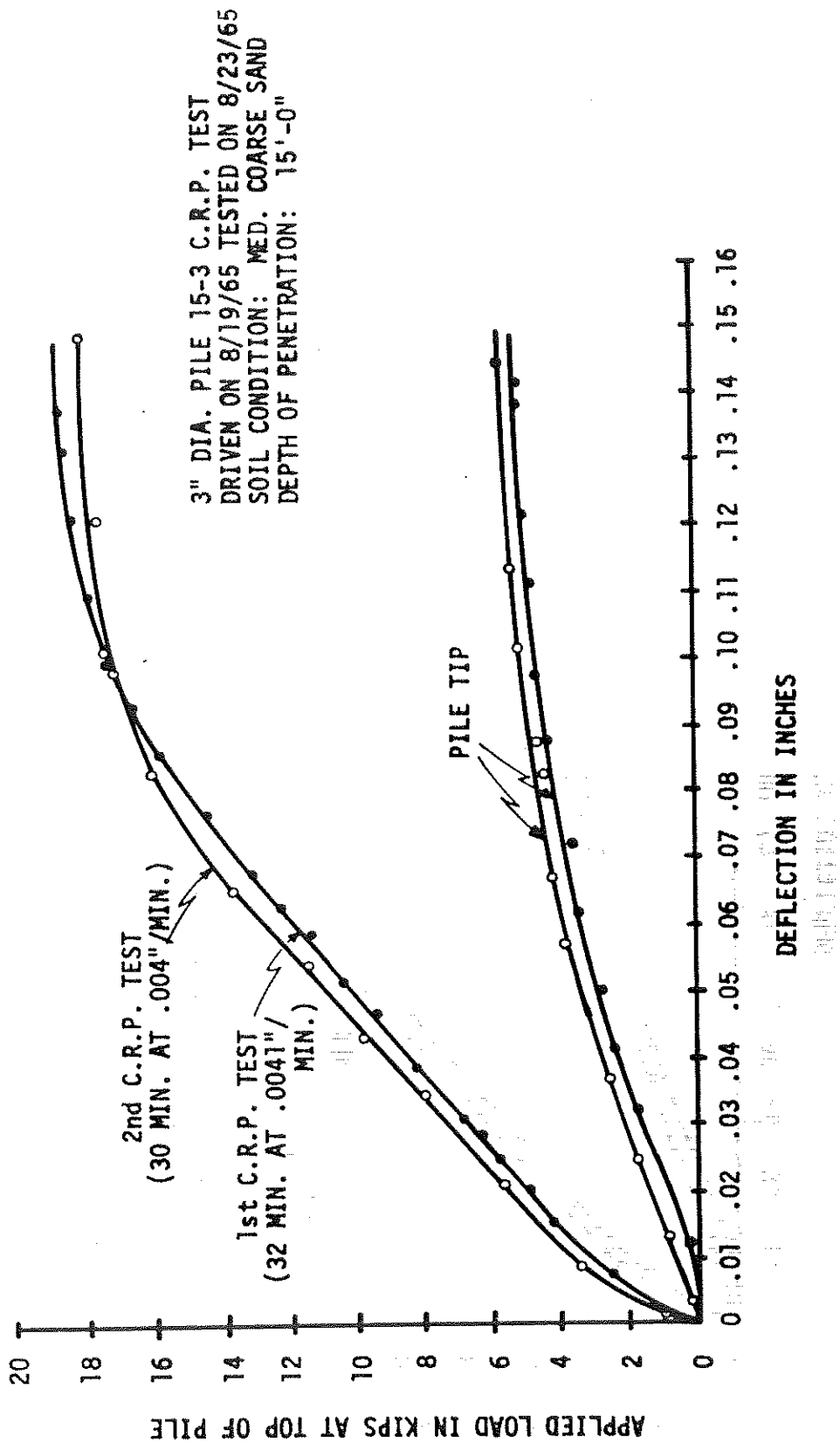


Figure 6 C.R.P. Test Results of Reduced-Scale Pile 15-3, 3 days after Driving

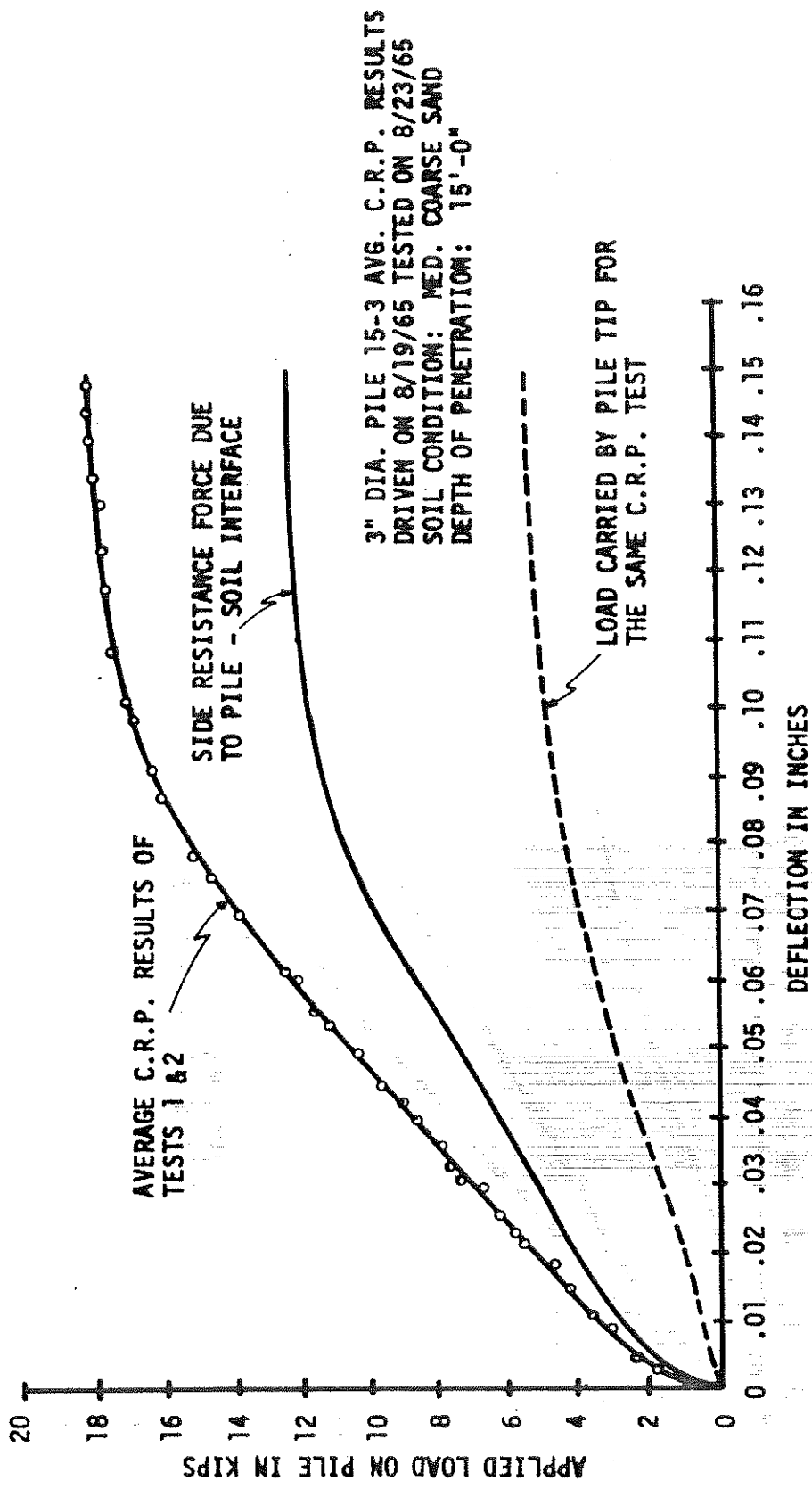


Figure 7 Average C.R.P. Test Results of Reduced-Scale Pile 15-3, 3 days after Driving

MODEL PILE 15-4 SAND

BLOW NO. 348 DATE OCT. 9 1965

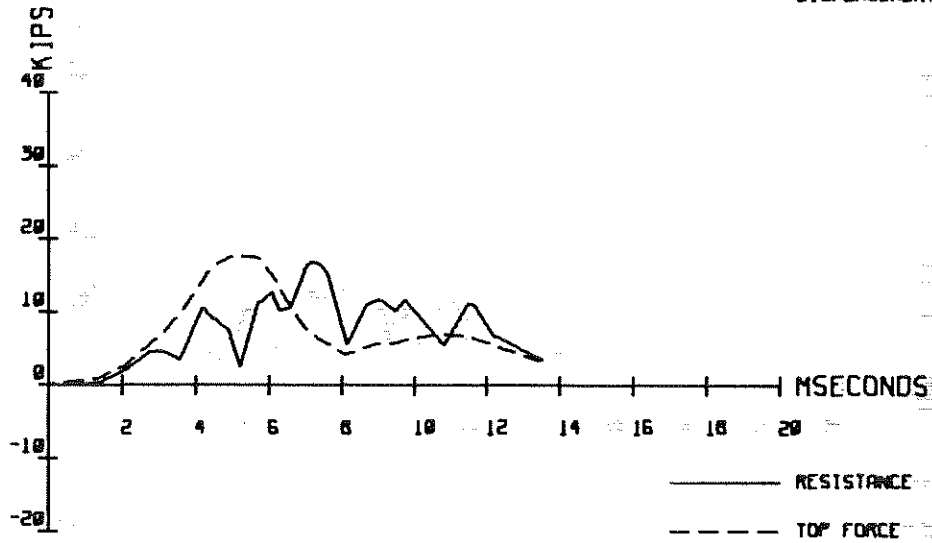
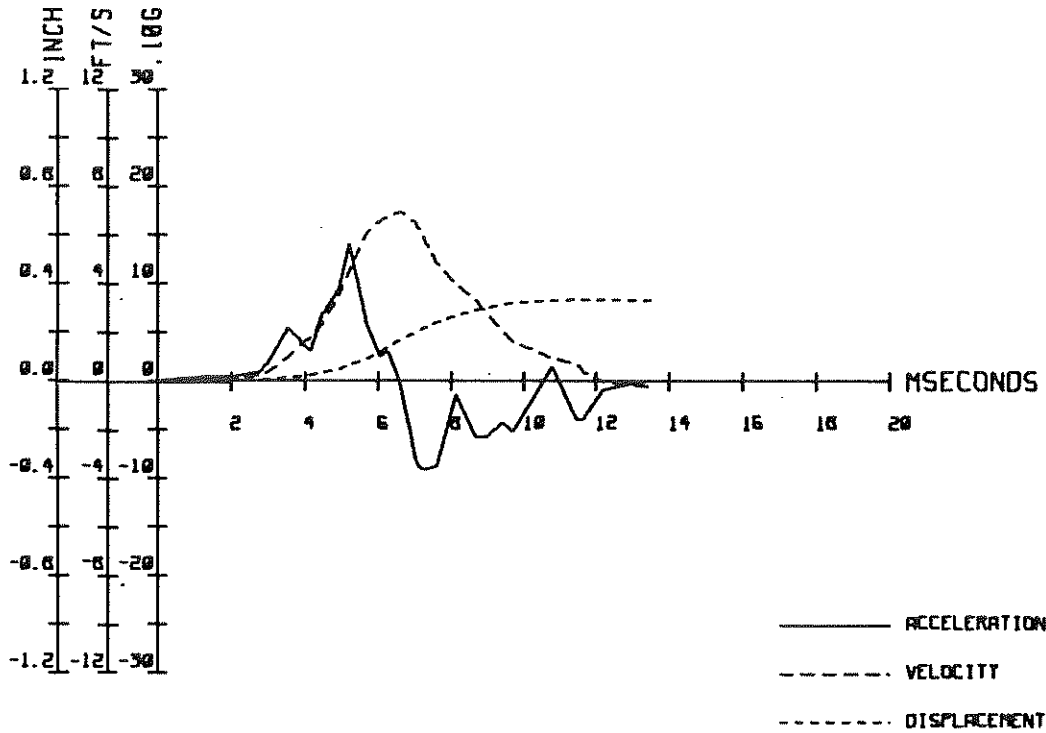


Figure 8 Dynamic Results of Reduced-Scale Pile 15-4, Blow No. 348 at the End of Driving

MODEL PILE 15-4 SAND

BLOW NO. 2-A DATE OCT. 15 1965

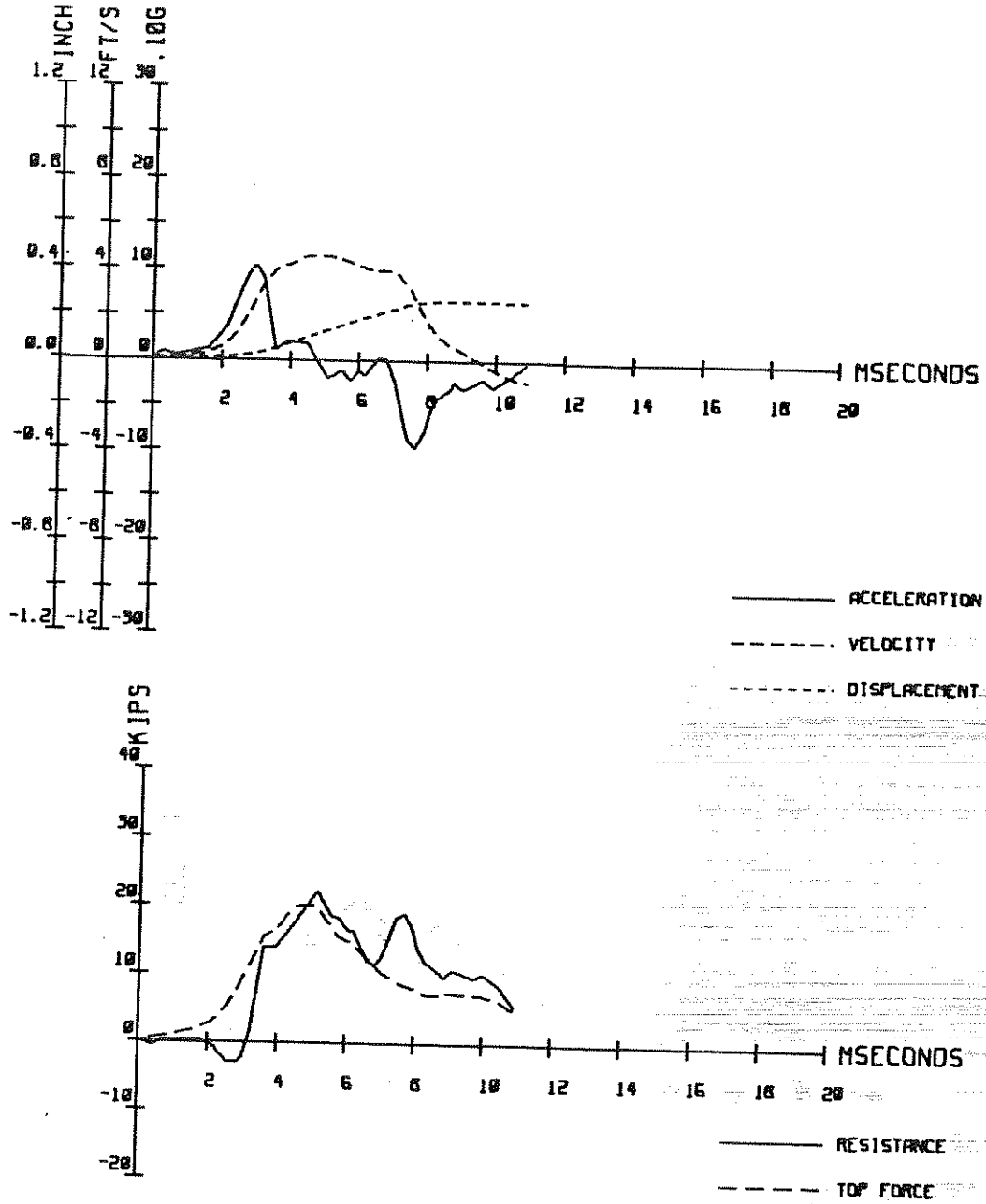


Figure 9 Dynamic Results of Reduced-Scale Pile 15-4, Blow 2A

MODEL PILE 15-4 SAND

BLOW NO. 3-A DATE OCT. 15 1965

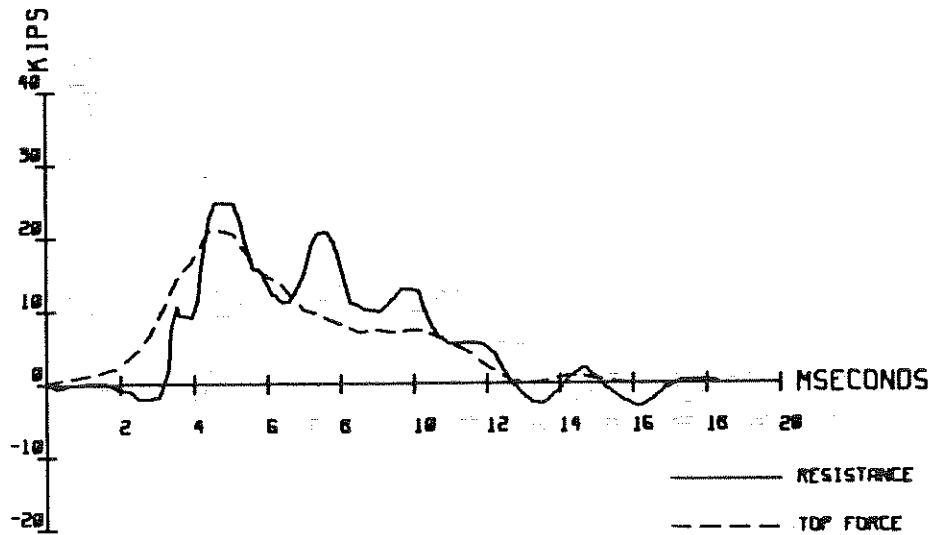
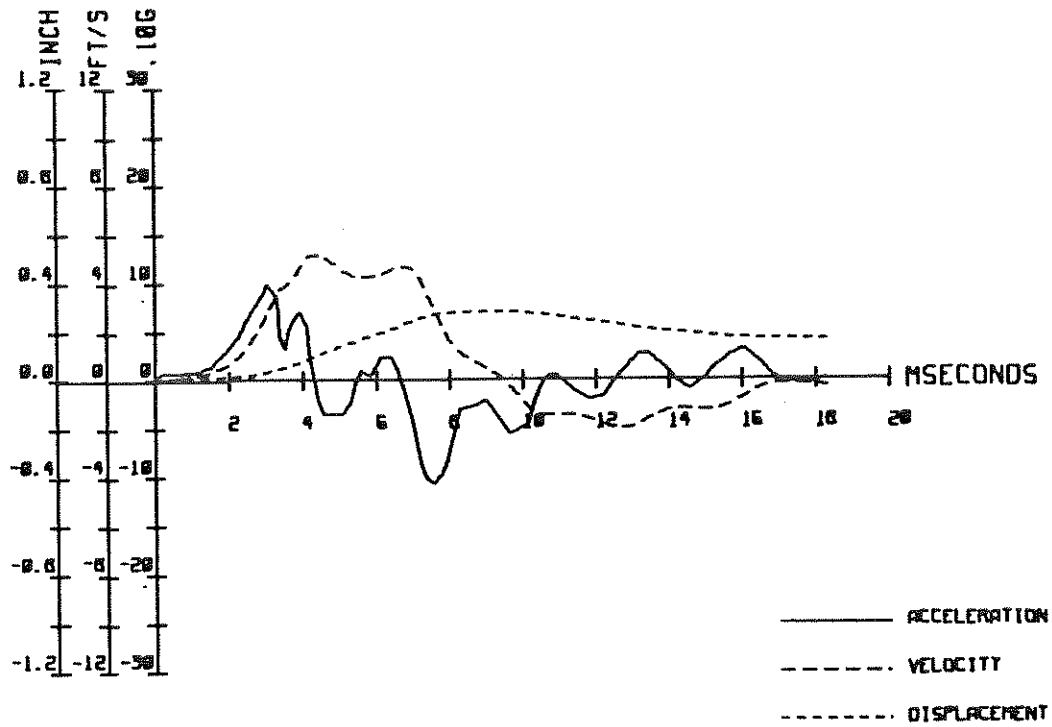


Figure 10 Dynamic Results of Reduced-Scale Pile 15-4, Blow 3A

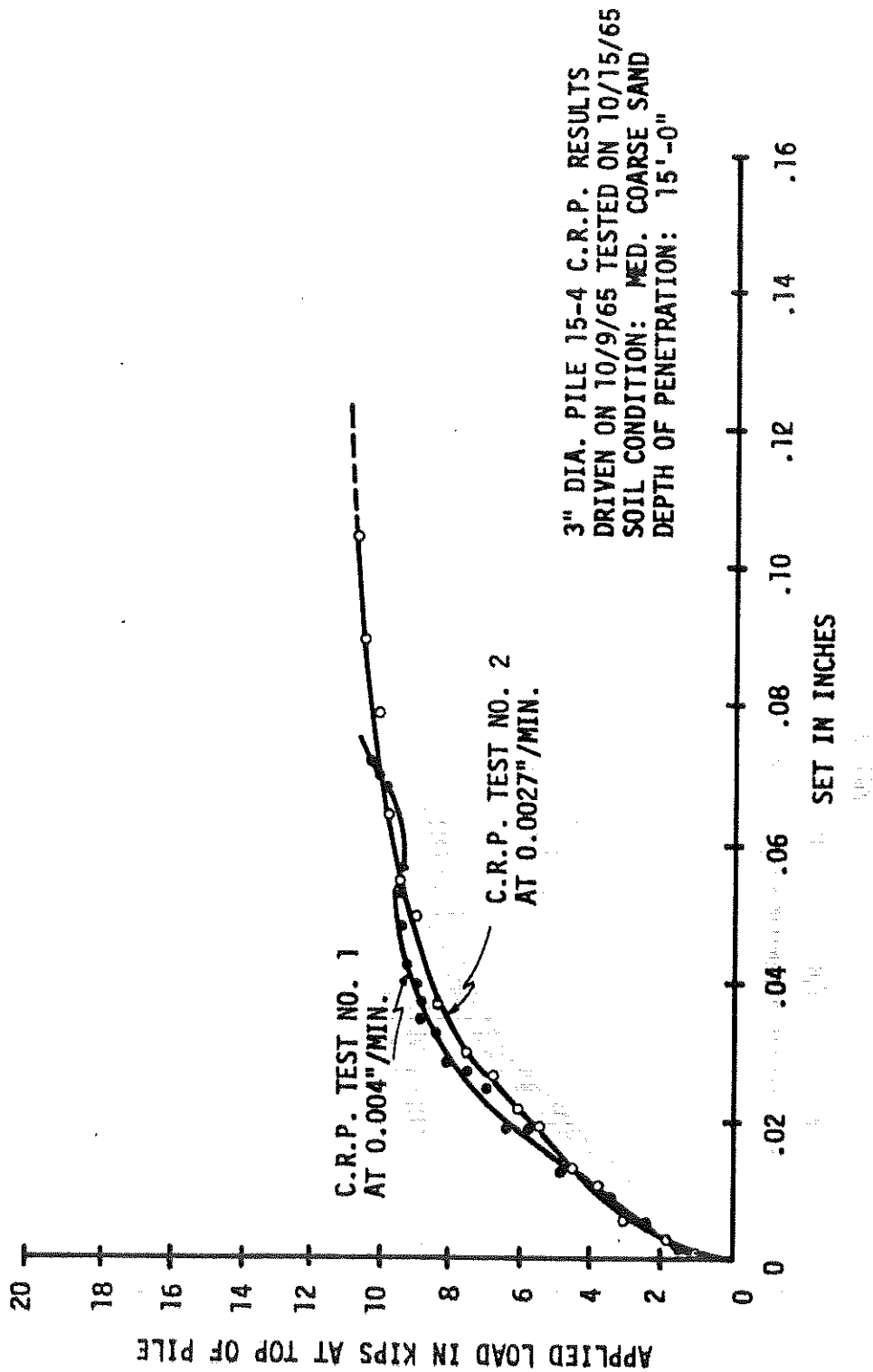


Figure 11 C.R.P. Test Results of Reduced-Scale Pile 15-4

MODEL PILE 15-6 SAND

BLOW NO. 263 DATE JANUARY 26 1965

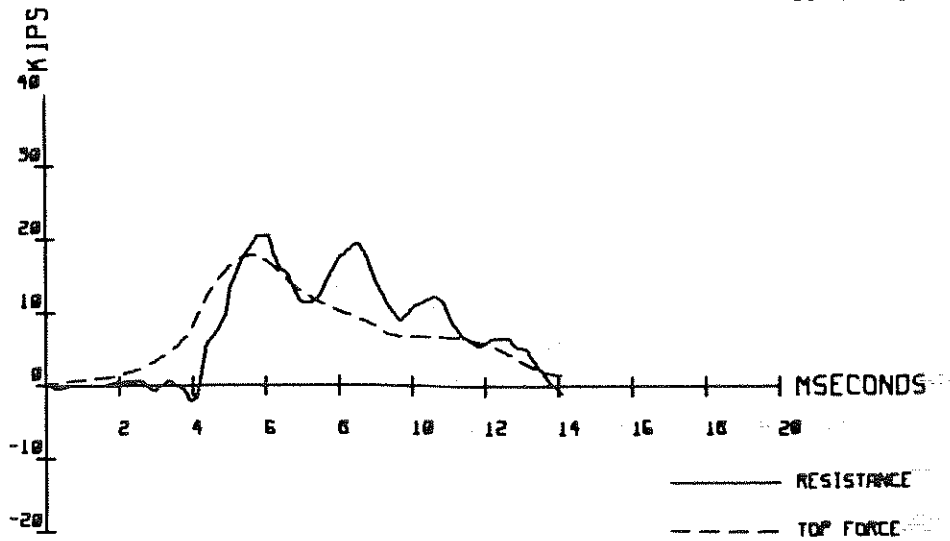
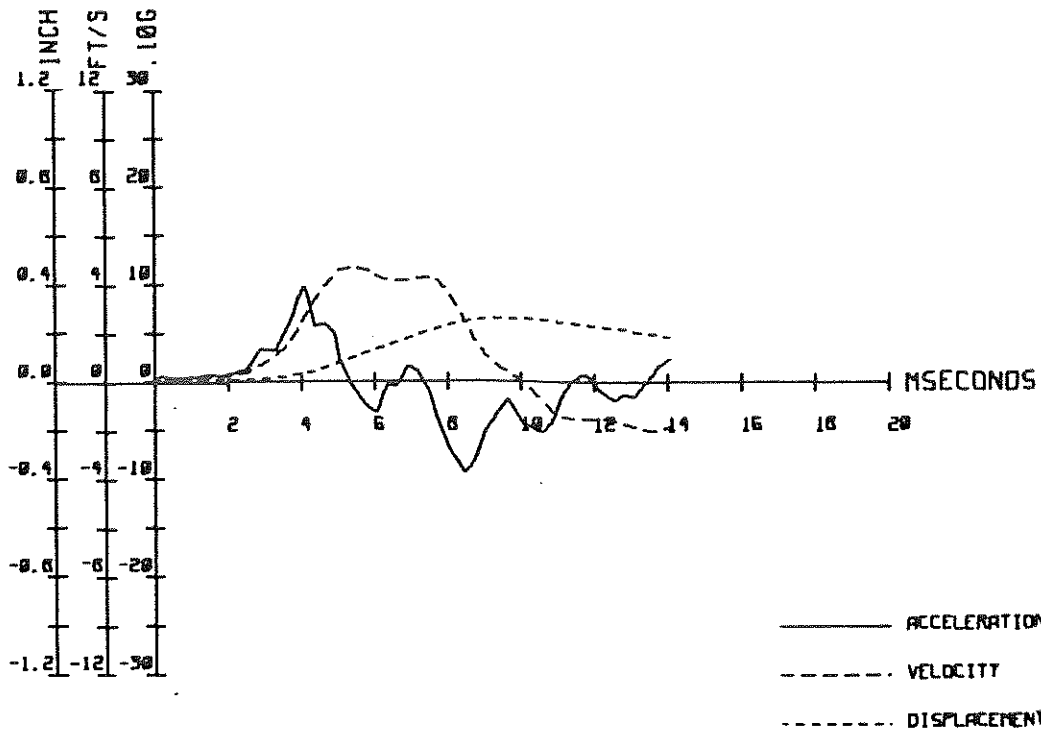


Figure 12 Dynamic Results of Reduced-Scale Pile 15-6 at the End of Driving

MODEL PILE 15-6 SAND

BLOW NO. 2-A DATE MAR. 5 1966

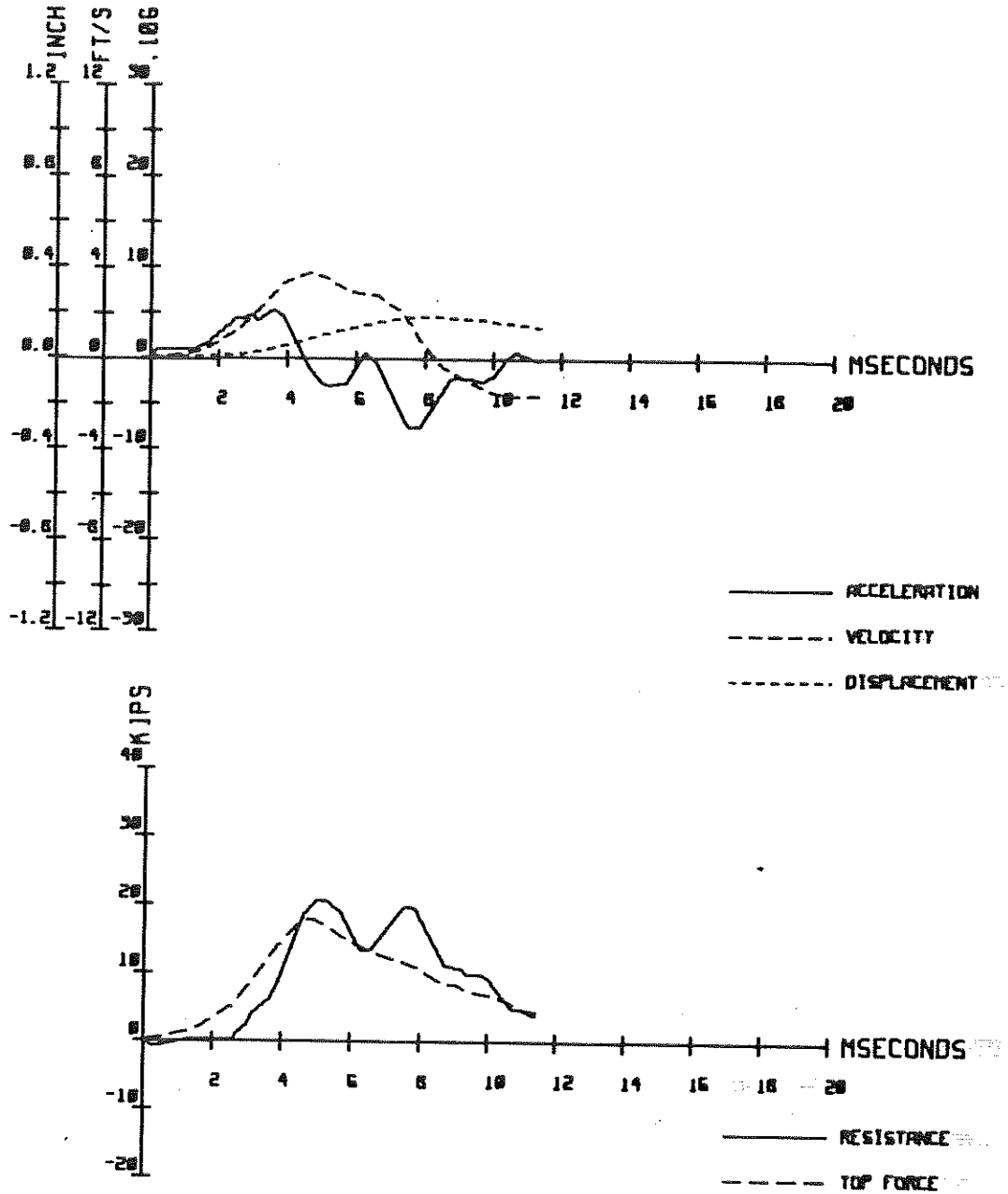


Figure 13 Dynamic Results of Reduced-Scale Pile 15-6
Blow No. 2A

MODEL PILE 15-6 SAND

BLOW NO. 4-A DATE MAR. 5 1966

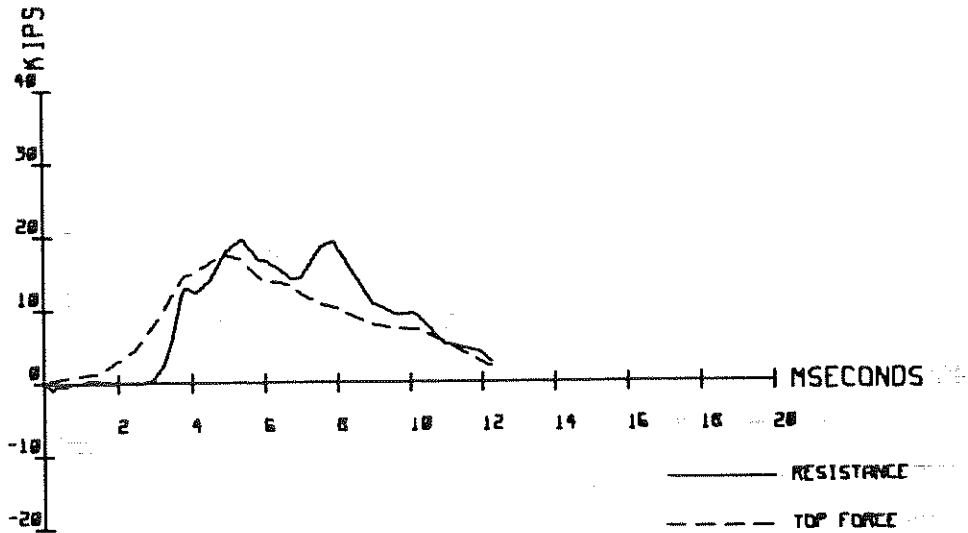
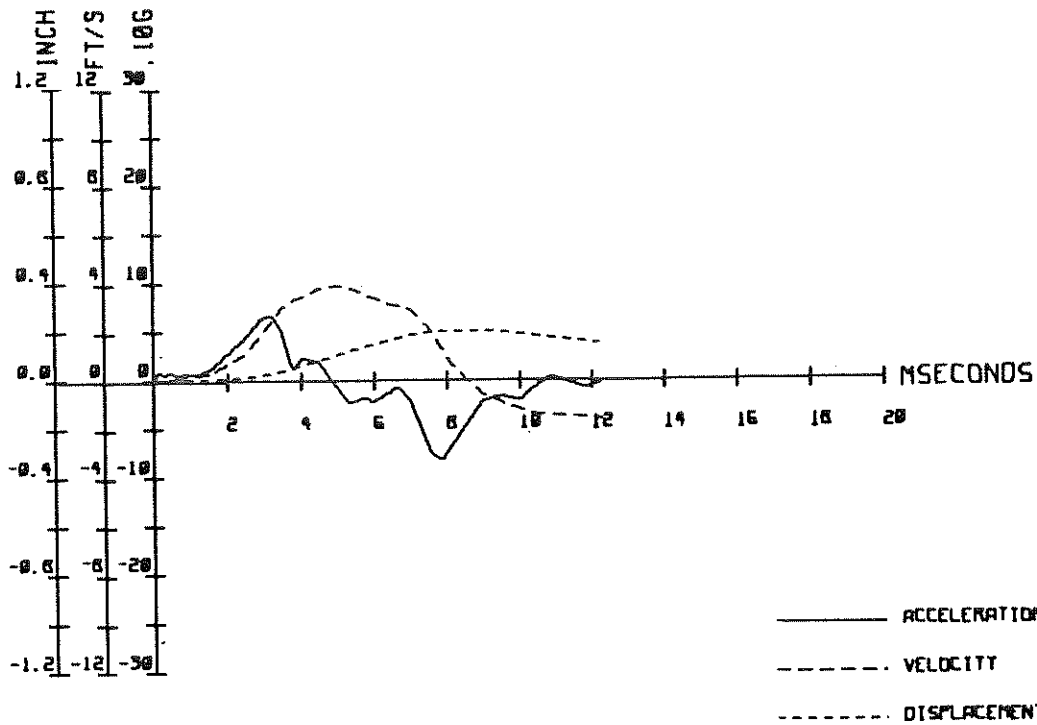


Figure 14 Dynamic Results of Reduced-Scale Pile 15-6, Blow No. 4A

MODEL PILE 15-6 SAND

BLOW NO. 9-A DATE MARCH 5 1966

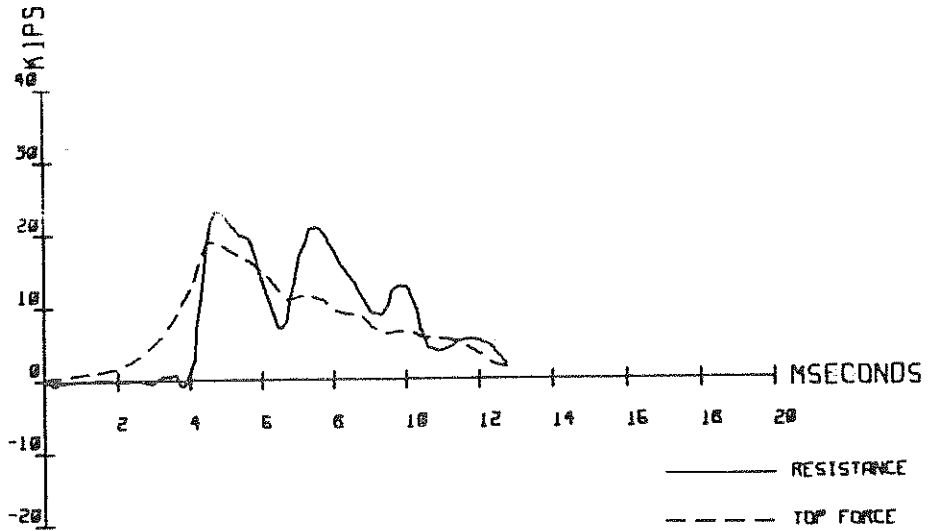
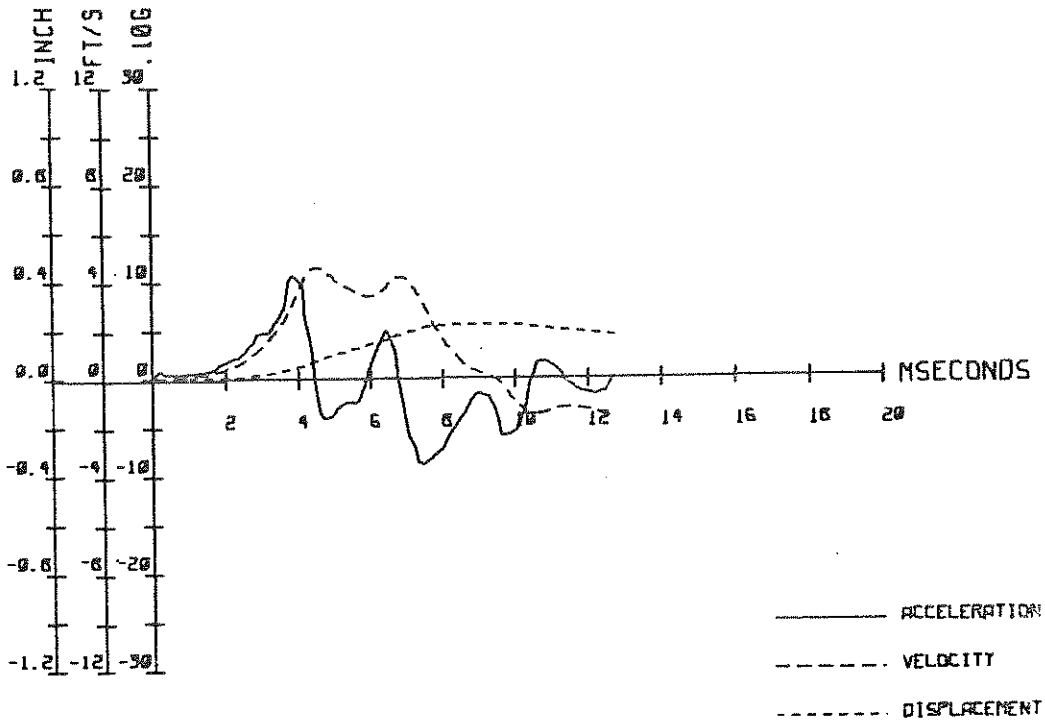


Figure 15 Dynamic Results of Reduced-Scale Pile 15-6,
Blow 9A

3" DIA. PILE 15-6 C.R.P. TEST
 DRIVEN ON 1/26/66 TESTED ON 3/5/66
 SOIL CONDITION: MED. COARSE SAND
 DEPTH OF PENETRATION: 15'-0"

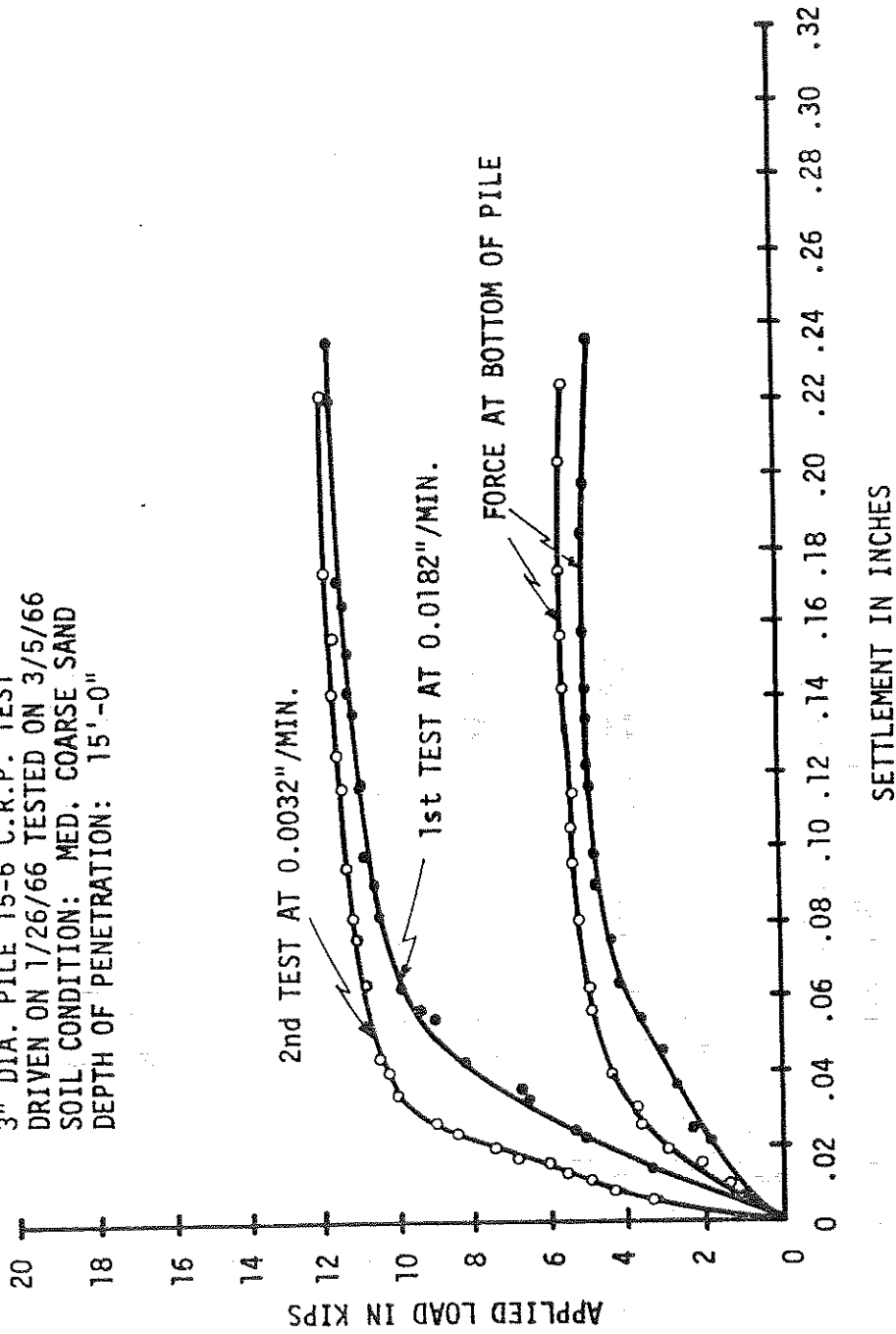


Figure 16: C.R.P. Test Results of Reduced-Scale Pile 15-6

MODEL PILE 15-7 SAND

BLOW NO. 293 DATE JAN. 22 1966

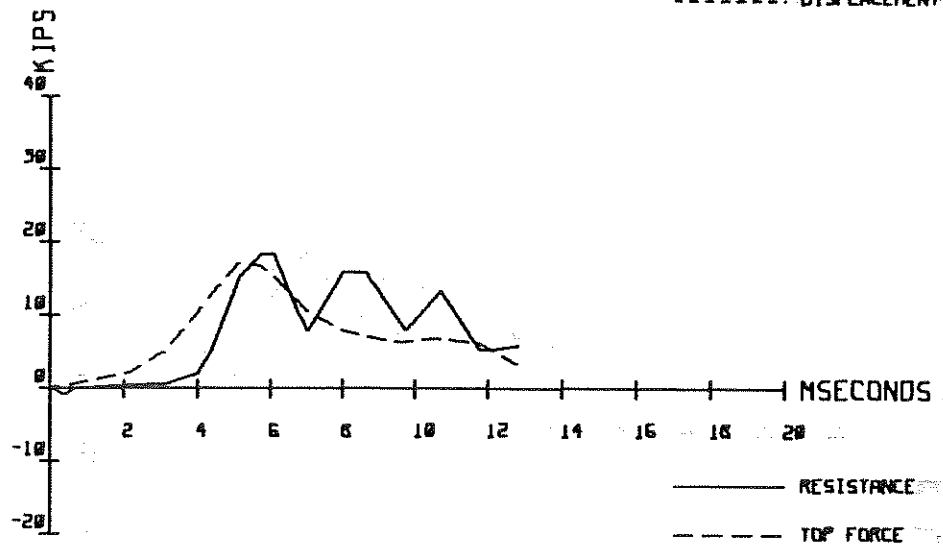
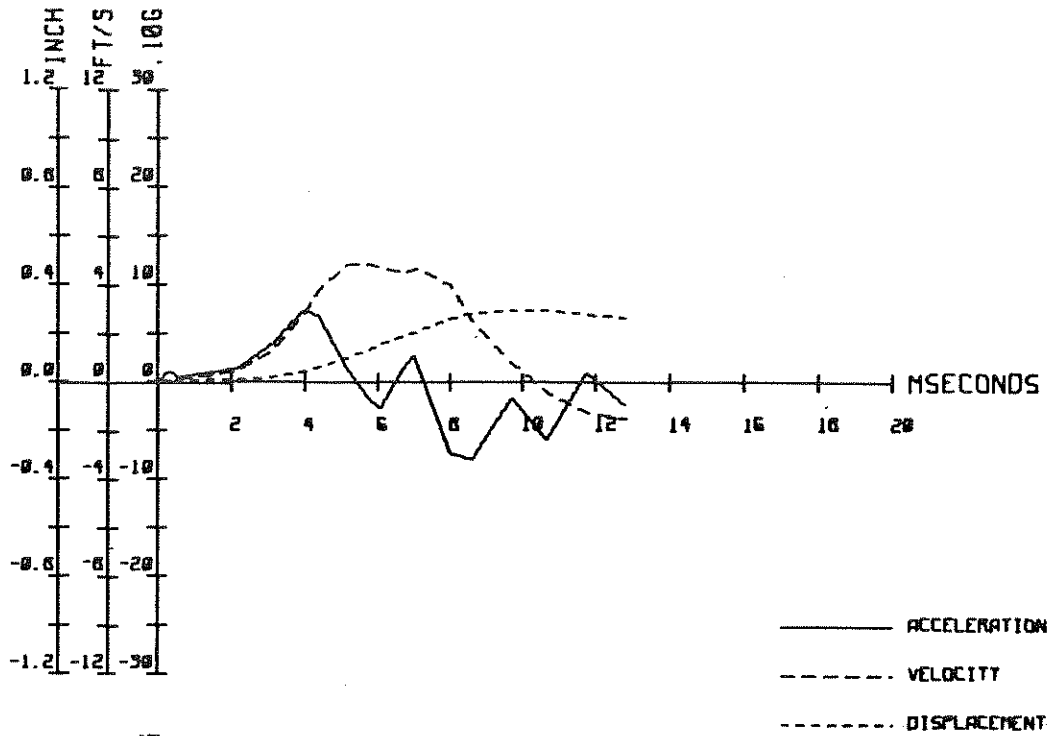


Figure 17 Dynamic Results of Reduced-Scale Pile 15-7, at the End of Driving

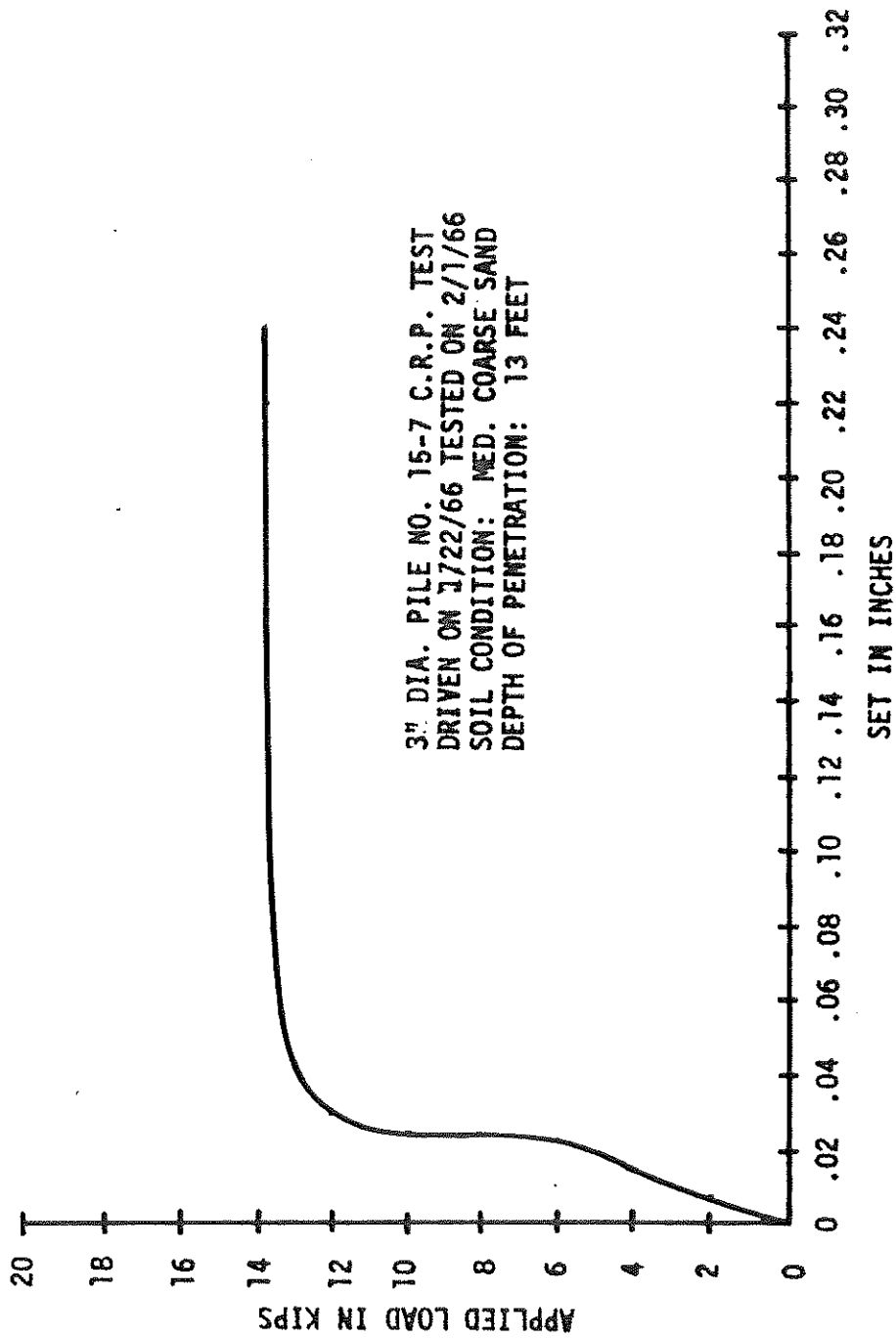


Figure 18: C.R.P. Test Results of Reduced-Scale Pile 15-7

MODEL PILE 15-7 SAND

BLOW NO. 4-A DATE FEBRUARY 1 1965

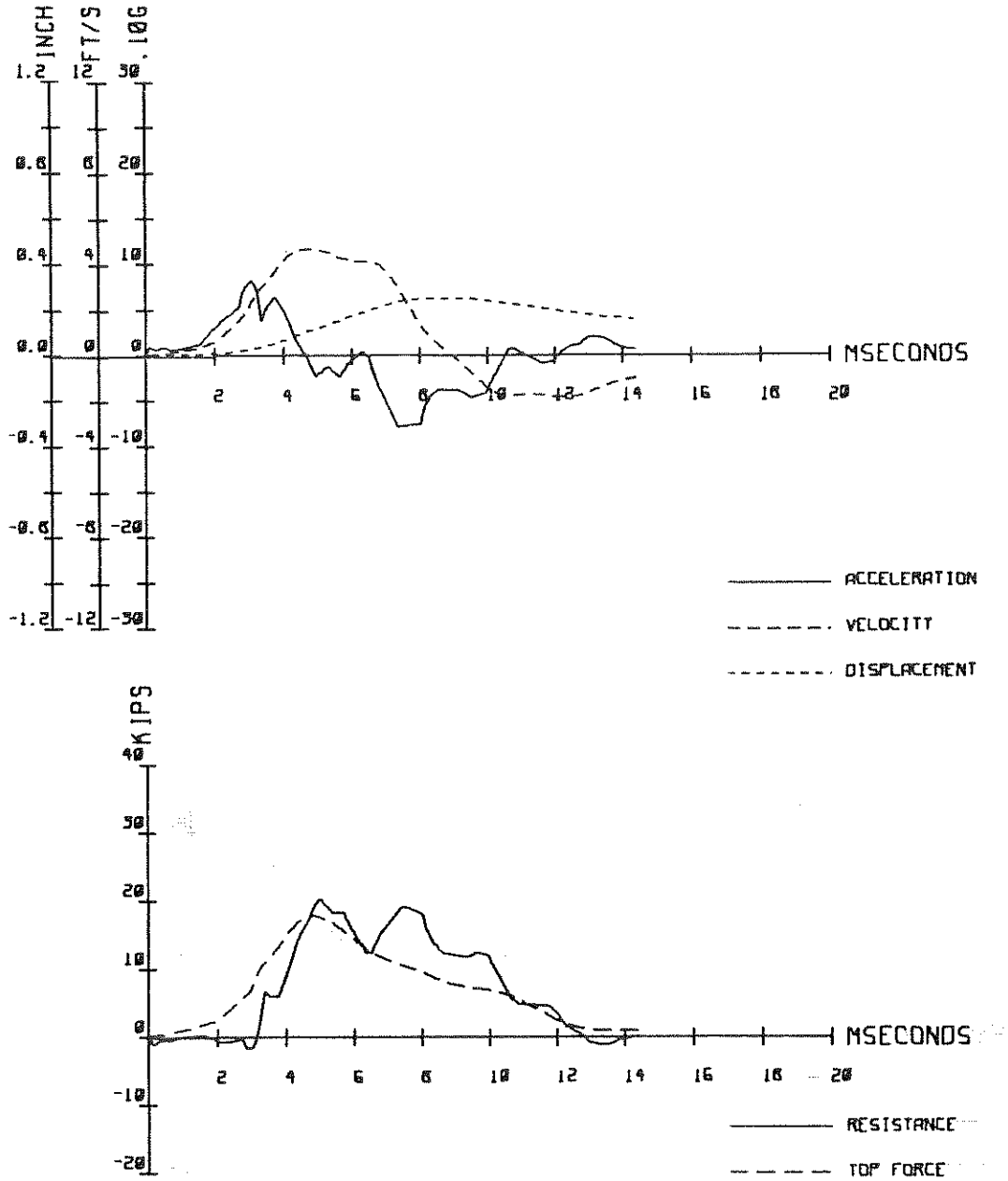


Figure 19 Dynamic Results of Reduced-Scale Pile 15-7,
Blow 4A

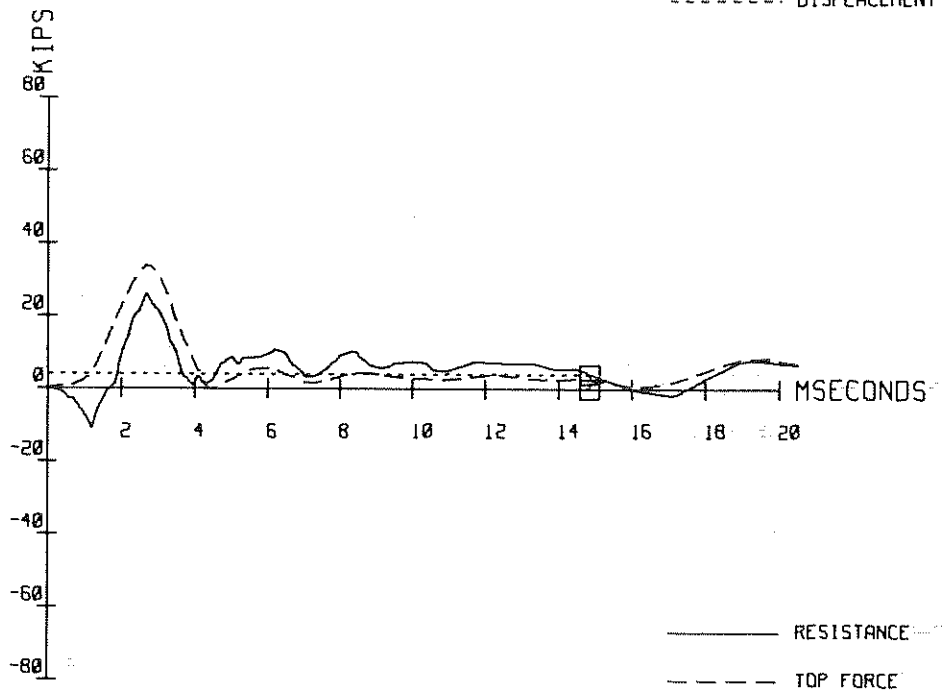
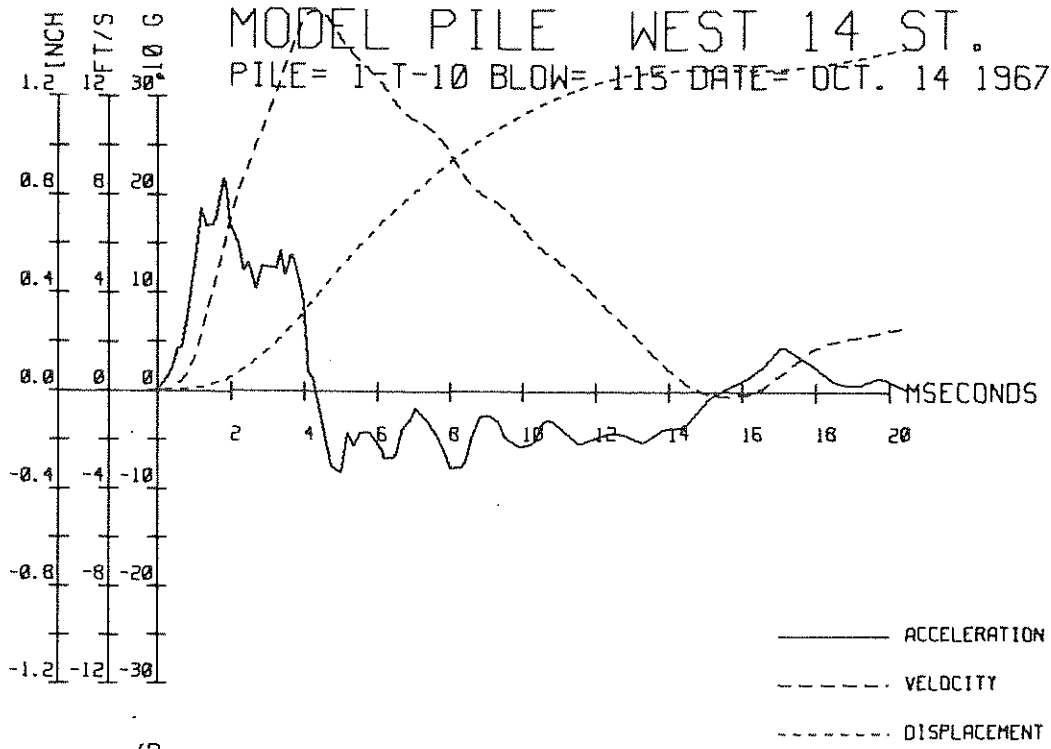


Figure 20

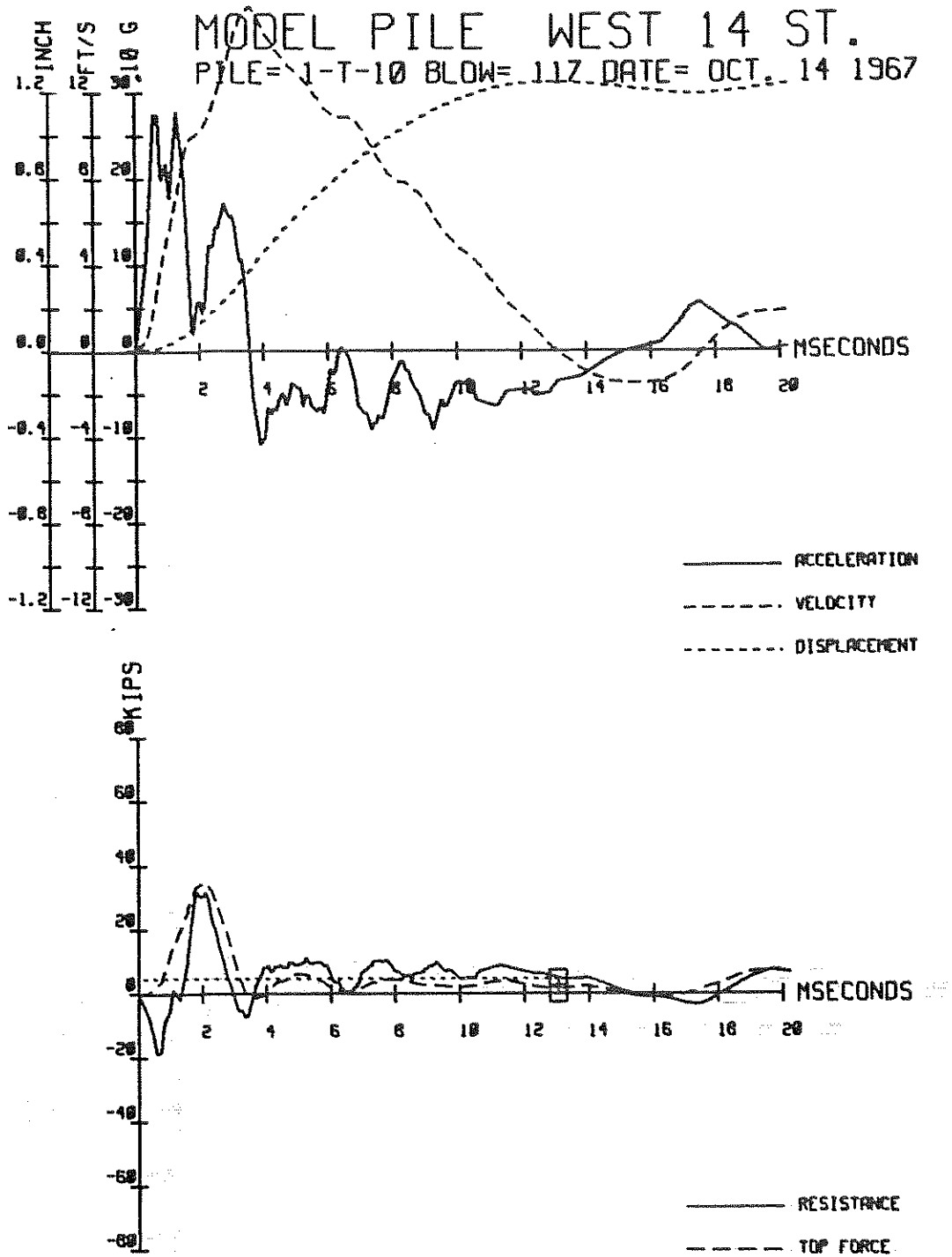


Figure 21

Pile Driven on: 10/14/67
 Pile Tested on: 10/14/67

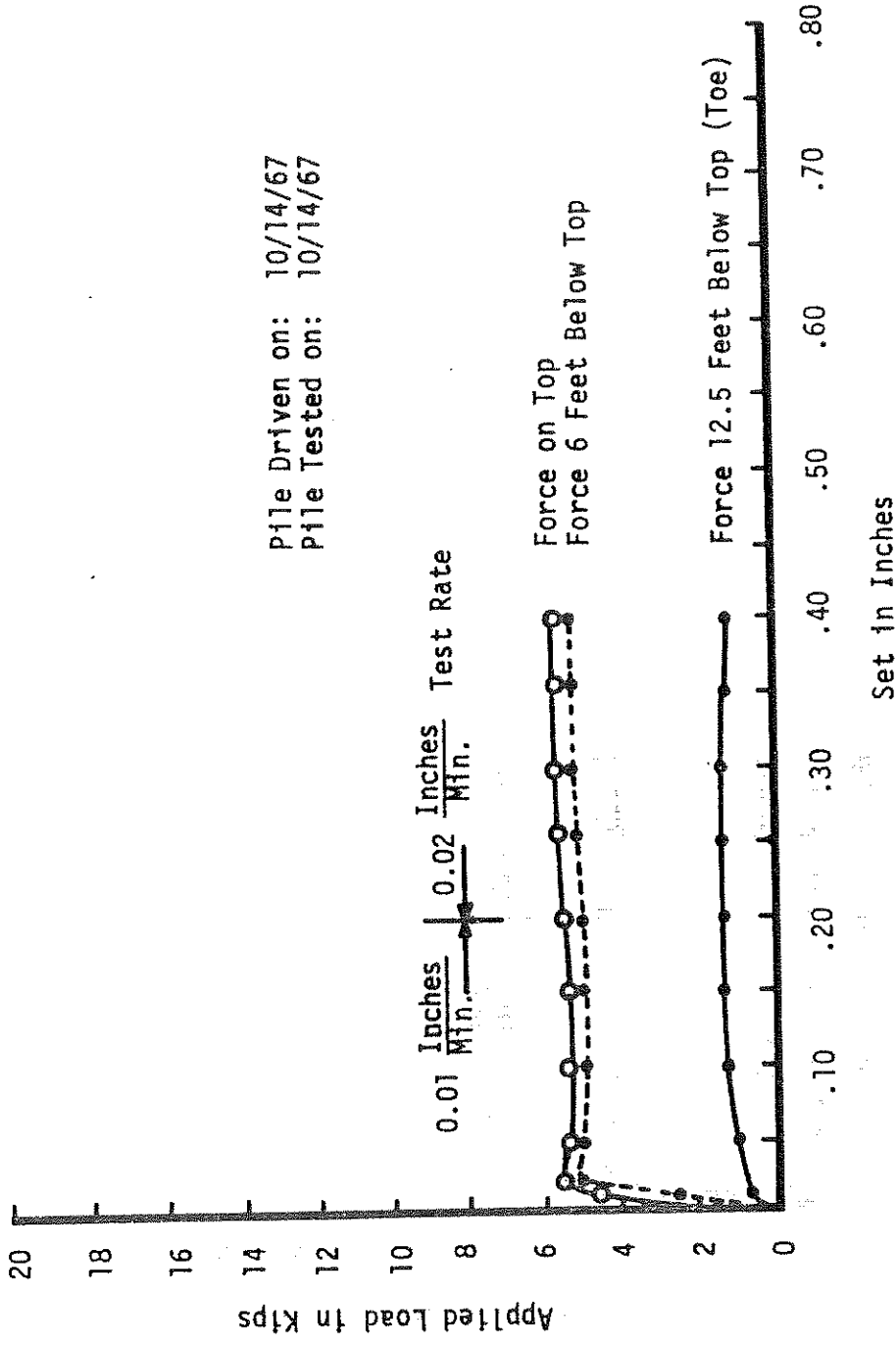


Figure 22: C.R.P. Test Results of Pile 1-T-10 After Driving Pile

Pile Driven on: 10/14/67
 Pile Tested on: 10/21/67
 Pile Restruck on: 10/21/67

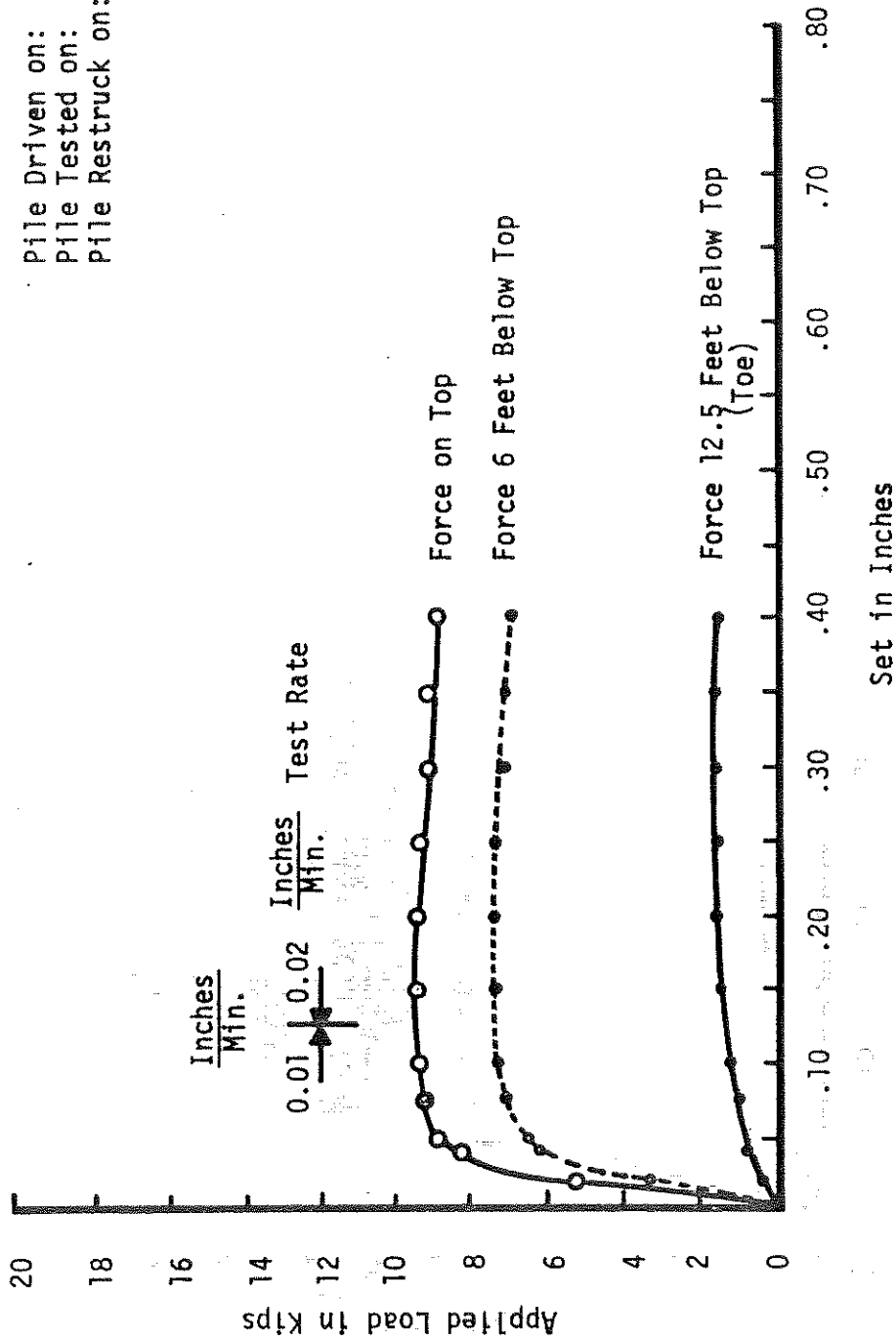


Figure 23: C.R.P. Test Results of Pile 1-T-10 Before Restrucking Pile

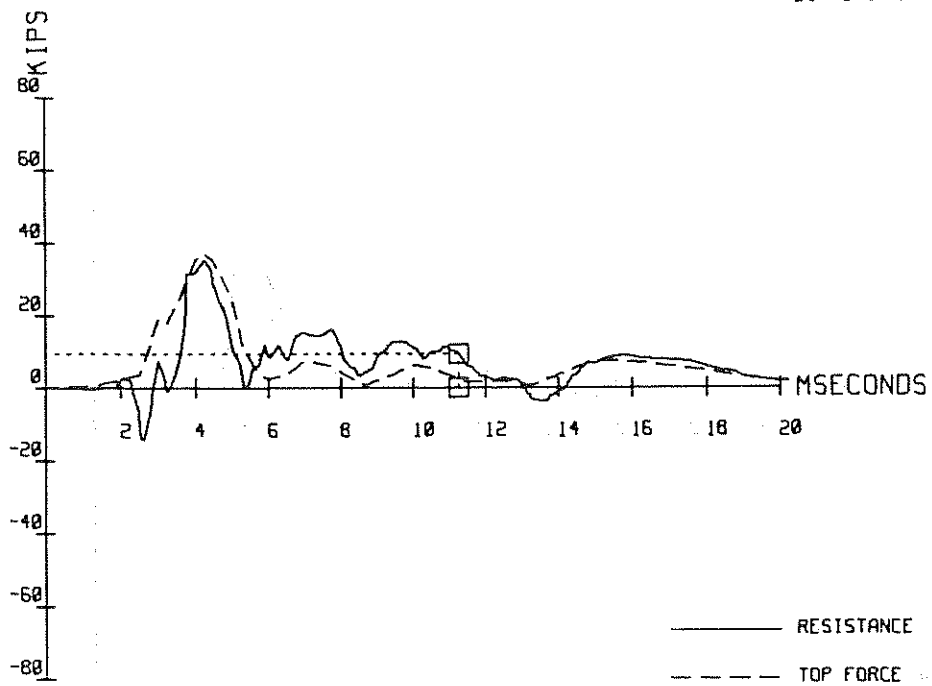
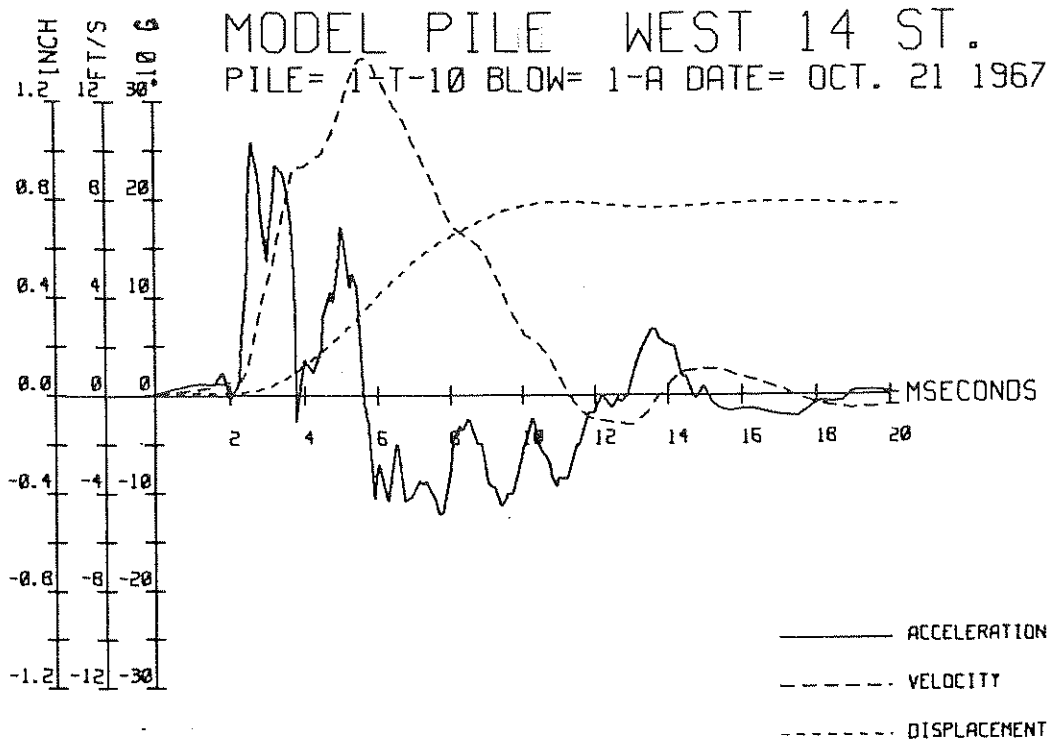


Figure 24

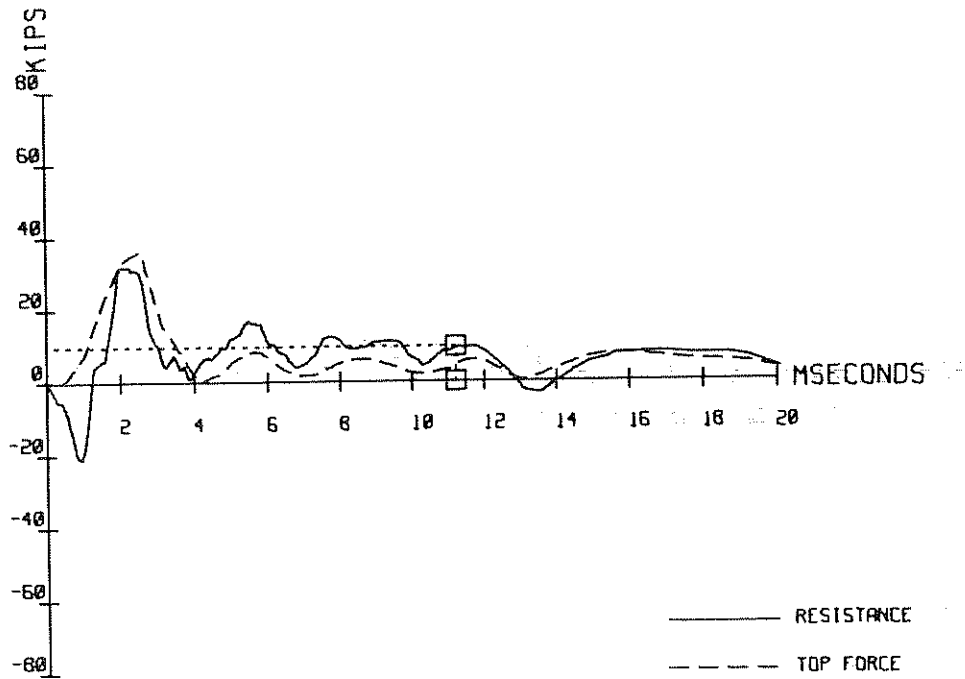
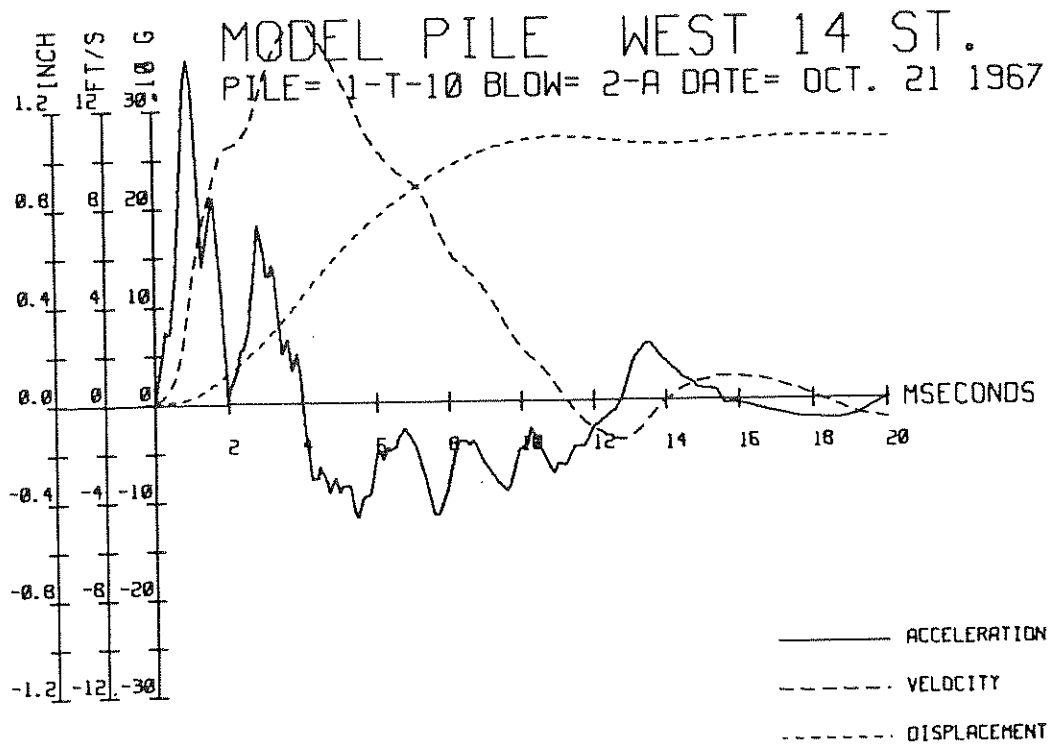


Figure 25

MODEL PILE WEST 14 ST.
 PILE= 1-T-15-20 BLOW= 4 DATE= NOV. 25 67

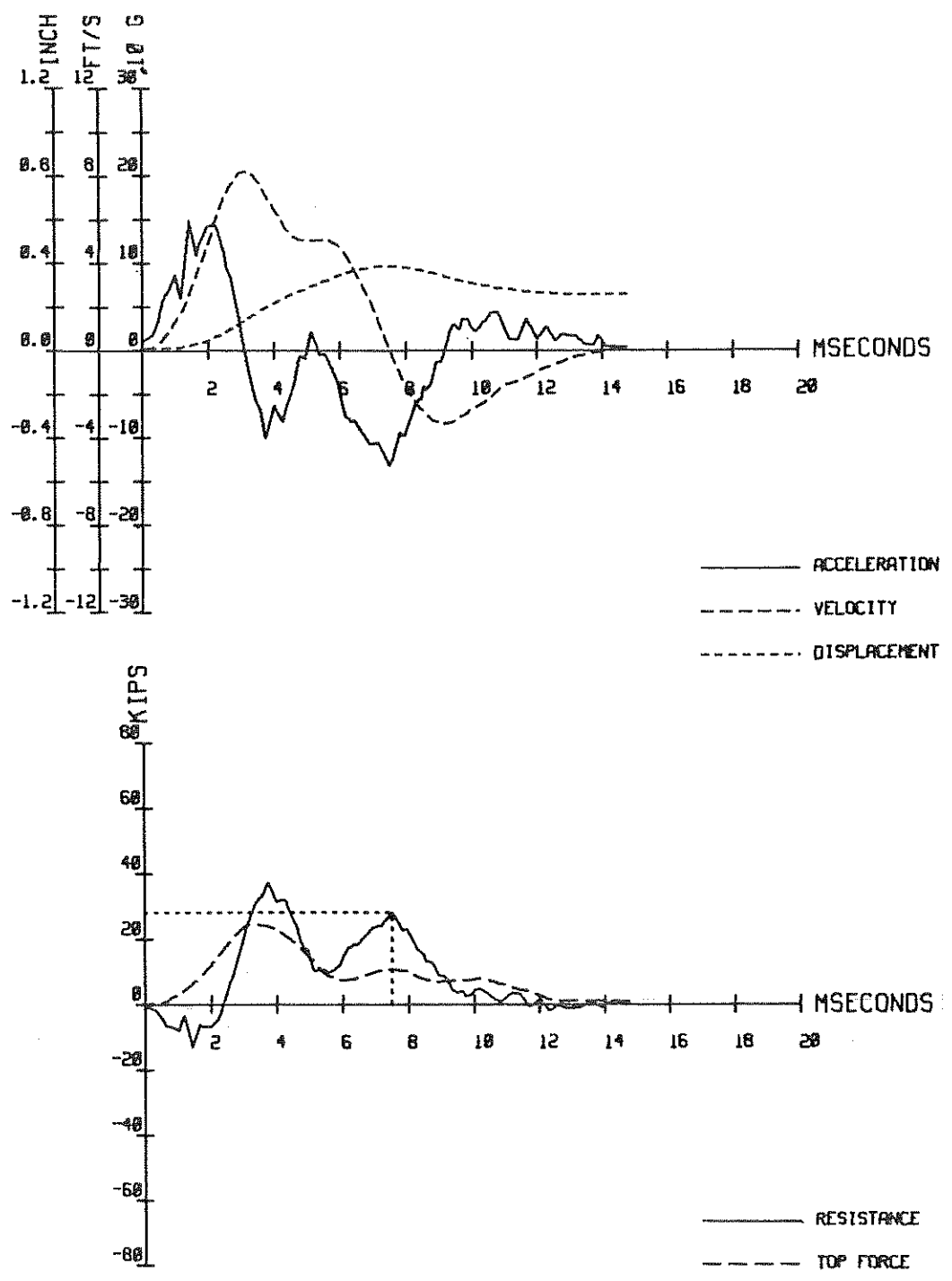


Figure 26

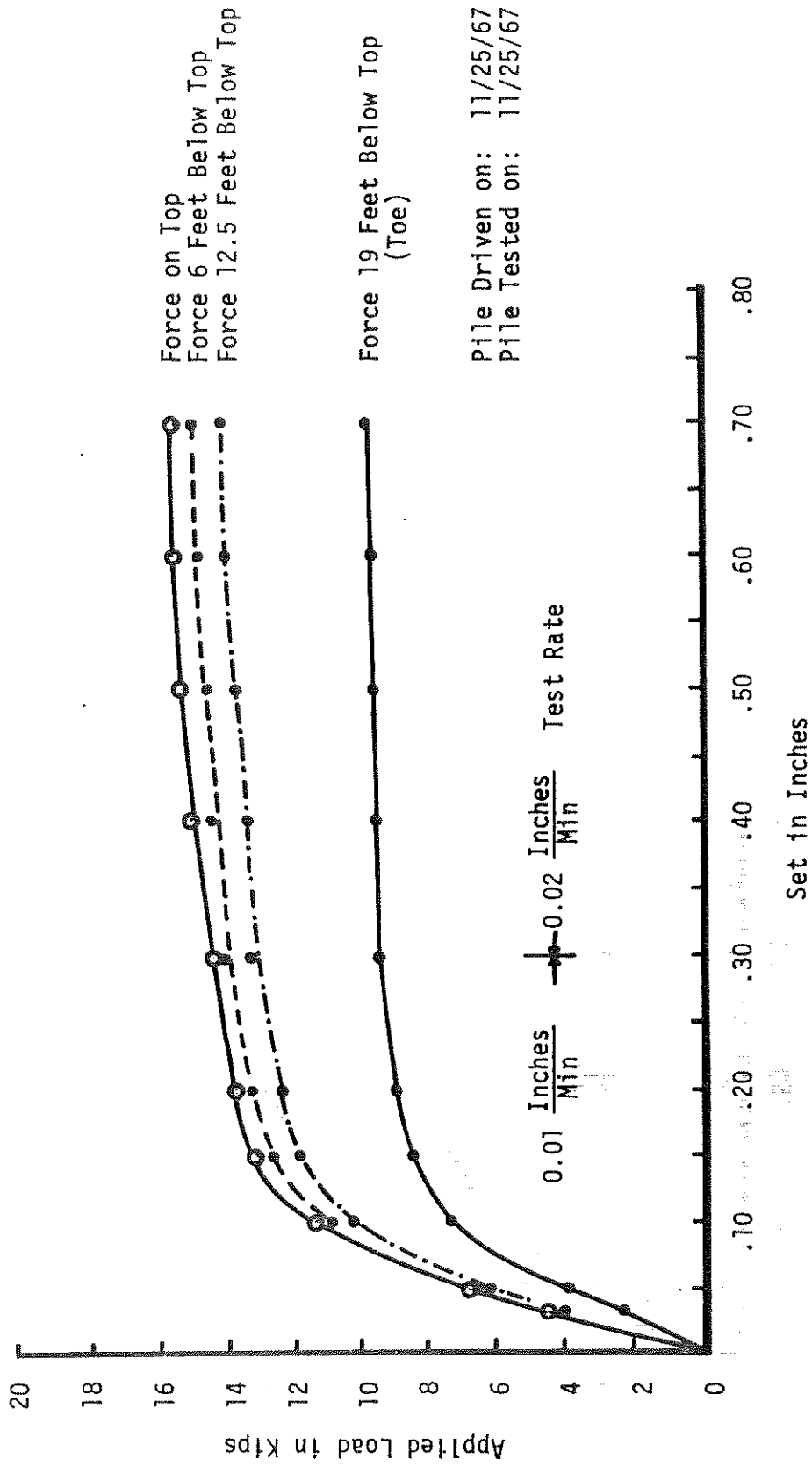


Figure 27: C.R.P. Test Results of Pile 1-T-15/20 After Driving Pile

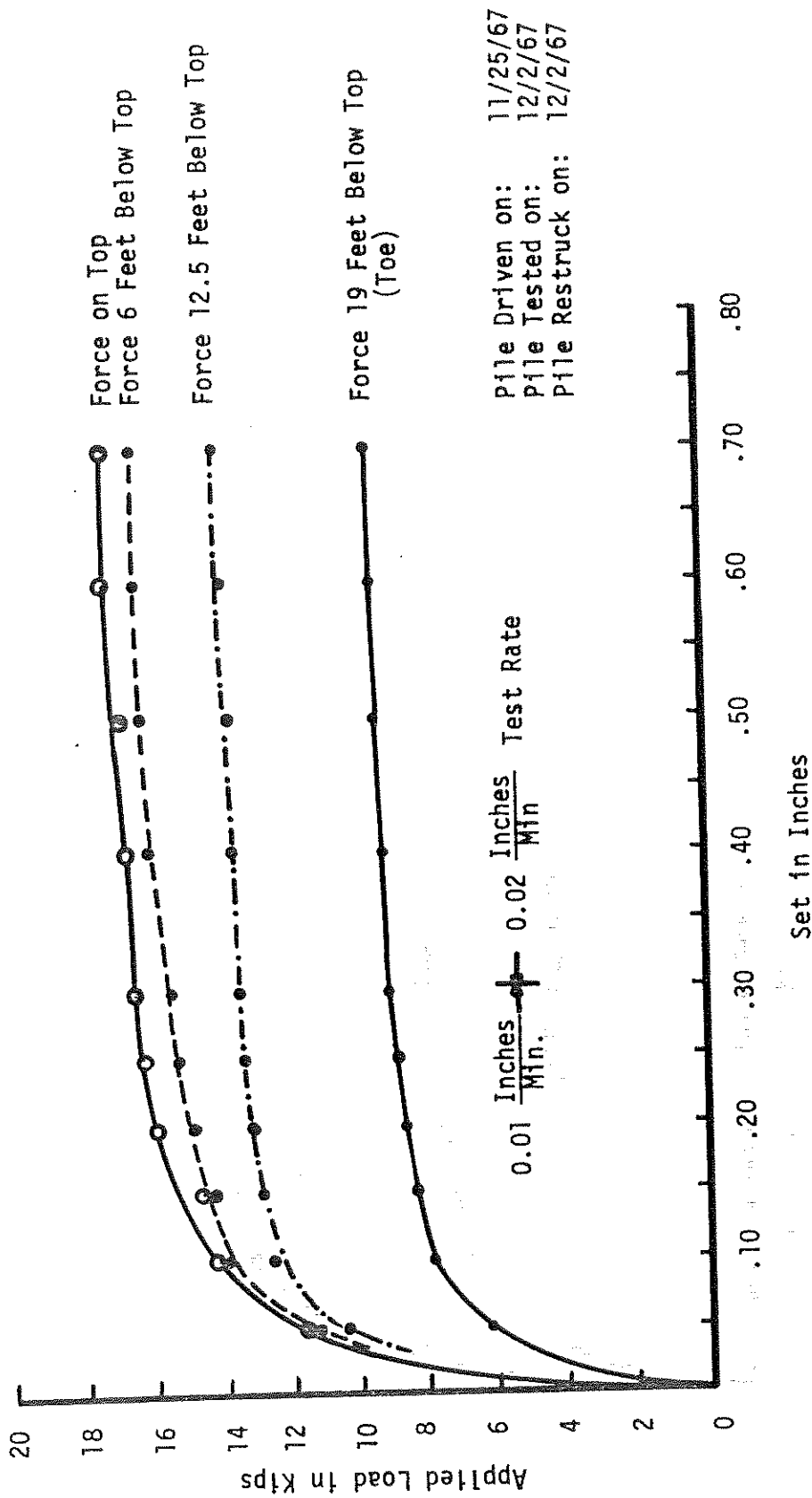


Figure 28: C.R.P. Test Results of Pile 1-T-15/20 Before Restricting Pile

MODEL PILE WEST 14 ST.
 PILE= 1-T-15-20 BLOW=1-A DATE= DEC. 2 1967

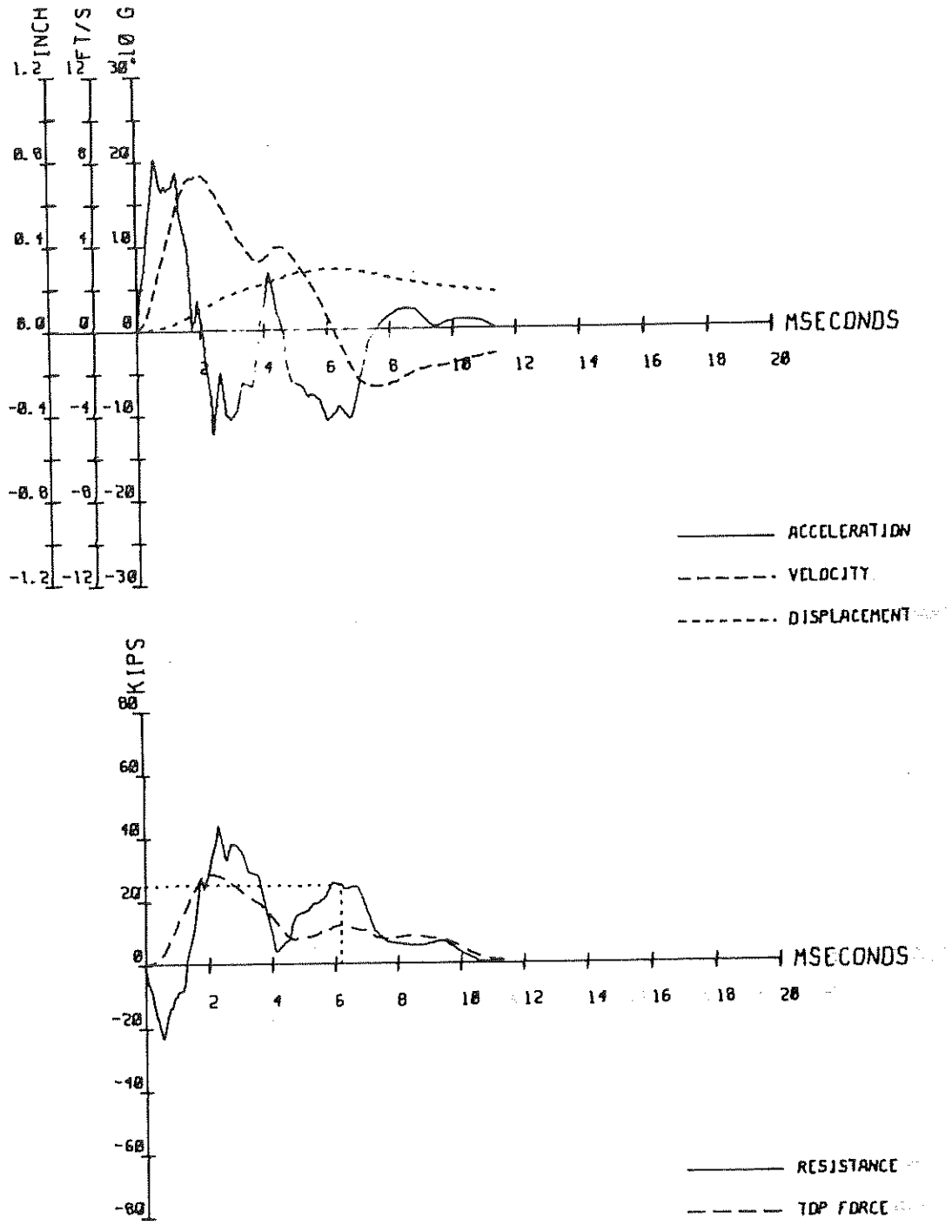


Figure 29

MODEL PILE WEST 14 STREET
 PILE=2-T-15-20 BLOW=5 DATE=DEC. 28 1967

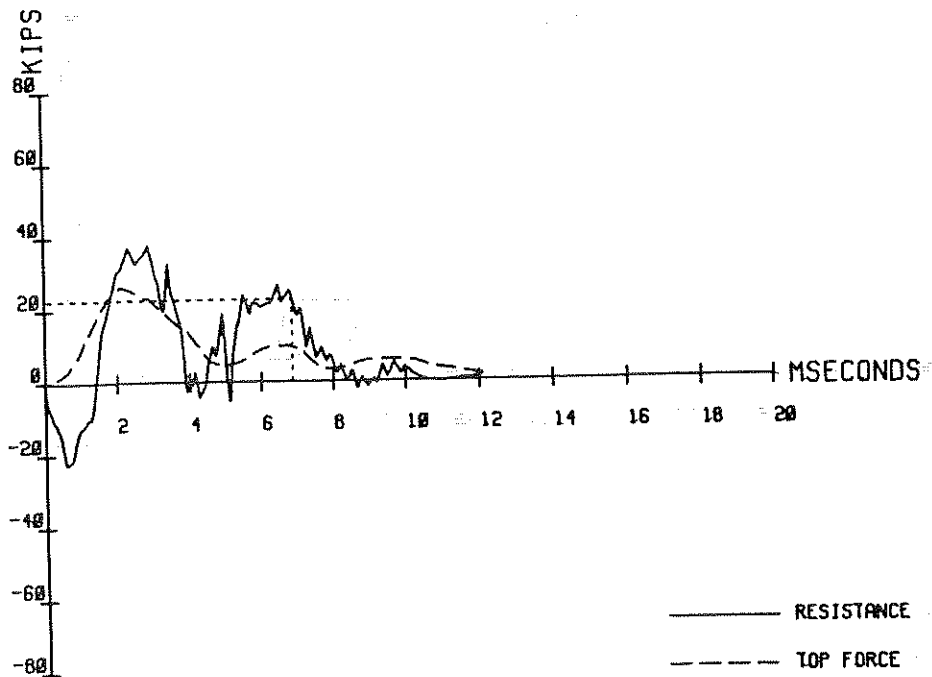
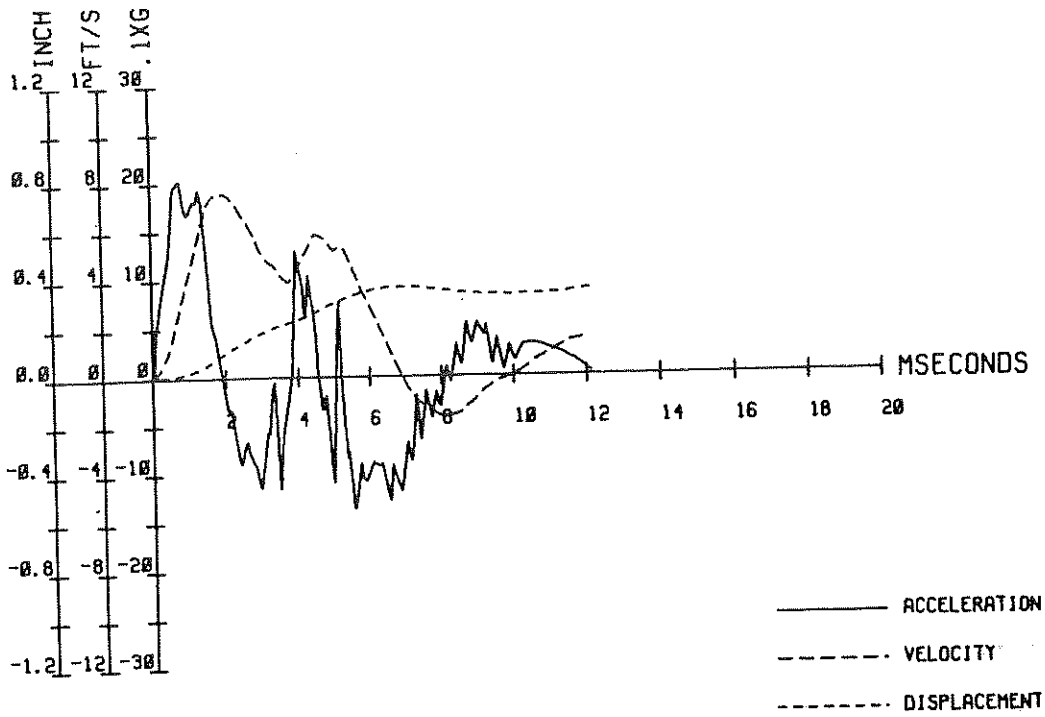


Figure 30

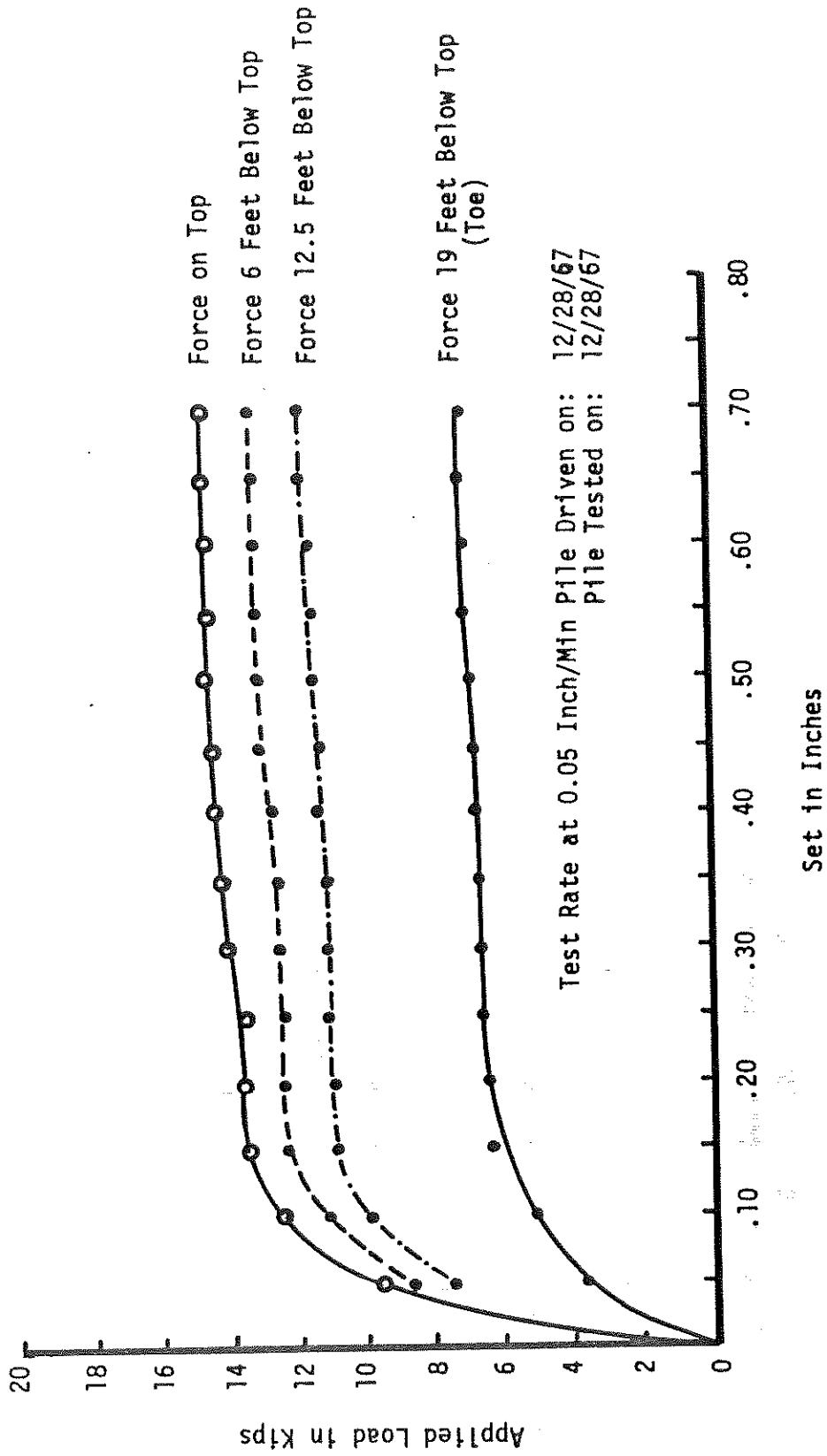


Figure 31: C.R.P. Test Results of Pile 2-T-15/20 After Driving Pile

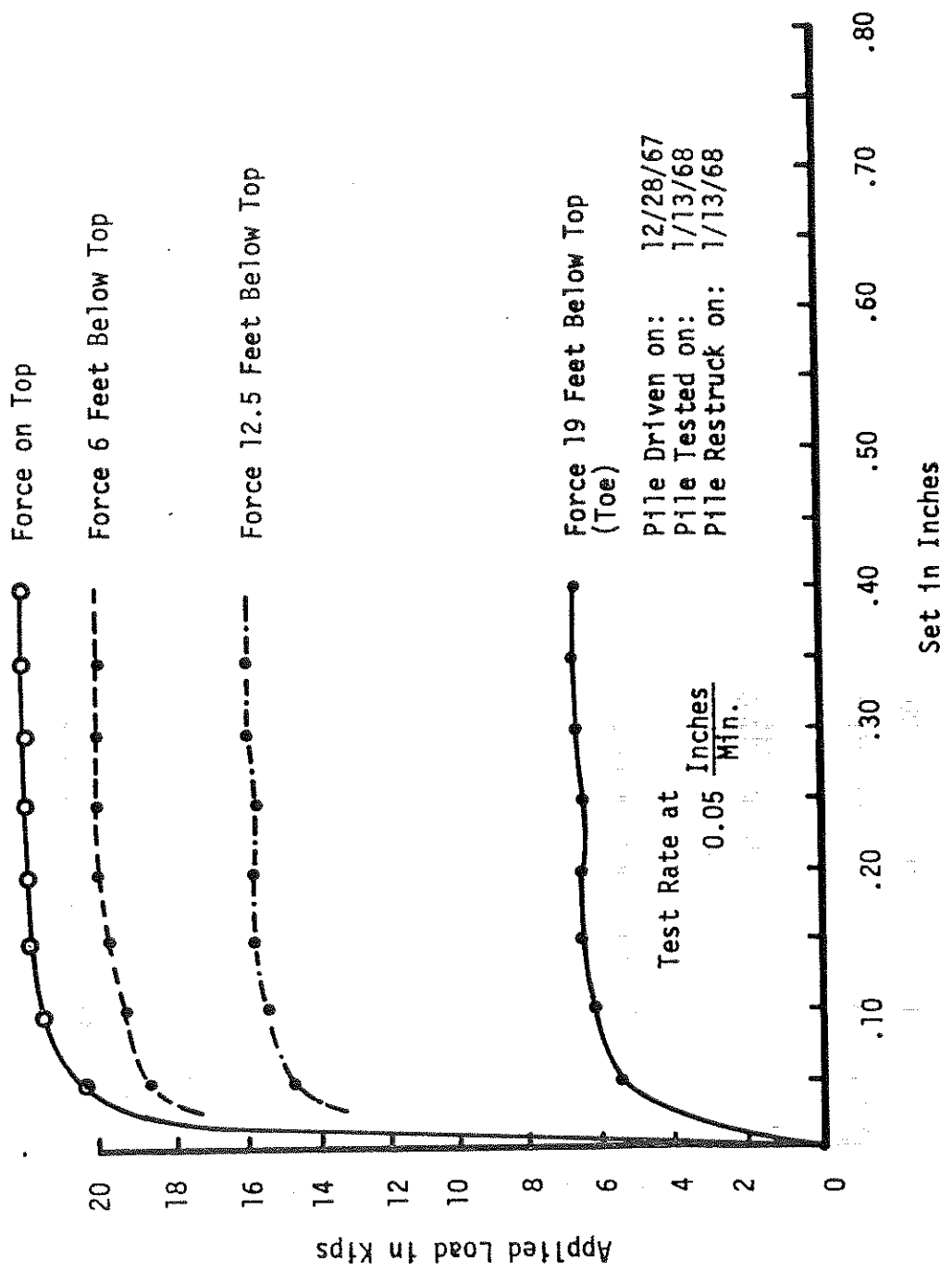


Figure 32: C.R.P. Test Results of Pile 2-T-15/20 Before Restrucking Pile

MODEL PILE WEST 14 ST.
 PILE= 2-T-15-20 BLOW=2-A DATE= JAN. 13 1968

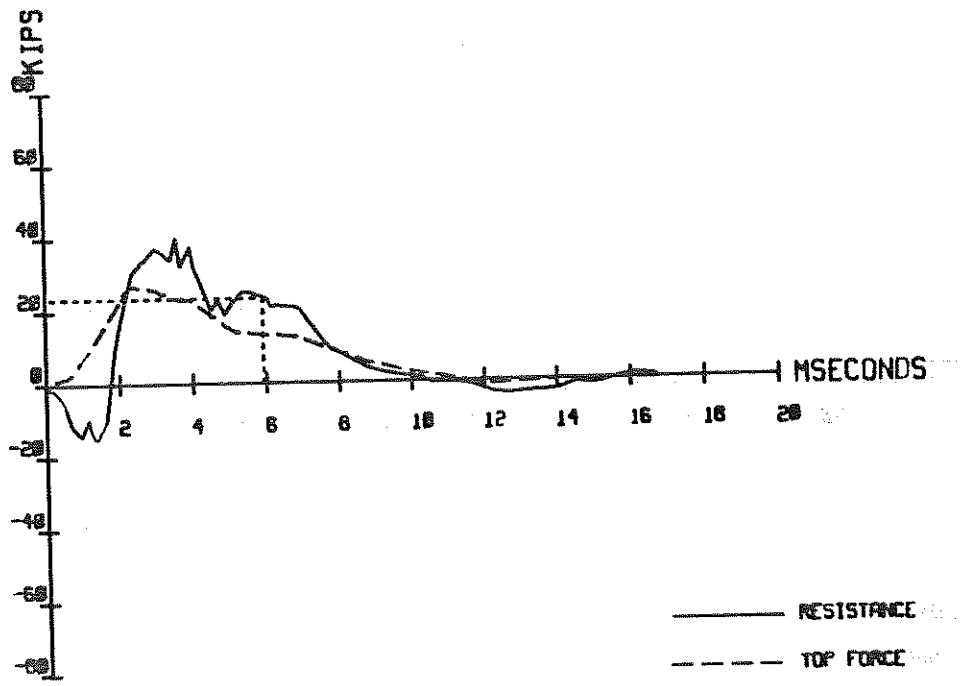
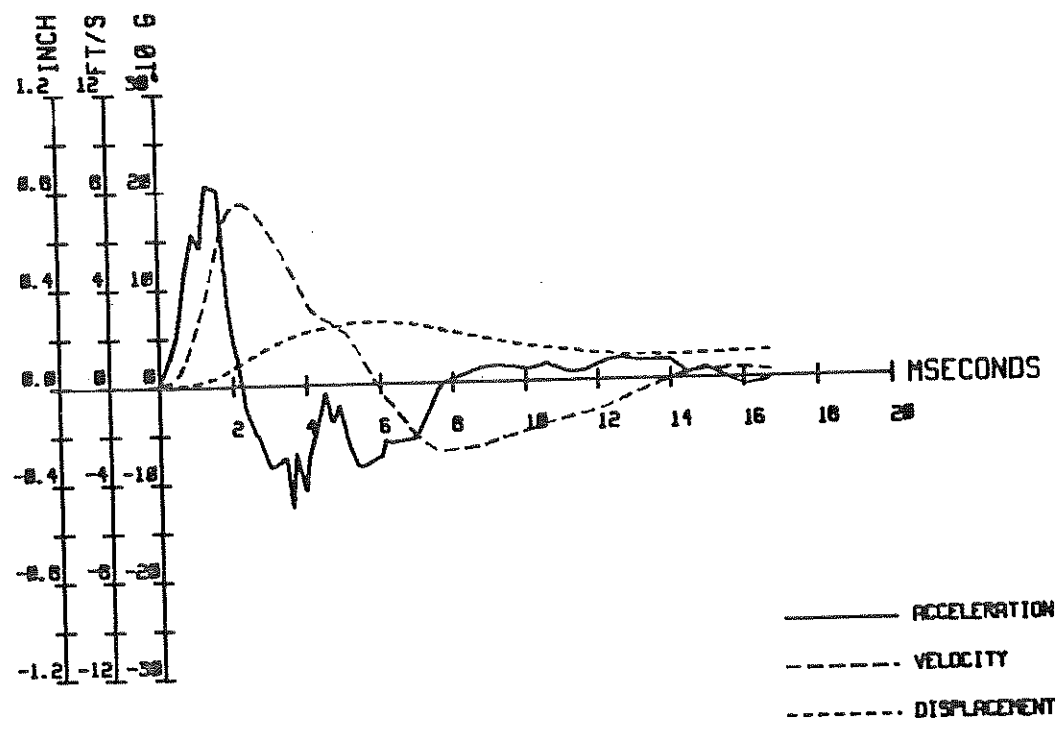


Figure 33

MODEL PILE WEST 14 ST.
 PILE= 2-T-15-20 BLOW=1-A DATE= JAN. 13 1968

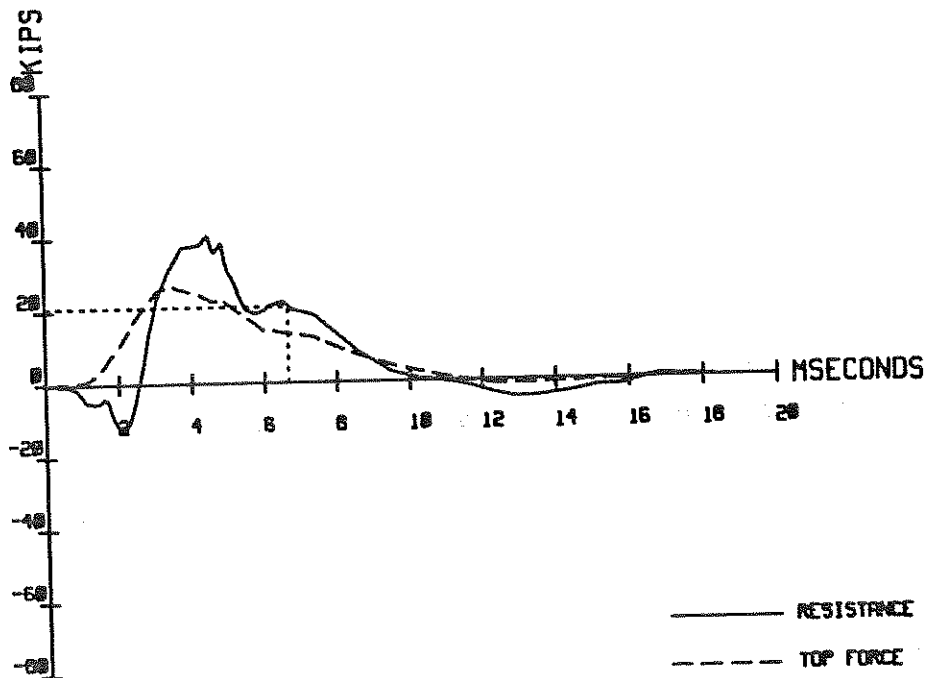
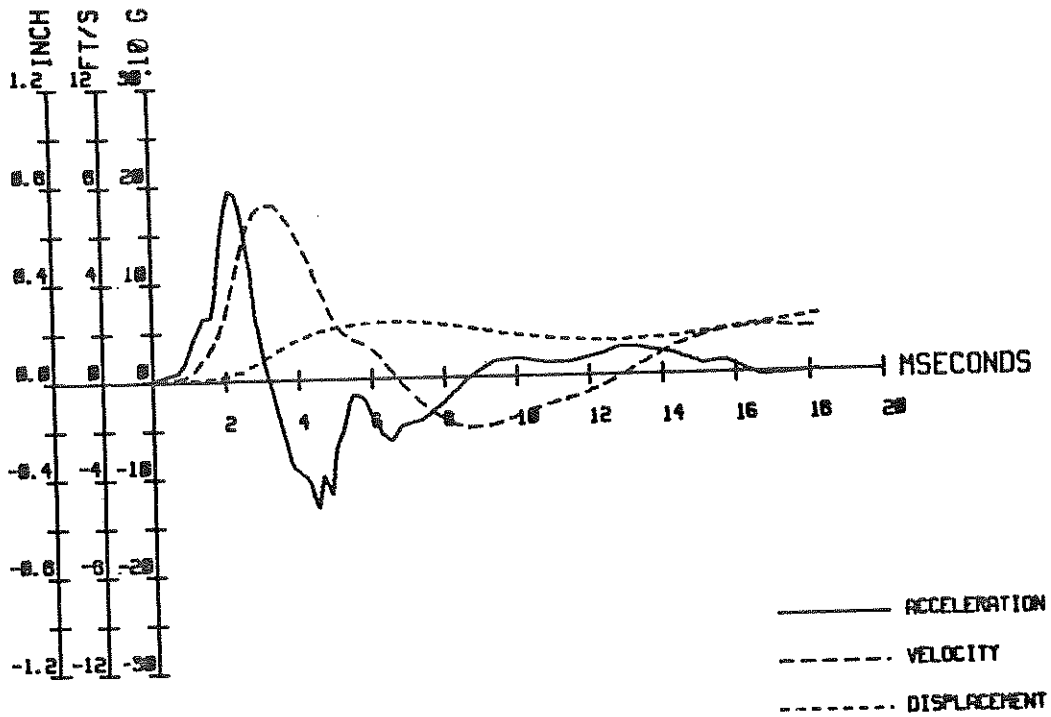


Figure 34

LOADTEST AND DYNAMIC RESULTS
FOR MODEL PILES DRIVEN IN SILT

Test Site: Jennings Road in Cleveland, Ohio

Surface Elevation at 627.0 Feet

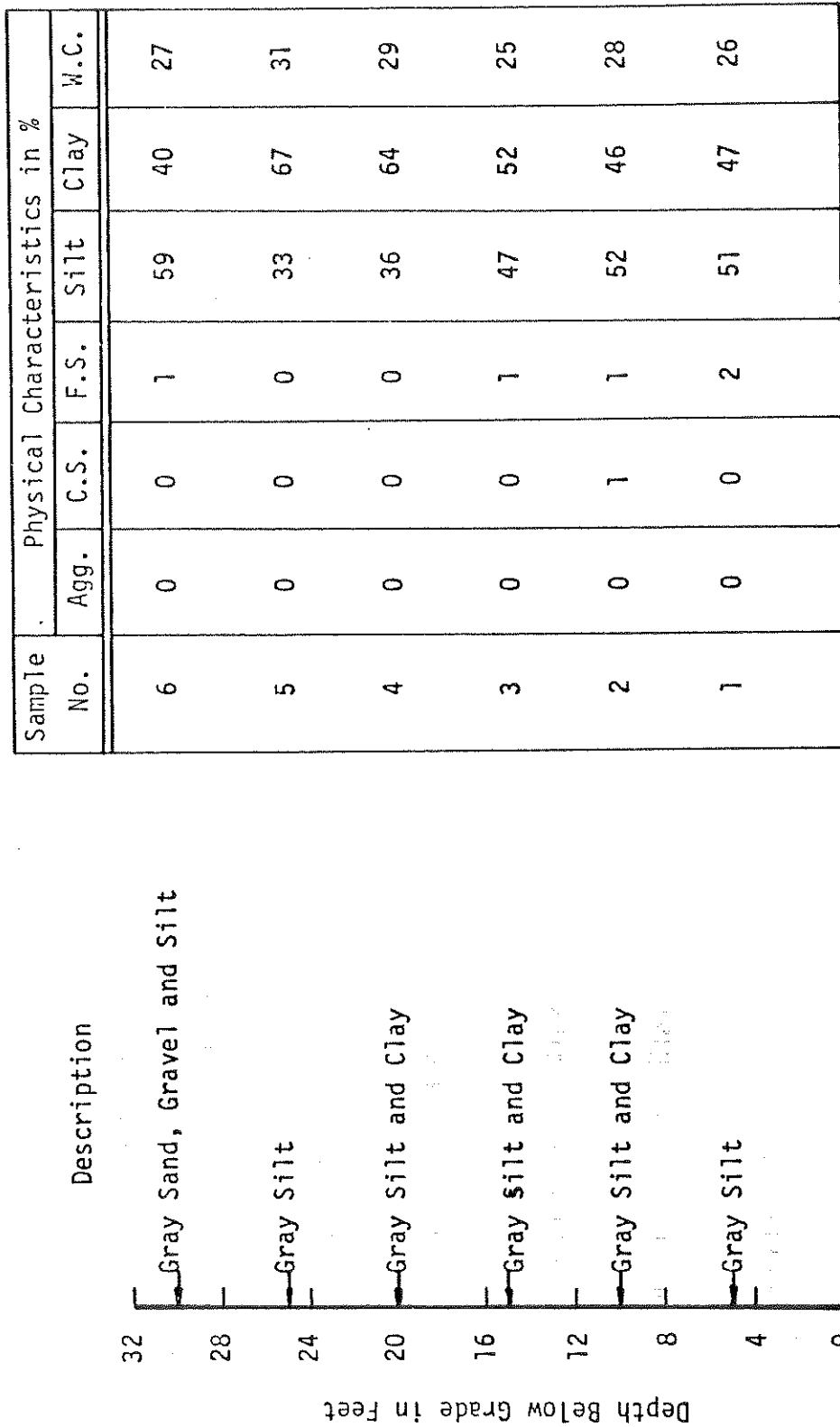


Figure 35 Soil Characteristics at Jennings Road Site

MODEL PILE 10-1 SILT

BLOW NO. 136 DATE JUNE 27 1966

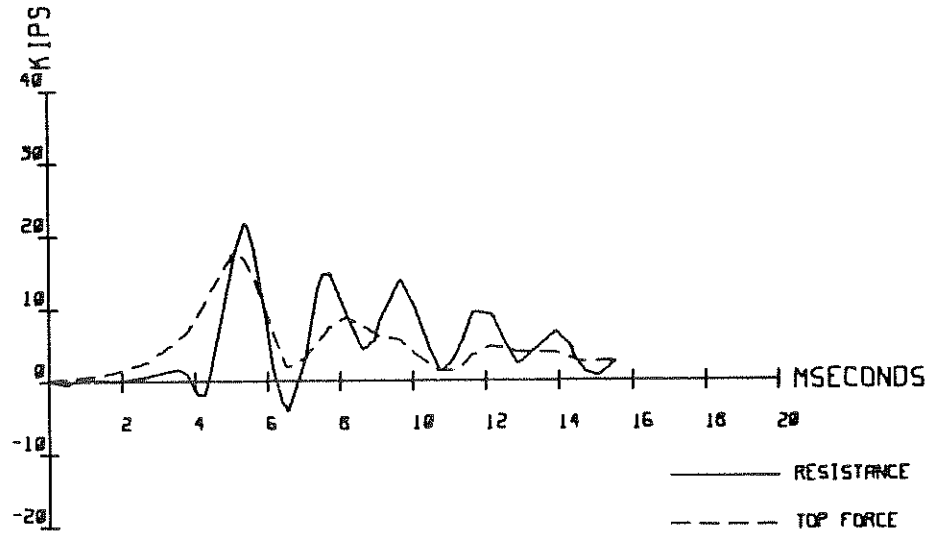
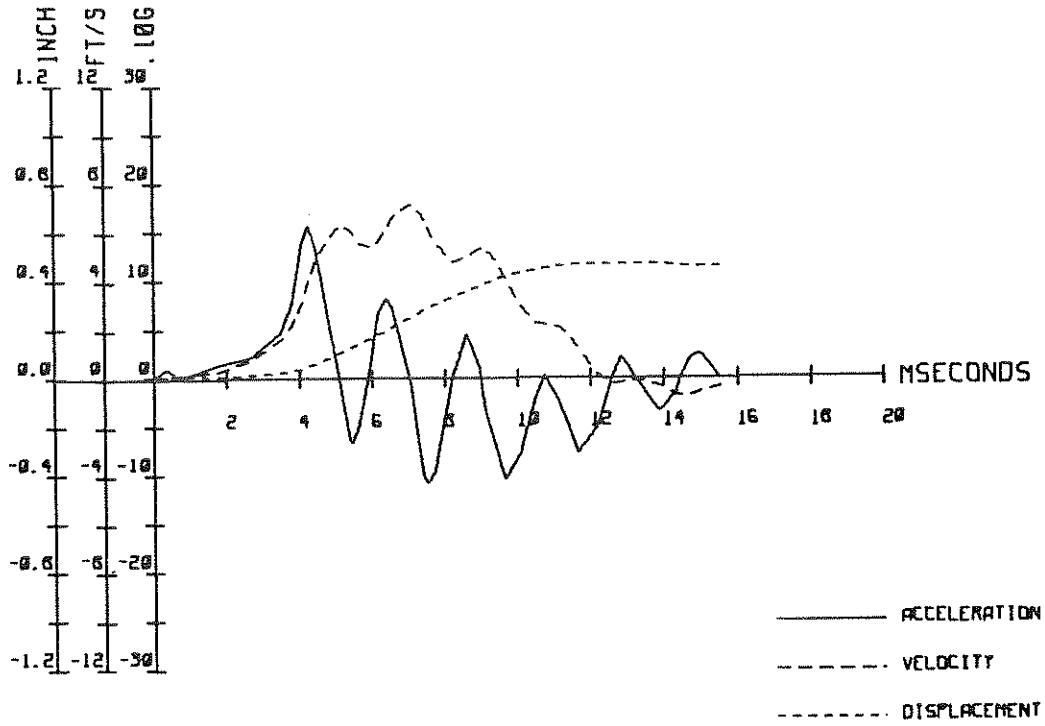


Figure 36 Dynamic Results of Reduced-Scale Pile 10-1 Silt, at the End of Driving.

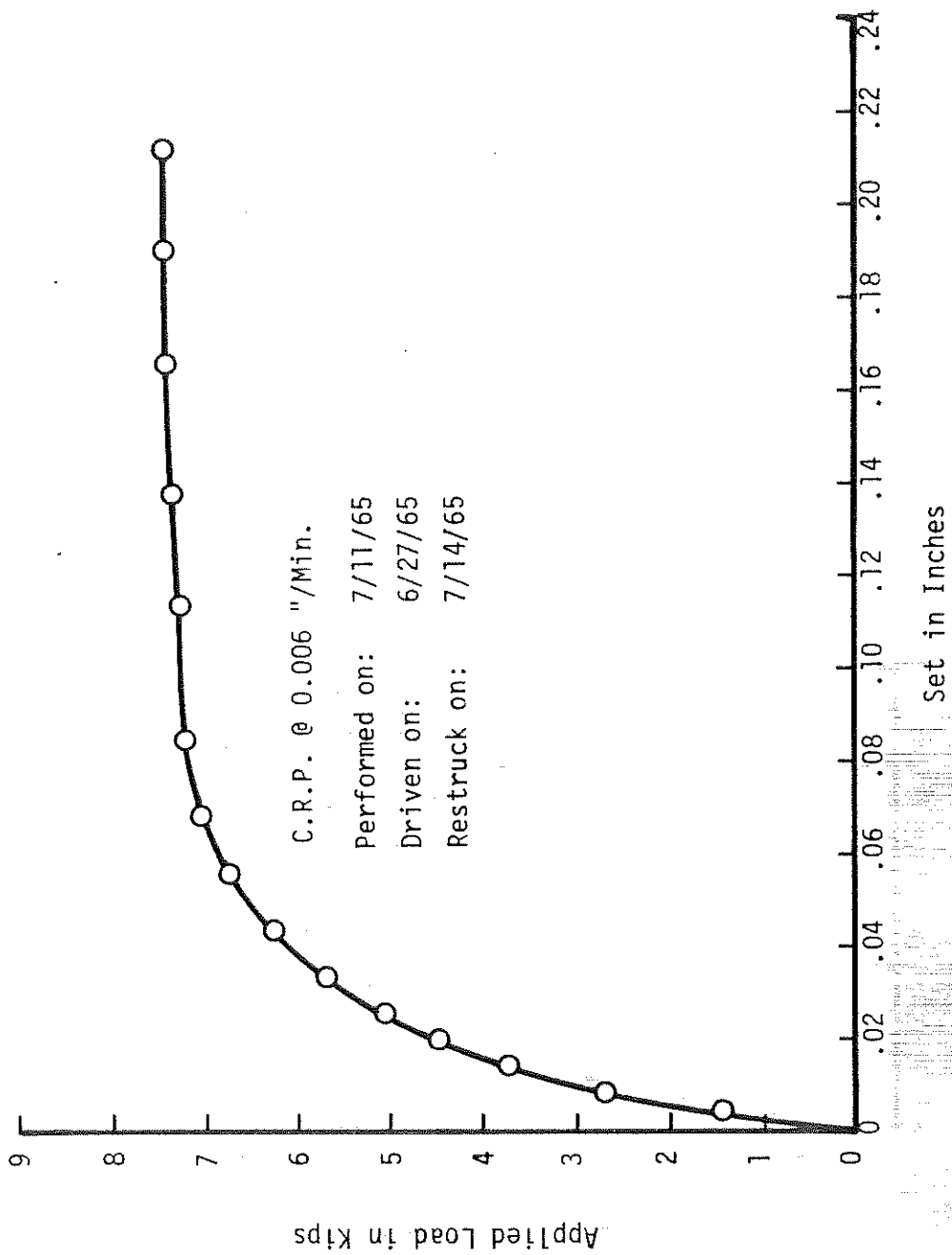


Figure 37 C.R.P. Test Results of Reduced-Scale Pile 10-1 Silt

MODEL PILE 10-1 SILT

BLOW NO. 4-A DATE JULY 14 1966

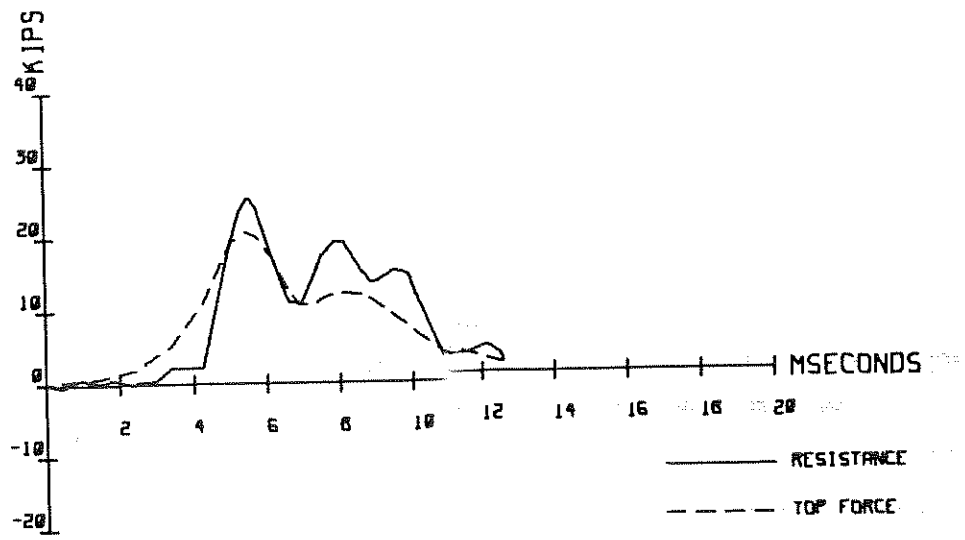
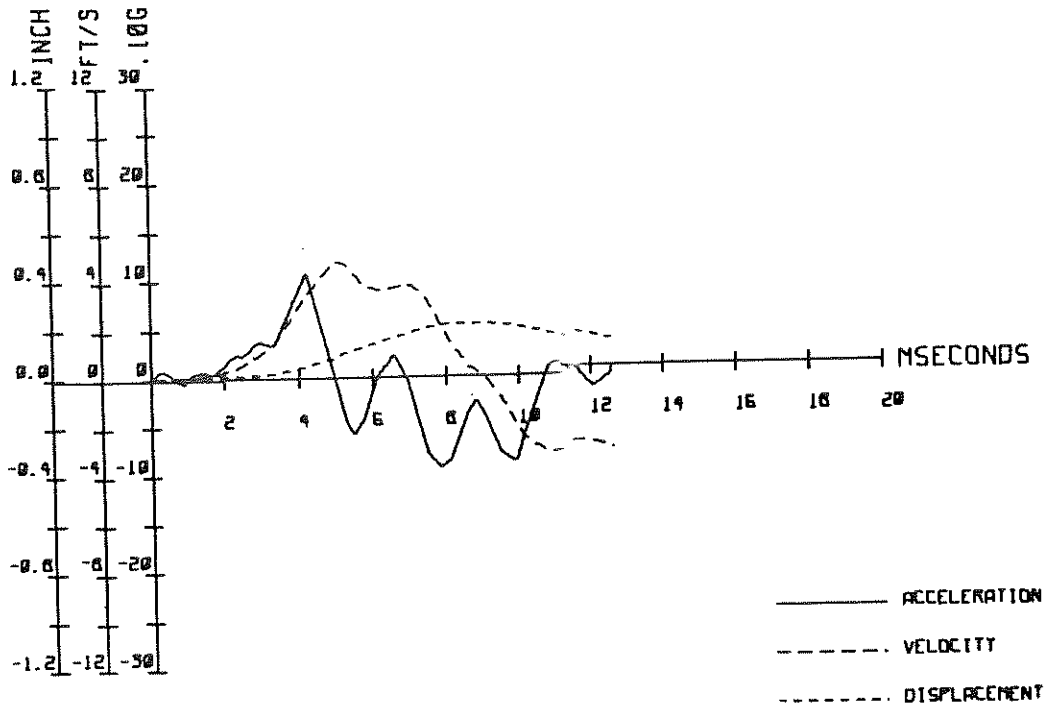


Figure 38 Dynamic Results of Reduced-Scale Pile 10-1 Silt, Blow 4A

MODEL PILE 10-1 SILT

BLOW NO. 5-A DATE JULY 14 1966

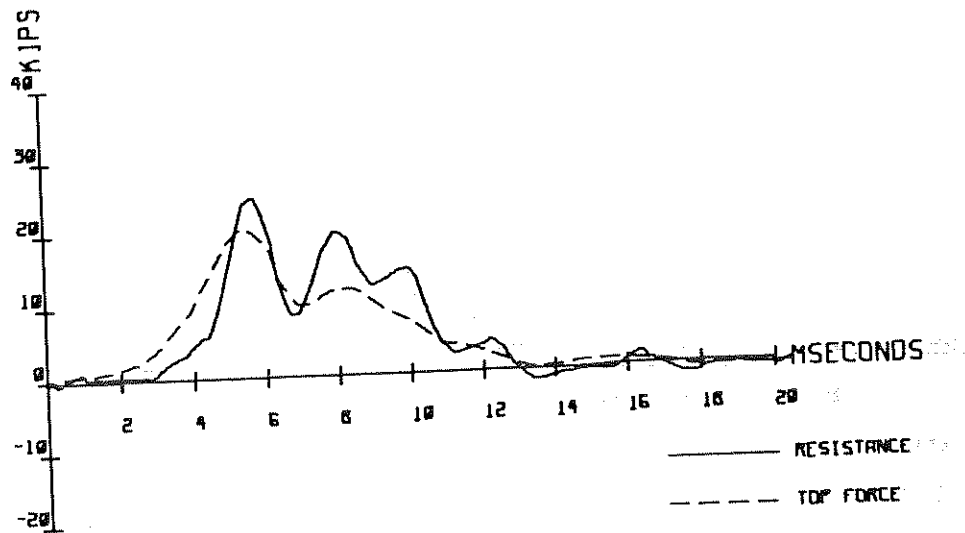
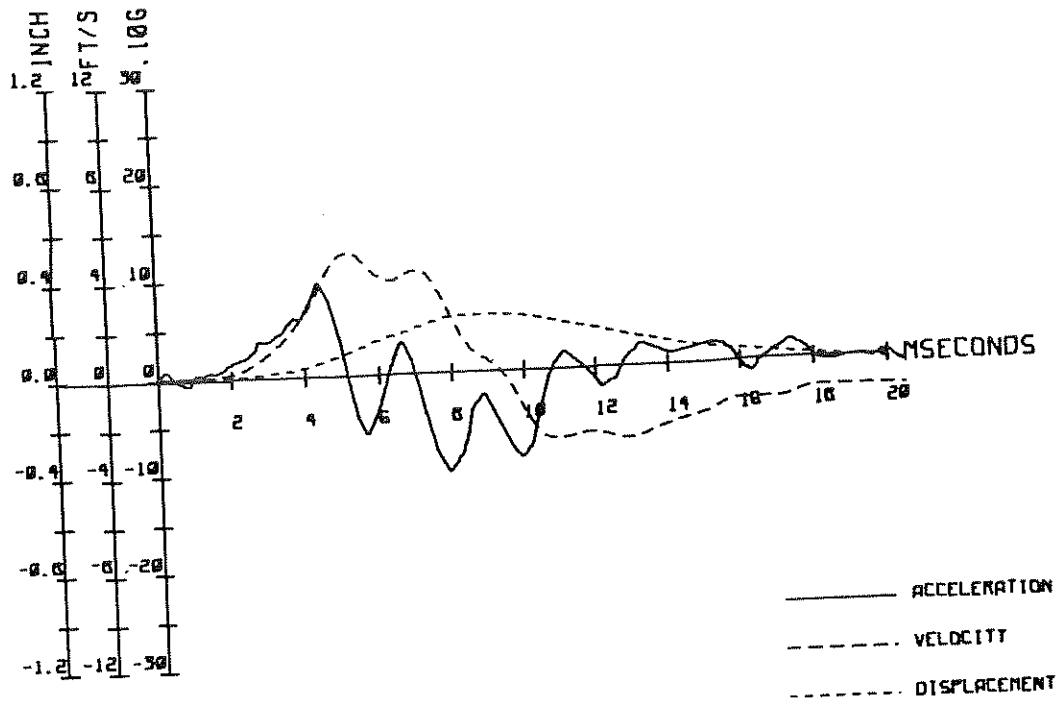


Figure 39 Dynamic results of Reduced-Scale Pile 10-1 Silt, Blow 5A

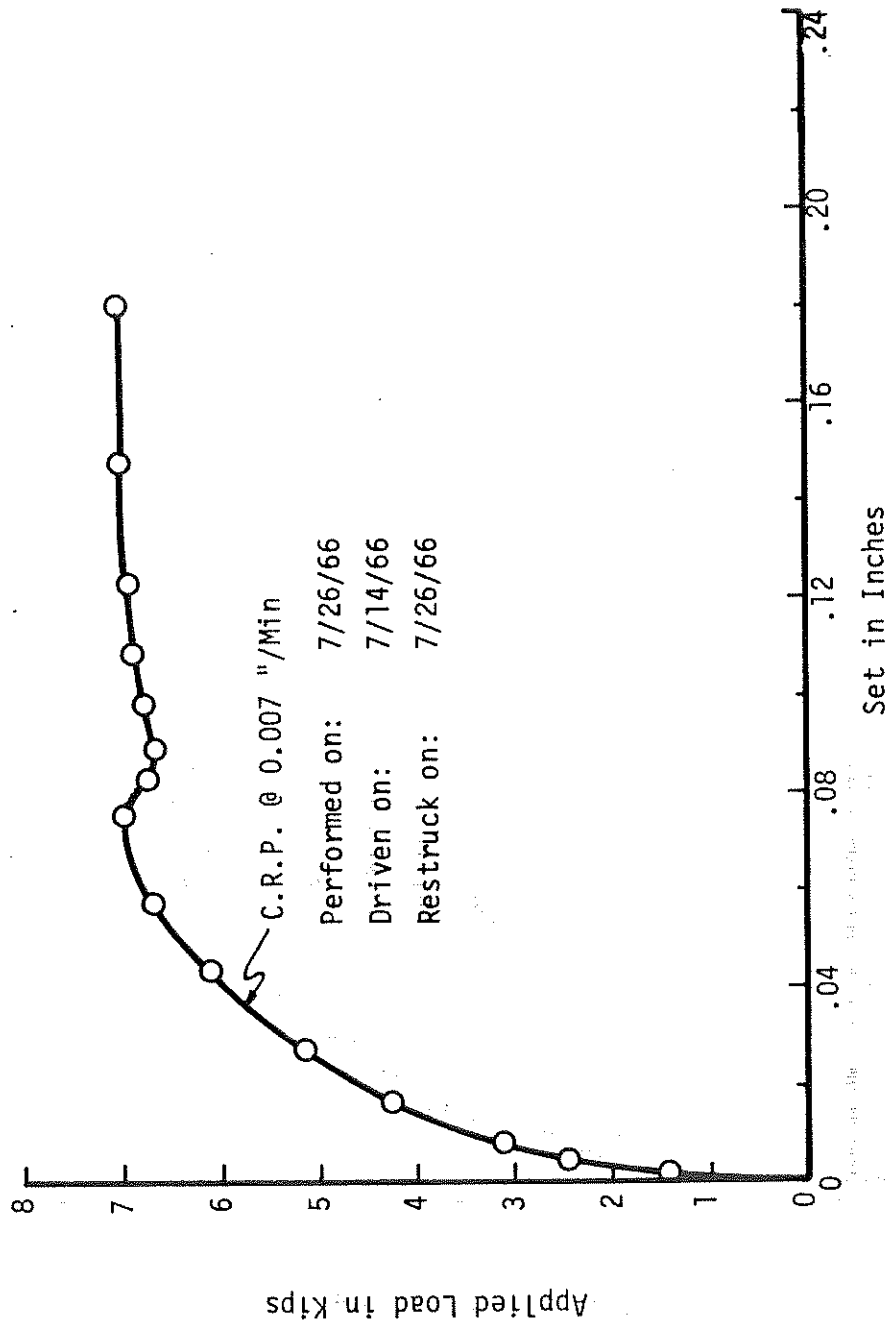


Figure 40 C.R.P. Test Results of Pile 10-2 Silt

MODEL PILE 10-2 SILT

BLOW NO. 1-A DATE JULY 26 1966

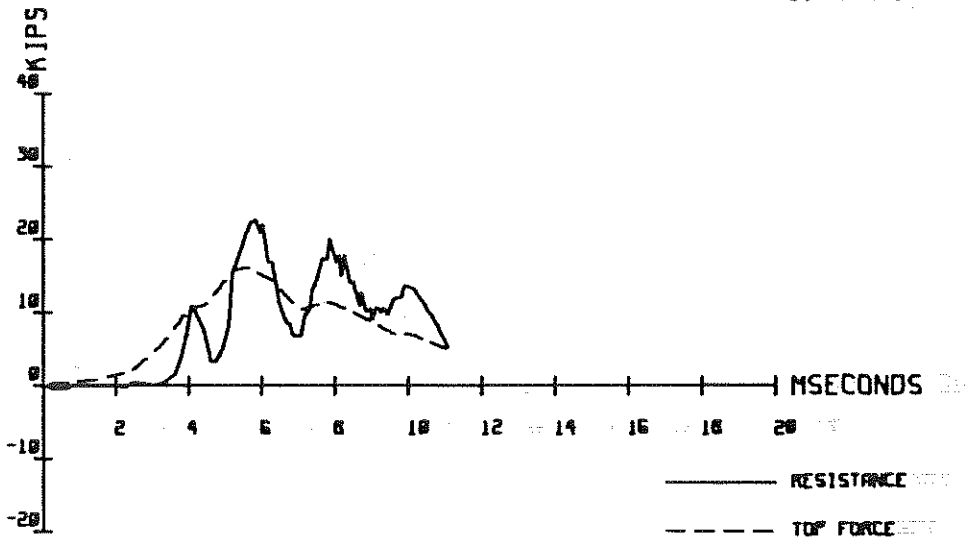
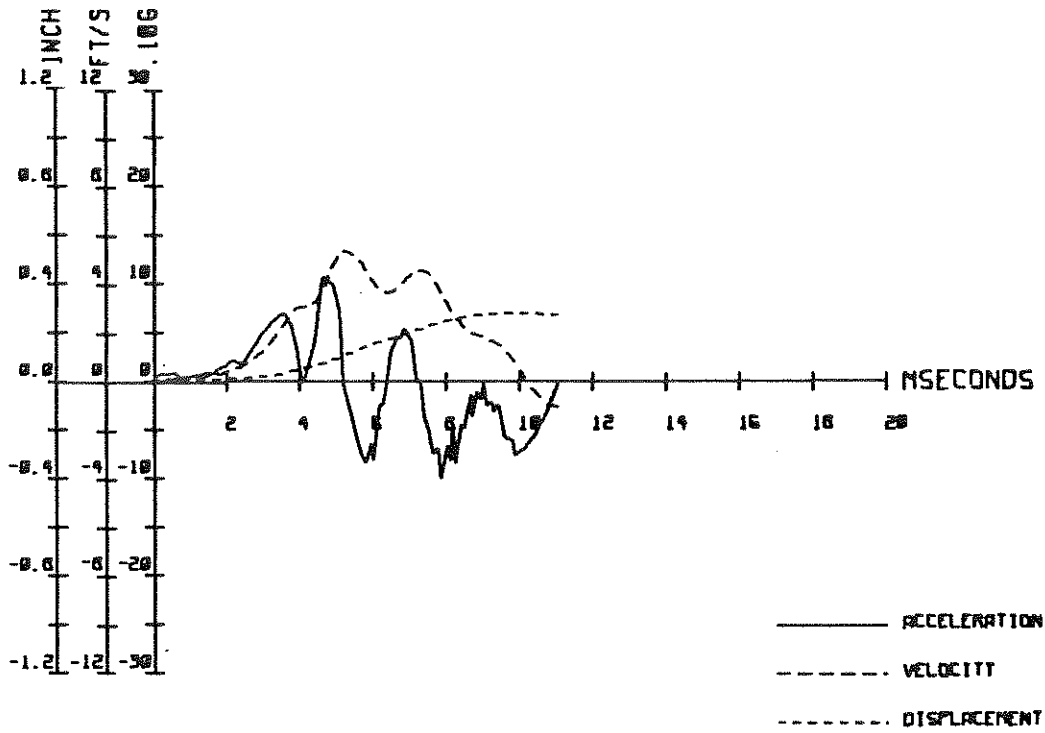


Figure 41 Dynamic Results of Reduced-Scale Pile 10-2 Silt, Blow 1A

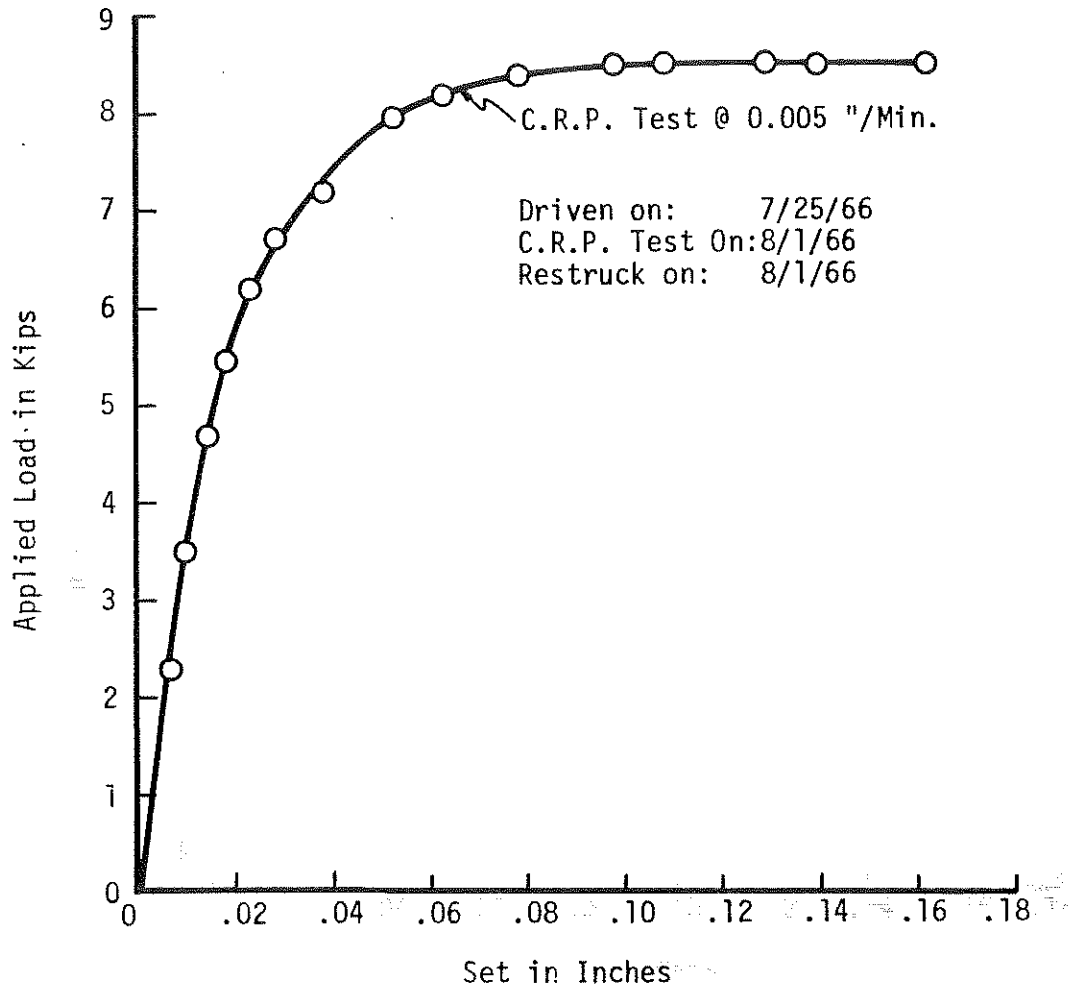


Figure 42 C.R.P. Test Results of Reduced-Scale Pile 10-3
 Silt

MODEL PILE 10-3 SILT

BLOW NO. 1-A DATE AUG. 1 1966

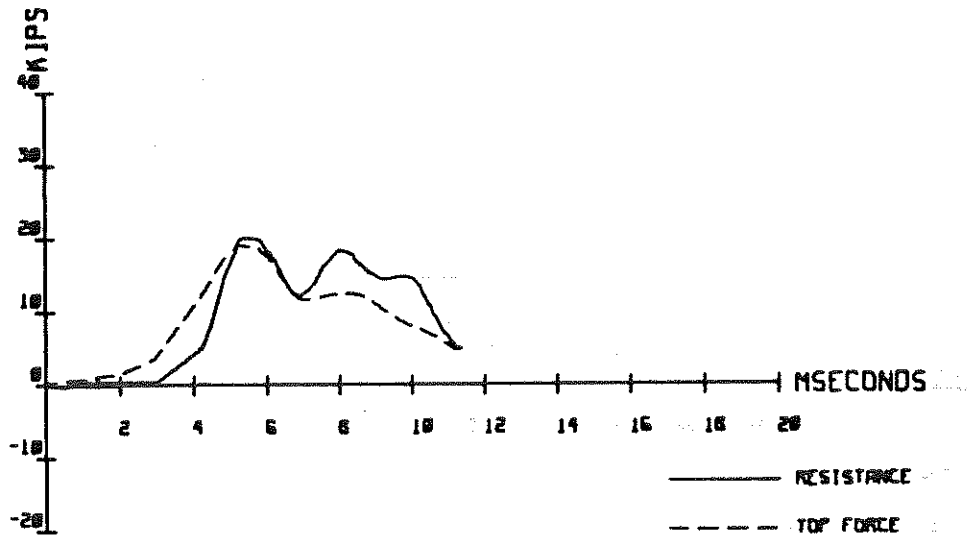
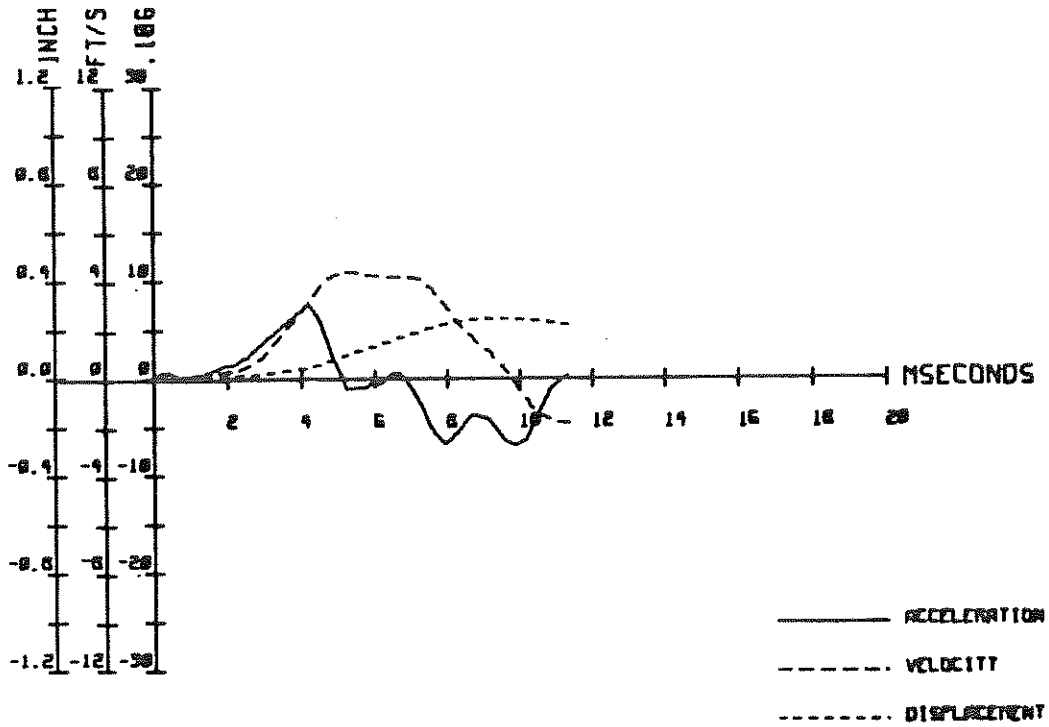


Figure 43 Dynamic Results of Reduced-Scale Pile 10-3, Blow 1A.

MODEL PILE 10-4 SILT

BLOW NO. 129 DATE AUG. 1 1966

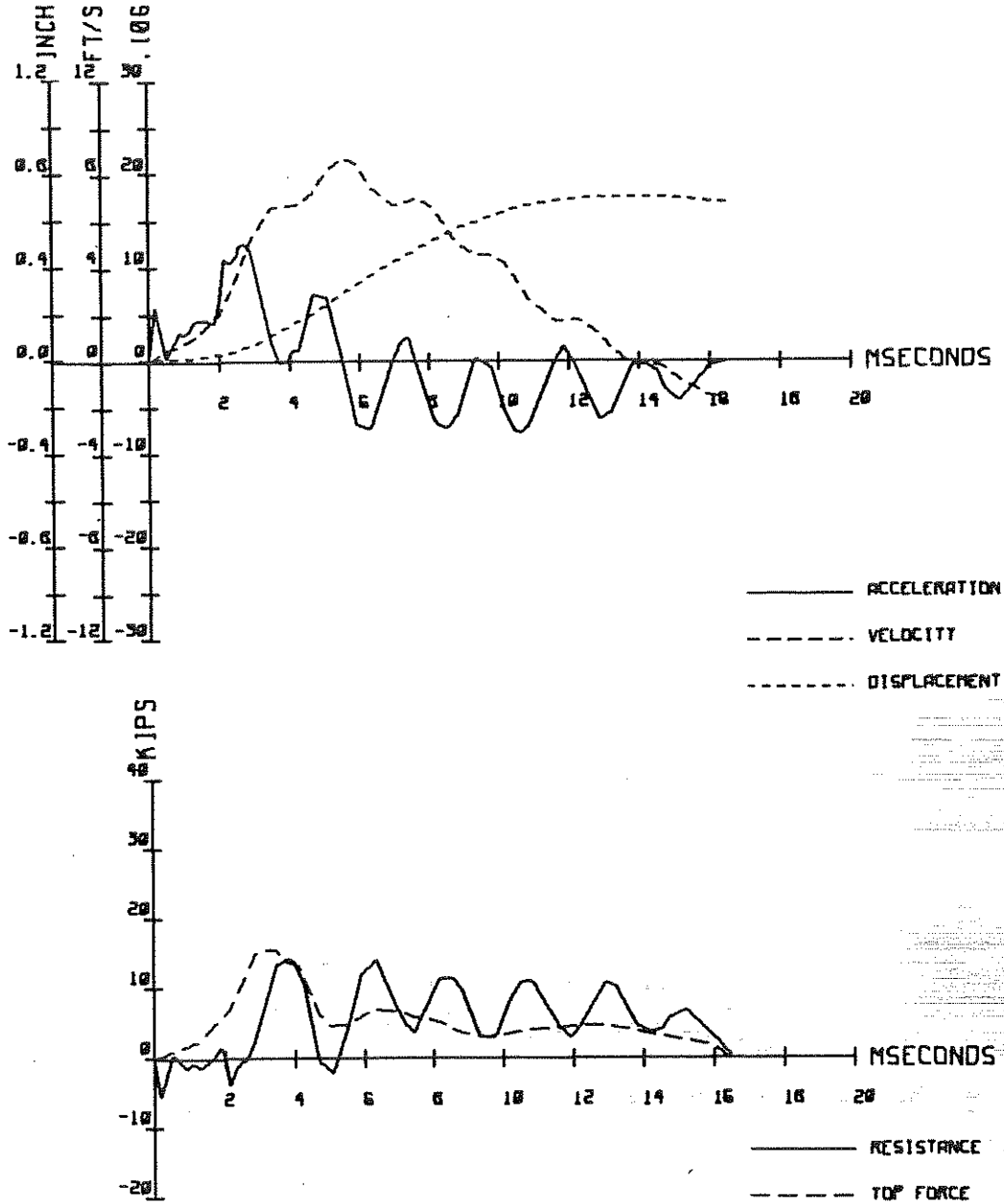


Figure 44 Dynamic Results of Reduced-Scale pile 10-4 Silt, at the end of Driving

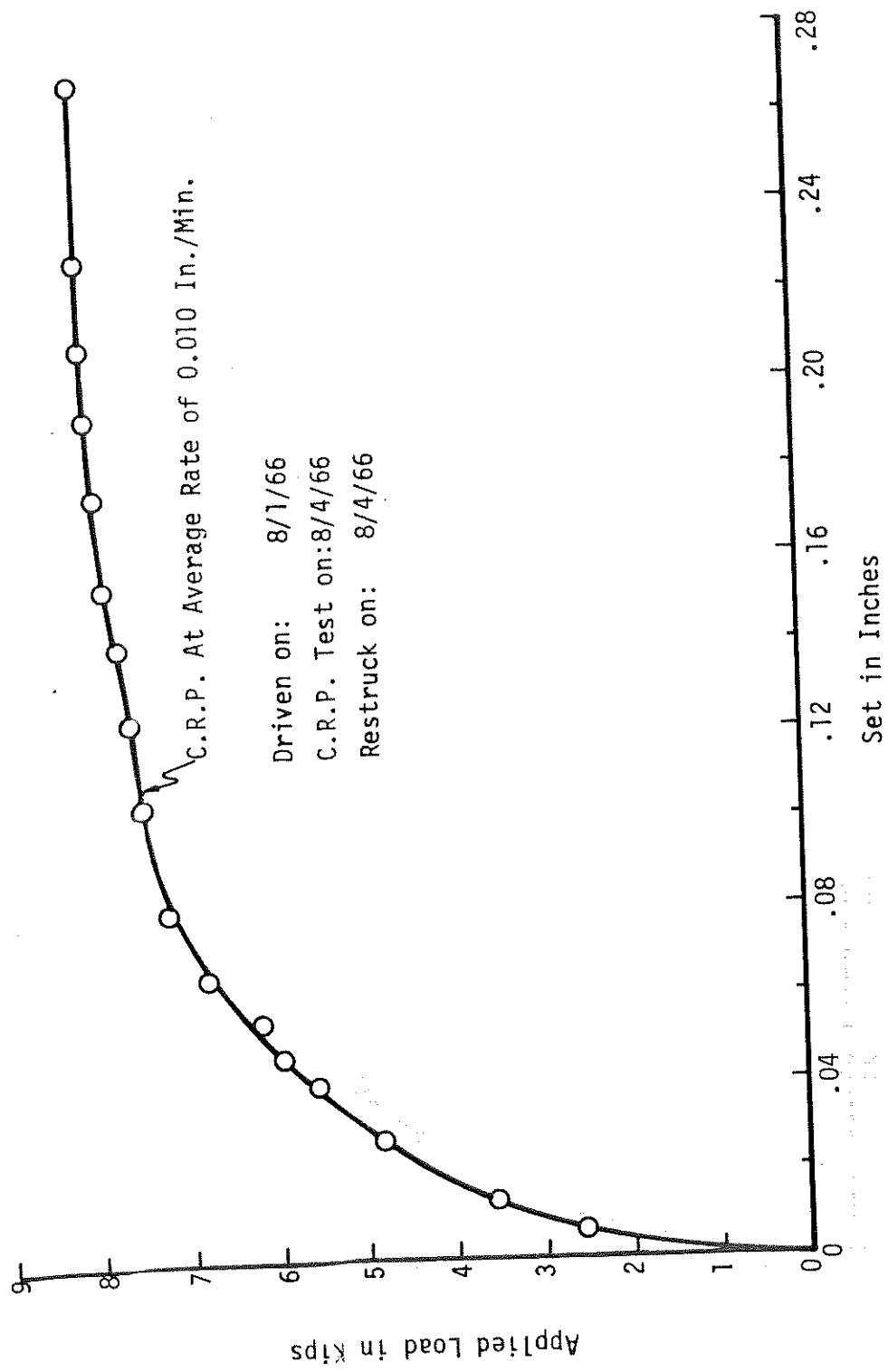


Figure 45 C.R.P. Test Results of Reduced-Scale Pile 10-4 Silt

MODEL PILE 10-4 SILT

BLOW NO. 1-A DATE AUG. 4 1966

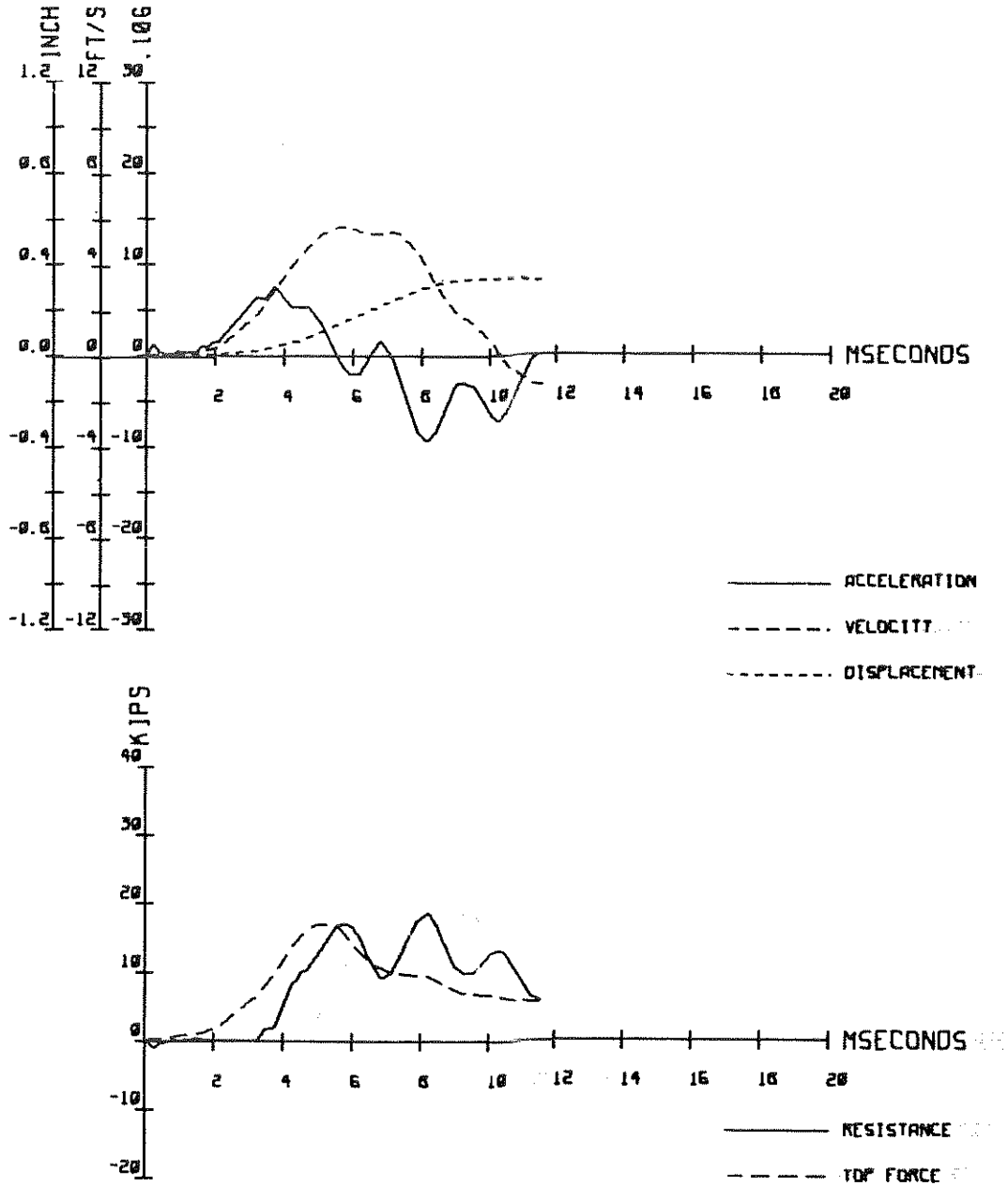


Figure 46 Dynamic Results of Reduced-Scale Pile 10-4 Silt, Blow 1A

MODEL PILE 10-4 SILT

BLOW NO. 2-A DATE AUG. 4 1966

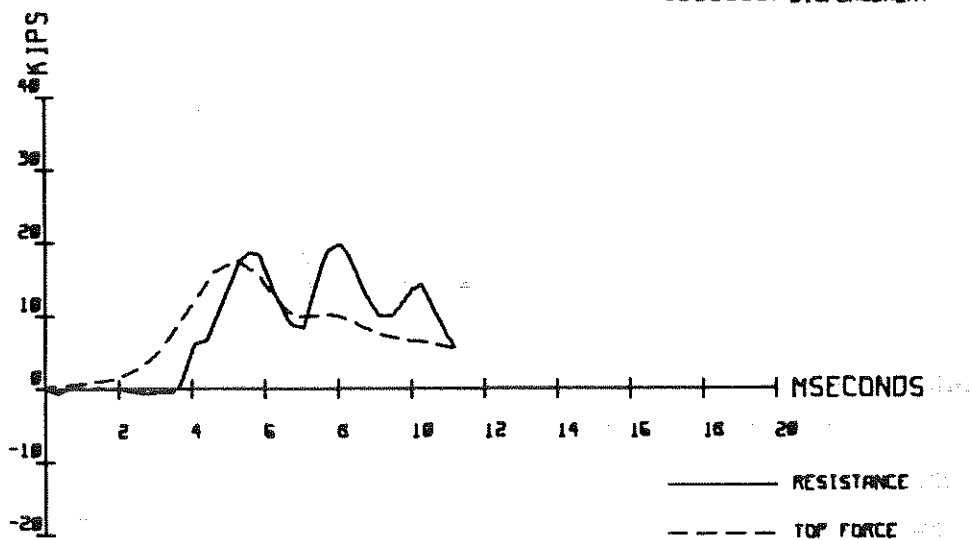
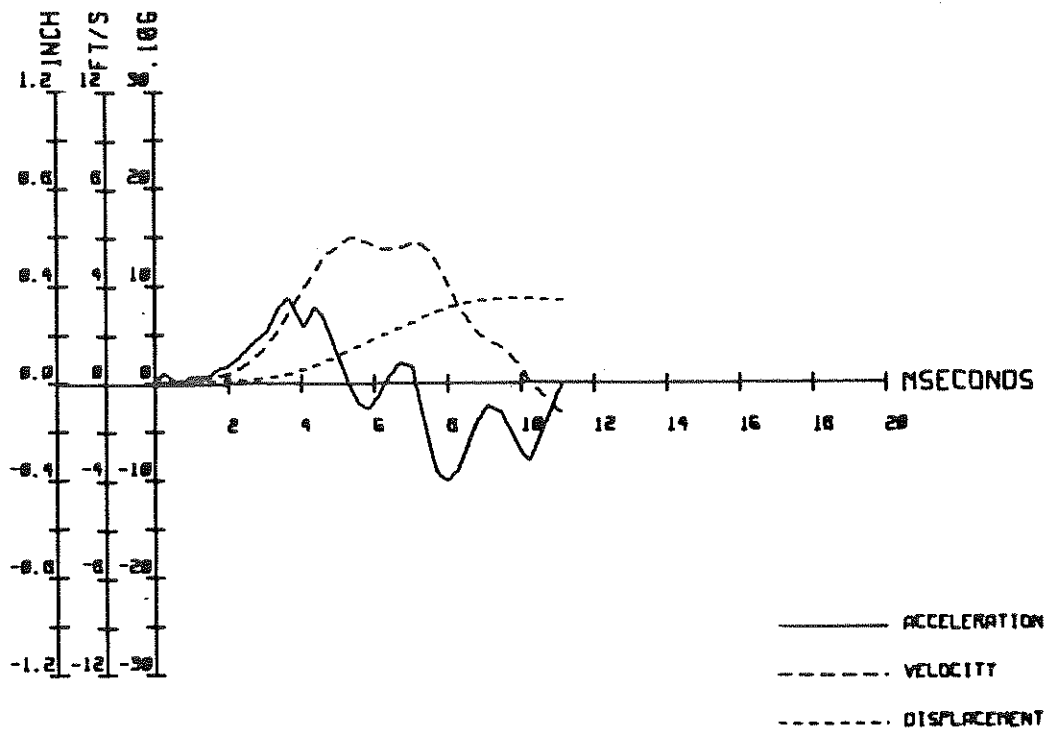


Figure 47 Dynamic Results of Reduced-Scale Pile 10-4 Silt, Blow 2A

MODEL PILE 10-5 SILT

BLOW NO. 4-A DATE AUG. 8 1966

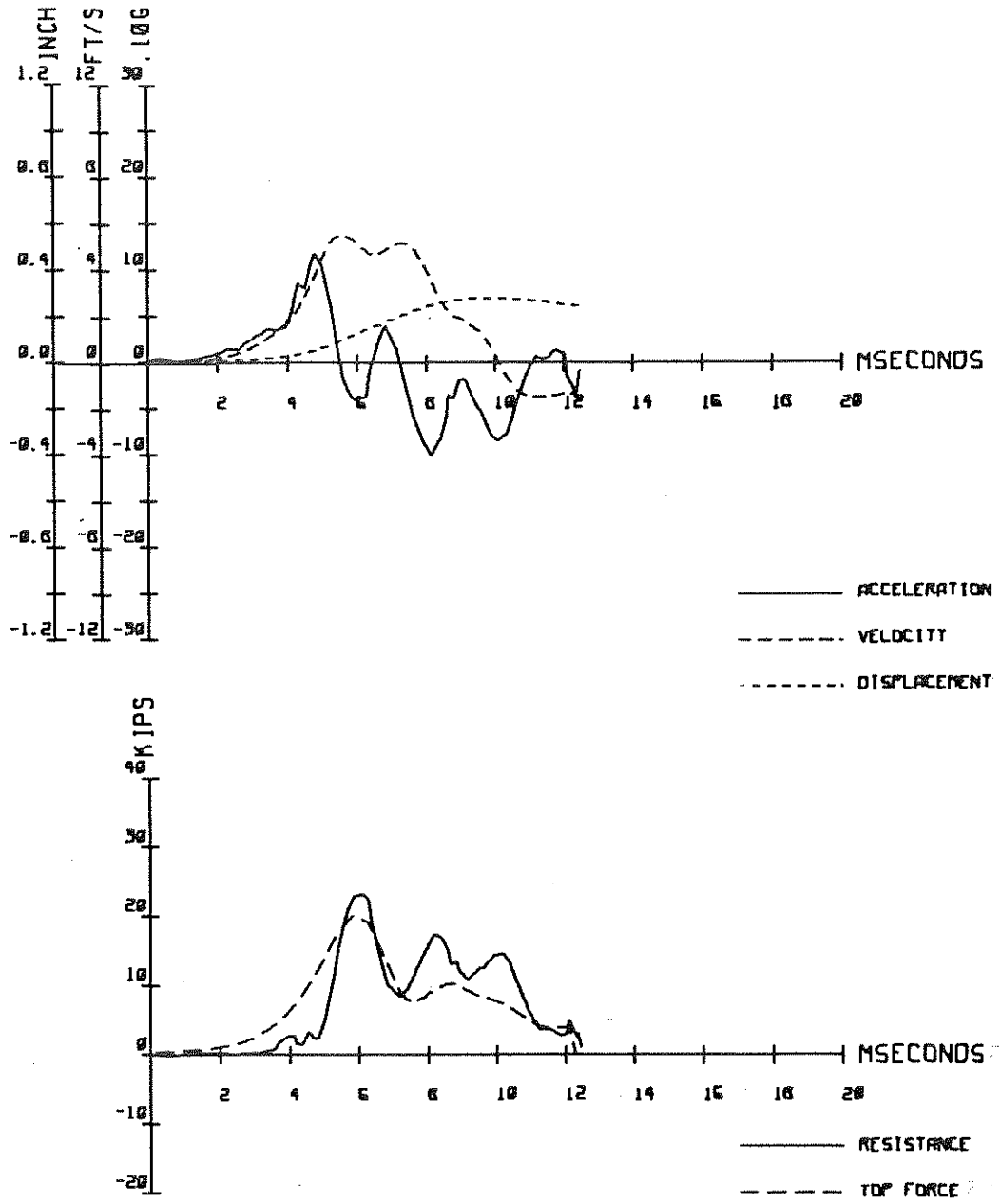


Figure 48 Dynamic Results of Reduced-Scale Pile 10-5 Silt,
Blow 4A

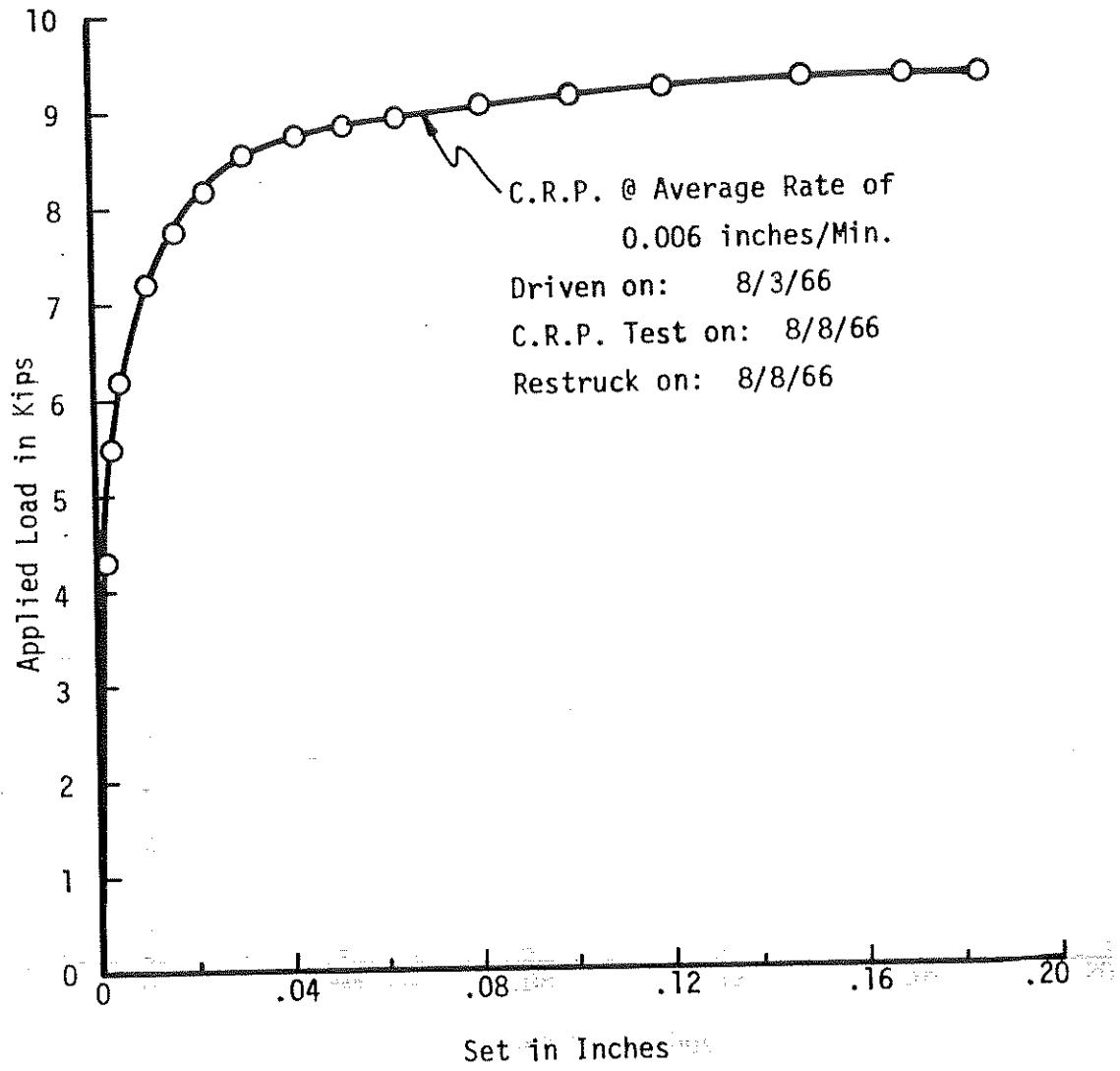


Figure 49 C.R.P. Test Results of Reduced-Scale Pile 10-5 Silt.

MODEL PILE 15-1 SILT

BLOW NO. 276 DATE JUNE 23 1966

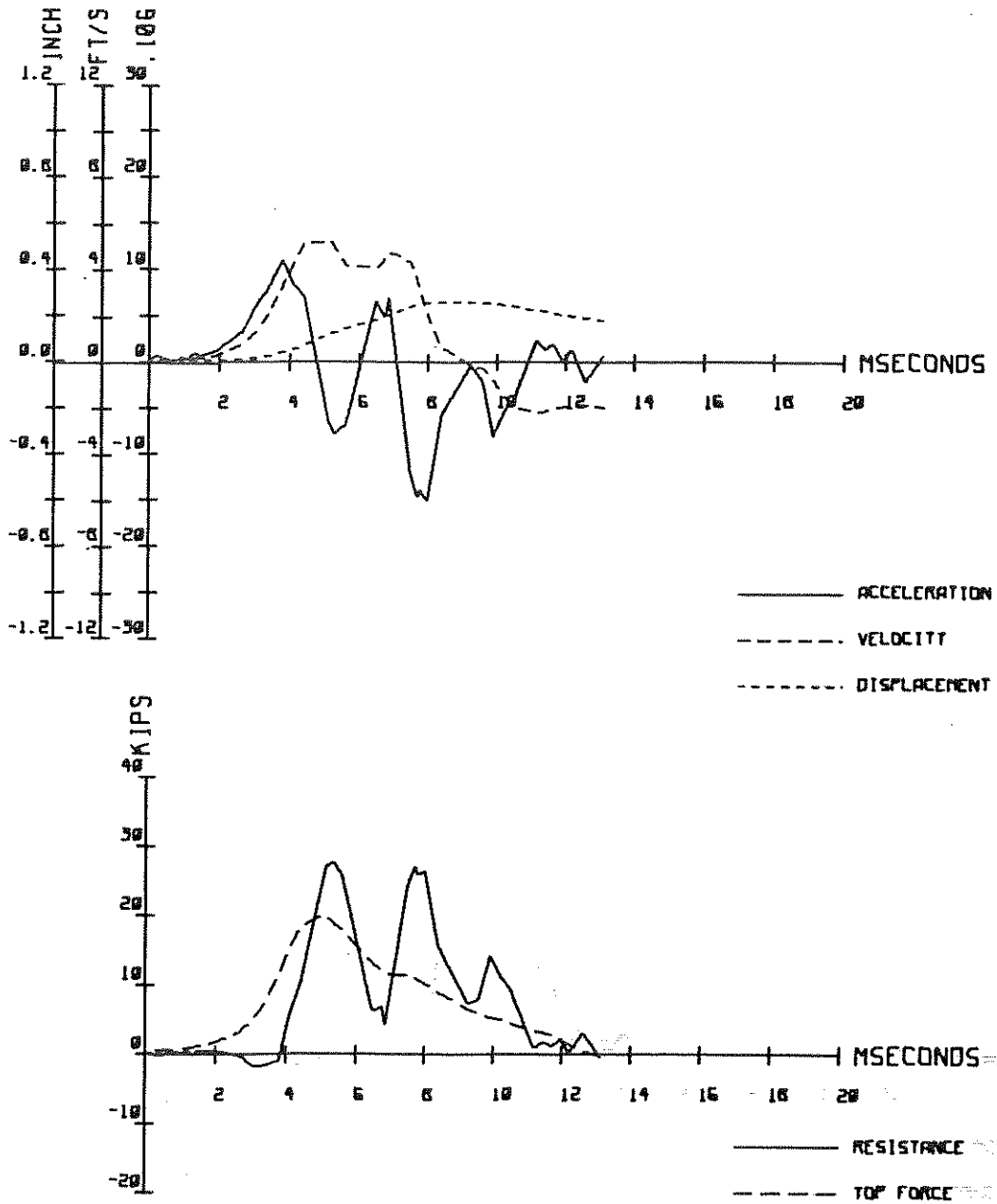


Figure 50 Dynamic Results of Reduced-Scale Pile 15-1 Silt at the End of Driving

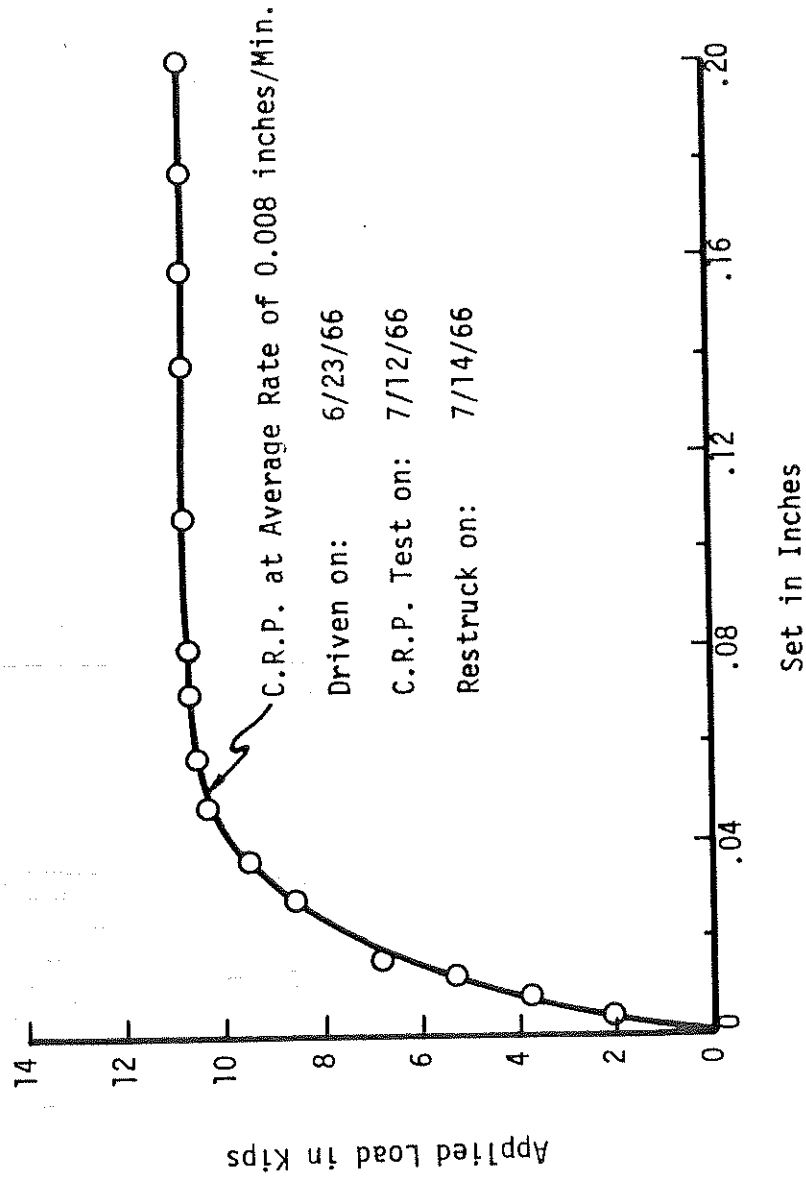


Figure 51 C.R.P. Test Results of Reduced-Scale Pile 15-1 Silt

MODEL PILE 15-1 SILT

BLOW NO. 2-A DATE JULY 14 1966

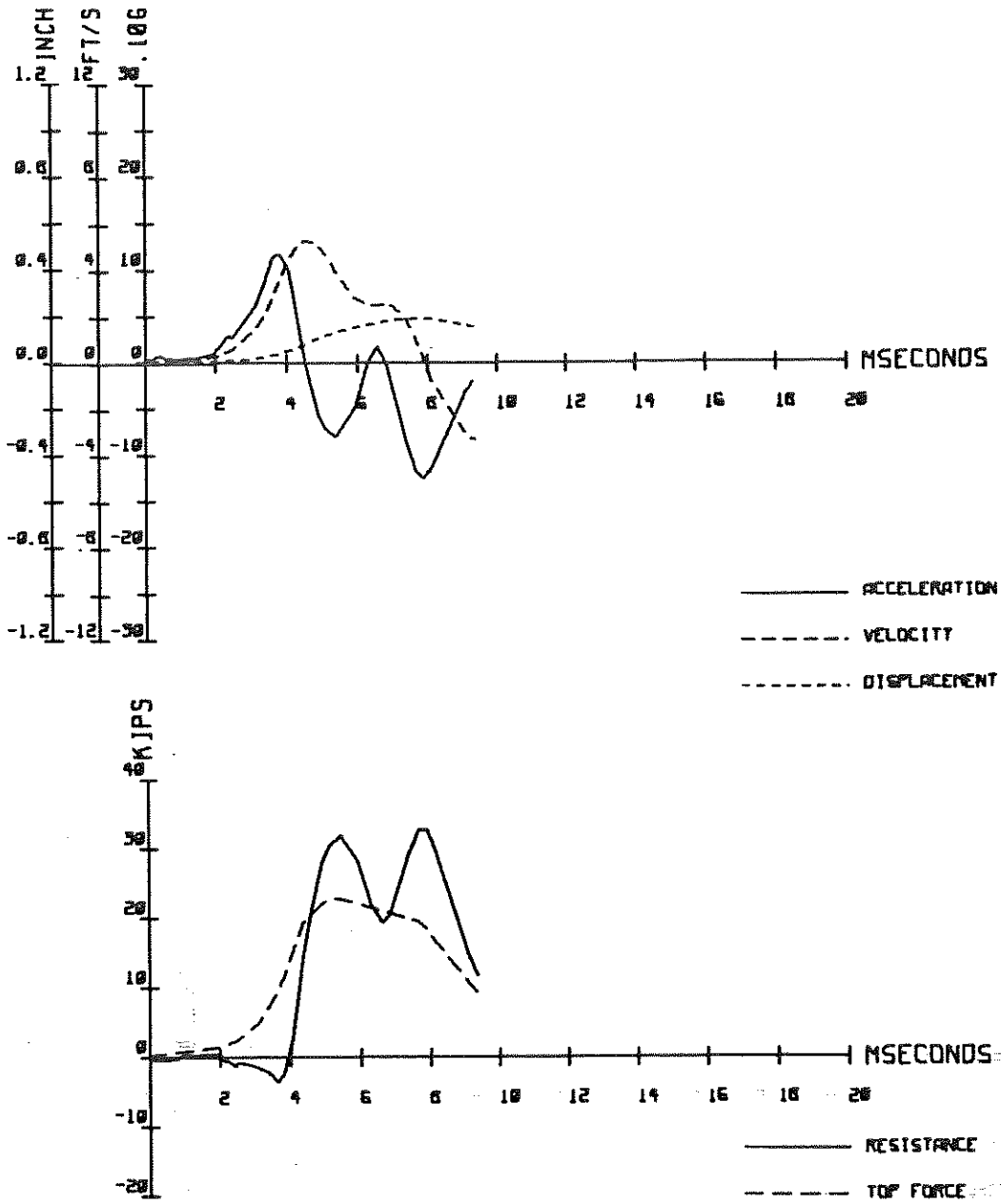


Figure 52 Dynamic Results of Reduced-Scale Pile 15-1 Silt, Blow 2A

MODEL PILE 15-5 SILT

BLOW NO. 304 DATE OCTOBER 22 1966

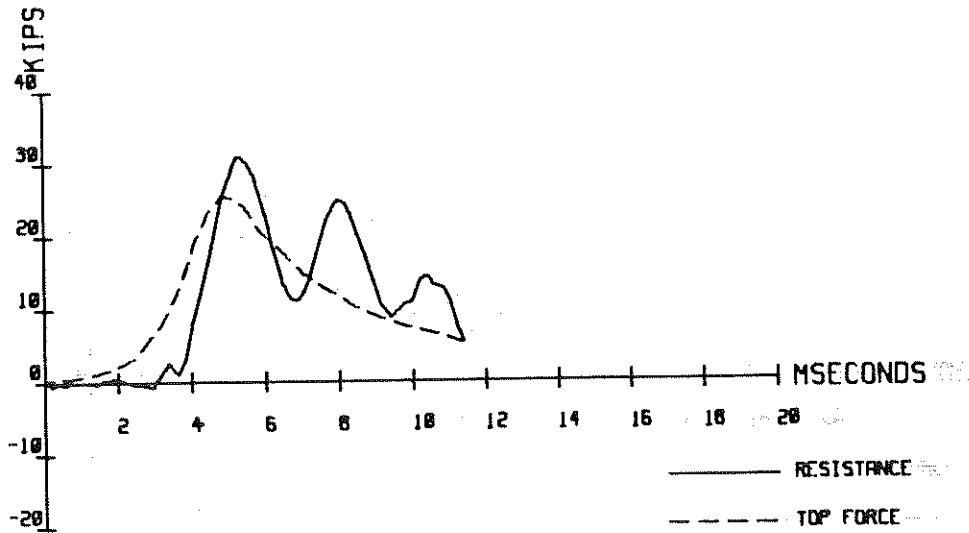
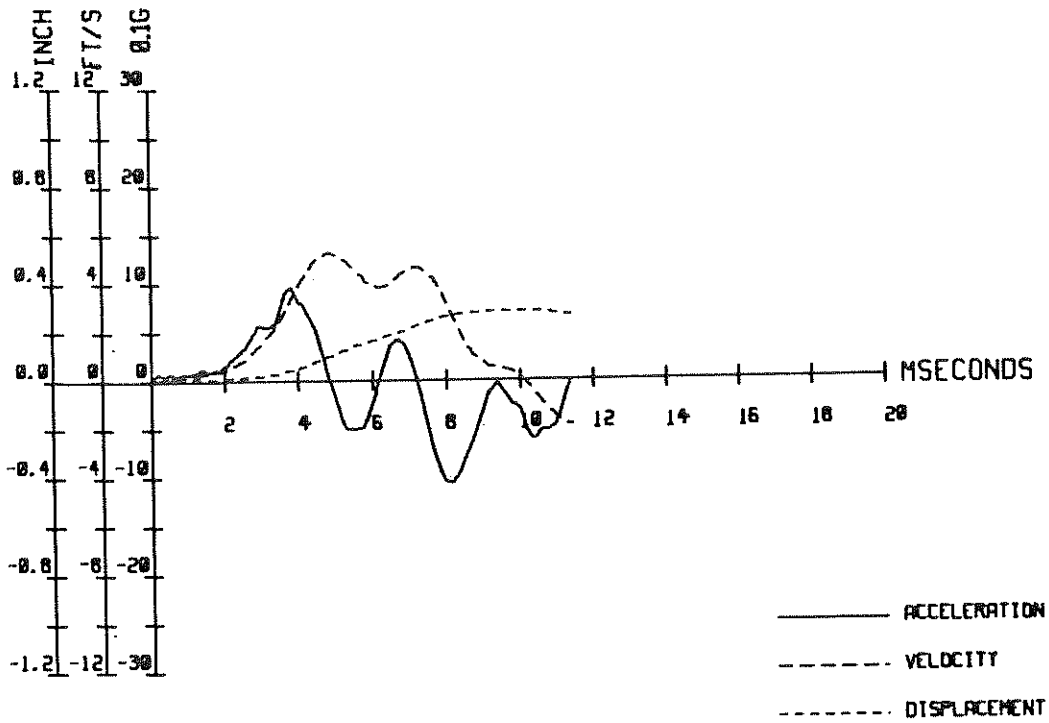


Figure 53 Dynamic Results of Reduced-Scale Pile 15-5 Silt, at the End of Driving.

Driven on: 10/22/66
C.R.P. Test on: 10/28/66
Restruck on: 11/12/66

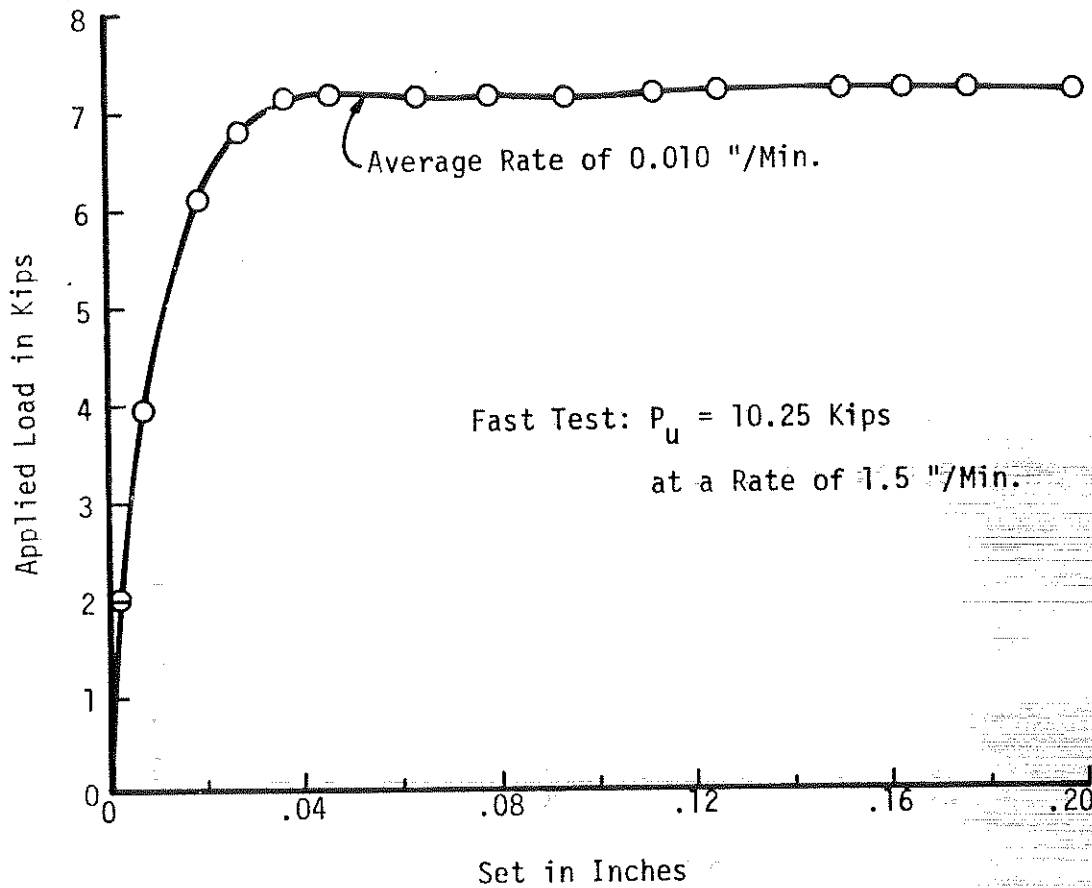


Figure 54 C.R.P. Test Results of Reduced-Scale Pile 15-5

MODEL PILE 15-5 SILT

BLOW NO. 1-A DATE NOVEMBER 12 1966

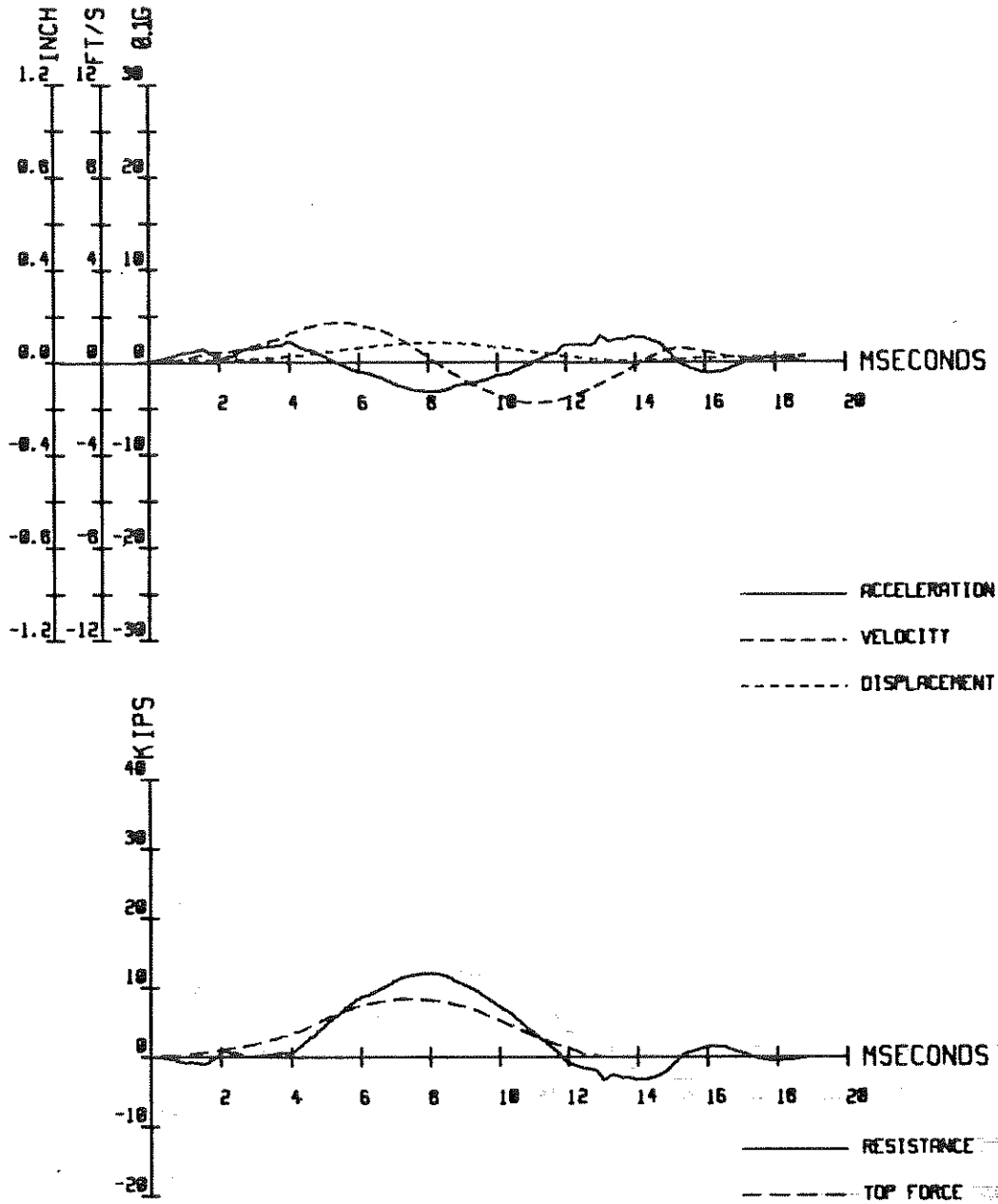


Figure 55 Dynamic Results of Reduced-Scale Pile 15-5 Silt, Blow 1A

MODEL PILE 15-5 SILT

BLOW NO. 3-A DATE NOVEMBER 12 1966

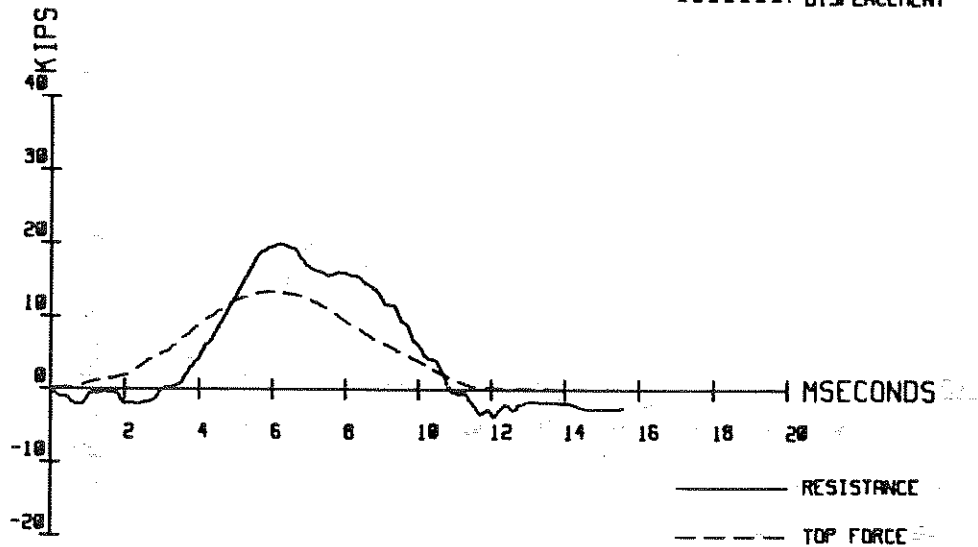
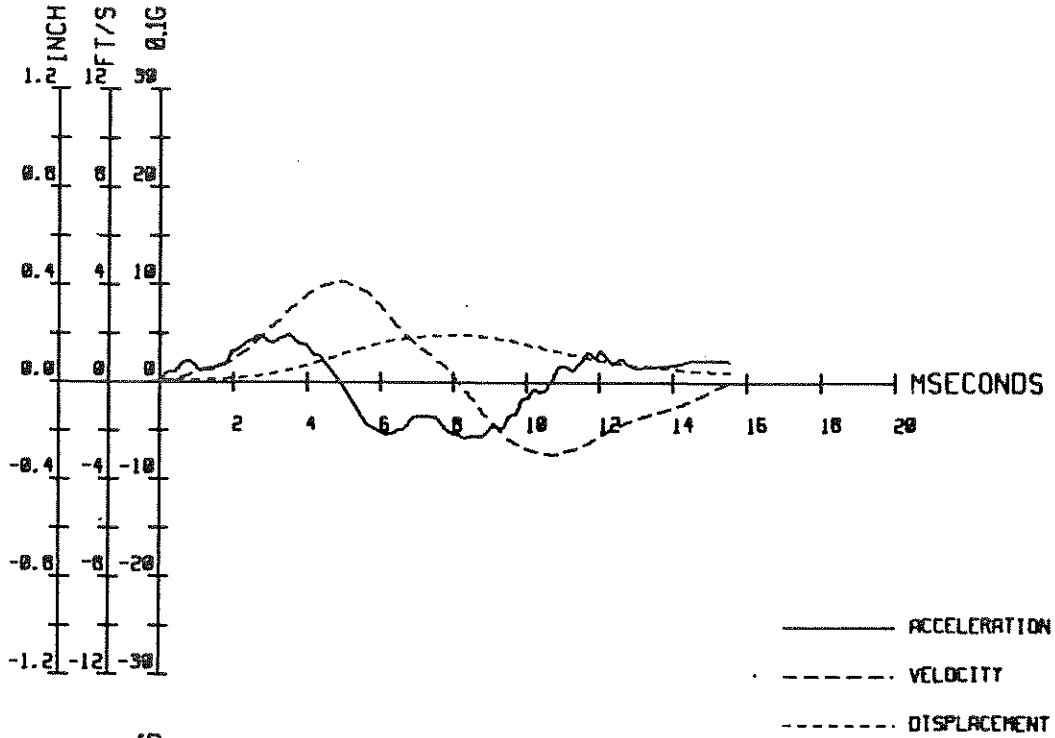


Figure 56 Dynamic Results of Reduced-Scale Pile 15-5 Silt
Blow 3A

LOADTEST AND DYNAMIC RESULTS
FOR MODEL PILES DRIVEN IN SILT AND CLAY

Test Site: Northfield and Aurora Road
North Randall, Ohio

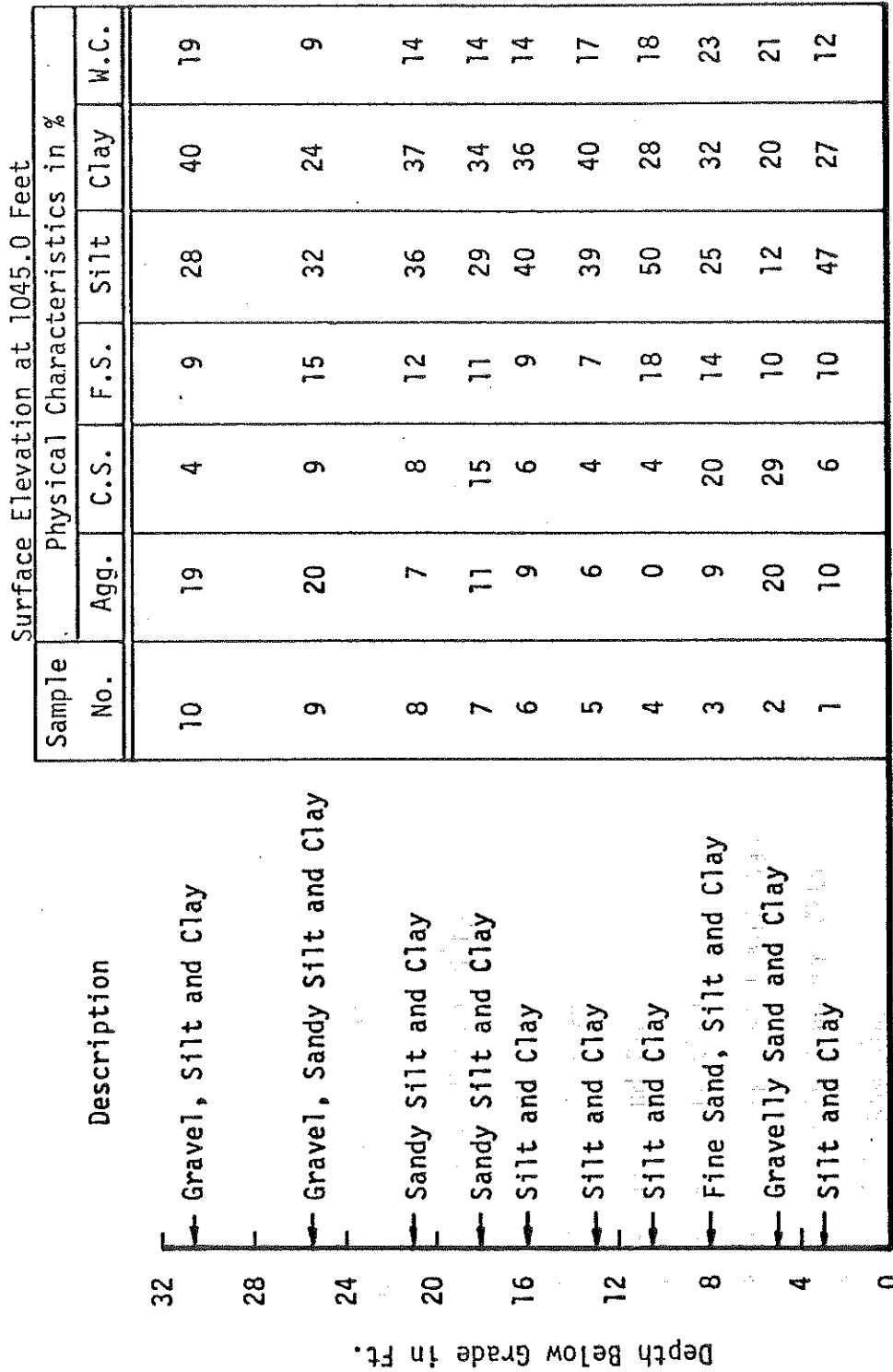


Figure 57 Soil Characteristics at Randall Yard Site

MODEL PILE 1-R-10 SILT AND CLAY
 BLOW NO. 226 DATE MARCH 4 1967

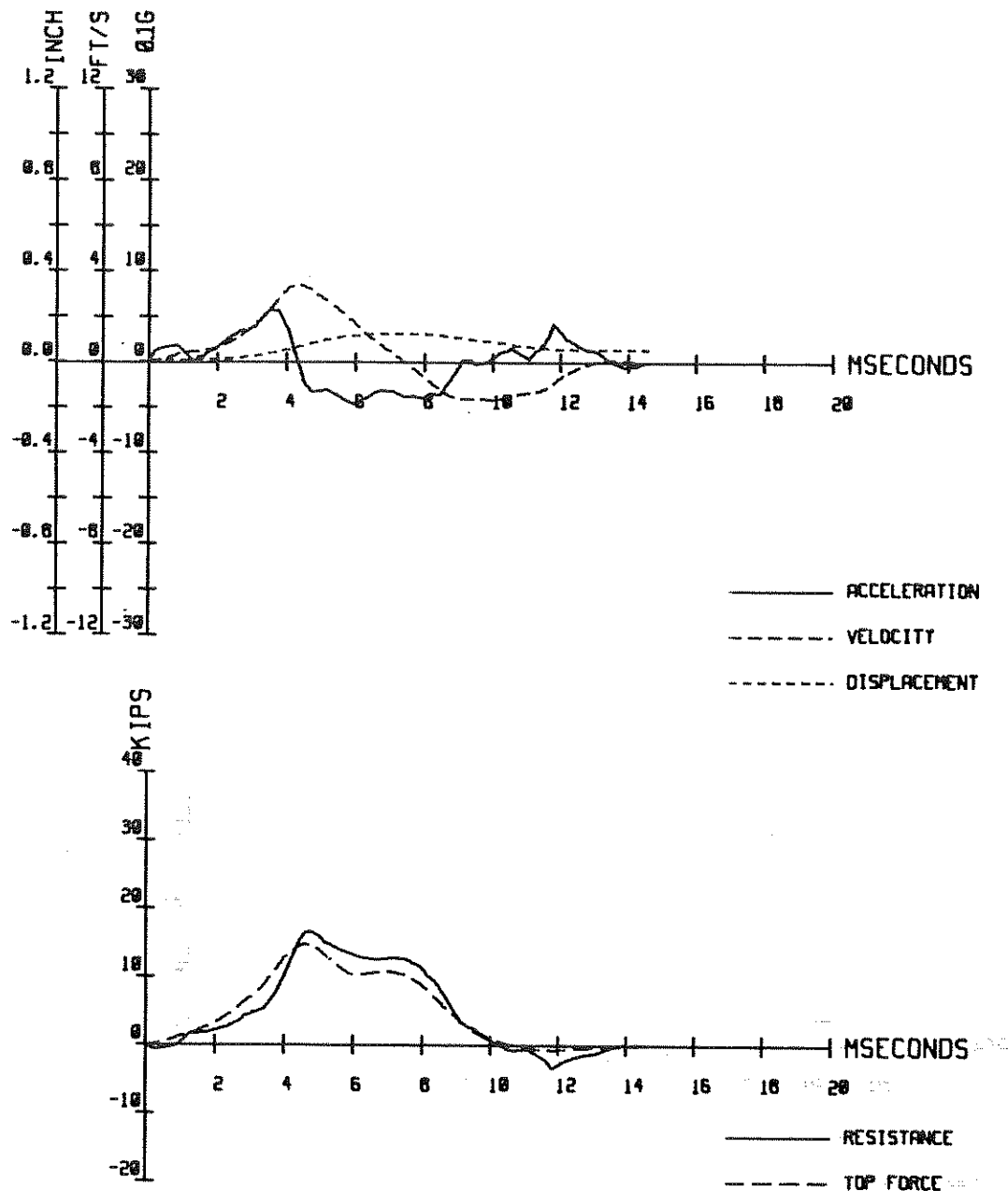


Figure 58 Dynamic Results of Reduced-Scale Pile 1-R-10 at the End of Driving

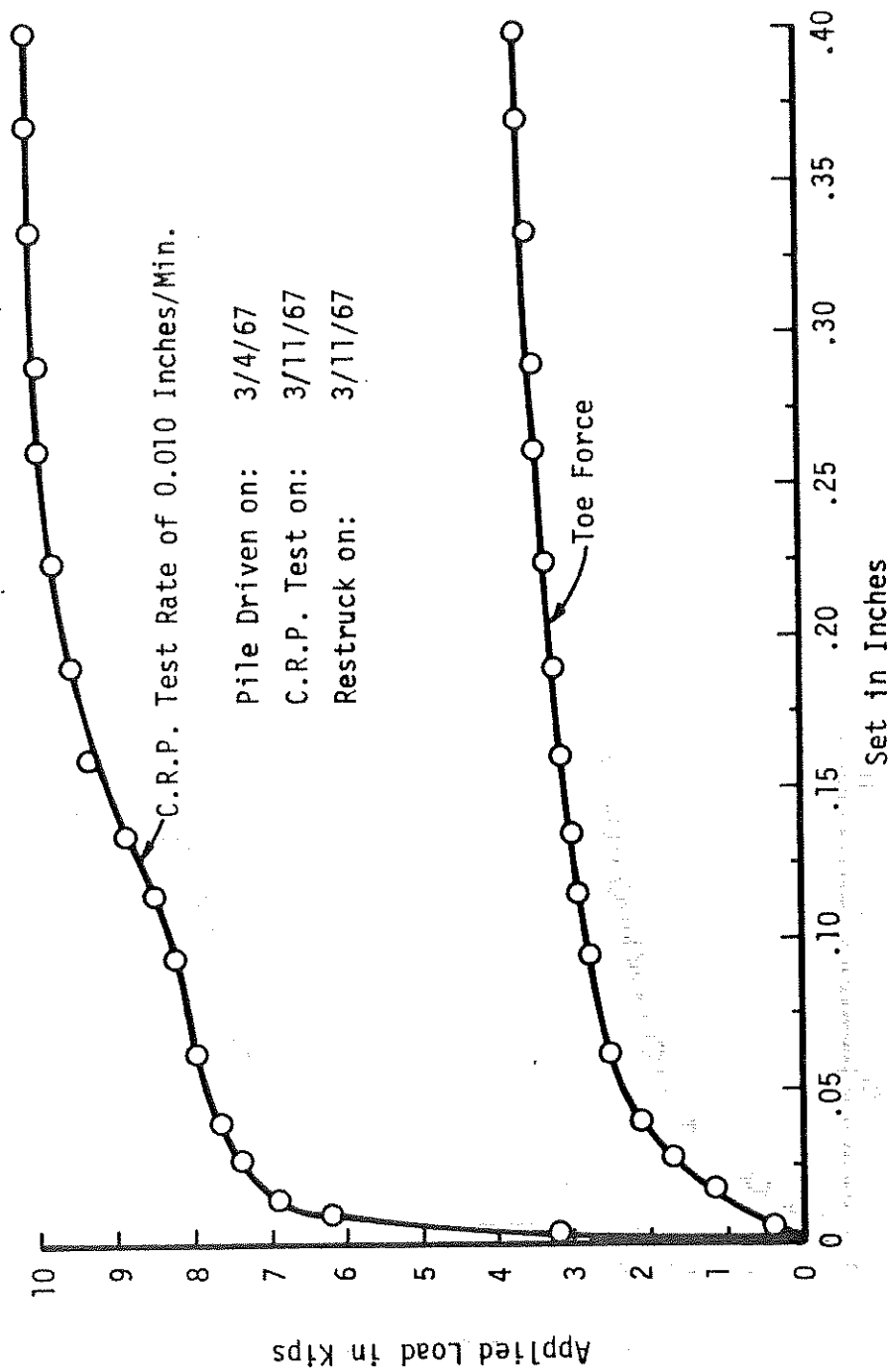


Figure 59 C.R.P. Test Results of Pile 1-R-10, One Week after Driving

MODEL PILE 1-R-10 SILT AND CLAY
 BLOW NO. 1-A DATE MARCH 11 1967

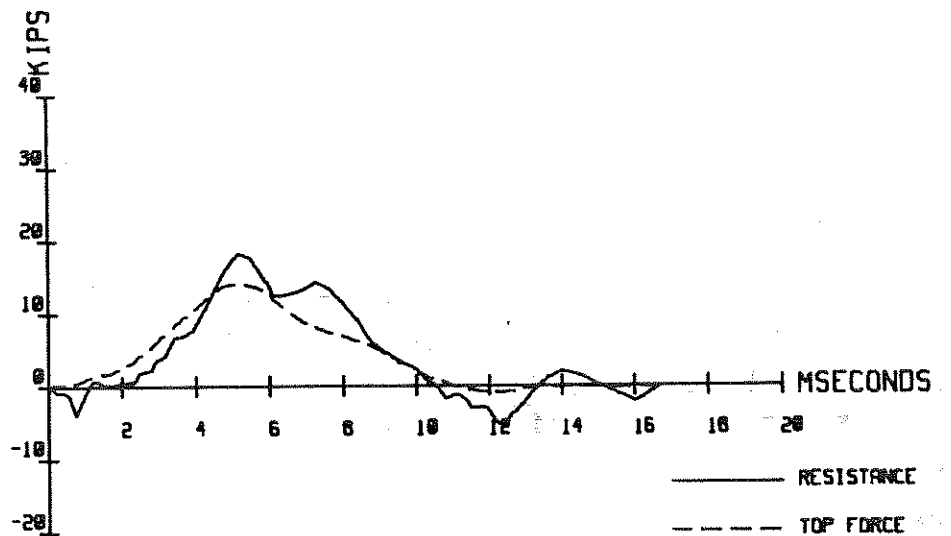
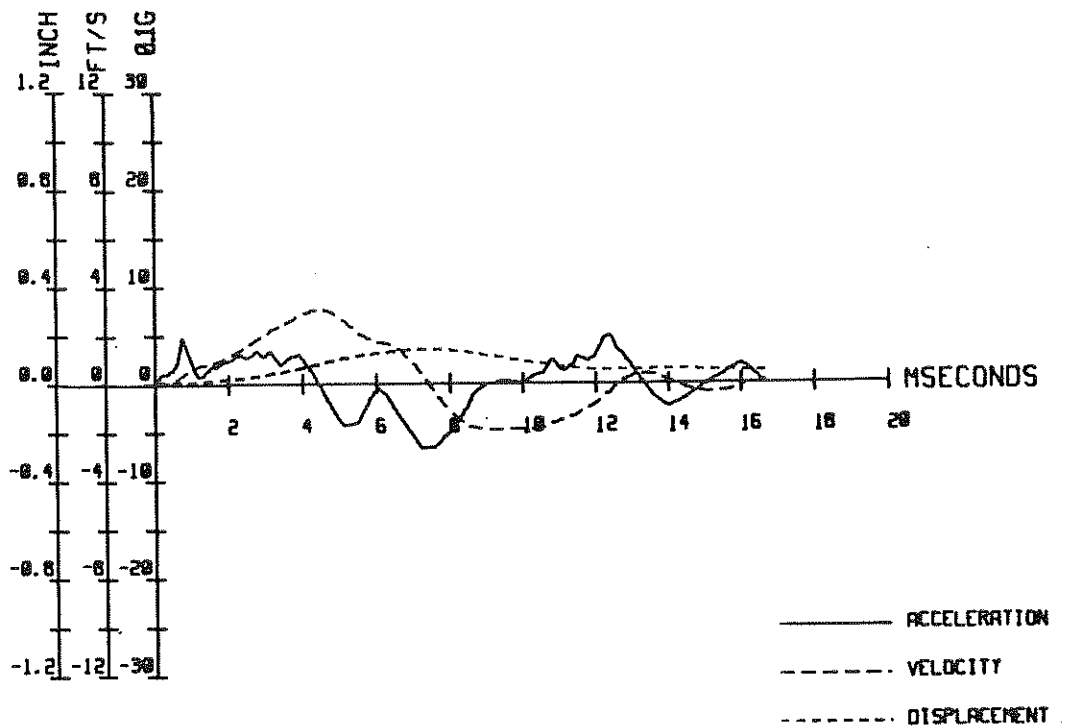


Figure 60 Dynamic Results of Reduced-Scale Pile 1-R-10 Upon Restriking, Blow 1A

MODEL PILE 1-R-10 SILT AND CLAY
 BLOW NO. 2-A DATE MARCH 11 1967

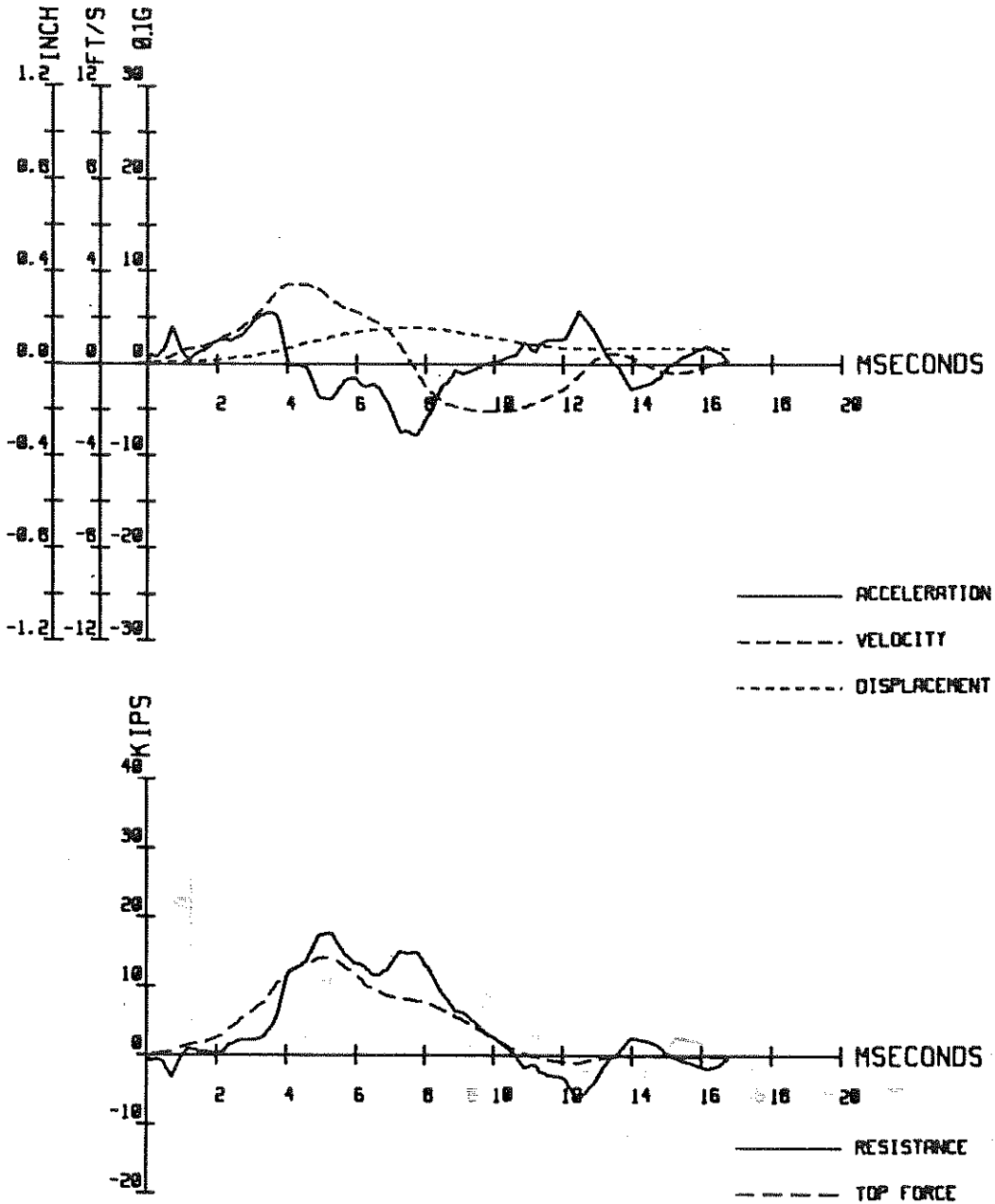


Figure 61 Dynamic Results of Reduced-Scale Pile 1-R-10 Upon Restriking, Blow 2A

MODEL PILE 1-R-15 SILT AND CLAY
 BLOW NO. 610 DATE MARCH 18 1967

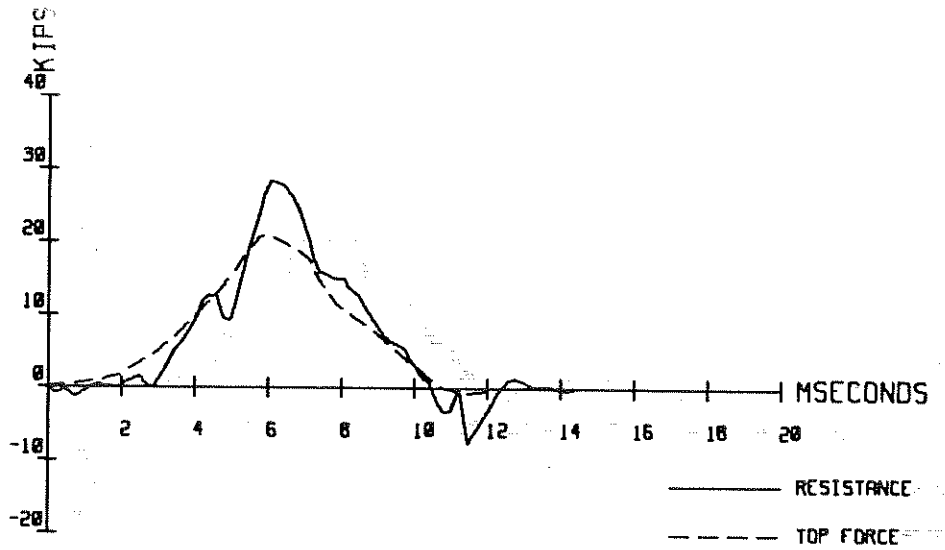
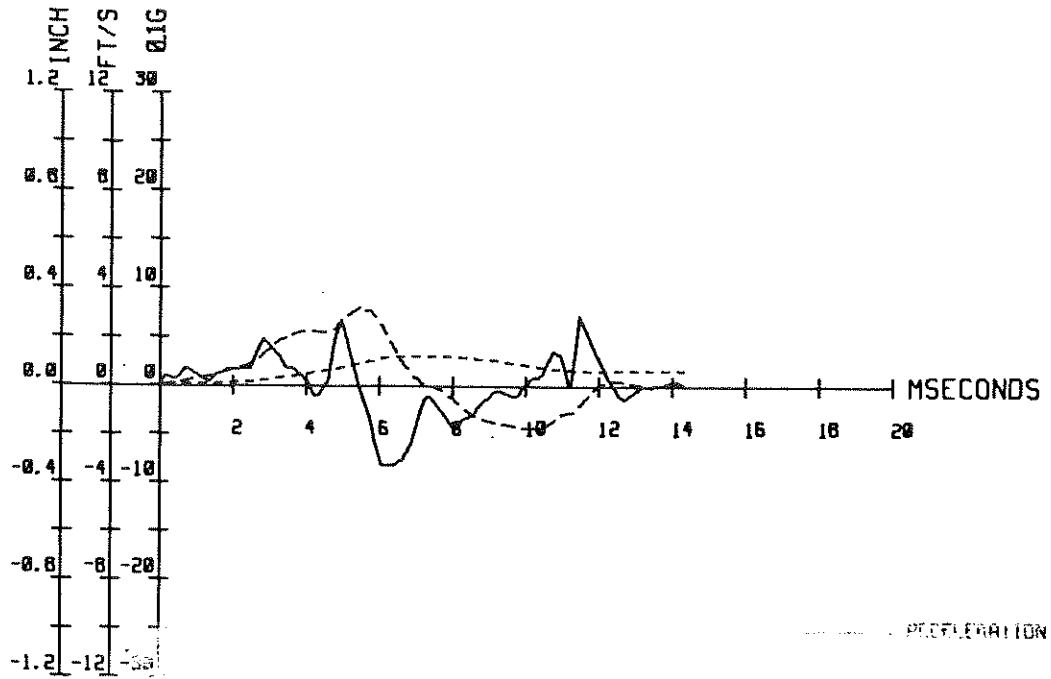


Figure 62 Dynamic Results of Reduced-Scale Pile 1-R-15 at the End of Driving

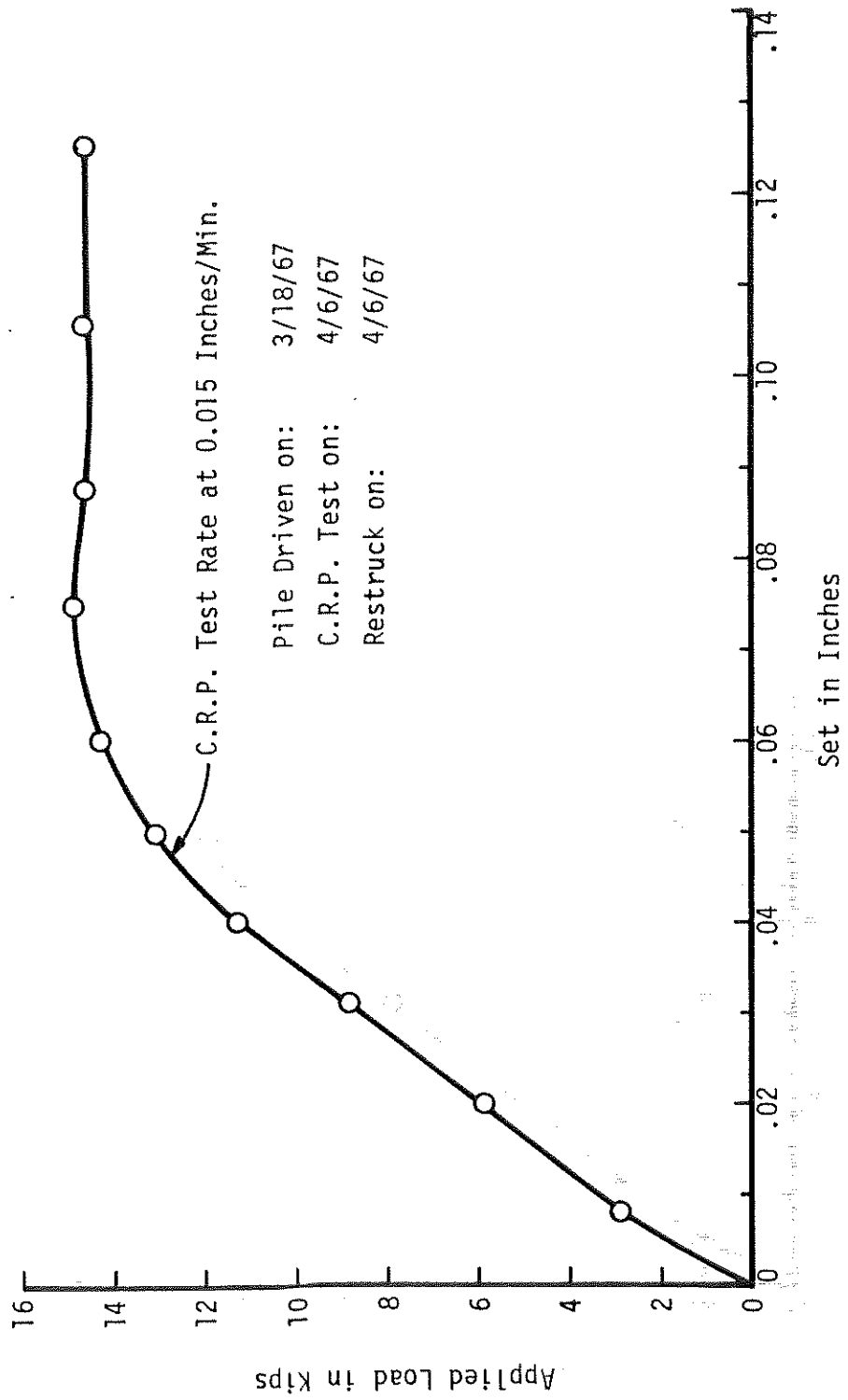


Figure 63 C.R.P. Test Results of Pile 1-R-15 Before Restrucking Pile

MODEL PILE 1-R-15 SILT AND CLAY
 BLOW NO. 1-A DATE APRIL 6 1967

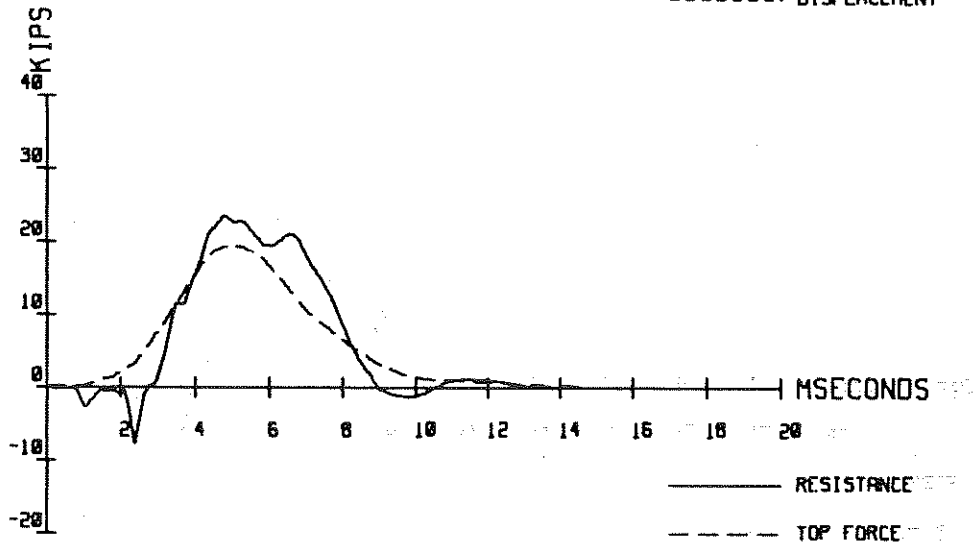
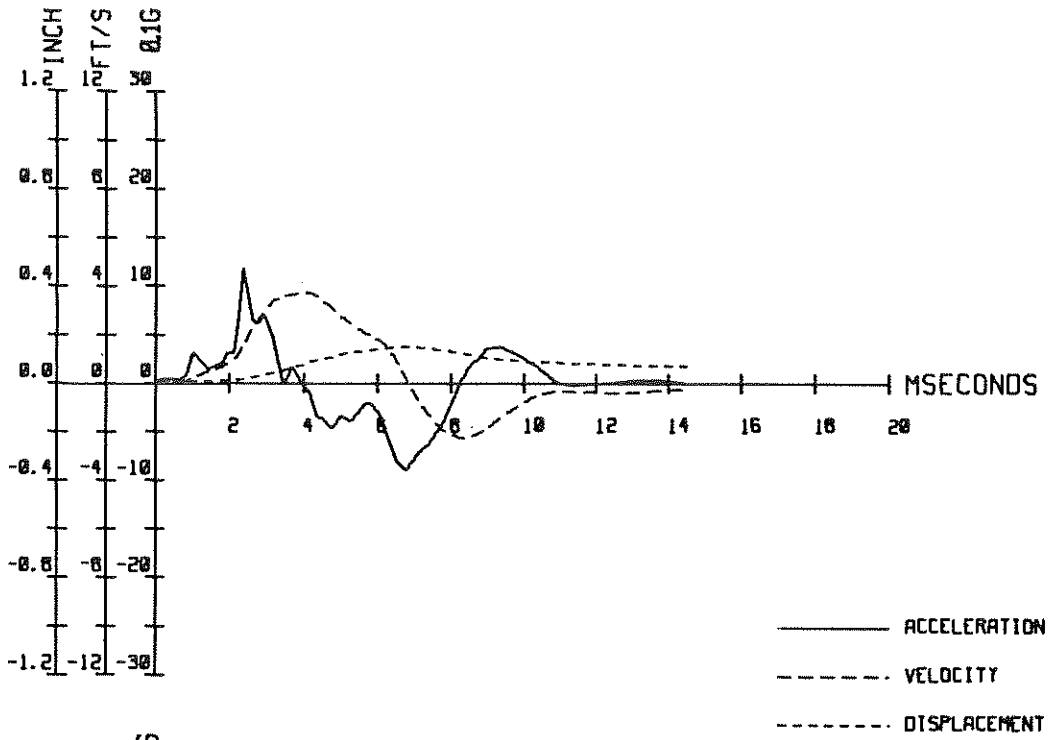


Figure 64 Dynamic Results of Reduced-Scale Pile 1-R-15 Upon Restriking, Blow 1A

MODEL PILE 1-R-15 SILT AND CLAY
 BLOW NO. 2-A DATE APRIL 6 1967

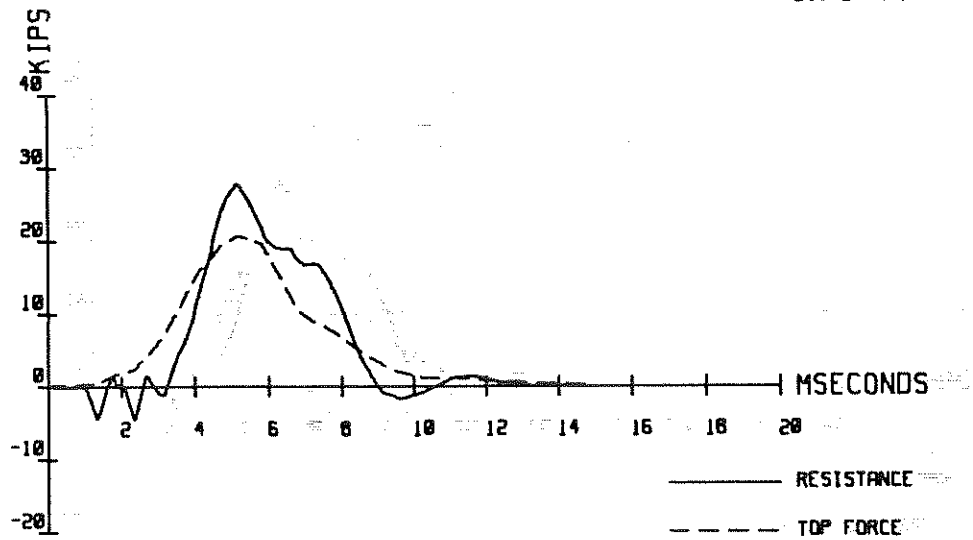
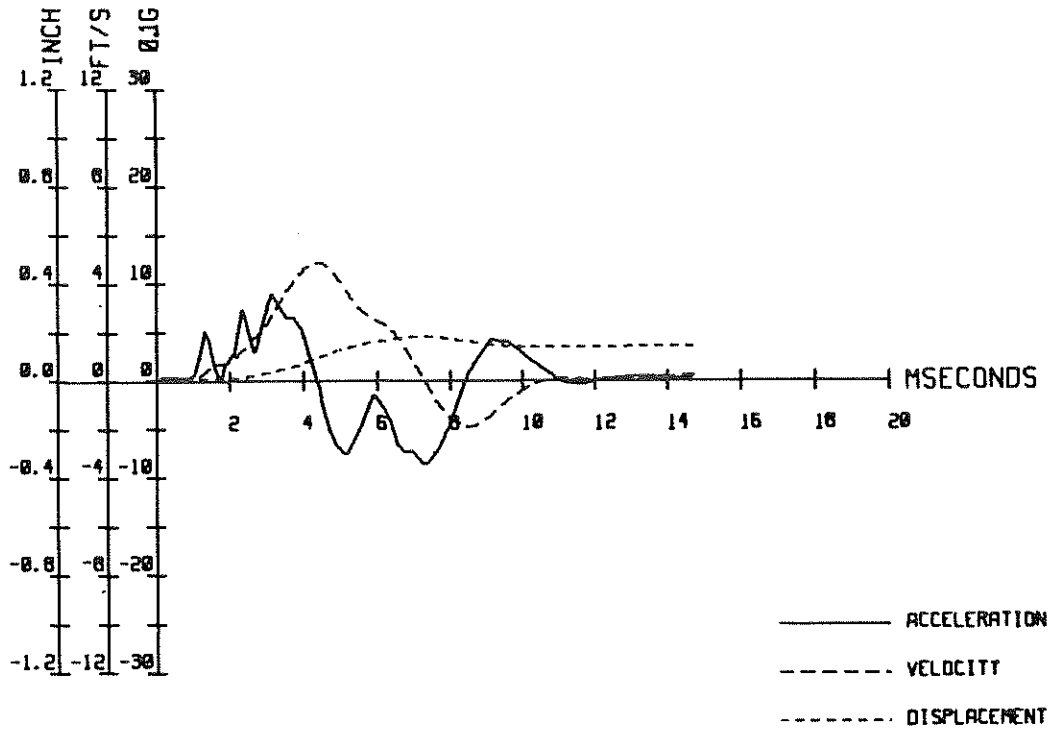


Figure 65 . Dynamic Results of Reduced-Scale Pile 1-R-15, Upon Restriking, Blow 2A

MODEL PILE 2-R-10 SILT AND CLAY
 BLOW NO. 130 DATE JULY 7 1967

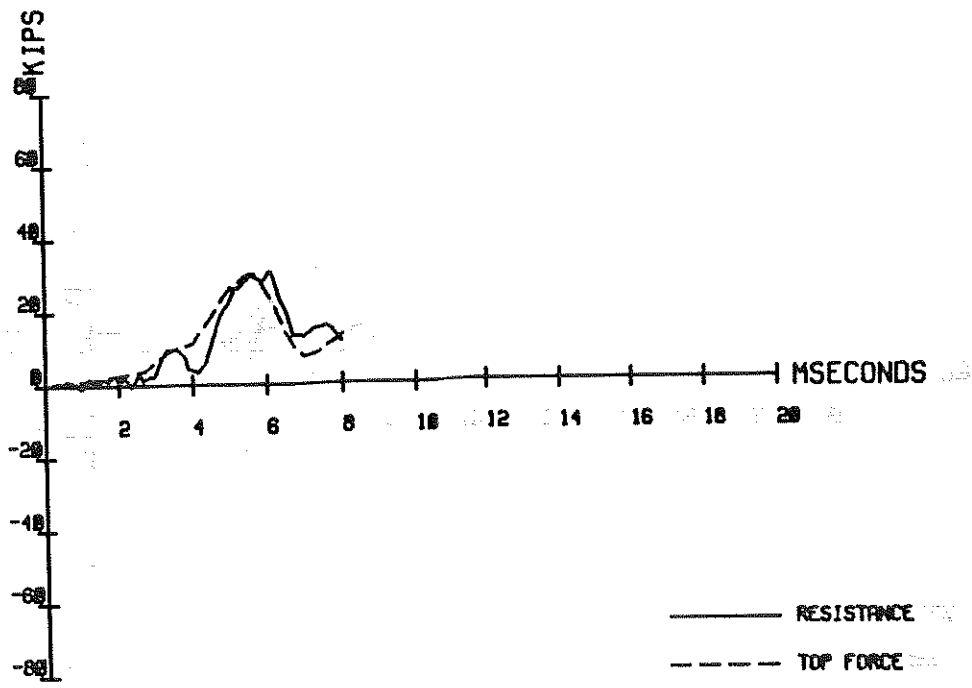
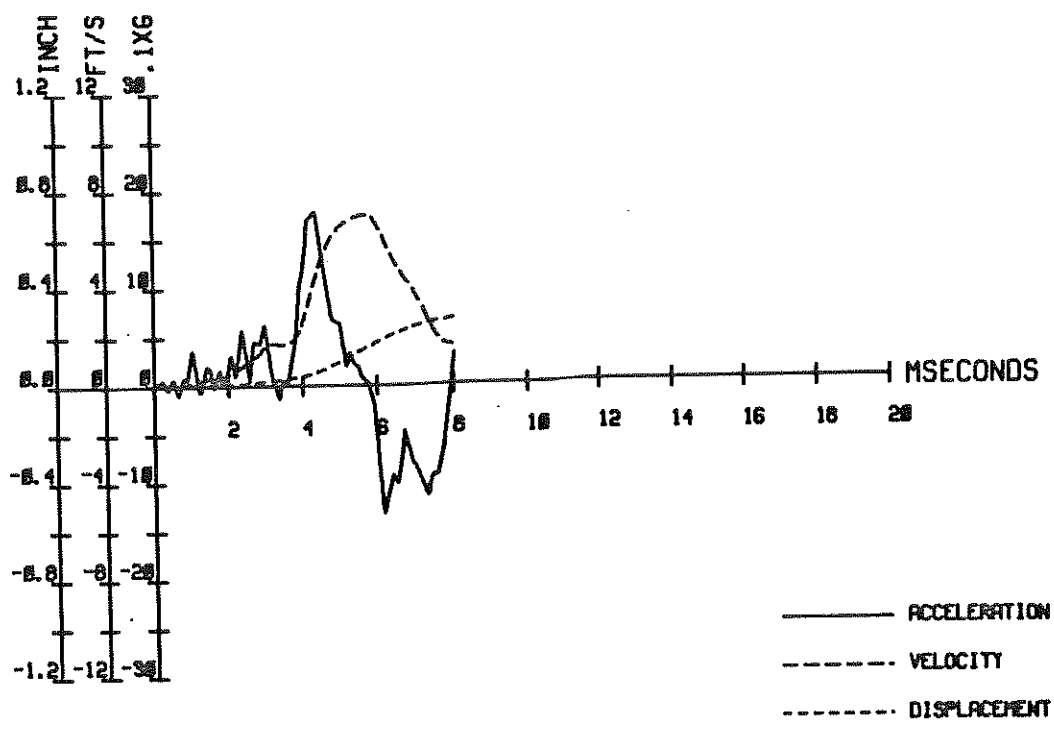


Figure 66 Dynamic Results of Reduced-Scale Pile 2-R-10, At the End of Driving, Blow 130

MODEL PILE 2-R-10 SILT AND CLAY
 BLOW NO. 131 DATE JULY 7 1967

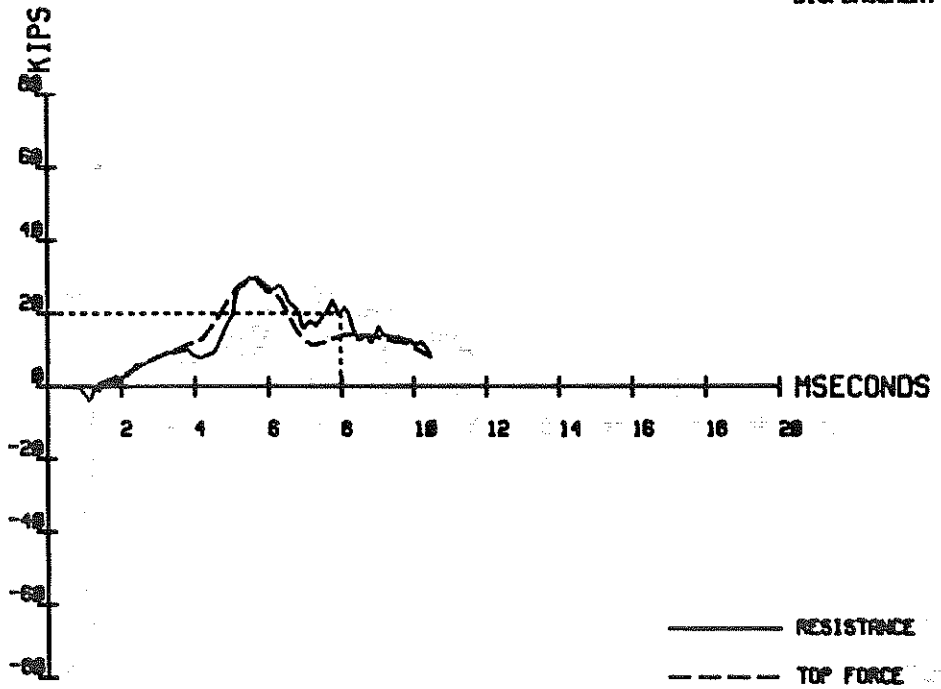
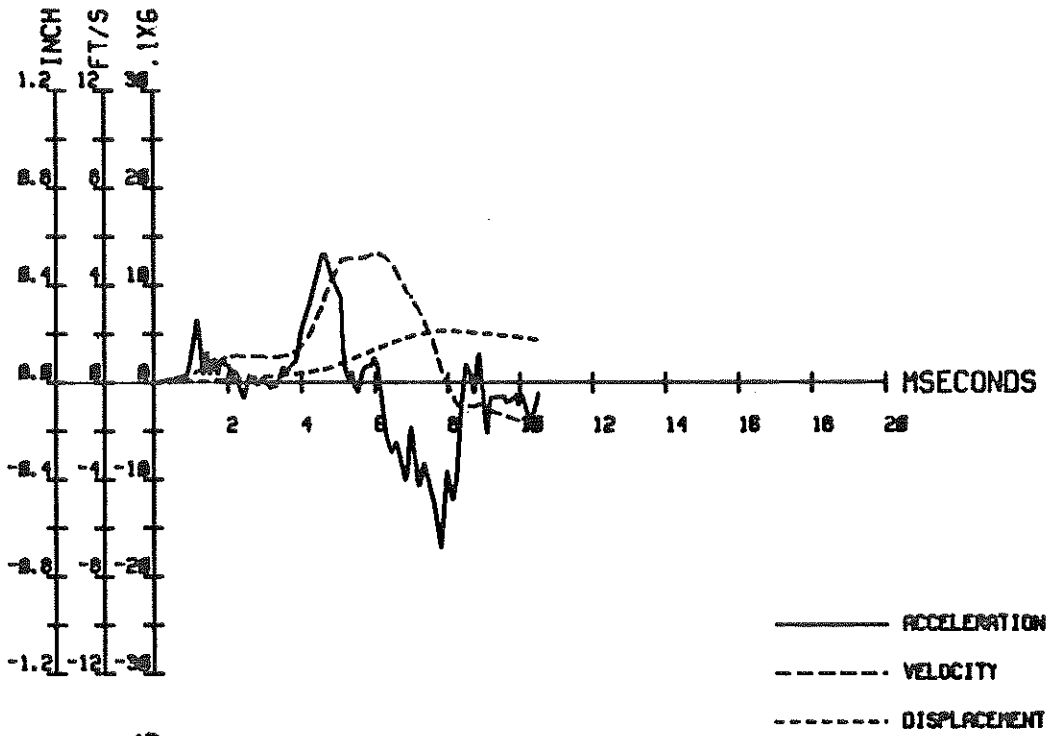


Figure 67 Dynamic Results of Reduced-Scale Pile 2-R-10, At the End of Driving, Blow 131.

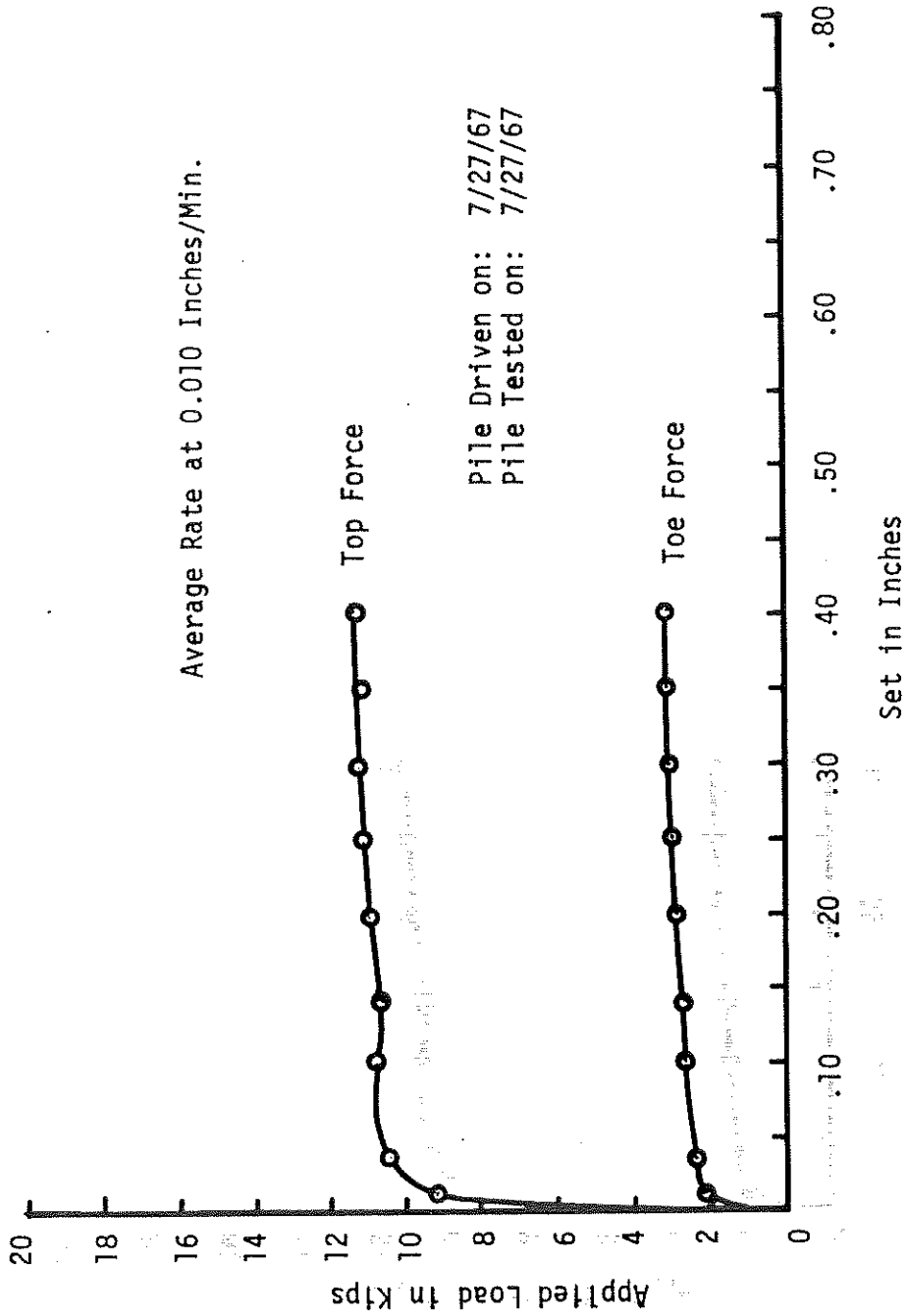


Figure 68 C.R.P. Test Results of Pile 2-R-10 After Driving Pile

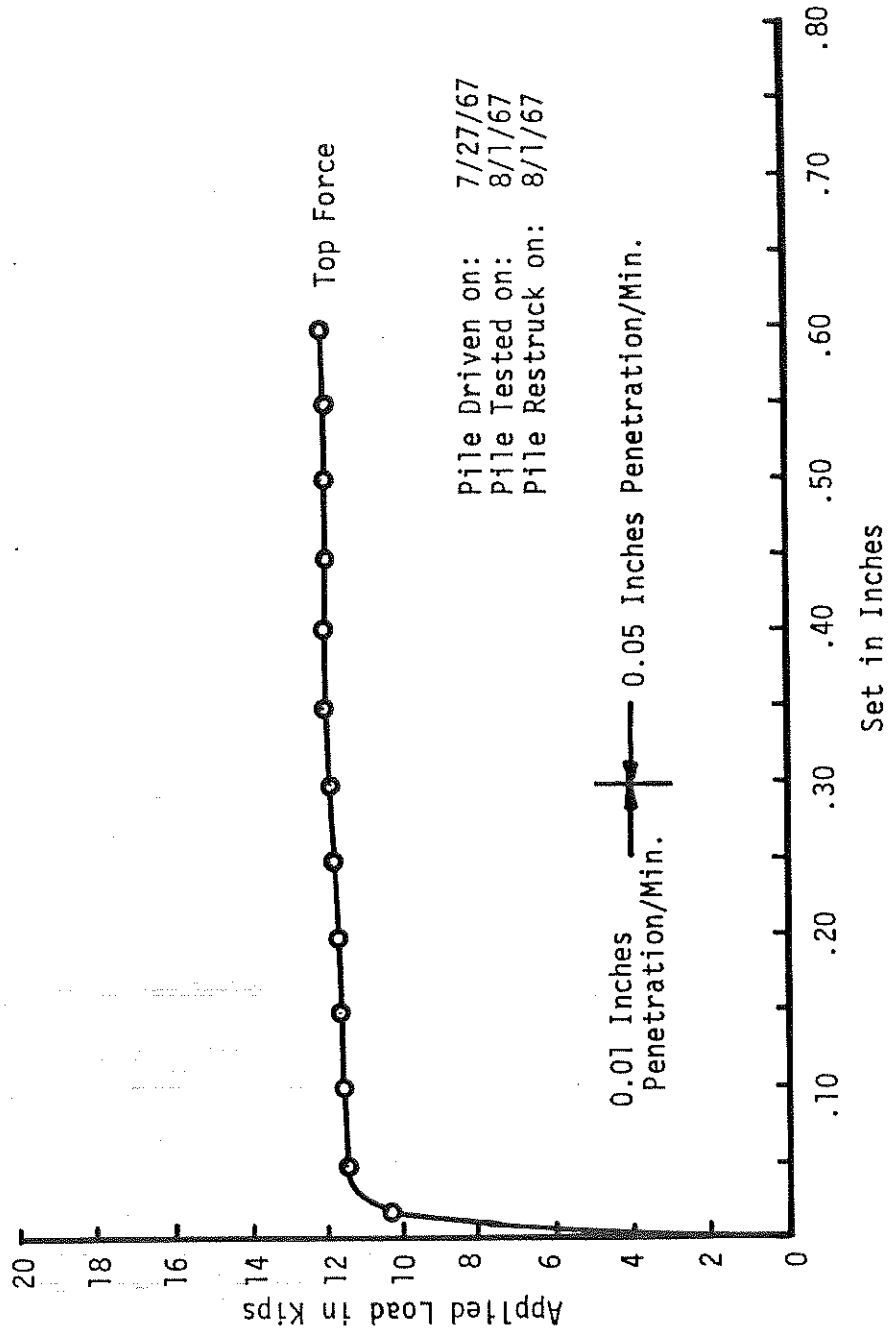


Figure 69 C.R.P. Test Results of Pile 2-R-10 Before Restrucking Pile

MODEL PILE 2-R-10 SILT AND CLAY
 BLOW NO. 1-A DATE AUG. 1 1967

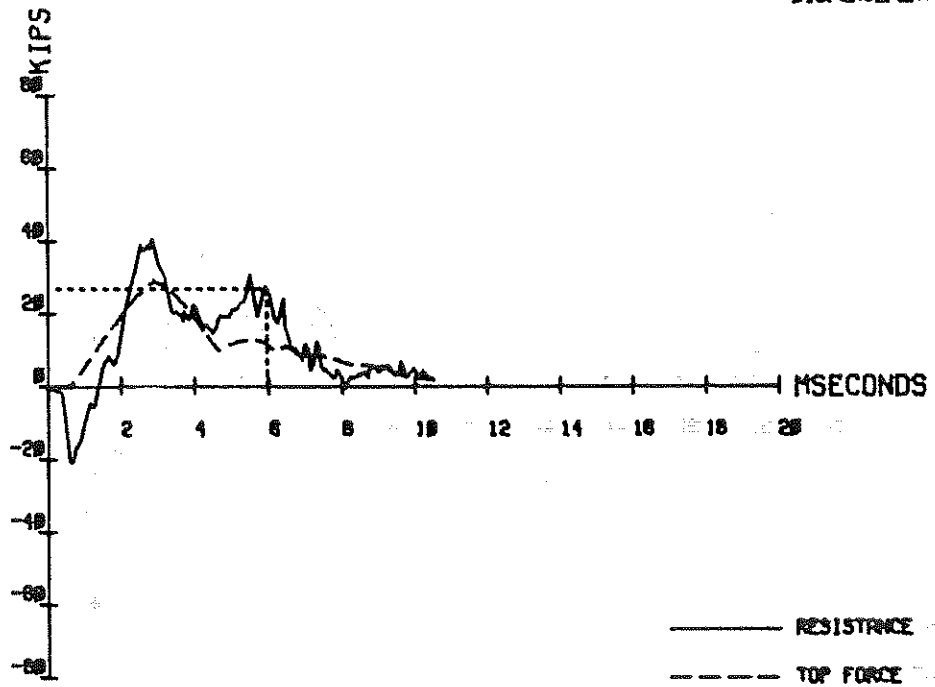
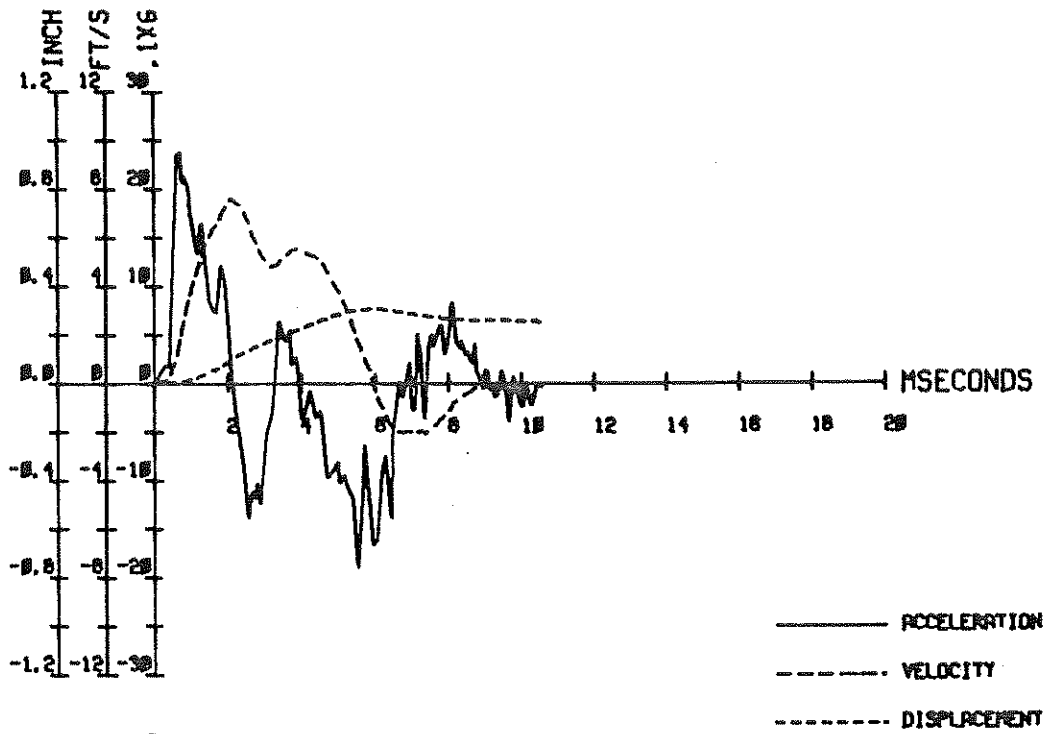


Figure 70 Dynamic Results of Reduced-Scale Pile 2-P-10, Upon Restriking, Blow 1-A

MODEL PILE 2-R-10 SILT AND CLAY
 BLOW NO. 4-A DATE AUG. 1 1967

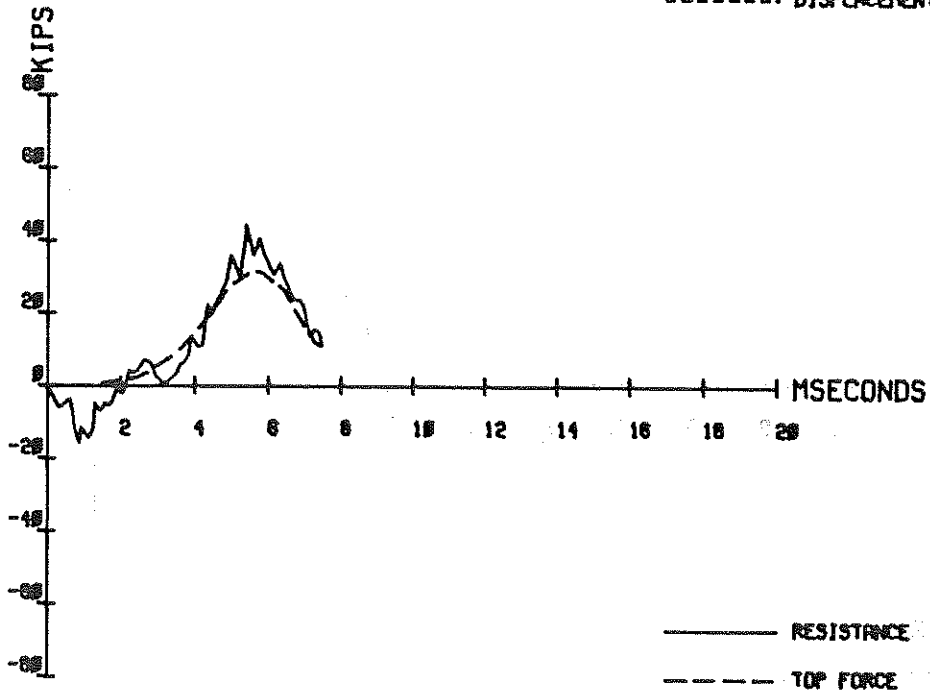
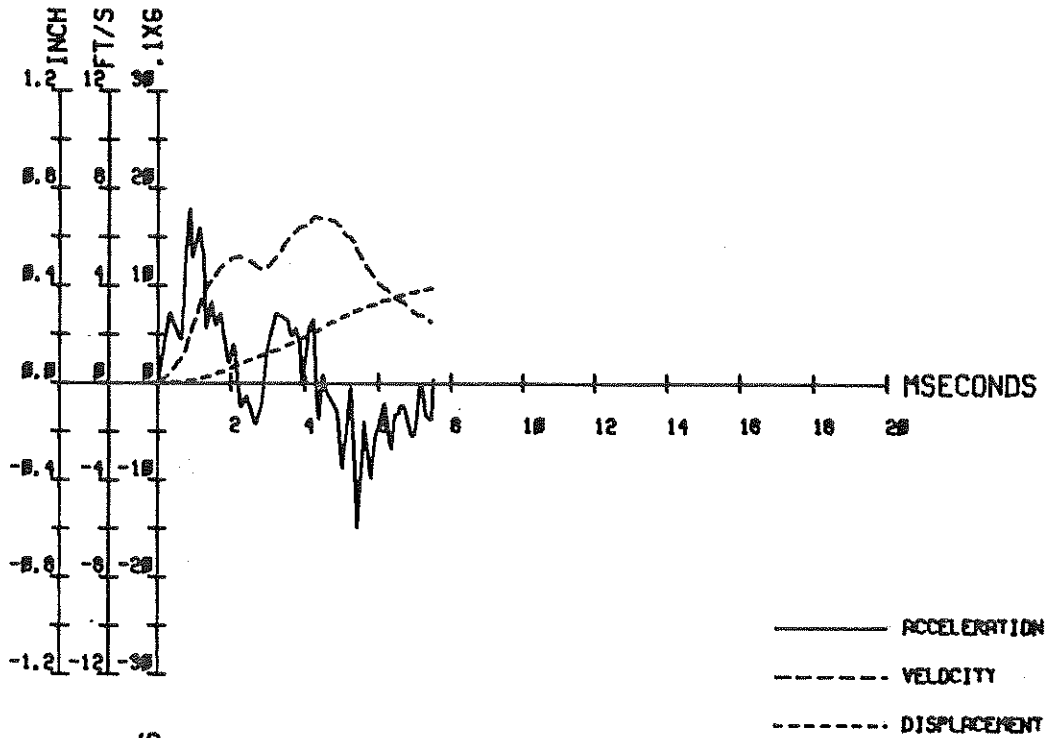


Figure 71 Dynamic Results of Reduced-Scale Pile 2-R-10, Upon Restriking, Blow 4-A

MODEL PILE 2-R-15 SILT AND CLAY
 BLOW NO. 214 DATE AUG. 1 1967

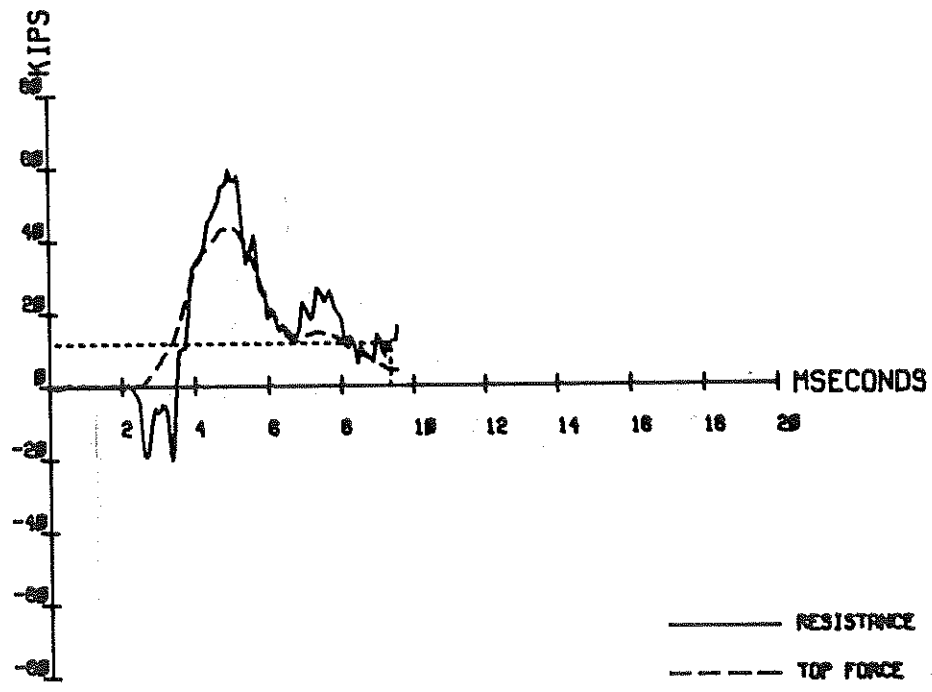
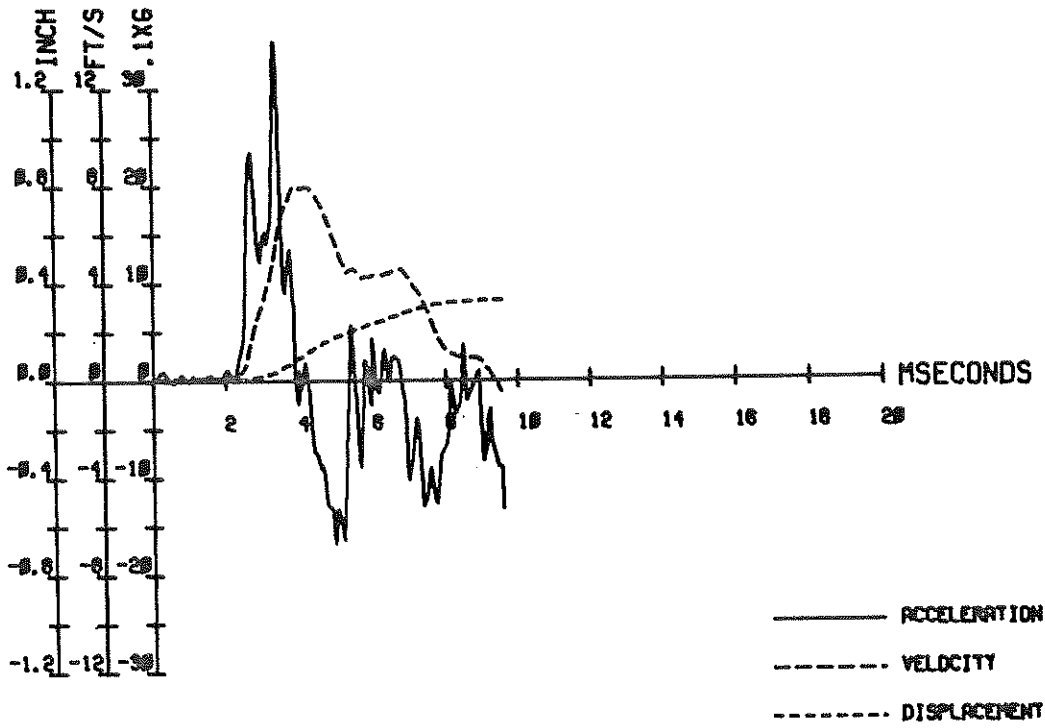


Figure 72 Dynamic Results of Reduced-Scale Pile 2-R-15, At the End of Driving, Blow 214.

MODEL PILE 2-R-15 SILT AND CLAY
 BLOW NO. 215 DATE AUG. 1 1967

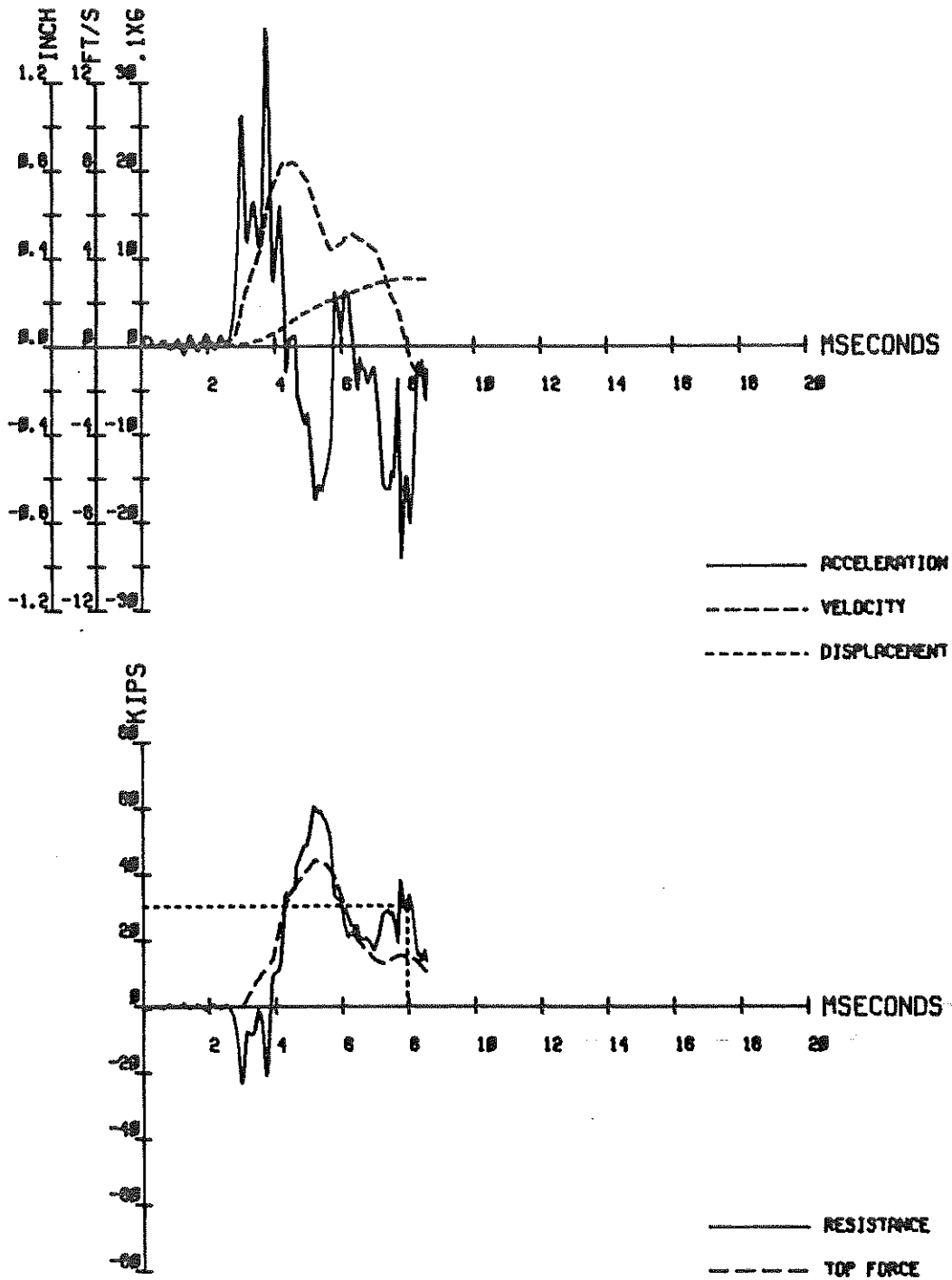


Figure 73 Dynamic Results of Reduced-Scale Pile 2-R-15, At the End of Driving, Blow 215.

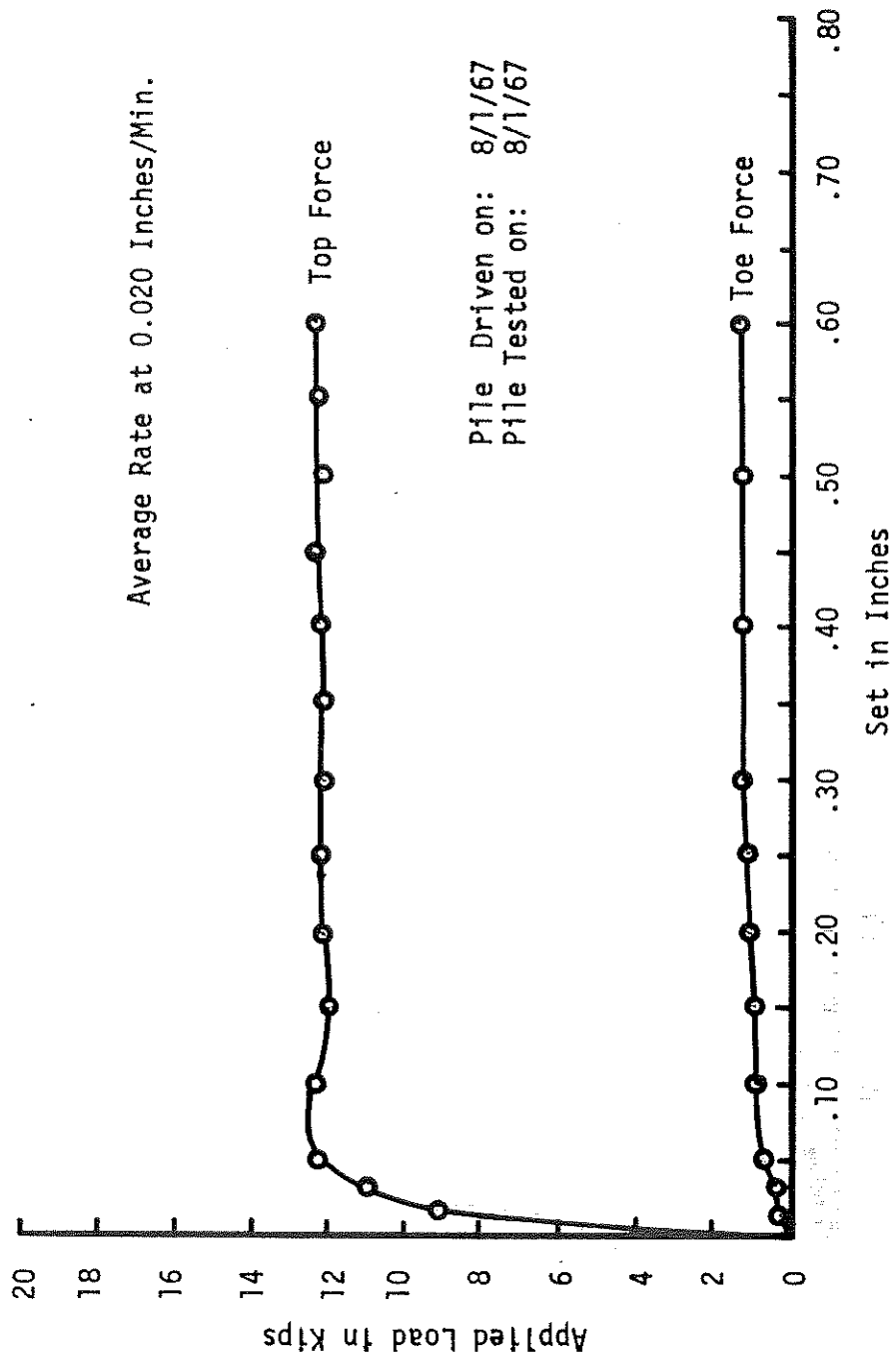


Figure 74: C.R.P. Test Results of Pile 2-R-15 After Driving Pile

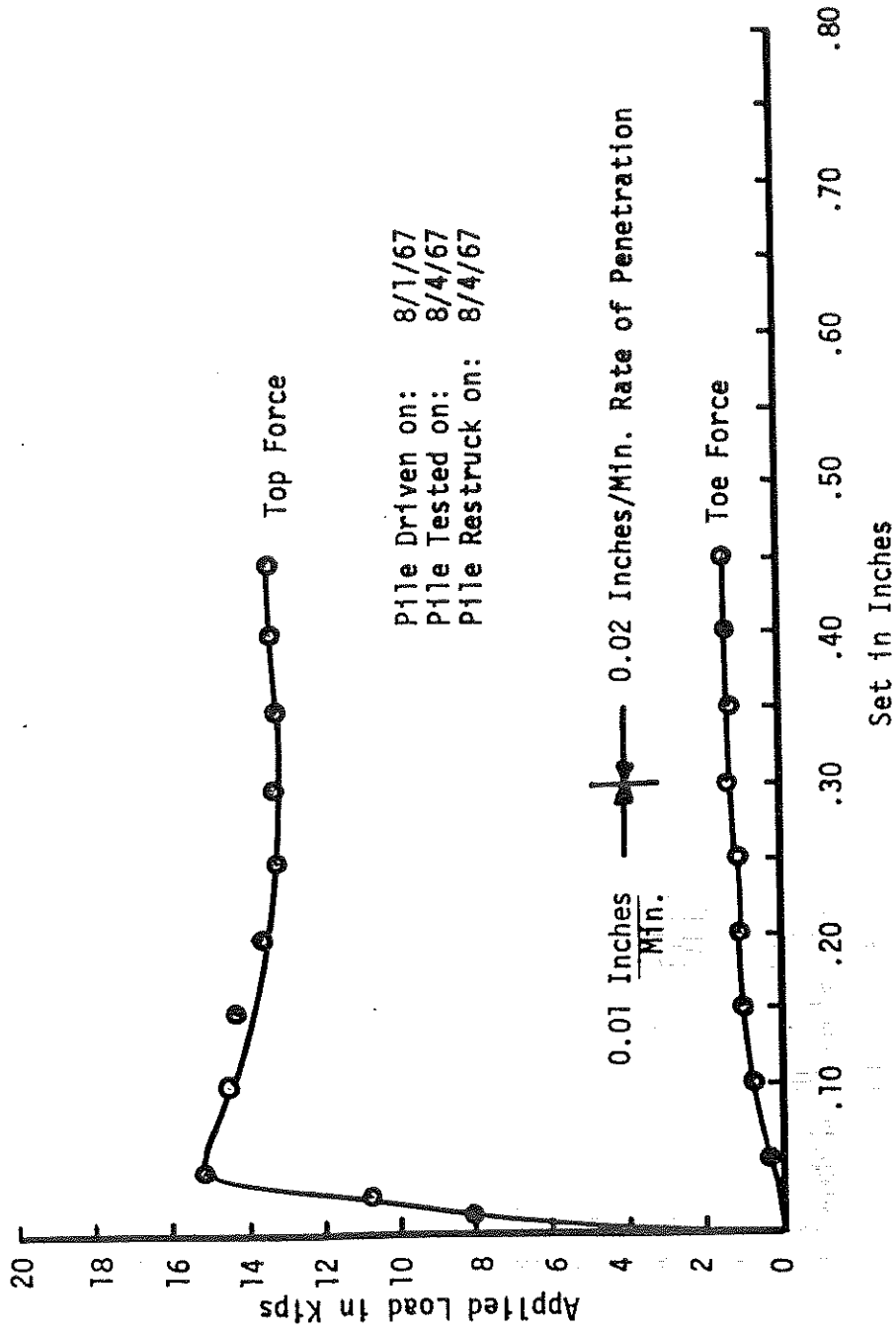


Figure 75: C.R.P. Test Results of Pile 2-R-15 Before Restrucking Pile

MODEL PILE 2-R-15 SILT AND CLAY
 BLOW NO. 2-A DATE AUG. 4 1967

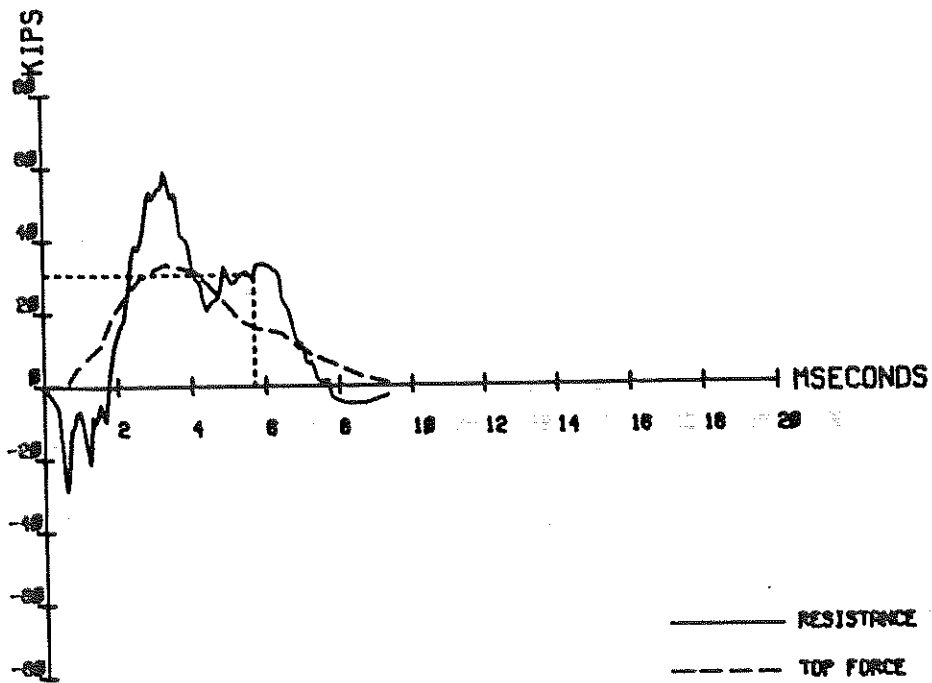
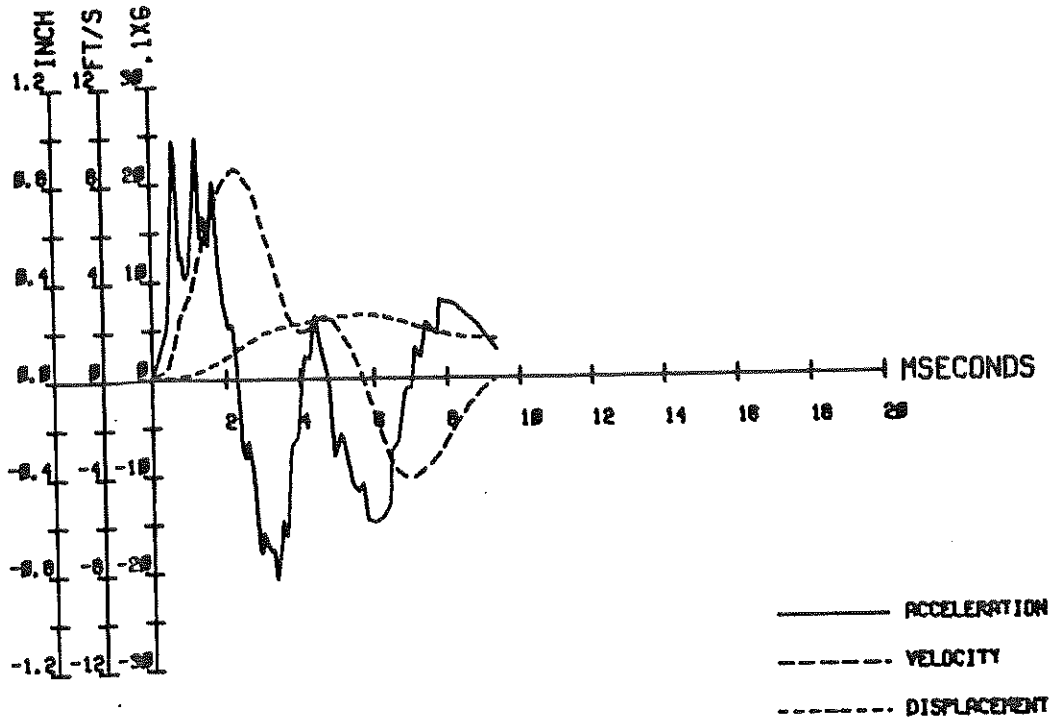


Figure 76 Dynamic Results of Reduced-Scale Pile 2-R-15, Upon Restriking, Blow 2-A.

MODEL PILE 2-R-15 SILT AND CLAY
 BLOW NO. 3-A DATE AUG. 4 1967

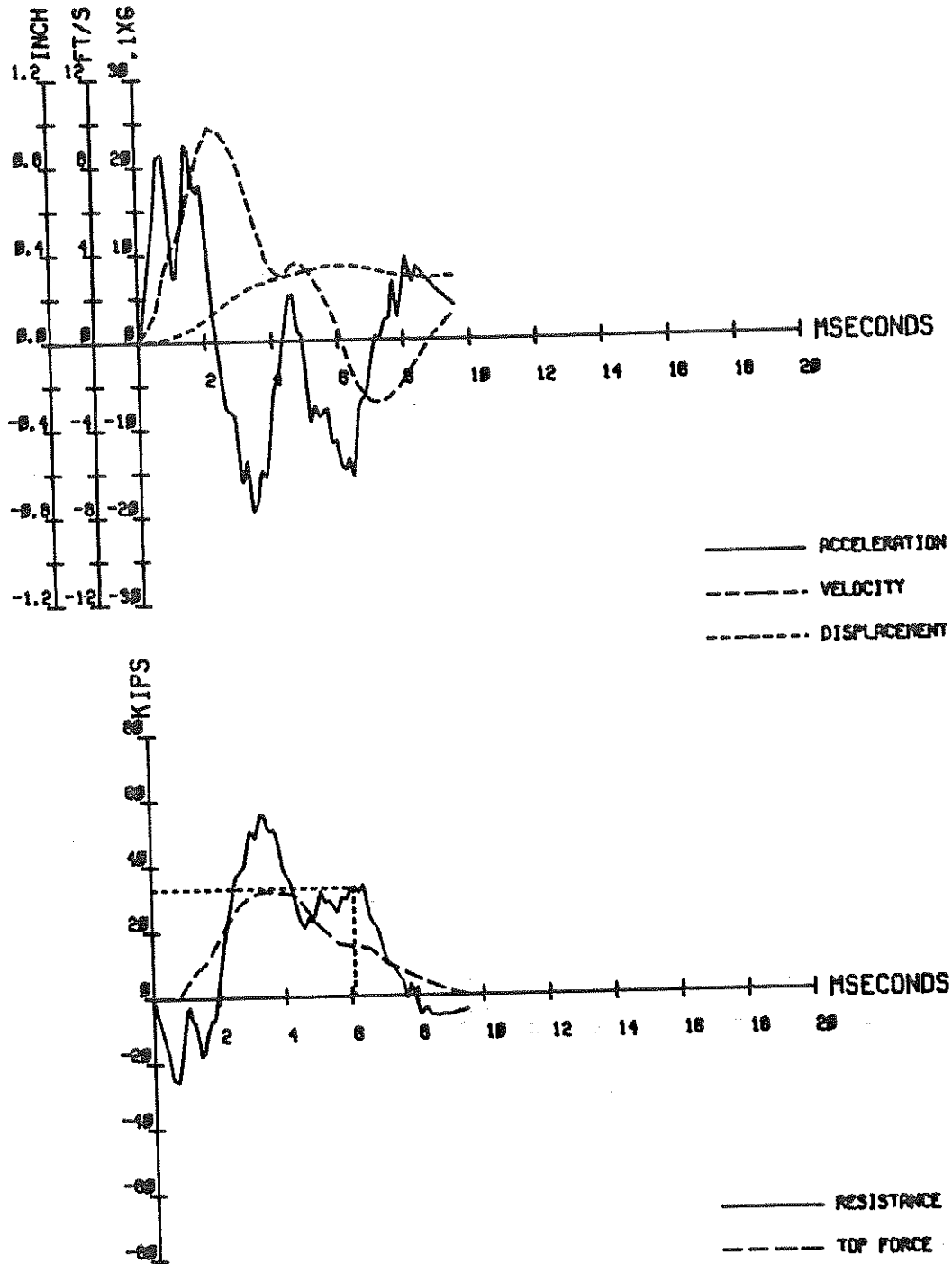


Figure 77 Dynamic Results of Reduced Scale Pile 2-R-15, Upon Restriking, Blow 3-A

MODEL PILE 2-R-15 SILT AND CLAY
 BLOW NO. 5-A DATE AUG. 4 1967

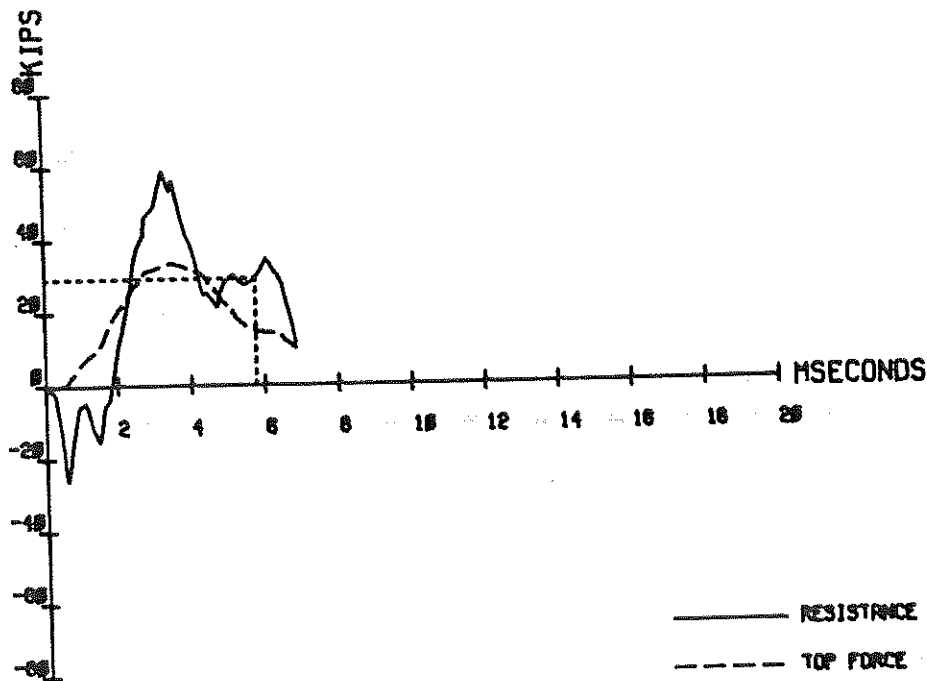
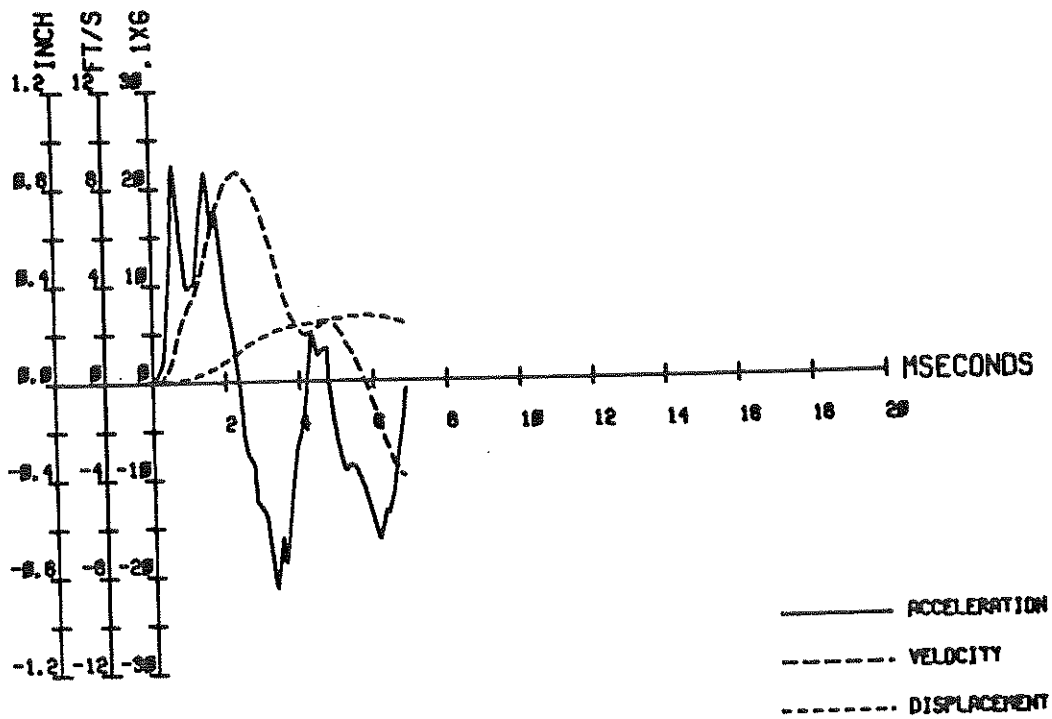


Figure 78 Dynamic Results of Reduced Scale Pile 2-R-15, Upon Restriking, Blow 5-A

MODEL PILE 2-R-20 SILT AND CLAY
 BLOW NO. 315 DATE AUG. 4 1967

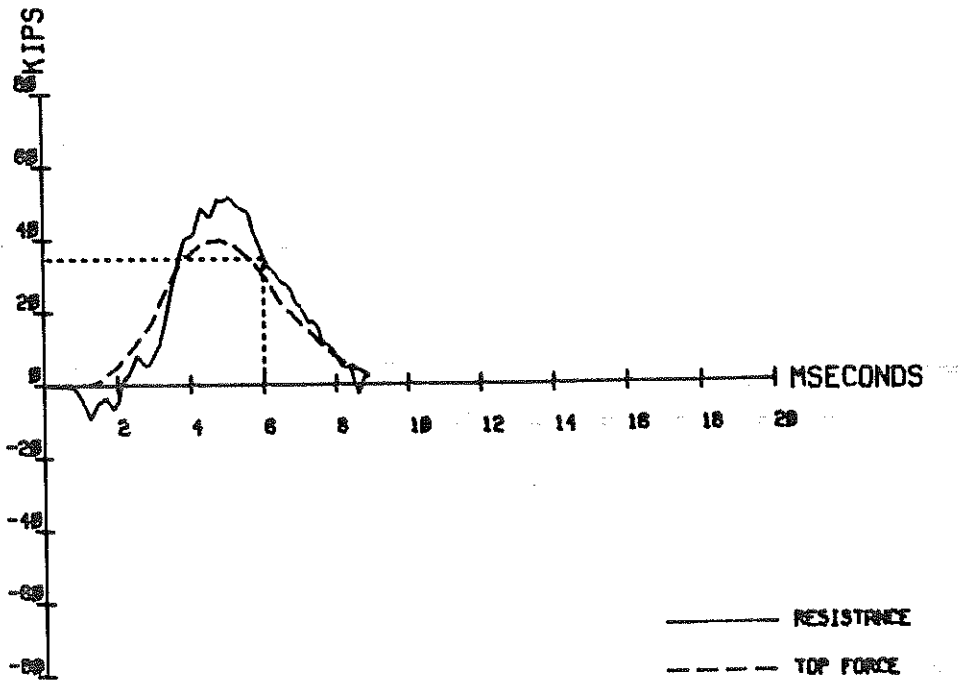
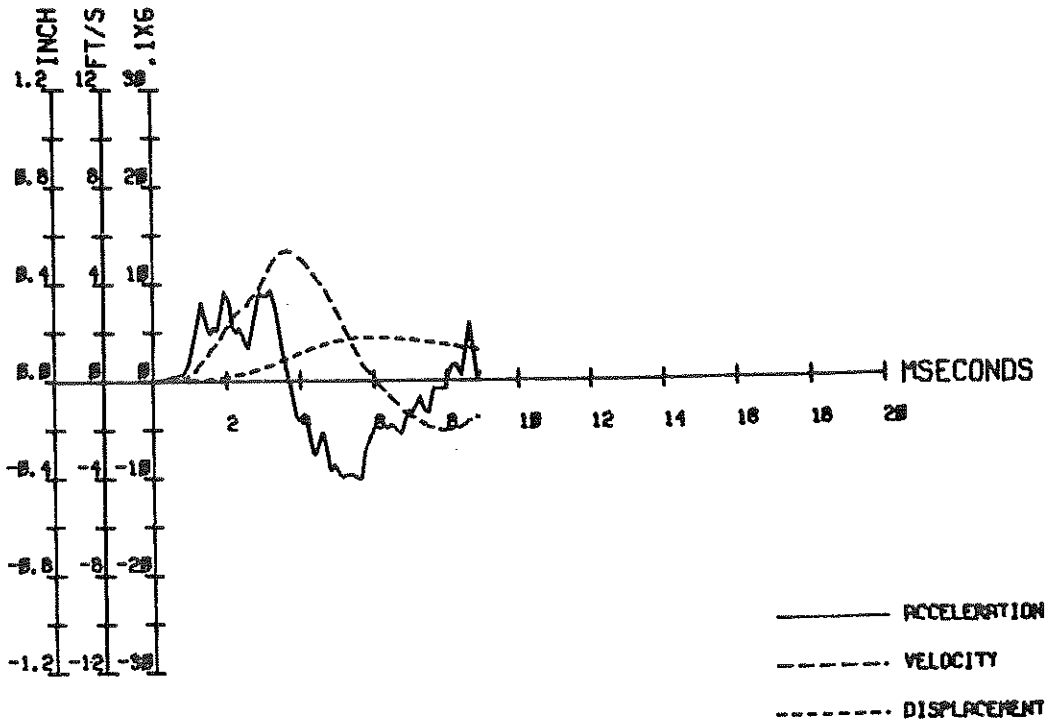


Figure 79 Dynamic Results of Reduced Scale Pile 2-R-20, At the End of Driving, Blow 315.

MODEL PILE 2-R-20 SILT AND CLAY
 BLOW NO. 316 DATE AUG. 4 1967

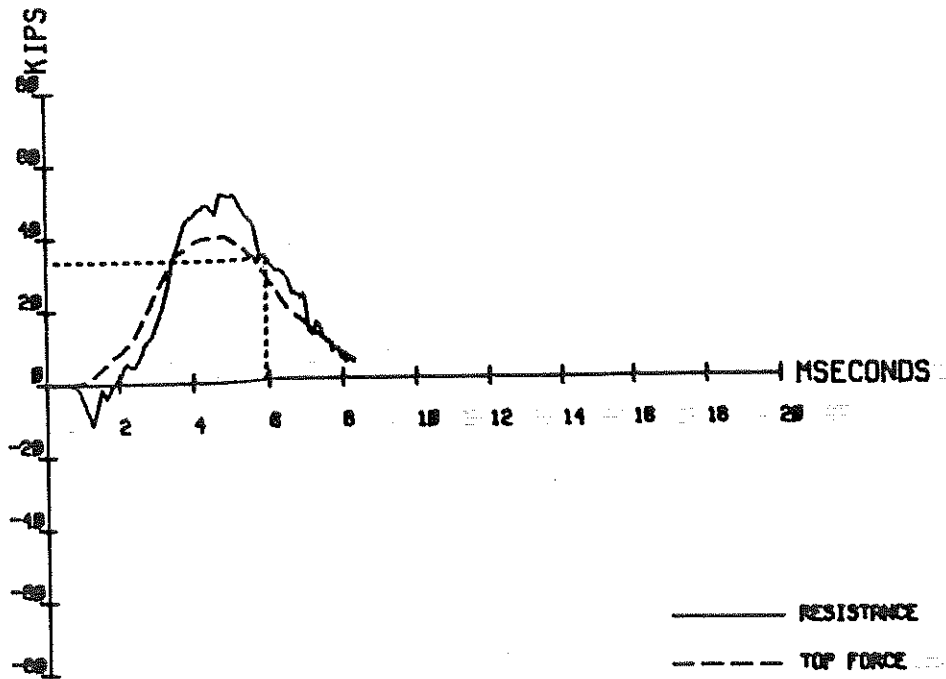
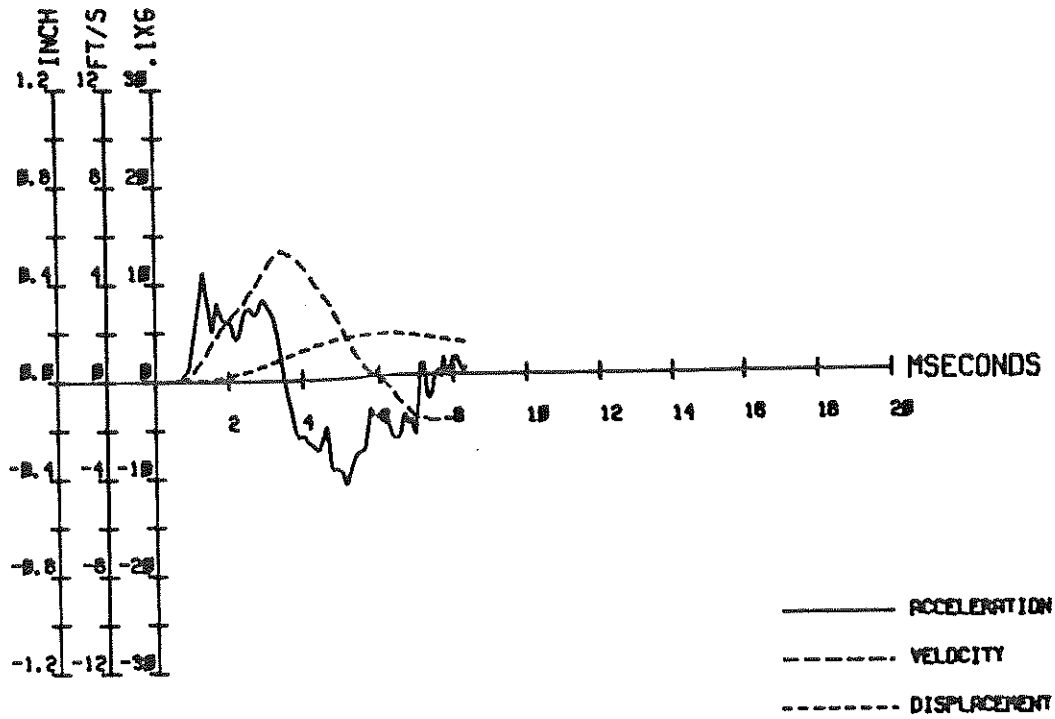


Figure 80 Dynamic Results of Reduced Scale Pile 2-R-20, At the End of Driving, Blow 316.

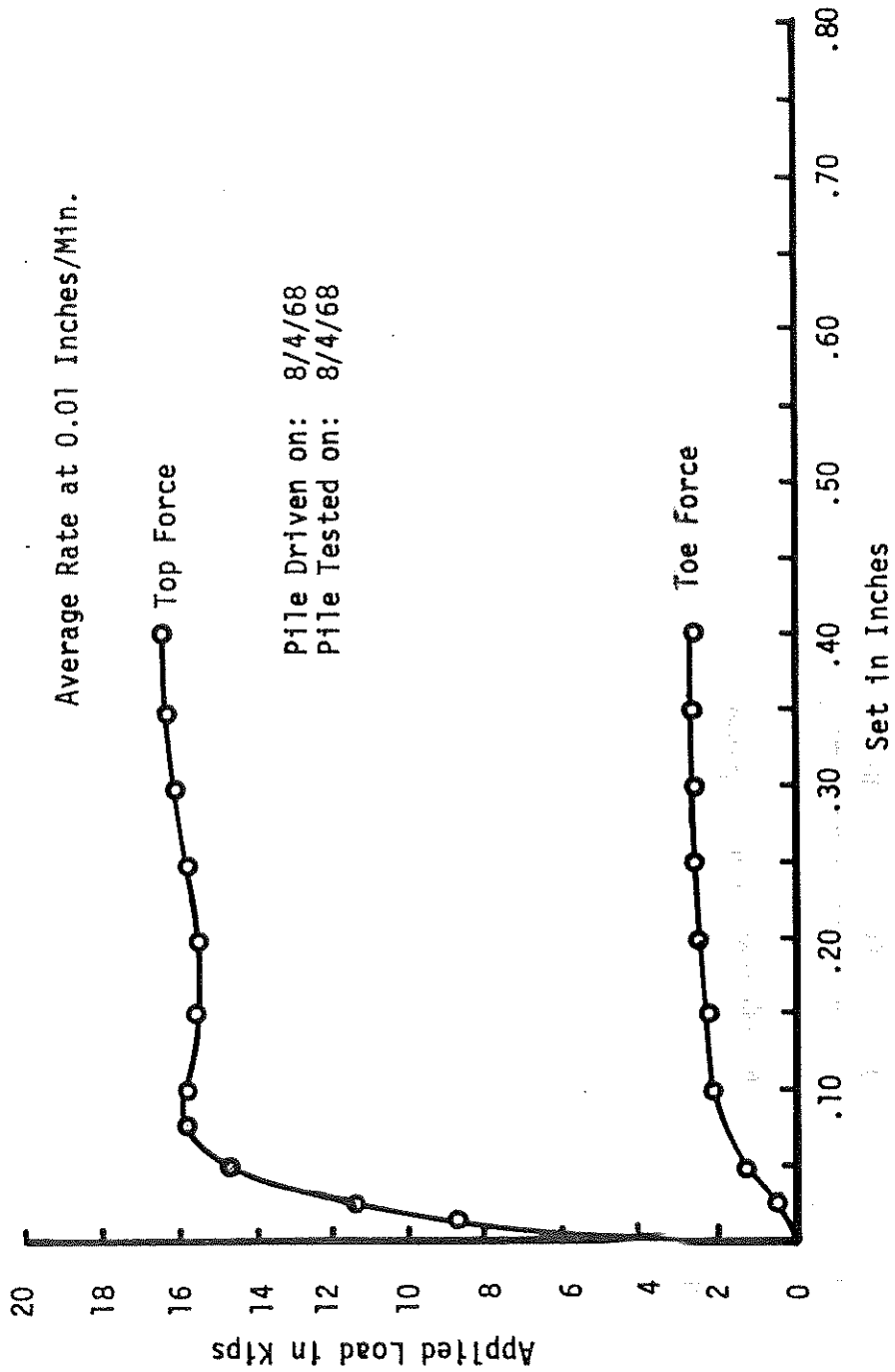


Figure 81 C.R.P. Test Results of Pile 2-R-20 After Driving Pile

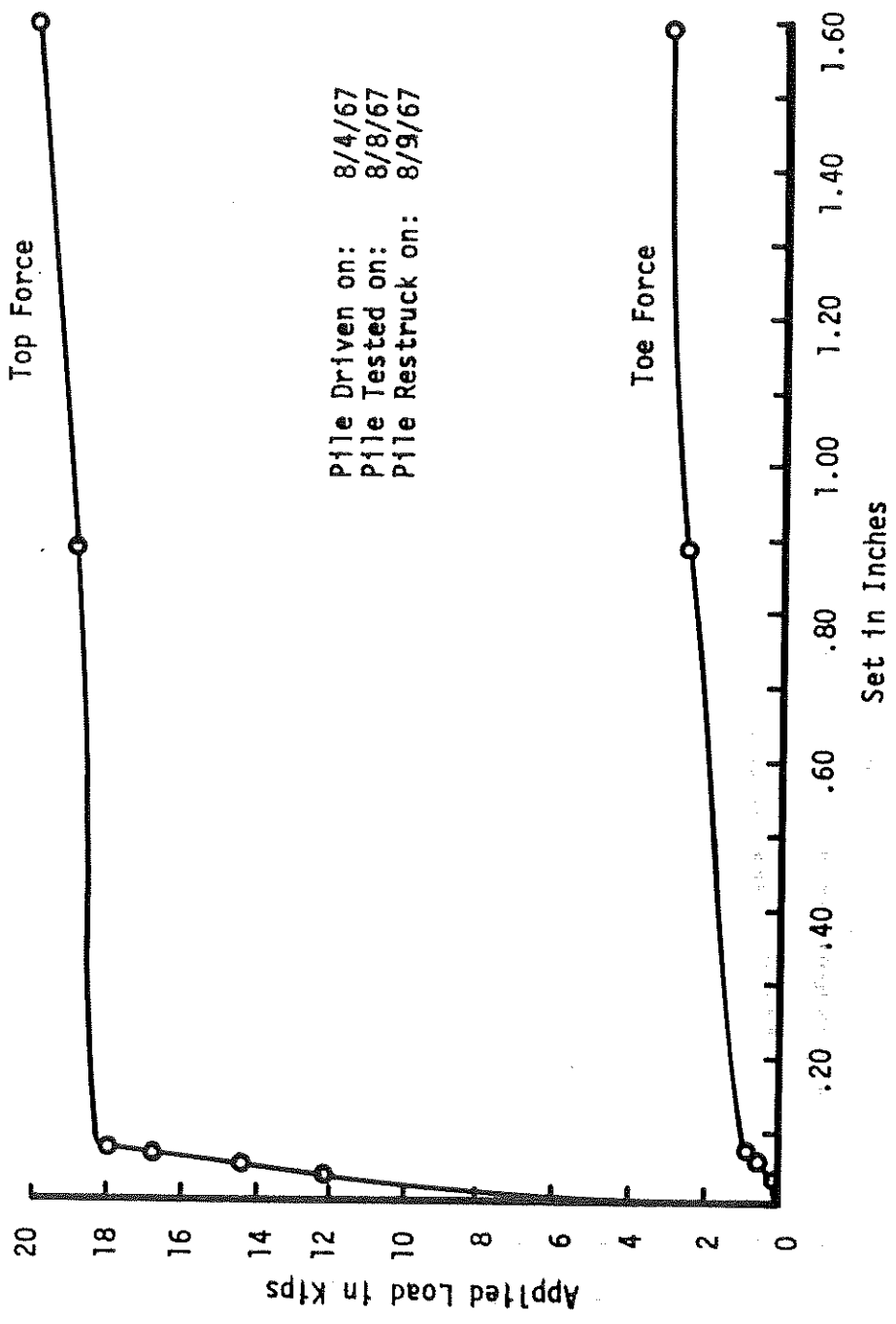


Figure 82: M.L. Test Result of Pile 2-R-20 Before C.R.P. Test and Then Restrucking of Pile

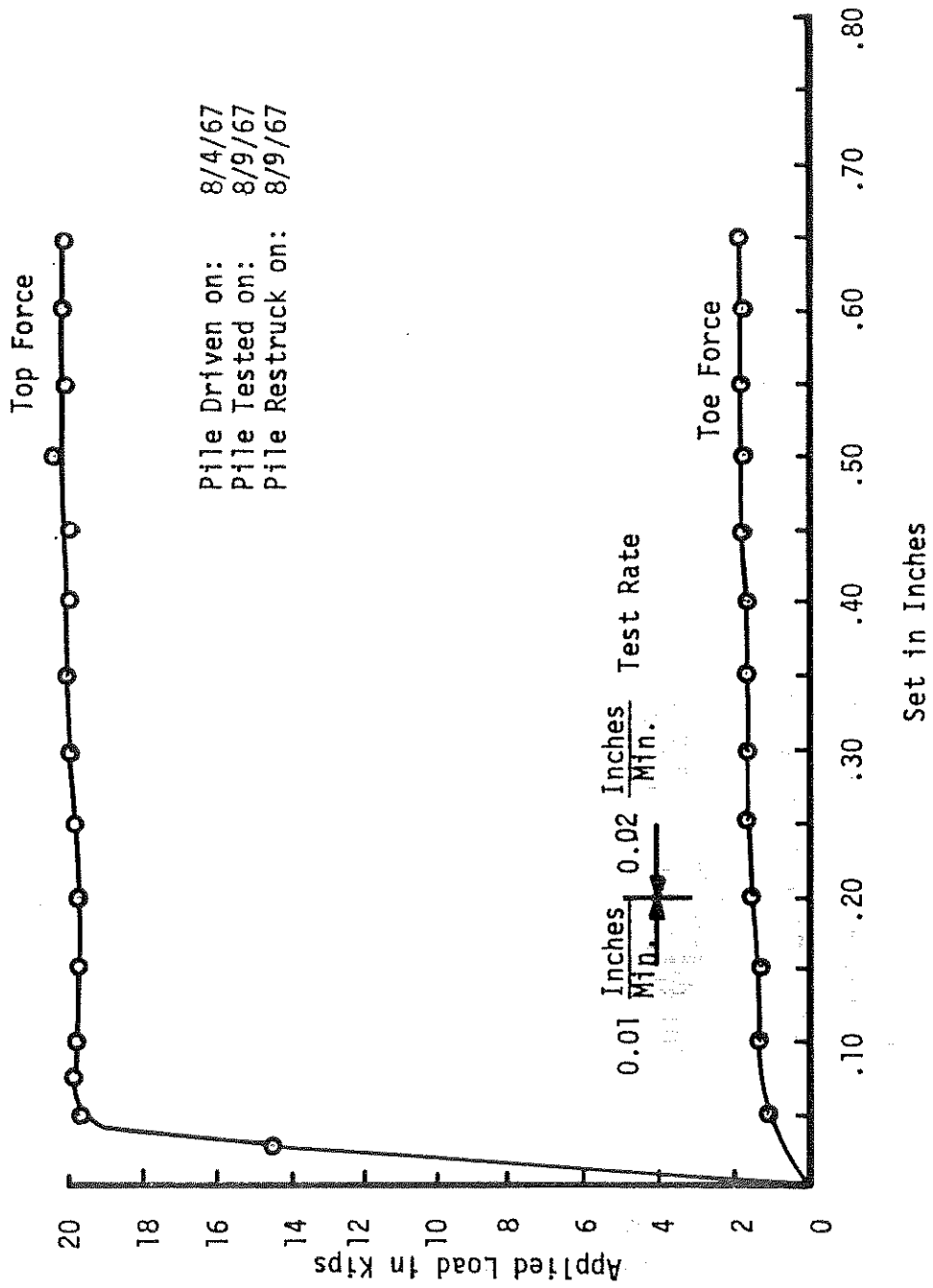


Figure 83: C.R.P. Test Result of Pile 2-R-20 Before Restrucking Pile

MODEL PILE 2-R-20 SILT AND CLAY
 BLOW NO. 4-A DATE AUG. 9 1967

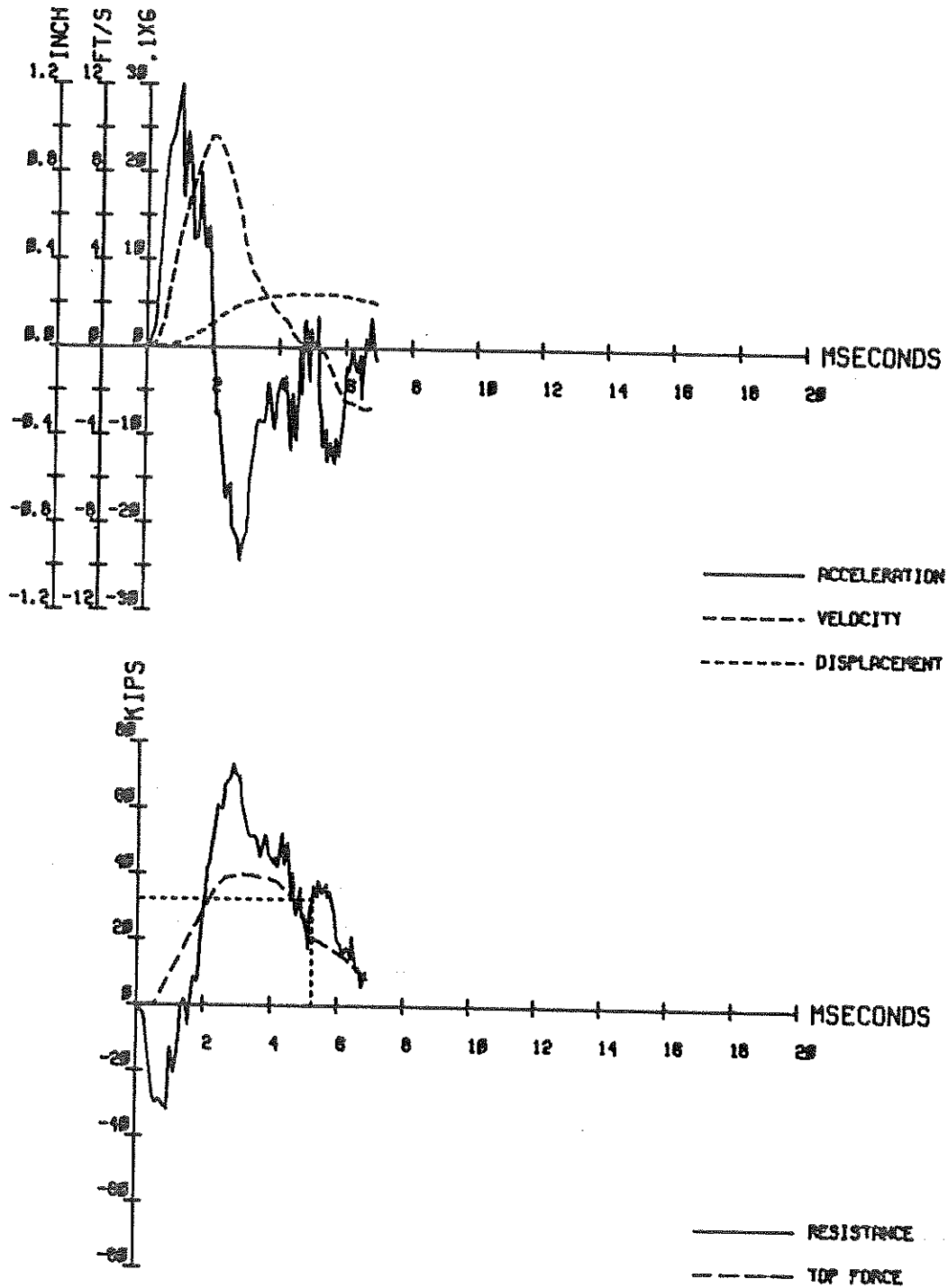


Figure 84 Dynamic Results of Reduced-Scale-Pile 2-R-20, Upon Restriking, Blow 4-A.

MODEL PILE 2-R-20 SILT AND CLAY
 BLOW NO. 7-A DATE AUG. 9 1967

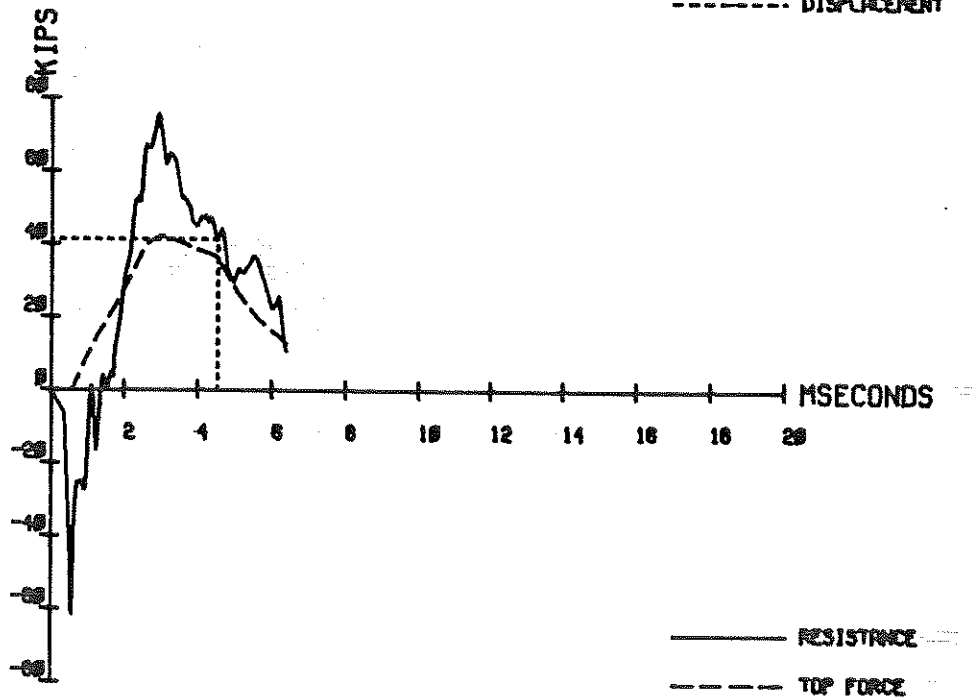
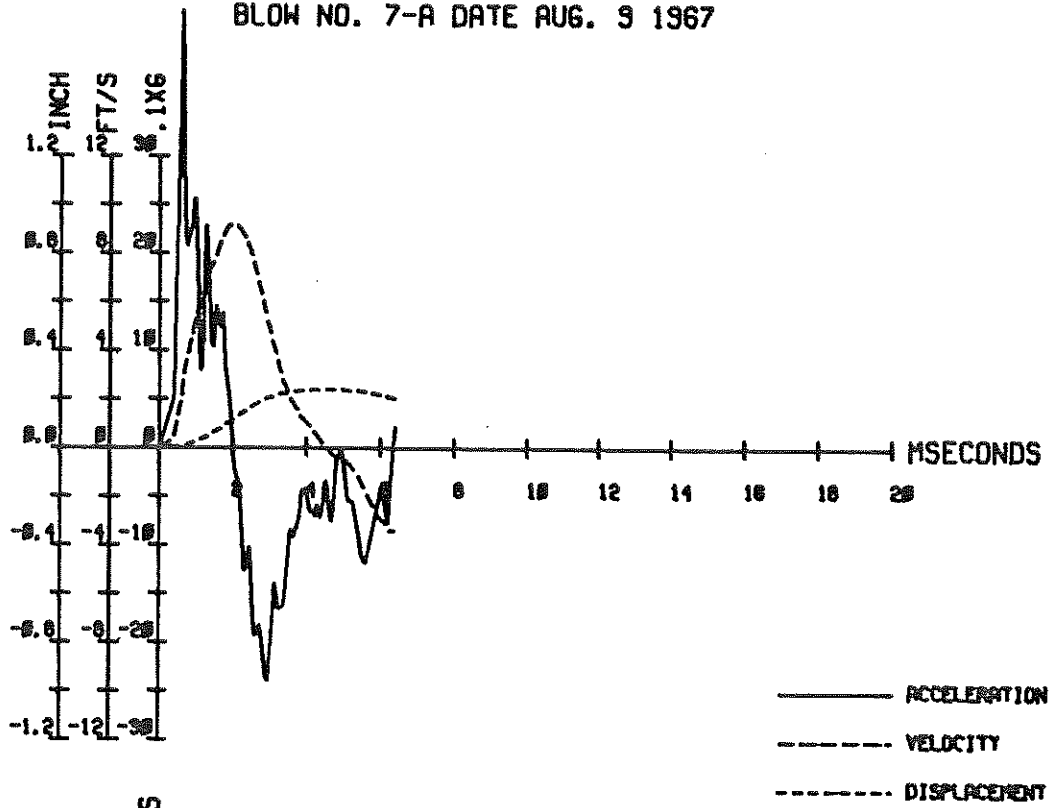


Figure 85 Dynamic Results of Reduced-Scale Pile 2-R-20, Upon Restriking Blow 7-A.

MODEL PILE 2-R-20 SILT AND CLAY
 BLOW NO. 9-A DATE AUG. 9 1967

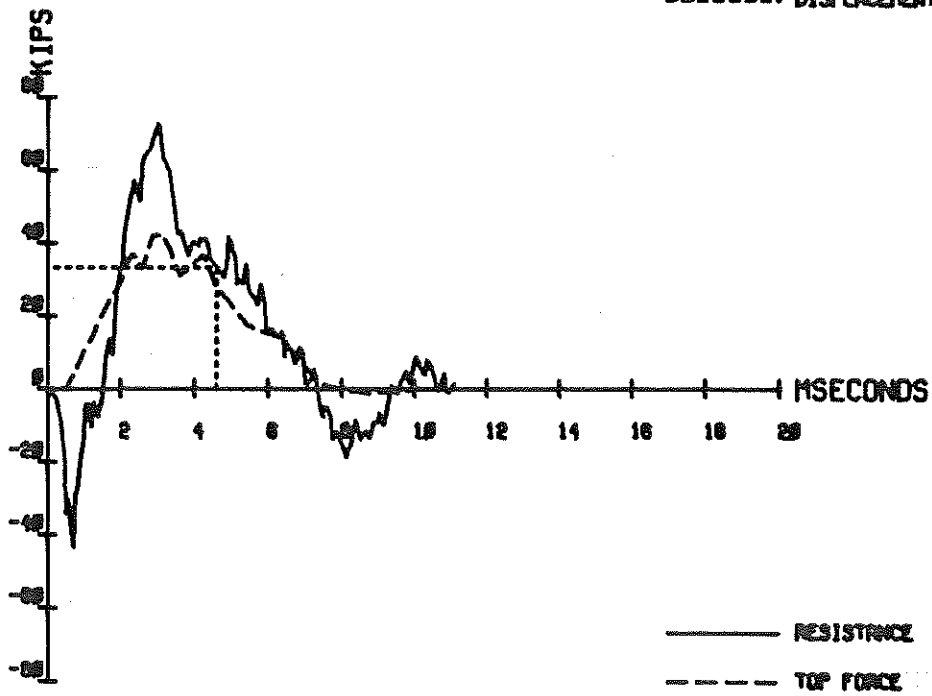
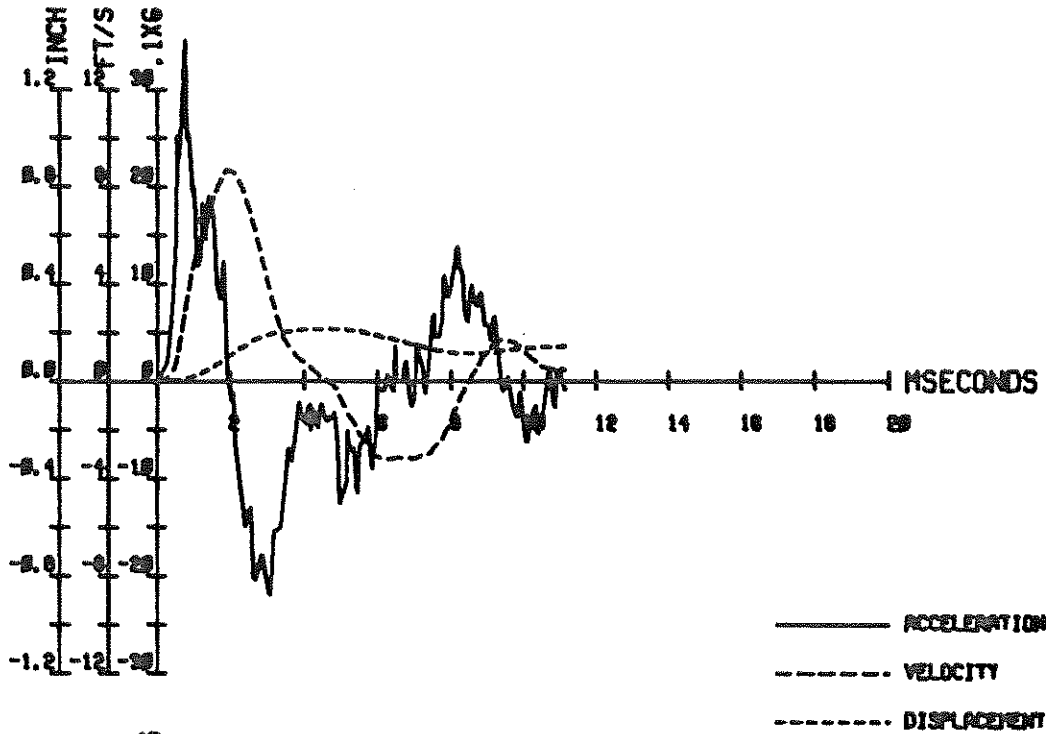


Figure 86 Dynamic Results of Reduced-Scale Pile 2-R-20, Upon Restriking, Blow 3-A

MODEL PILE 3-R-10 SILT AND CLAY
 BLOW NO. 129 DATE AUG. 18 1967

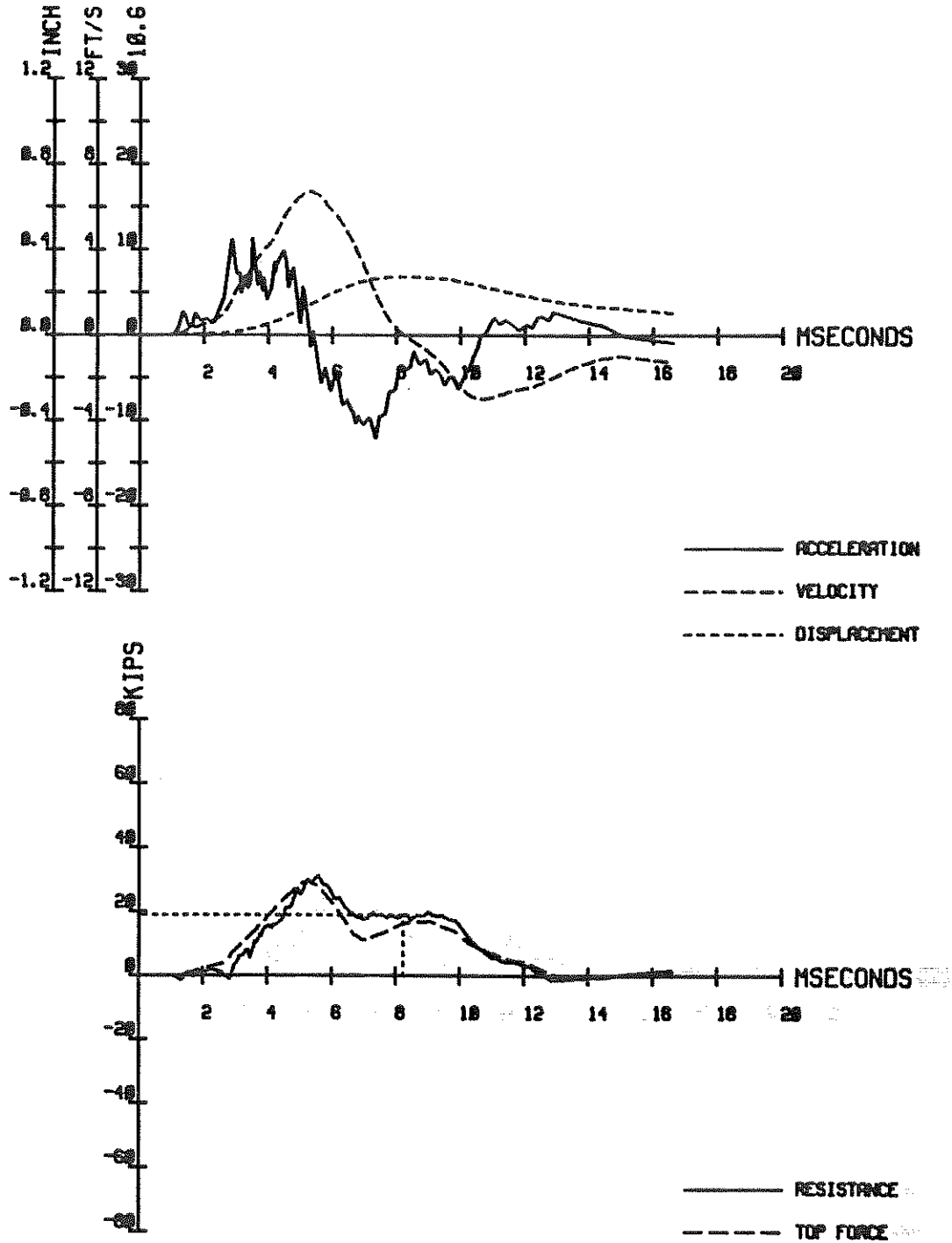


Figure 87 Dynamic Results of Reduced-Scale Pile 3-R-10, At the End of Driving, Blow 129.

MODEL PILE 3-R-10 SILT AND CLAY
 BLOW NO. 124 DATE AUG. 18 1967

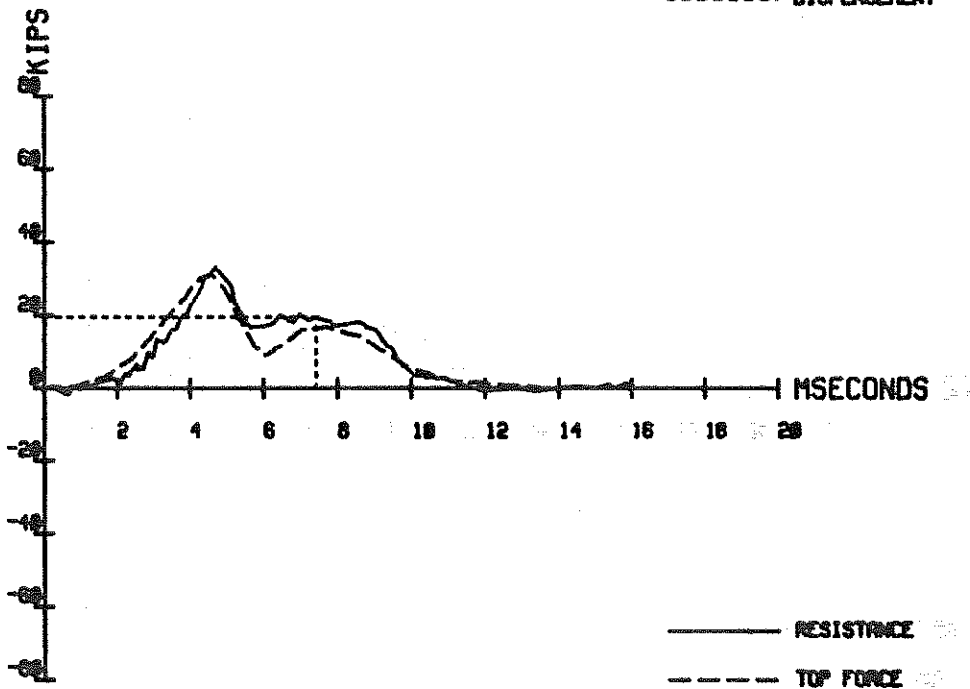
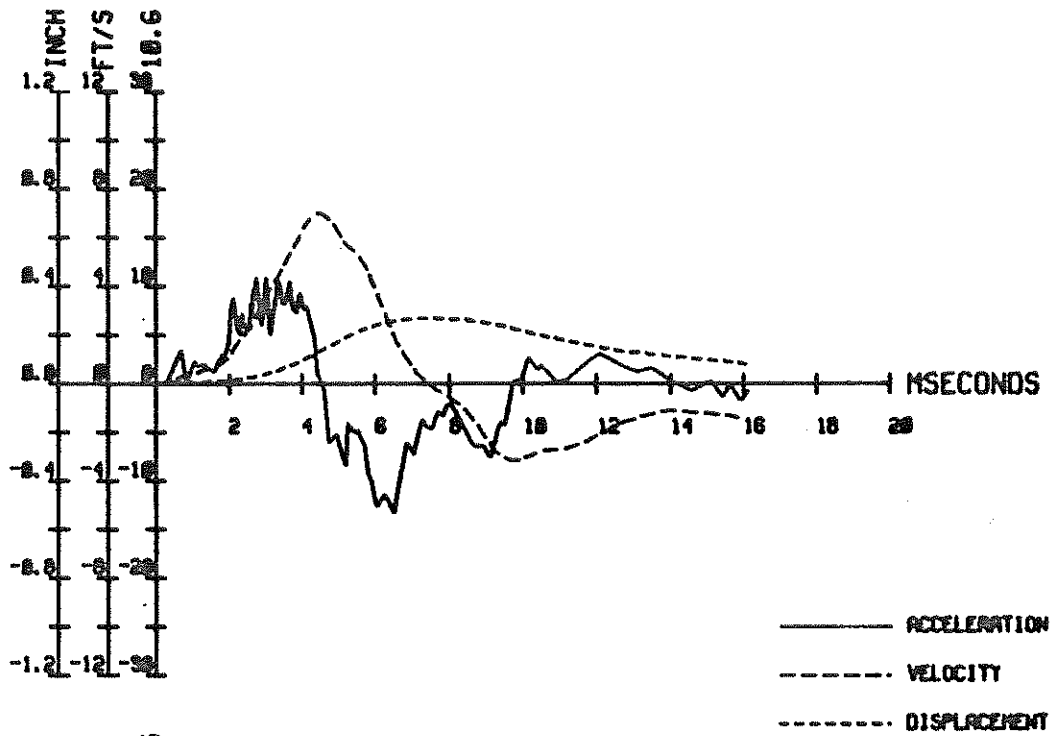


Figure 88 Dynamic Results of Reduced-Scale Pile 3-R-10, At the End of Driving, Blow 124.

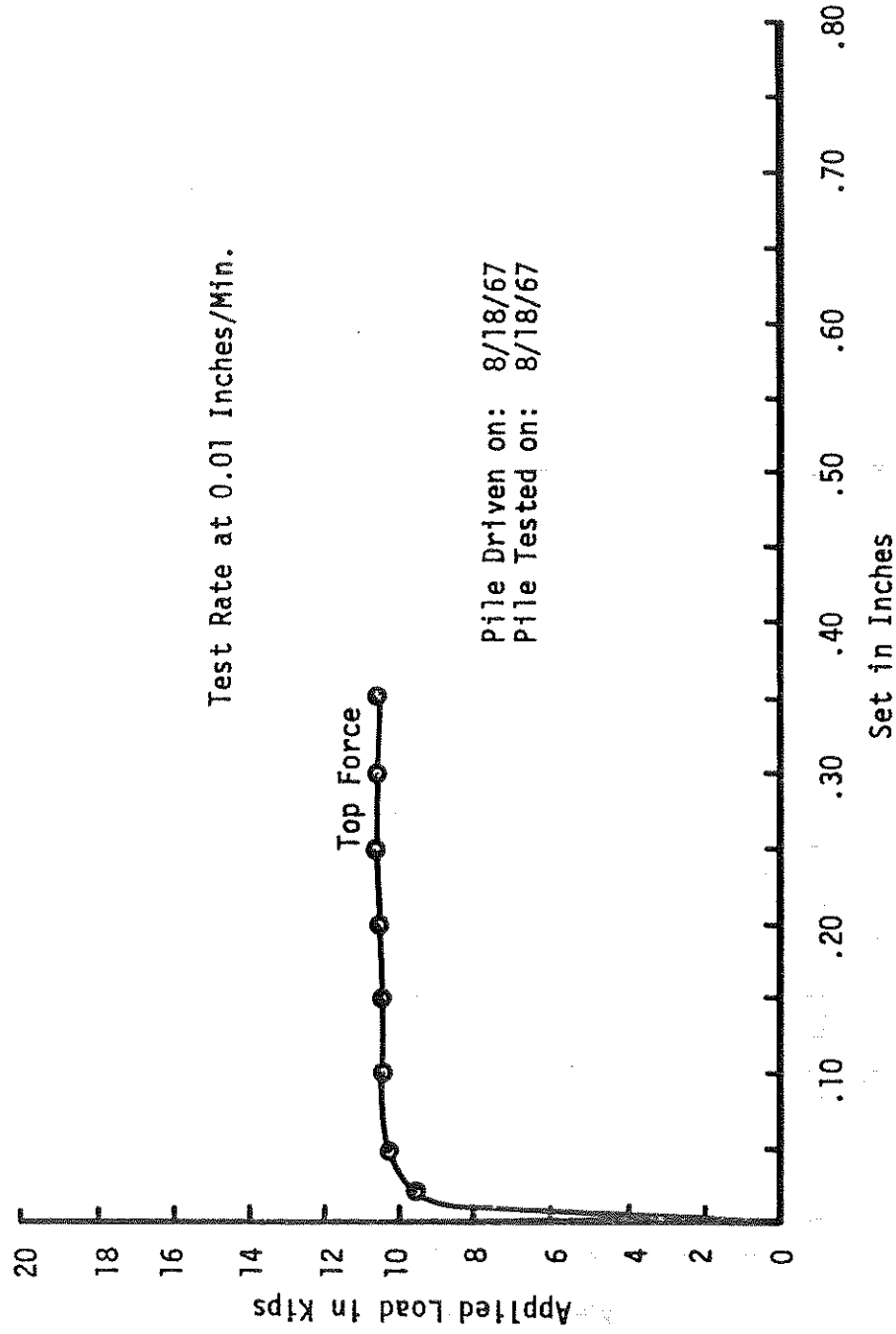


Figure 89: C.R.P. Test Result of Pile 3-R-10 After Driving Pile

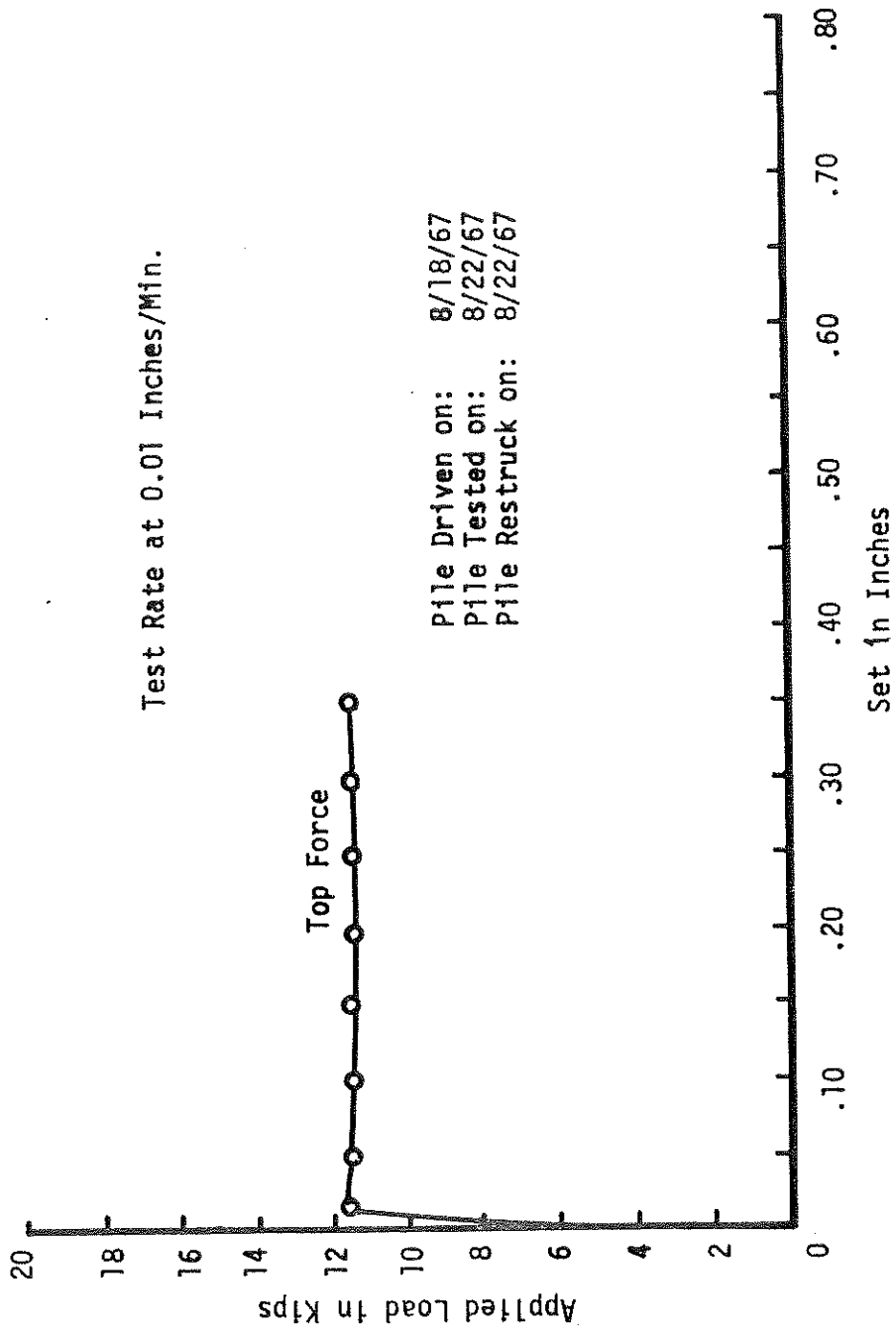


Figure 90: C.R.P. Test Result of Pile 3-R-10 Before Restrucking Pile

MODEL PILE 3-R-10 SILT AND CLAY
 BLOW NO. 1-A DATE AUG. 22 1967

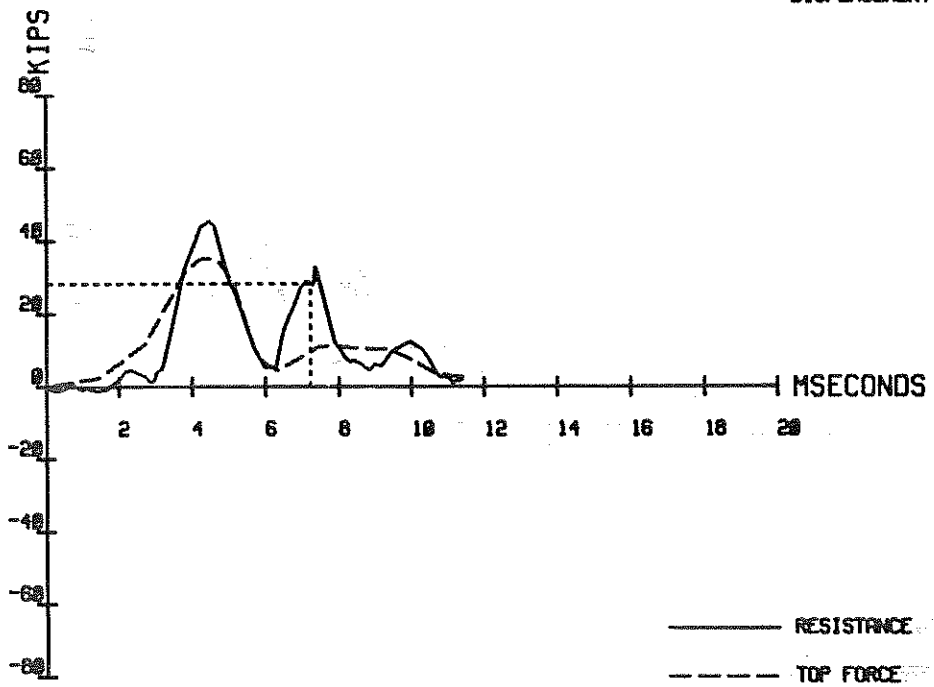
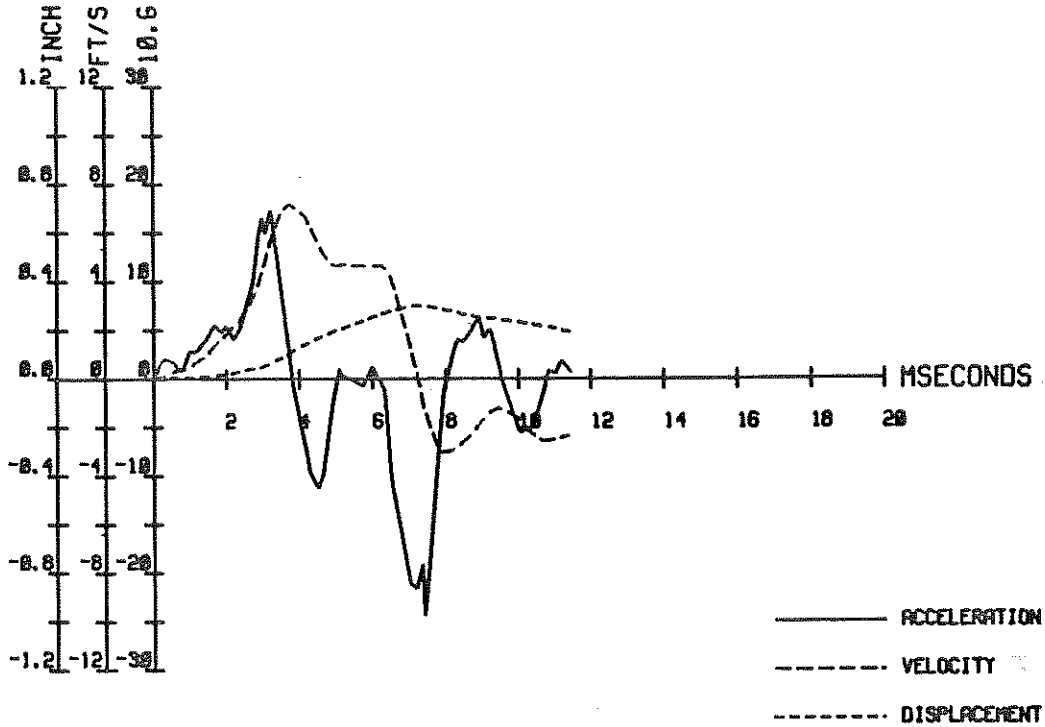


Figure 91 Dynamic Results of Reduced-Scale Pile 3-R-10, Upon Restriking, Blow 1-A.

MODEL PILE 3-R-10 SILT AND CLAY
 BLOW NO. 2-A DATE AUG. 22 1967

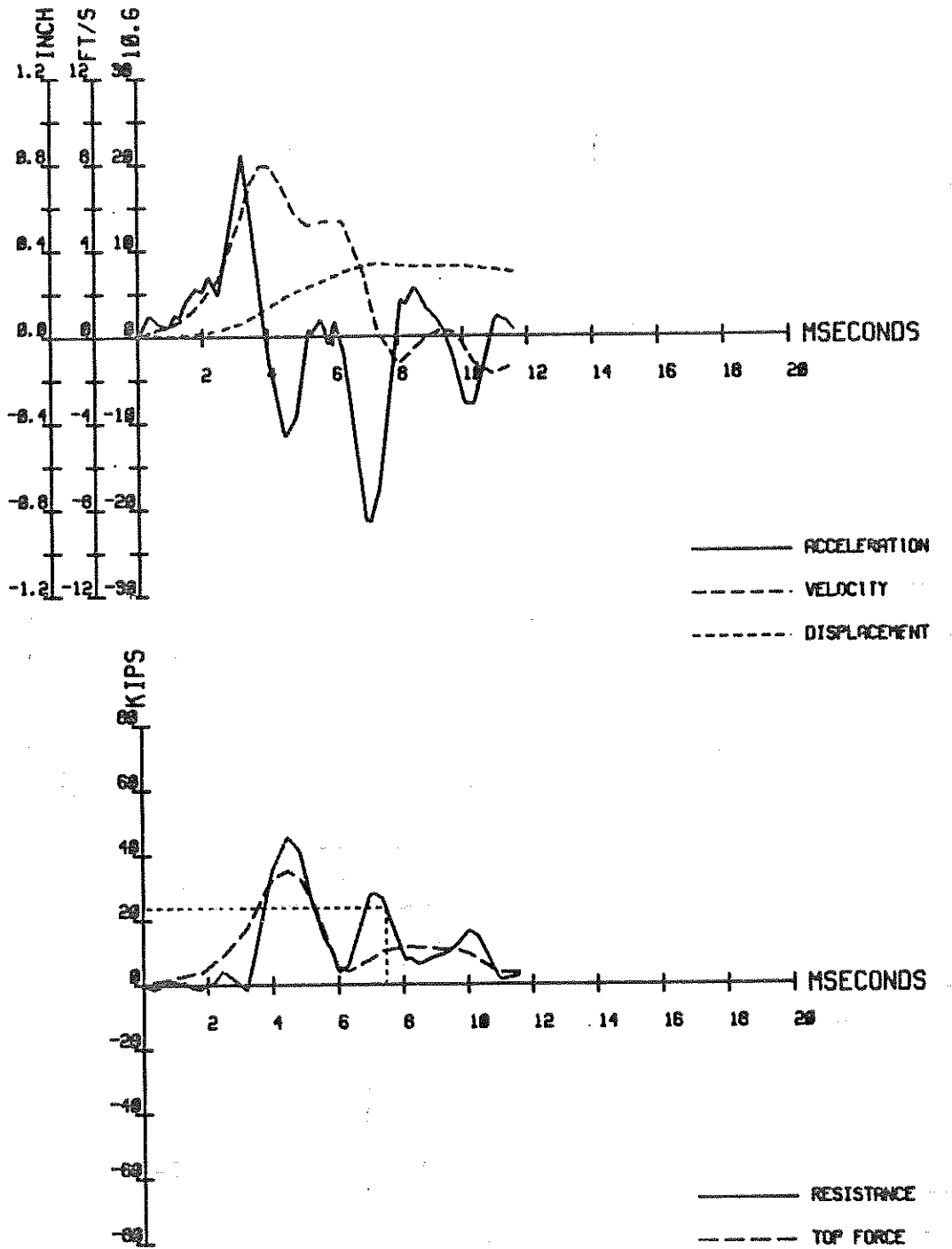


Figure 92 Dynamic Results of Reduced-Scale Pile 3-R-10, Upon Restriking, Blow 2-A

MODEL PILE 3-R-15 SILT AND CLAY
 BLOW NO. 199 DATE AUG. 22 1967

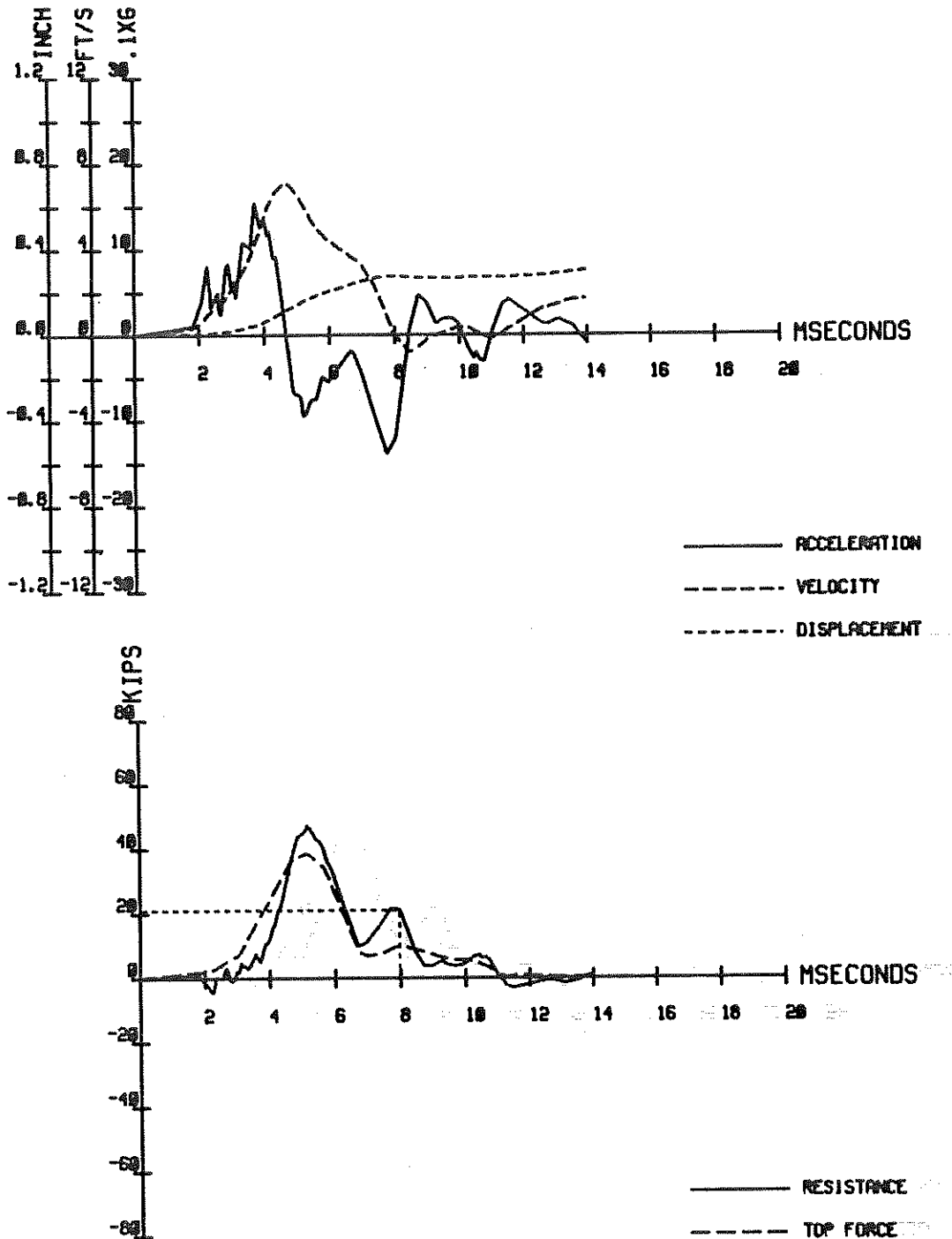


Figure 93 Dynamic Results of Reduced-Scale Pile 3-R-15, At the End of Driving, Blow 199.

MODEL PILE 3-R-15 SILT AND CLAY
 BLOW NO. 200 DATE AUG. 22 1967

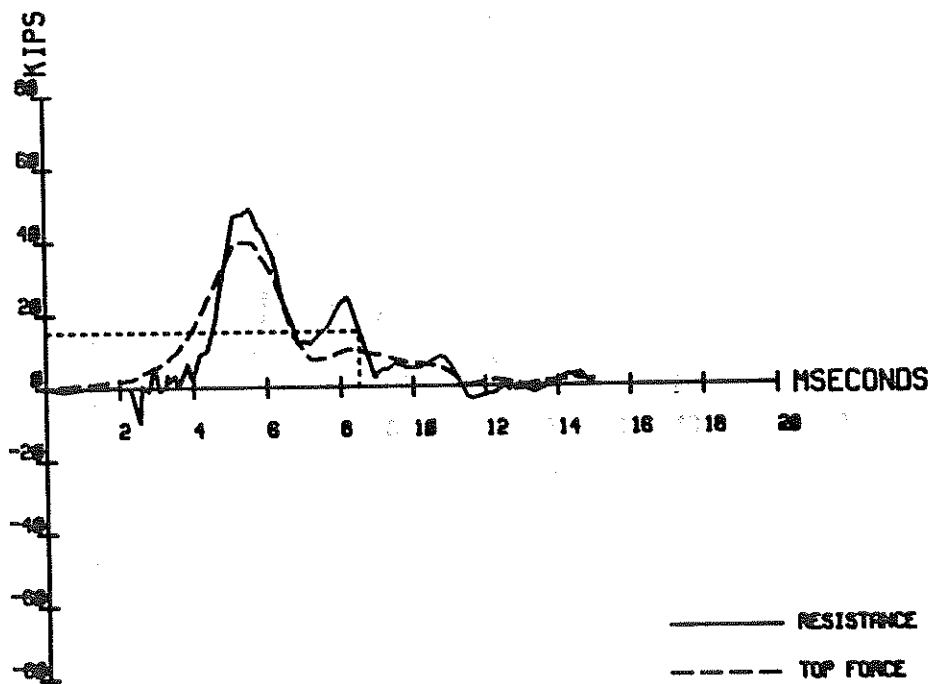
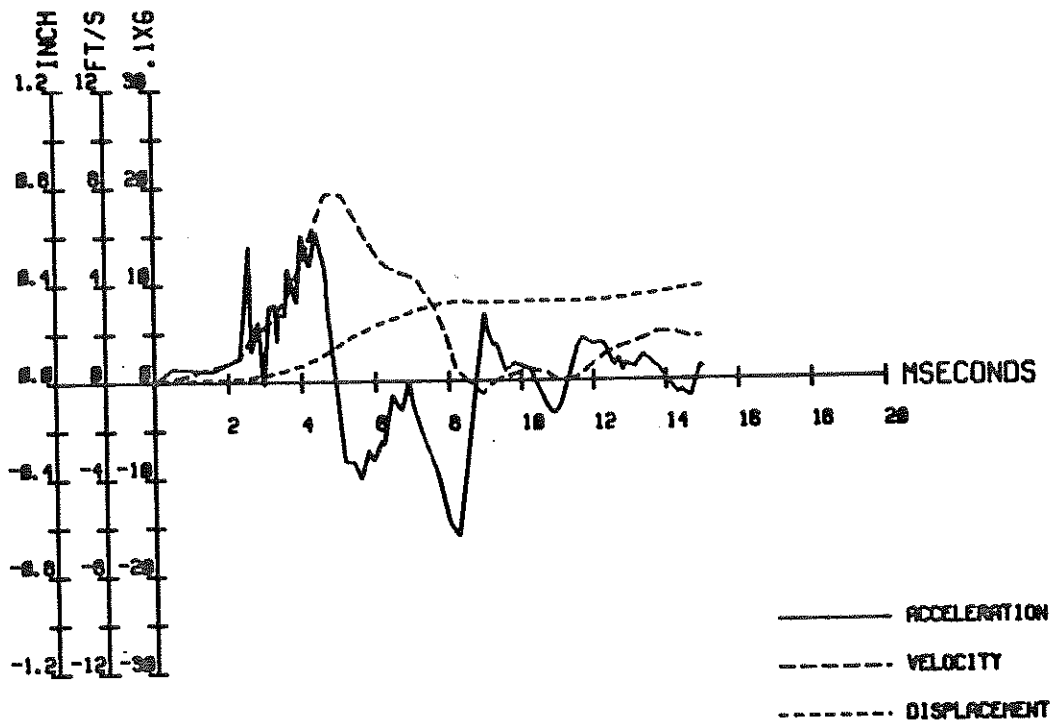


Figure 94 Dynamic Results of Reduced-Scale Pile 3-R-15, At the End of Driving, Blow 200

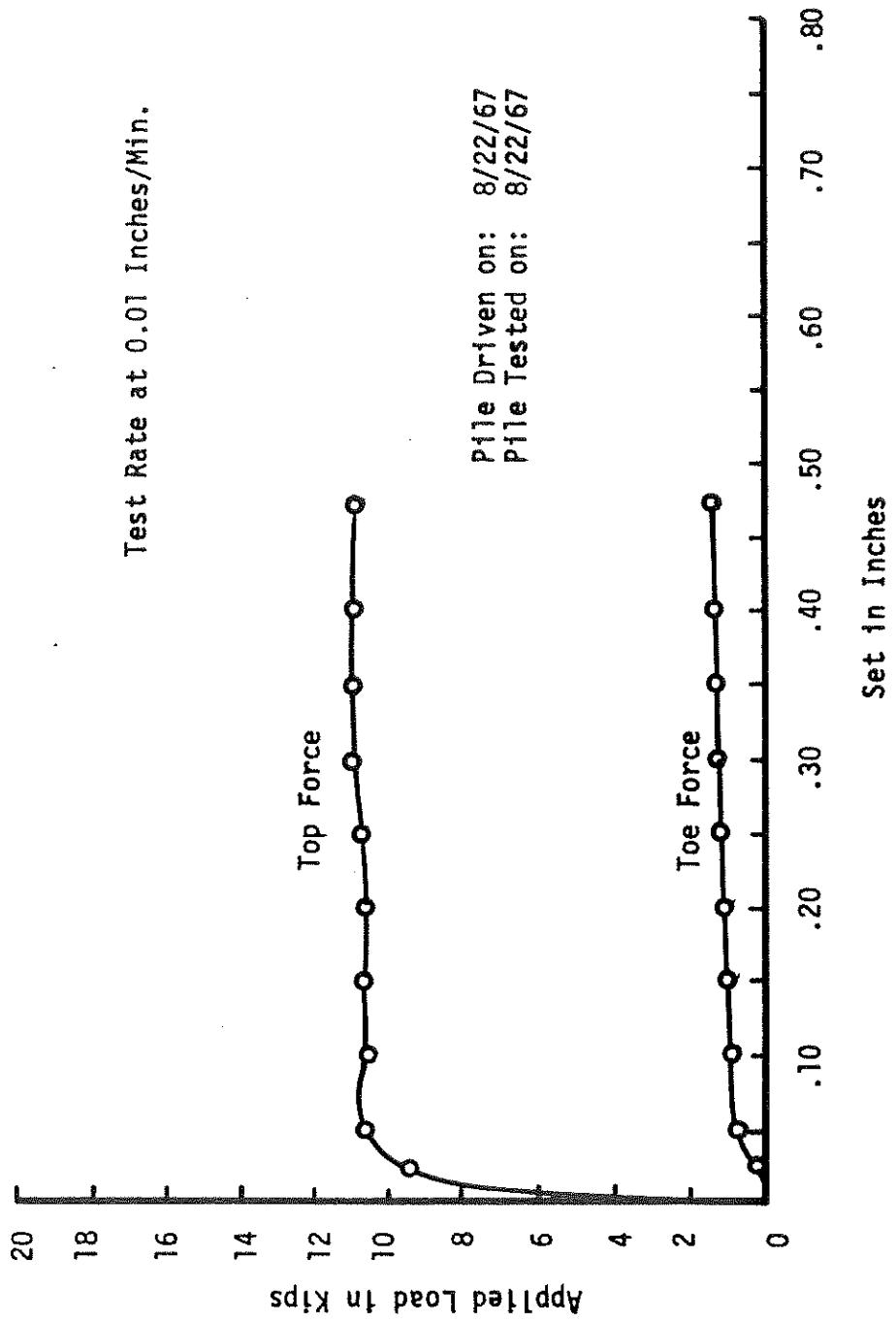


Figure 95: C.R.P. Test Results of Pile 3-R-15 After Driving Pile

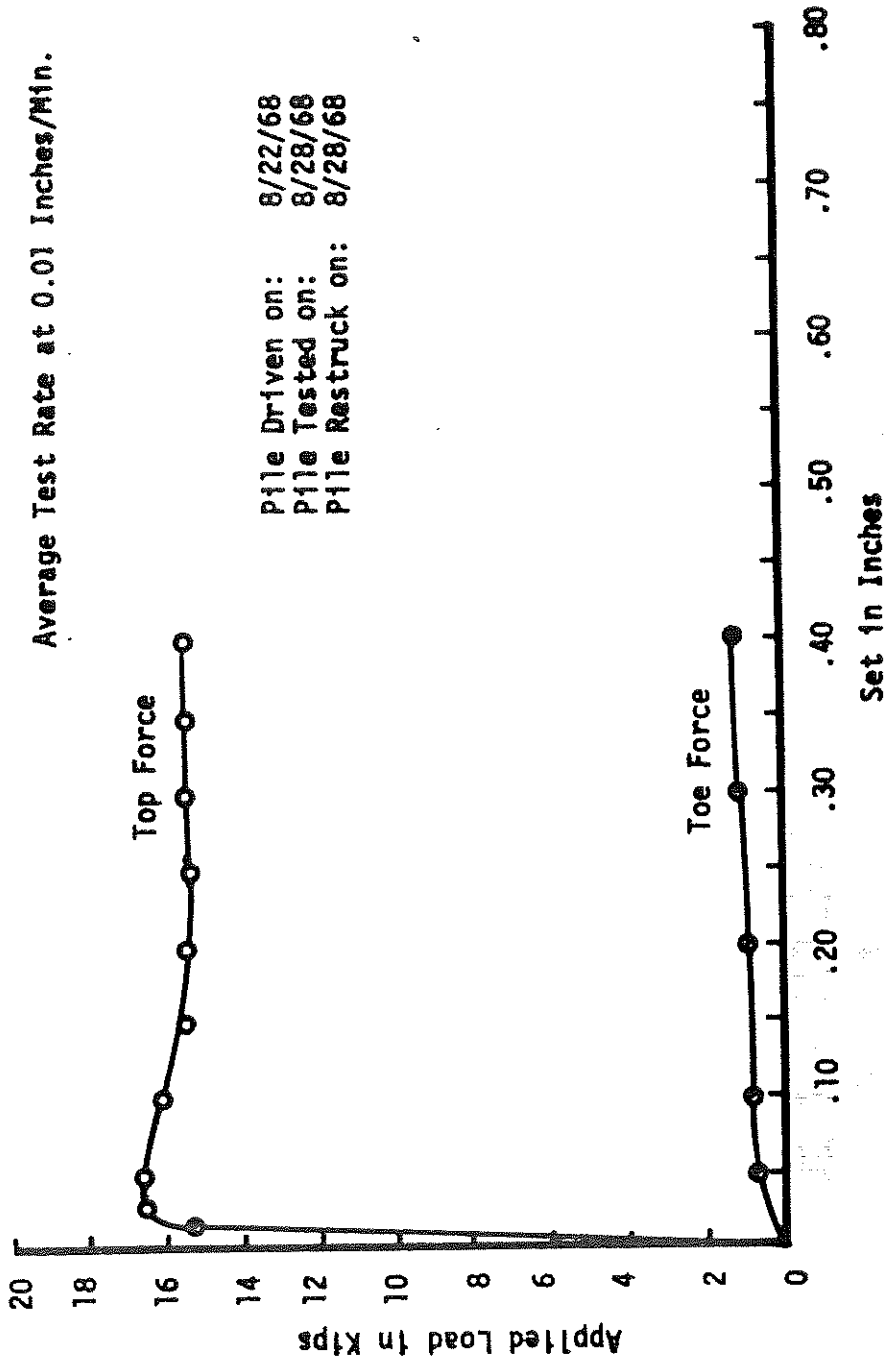


Figure 96: C.R.P. Test of Pile 3-R-15 Before Restrucking Pile

MODEL PILE 3-R-15 SILT AND CLAY
 BLOW NO. 6-A DATE AUG. 28 1967

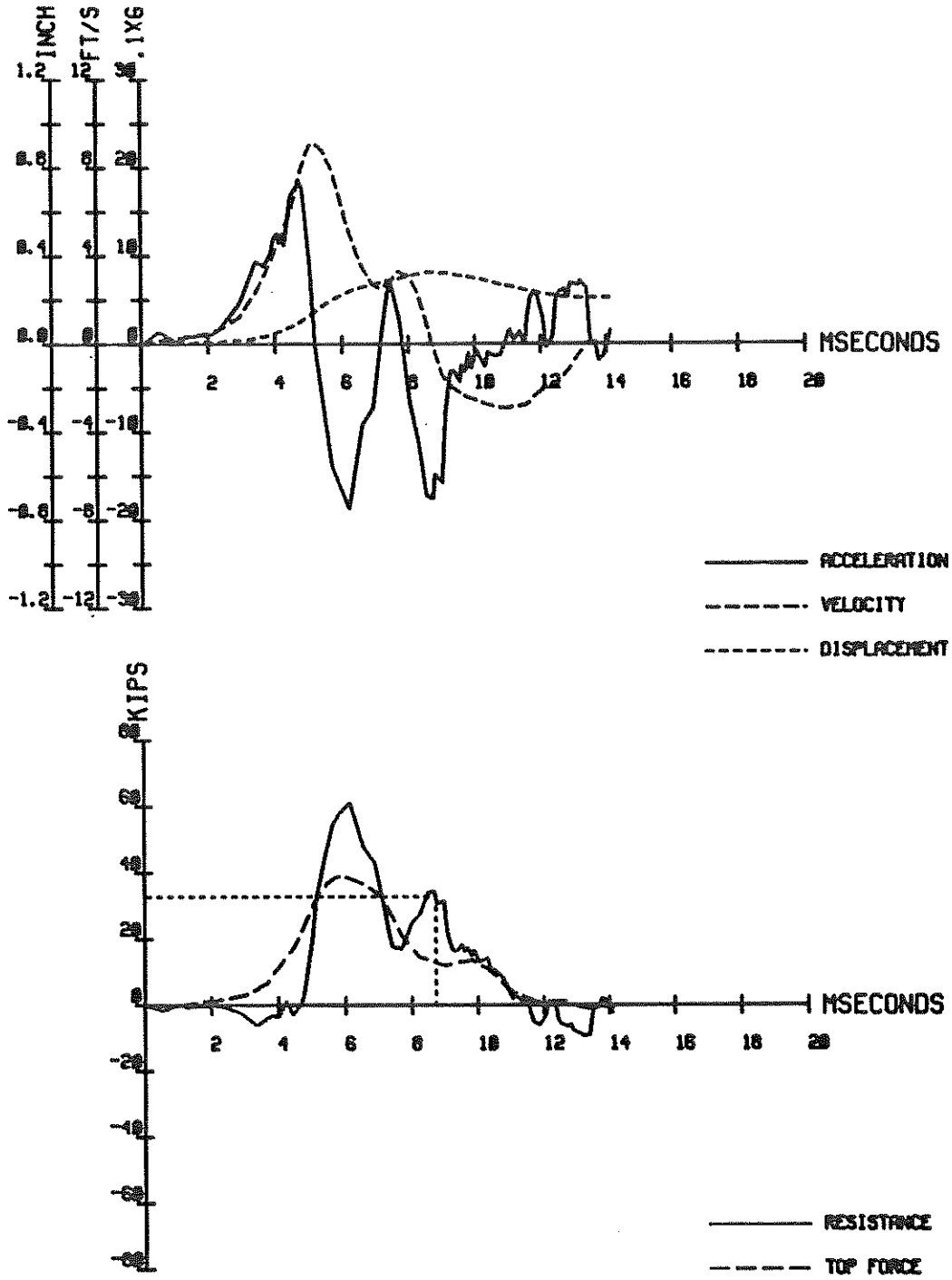


Figure 97 Dynamic Results of Reduced-Scale Pile 3-R-15, Upon Restriking, Blow 6-A

MODEL PILE 3-R-15 SILT AND CLAY
 BLOW NO. 7-A DATE AUG. 28 1967

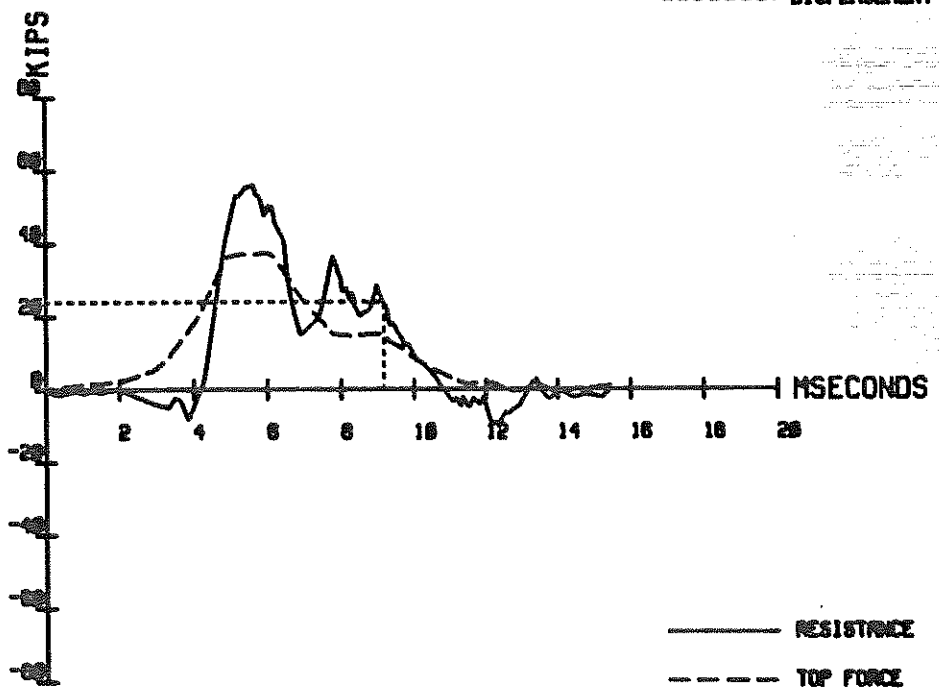
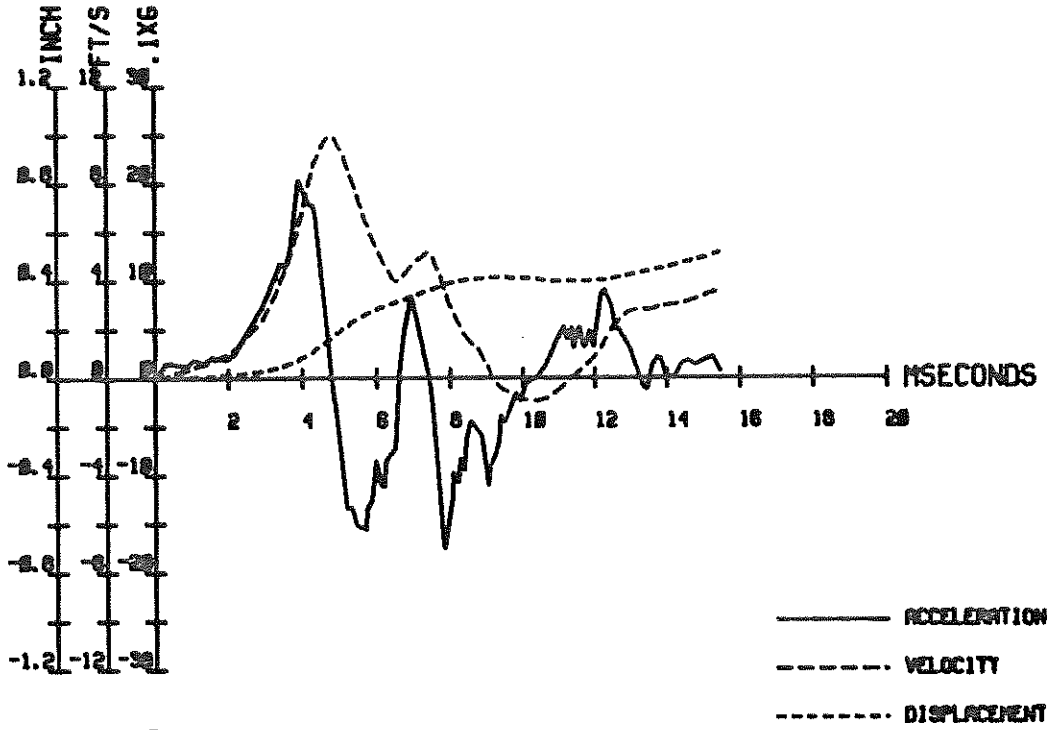


Figure 98 Dynamic Results of Reduced-Scale Pile 3-R-15, Upon Restriking, Blow 7-A

MODEL PILE 3-R-20 SILT AND CLAY
 BLOW NO. 268 DATE AUG. 30 1967

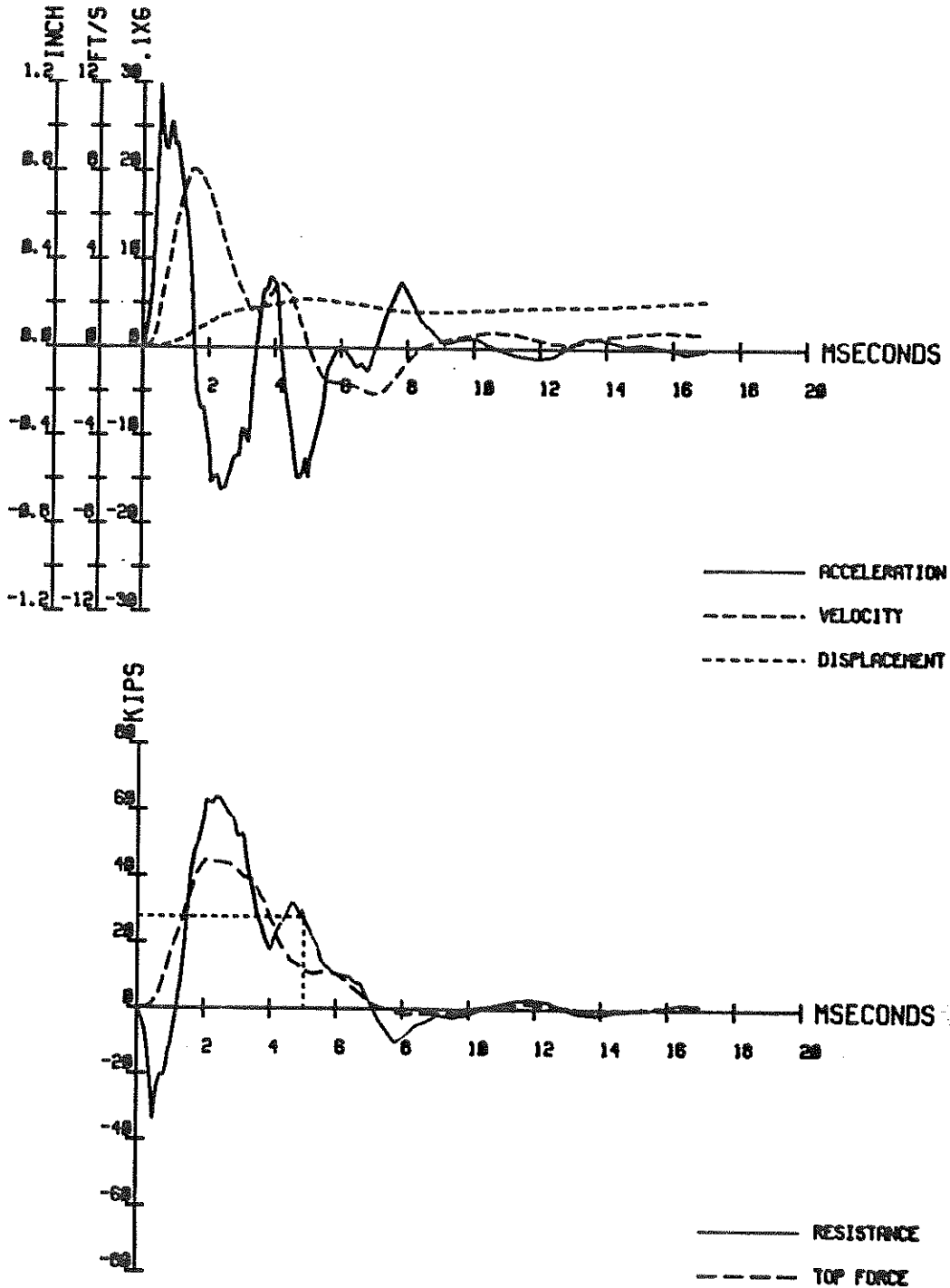


Figure 99 Dynamic Results of Reduced-Scale Pile 3-R-20, At the End of Driving, Blow 268.

MODEL PILE 3-R-20 SILT AND CLAY
 BLOW NO. 271 DATE AUG. 30 1967

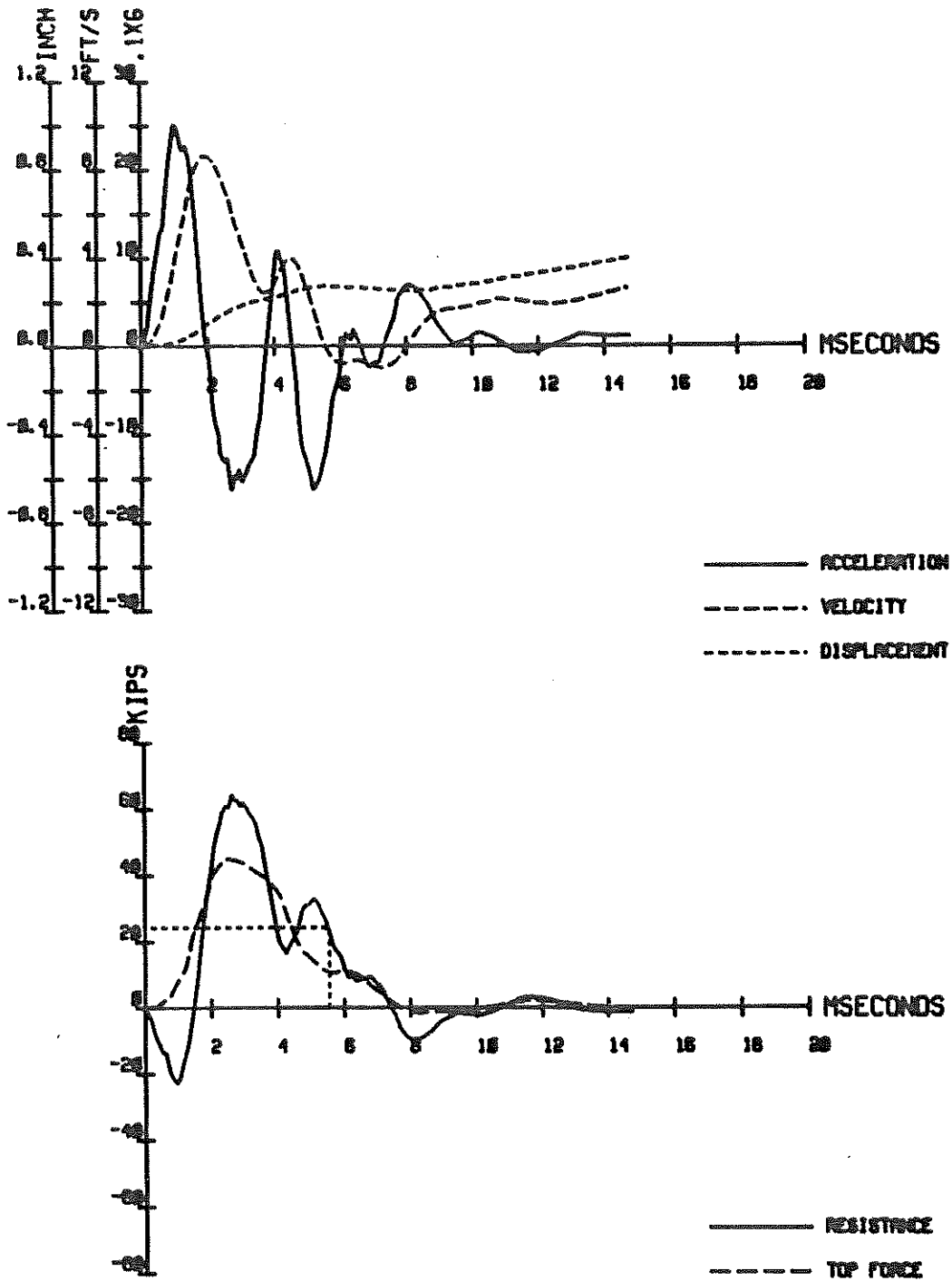


Figure 100 Dynamic Results of Reduced-Scale Pile 3-R-20, At the End of Driving, Blow 271

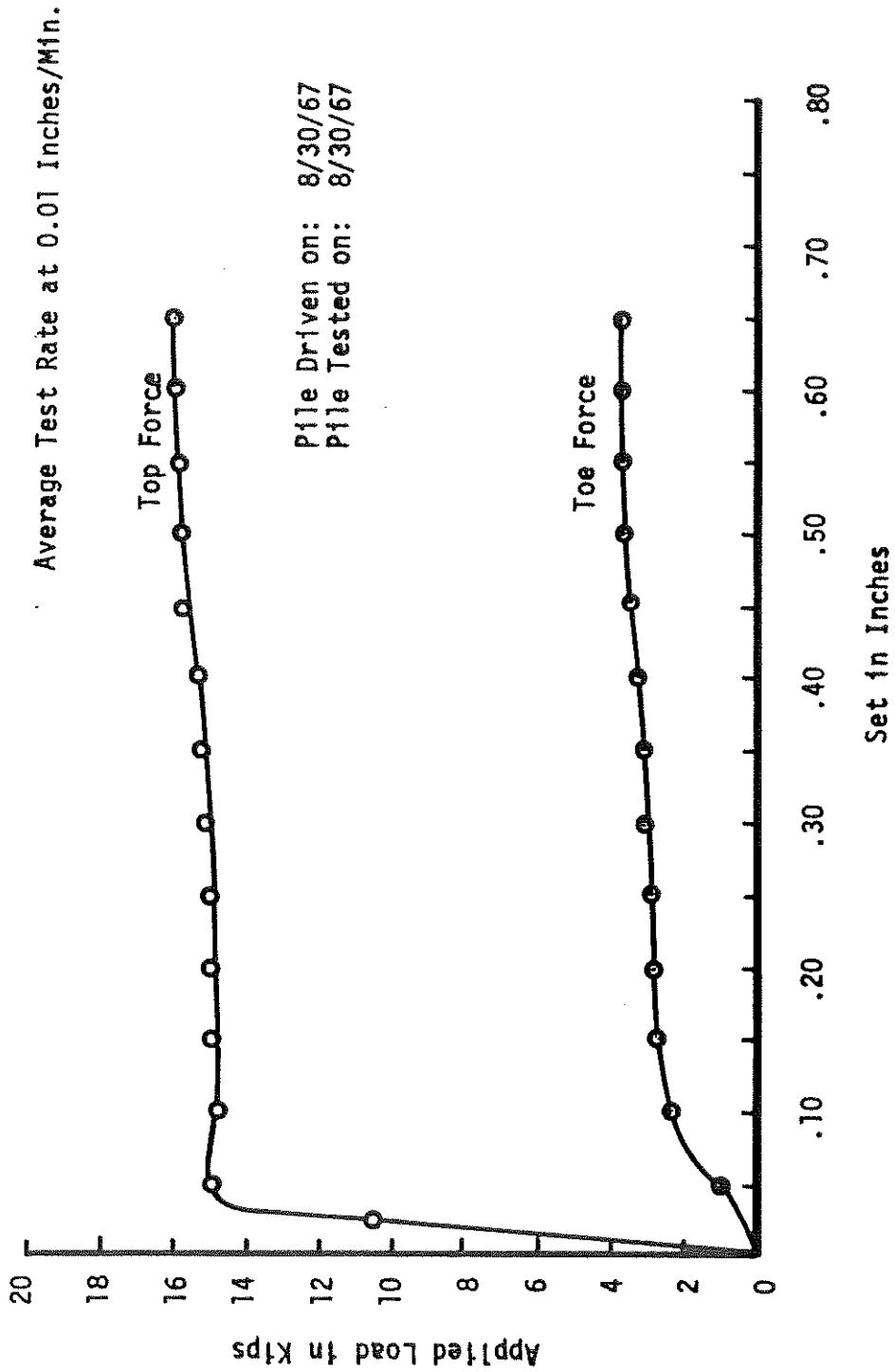


Figure 101:C.R.P. Test Results of Pile 3-R-20 After Driving Pile

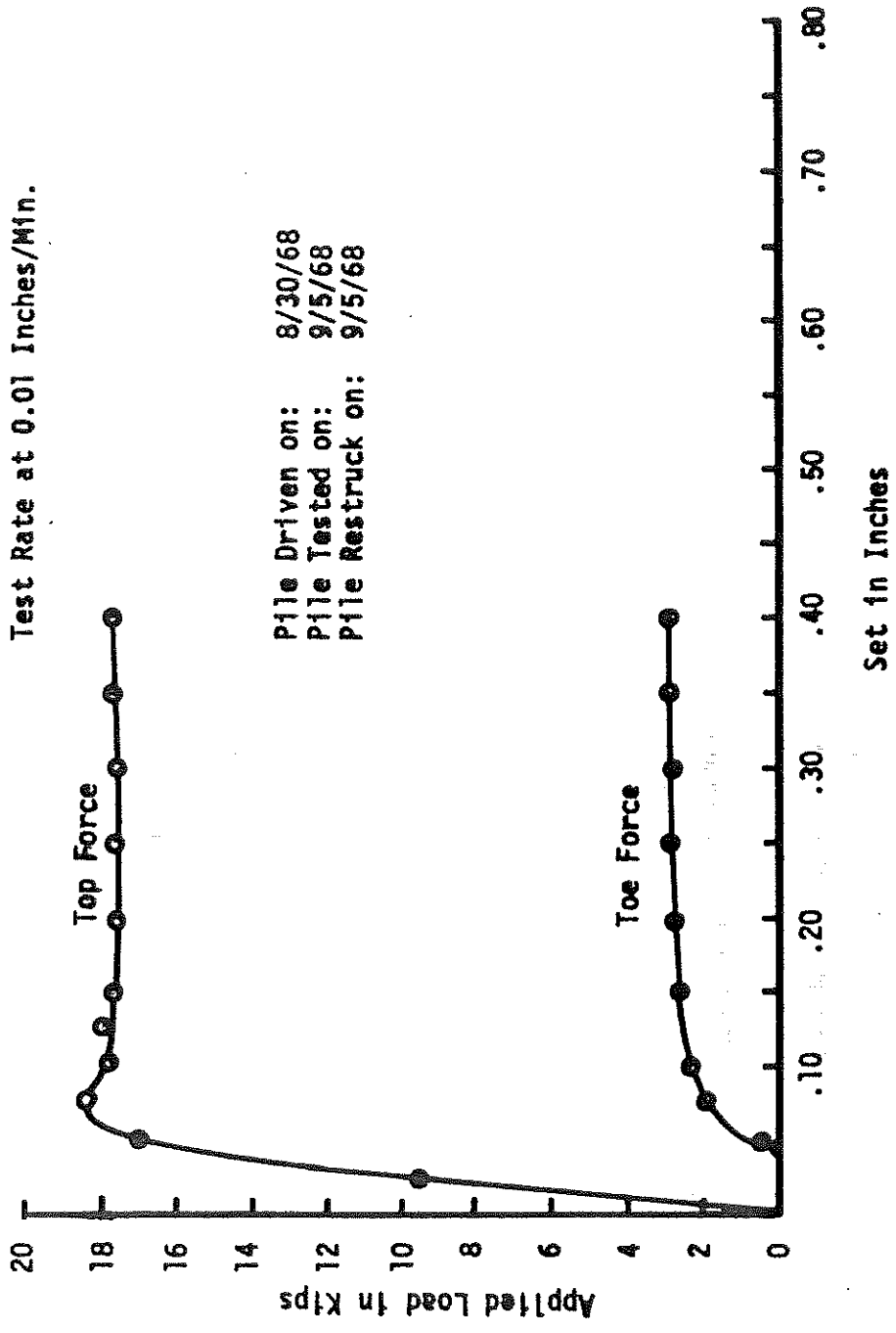


Figure 102: C.R.P. Test Results of Pile 3-R-20 Before Restrucking Pile

MODEL PILE 3-R-20 SILT AND CLAY
 BLOW NO. 1-A DATE SEP. 5 1967

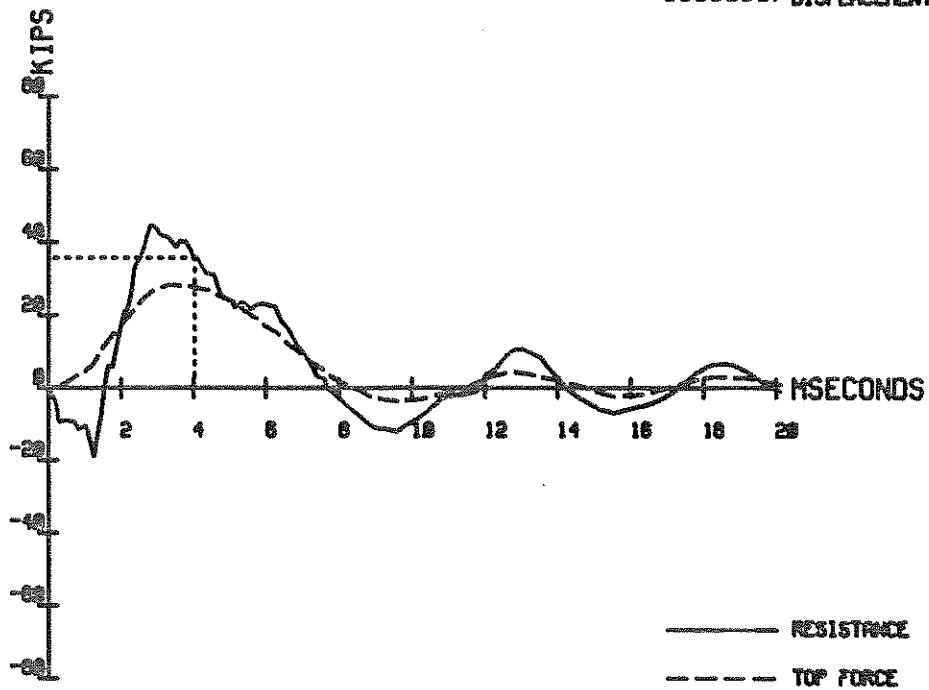
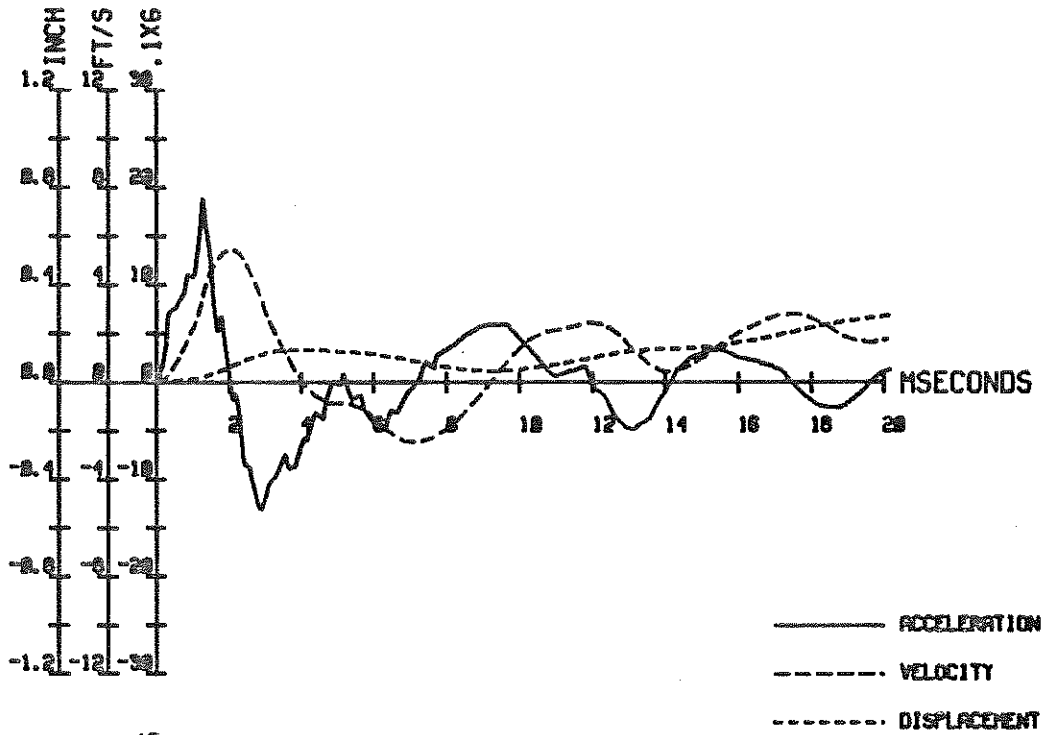


Figure 103 Dynamic Results of Reduced-Scale Pile 3-R-20, Upon Restriking, Blow 1-A

MODEL PILE 3-R-20 SILT AND CLAY
 BLOW NO. 3-A DATE SEP. 5 1967

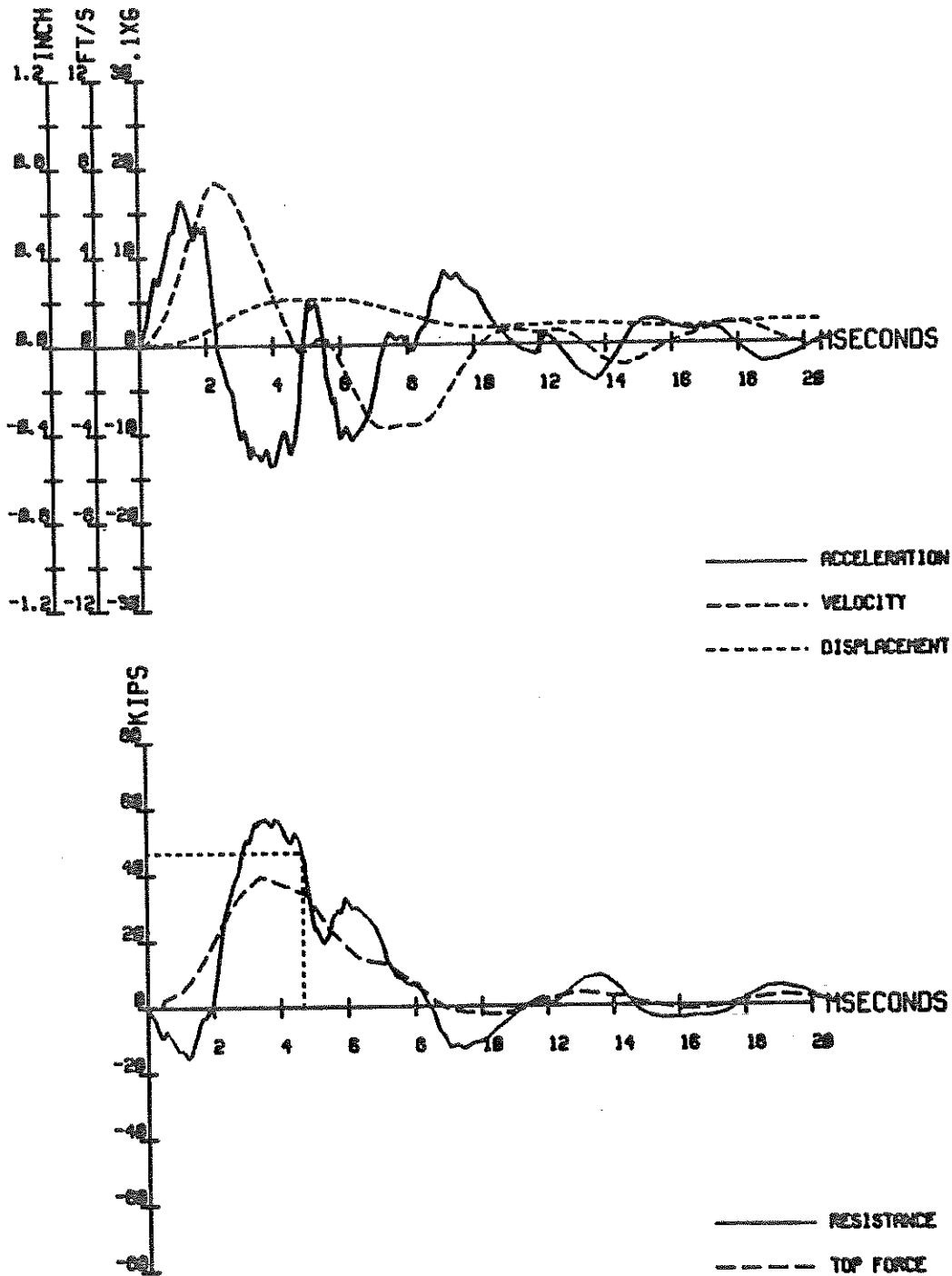


Figure 104 Dynamic Results of Reduced-Scale Pile 3-R-20, Upon Restriking, Blow 3-A

LOADTEST AND DYNAMIC RESULTS
FOR FULL SCALE PILES

Test Sites: Cleveland
Youngstown
Uhrichville
Toledo
Canton
Akron
Cincinnati

PILE 113 NORTH PIER

LAST BLOW DATE DEC. 15 1964

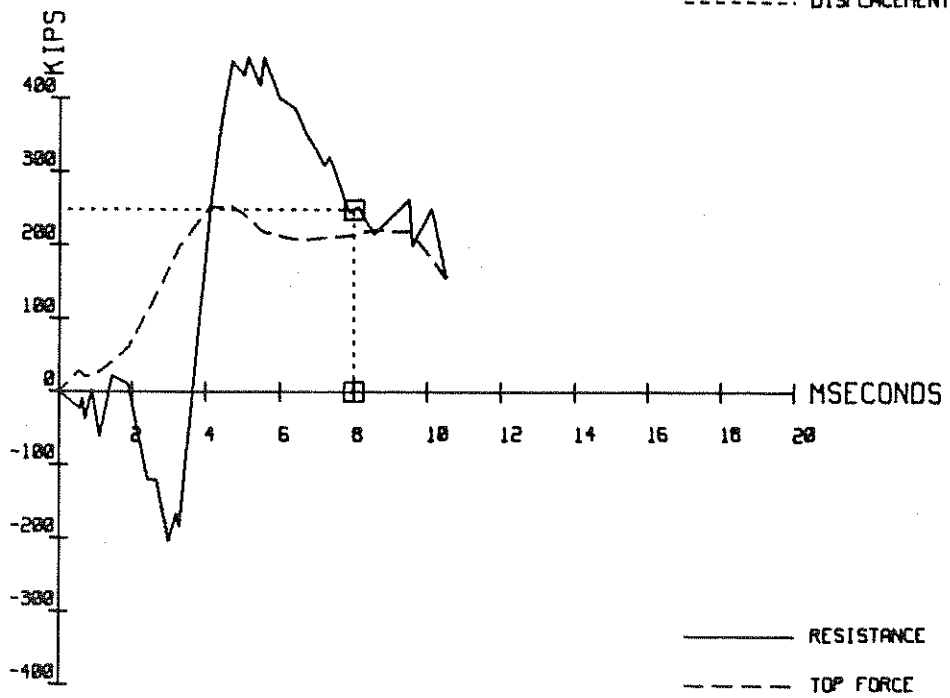
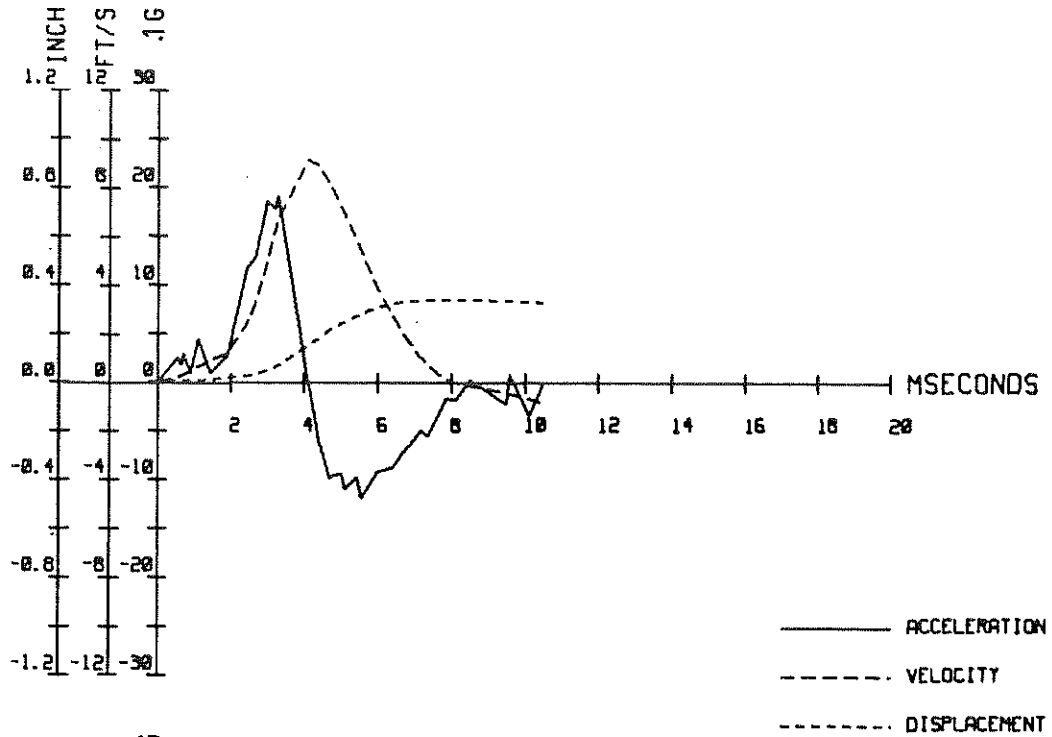


Figure 105 Dynamic Results of Full-Scale Pile No. 113, North Pier at the End of Driving

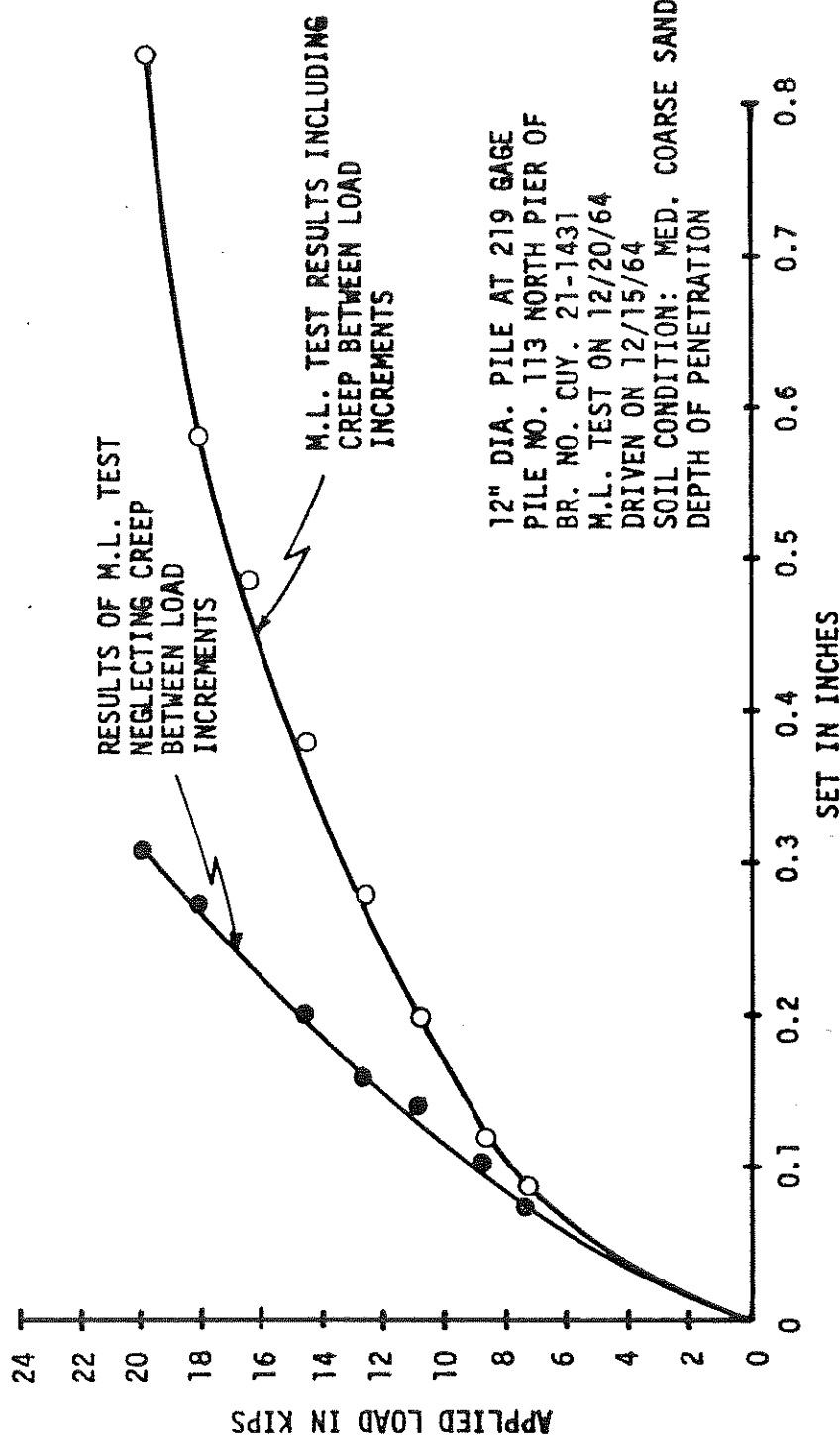


Figure 106 M.L. Test Results for Full-Scale Pile No. 113, N. Pier; Performed by Ohio Highway Department Personnel

PILE 138 PIER NO. 4

BLOW NO. 76 DATE MAR. 1 1966

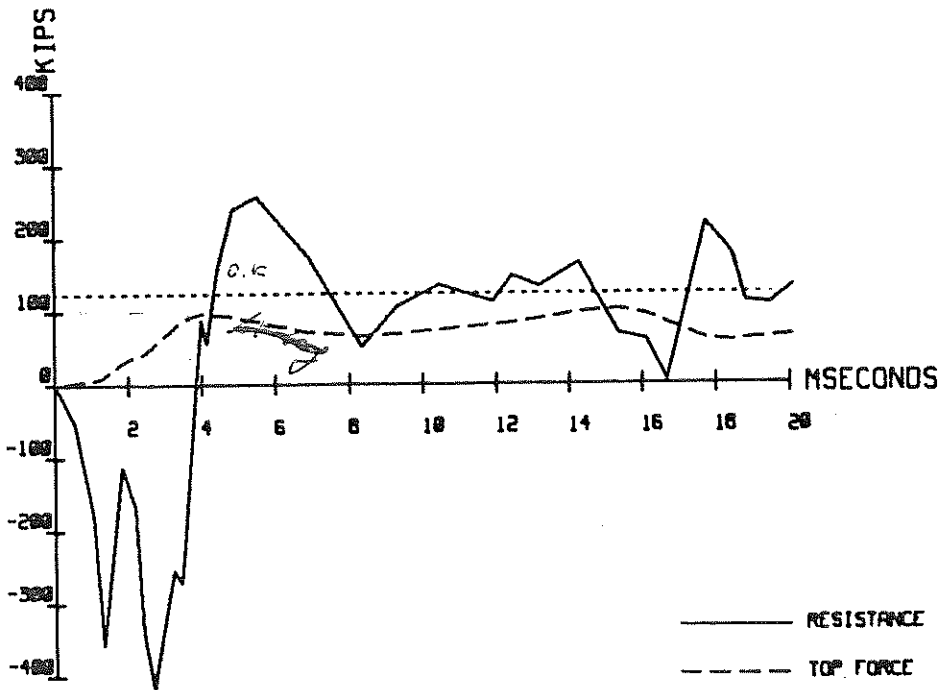
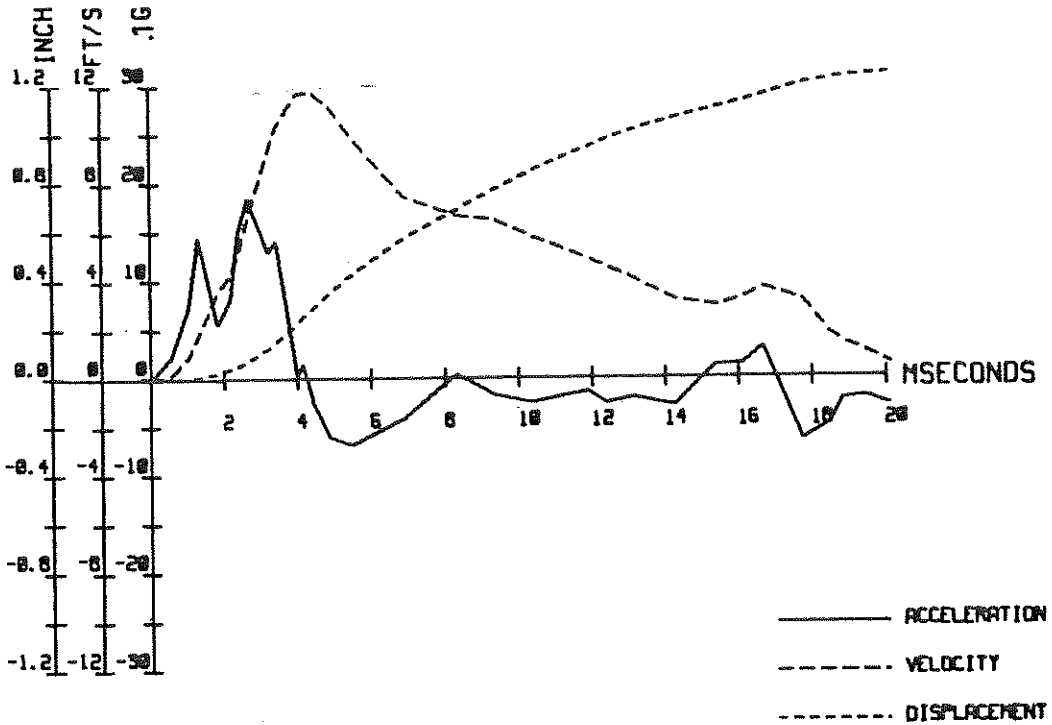


Figure 107 Dynamic Results of Full-Scale Pile No. 138, Pier No. 4 near the End of Driving (76' below grade).

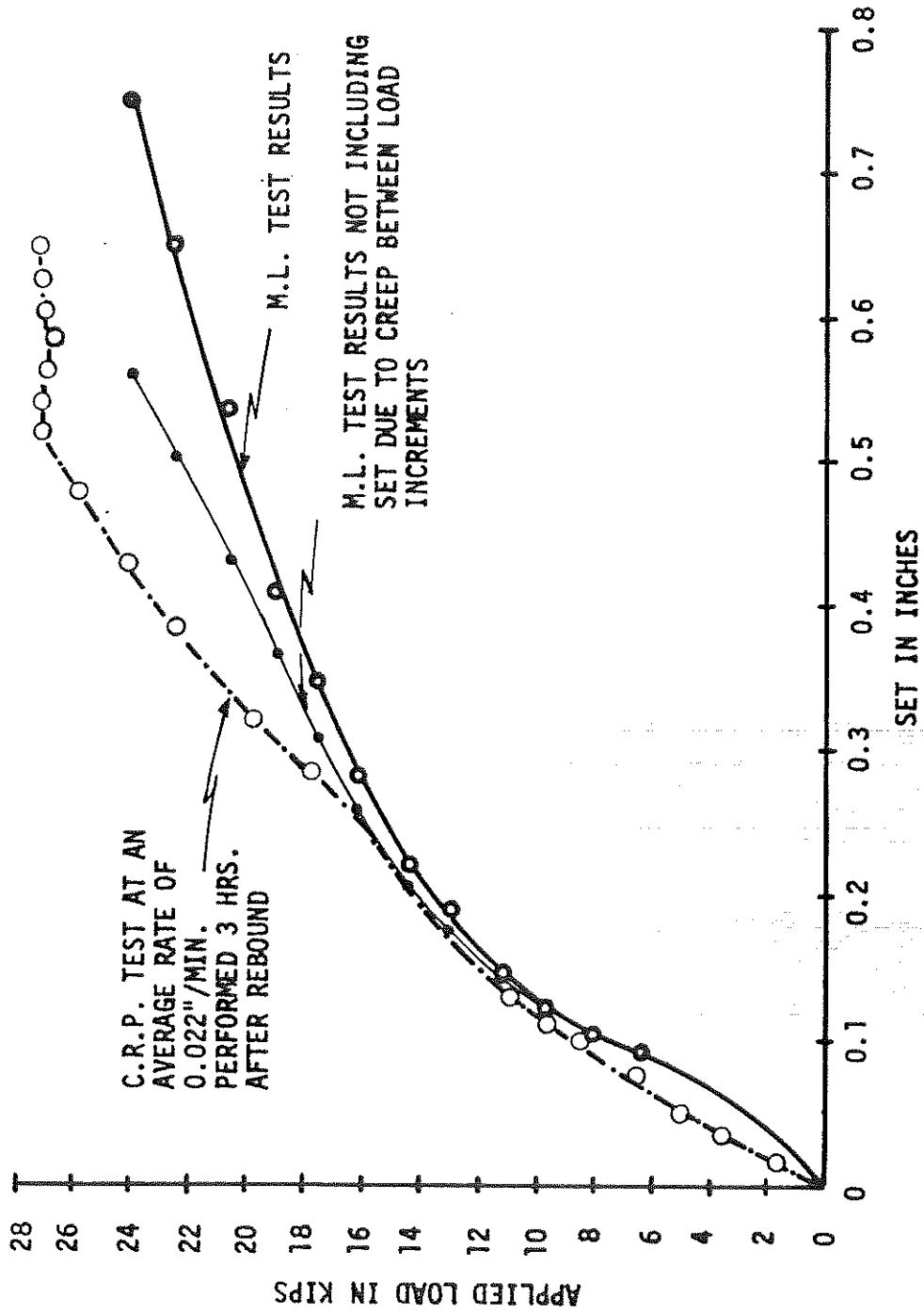


Figure 108 M.L. and C.R.P. Test Results of Full-Scale Pile 138 of Pier No. 4

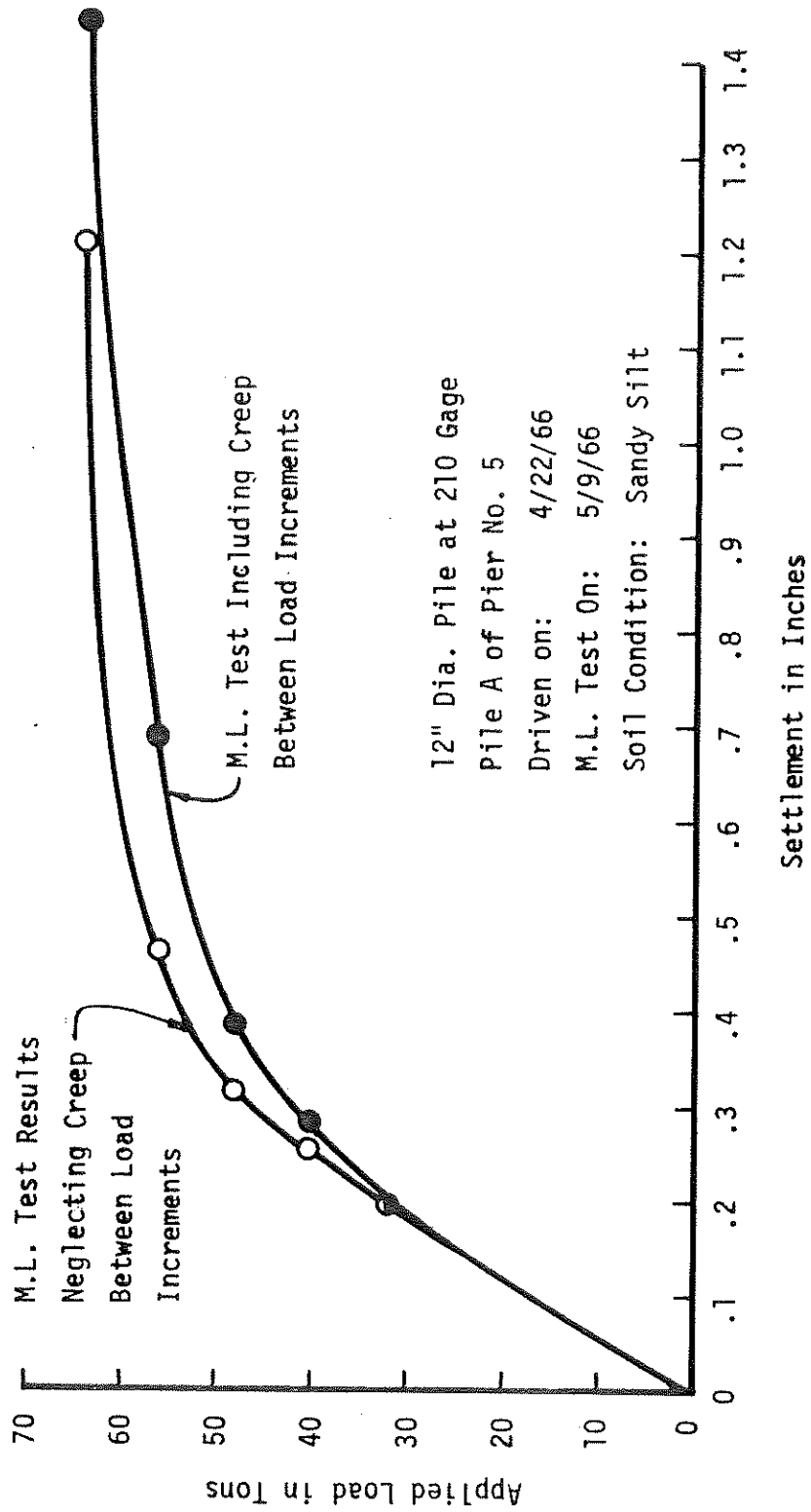


Figure 109 M.L. Test Results of Full-Scale Pile A of Pier No. 5

PILE NO. A PIER NO. 5
 BLOW NO. 12-A DATE MAY 17 1966

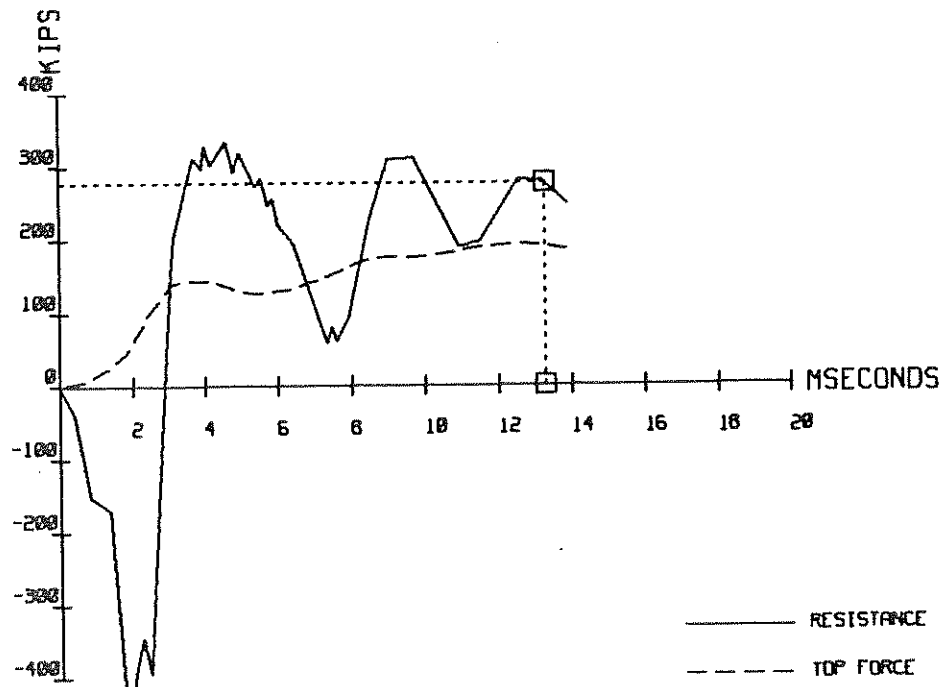
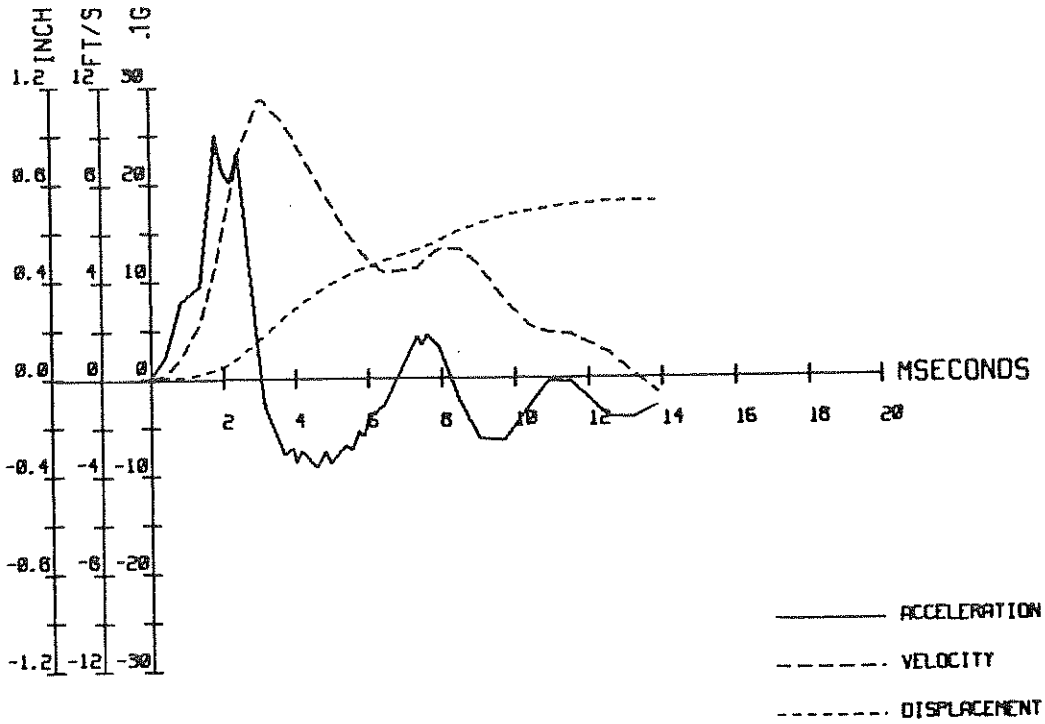


Figure 110 Dynamic Results of Full-Scale Pile A of Pier 5, Blow 12A upon Restricting Pile

PILE NO. A PIER NO. 5
 BLOW NO. 13-A DATE MAY 17 1966

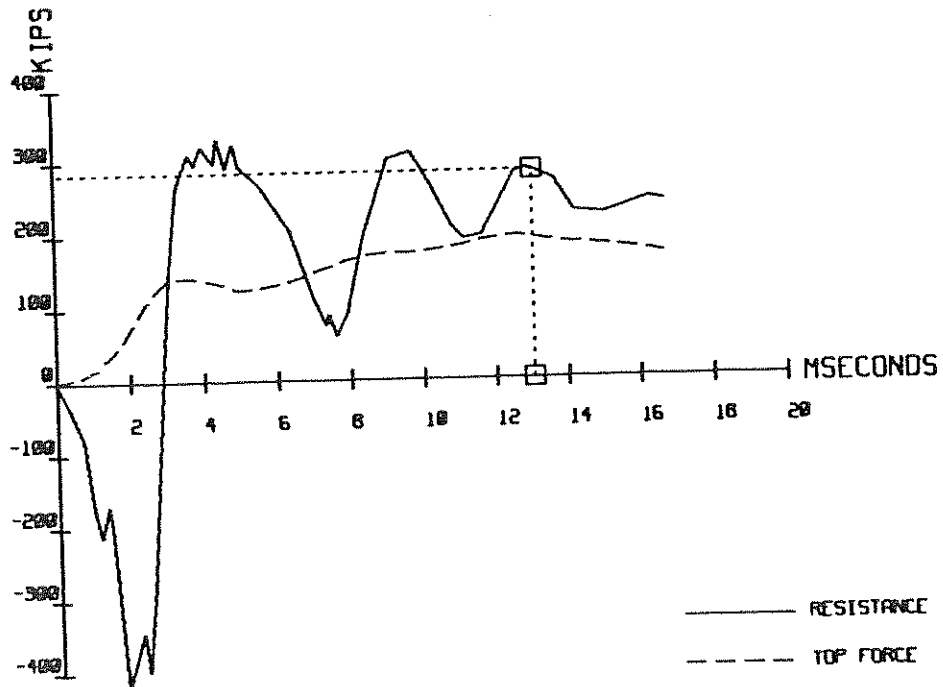
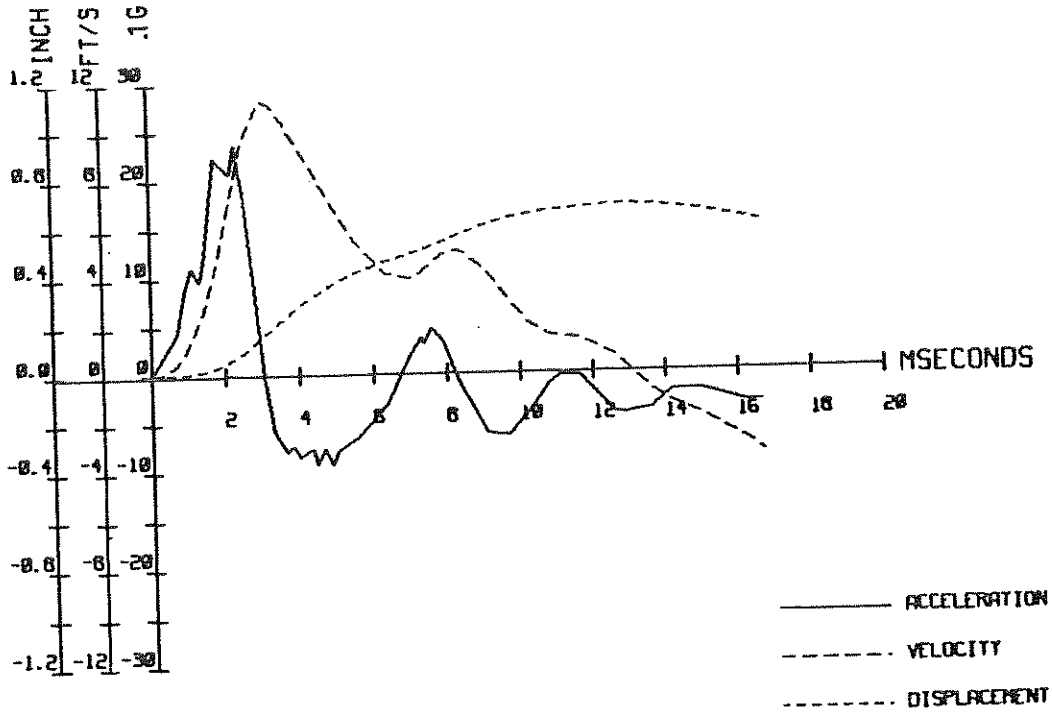


Figure 111 Dynamic Results of Full-Scale Pile A of Pier 5, Blow 13A upon Restriking Pile.

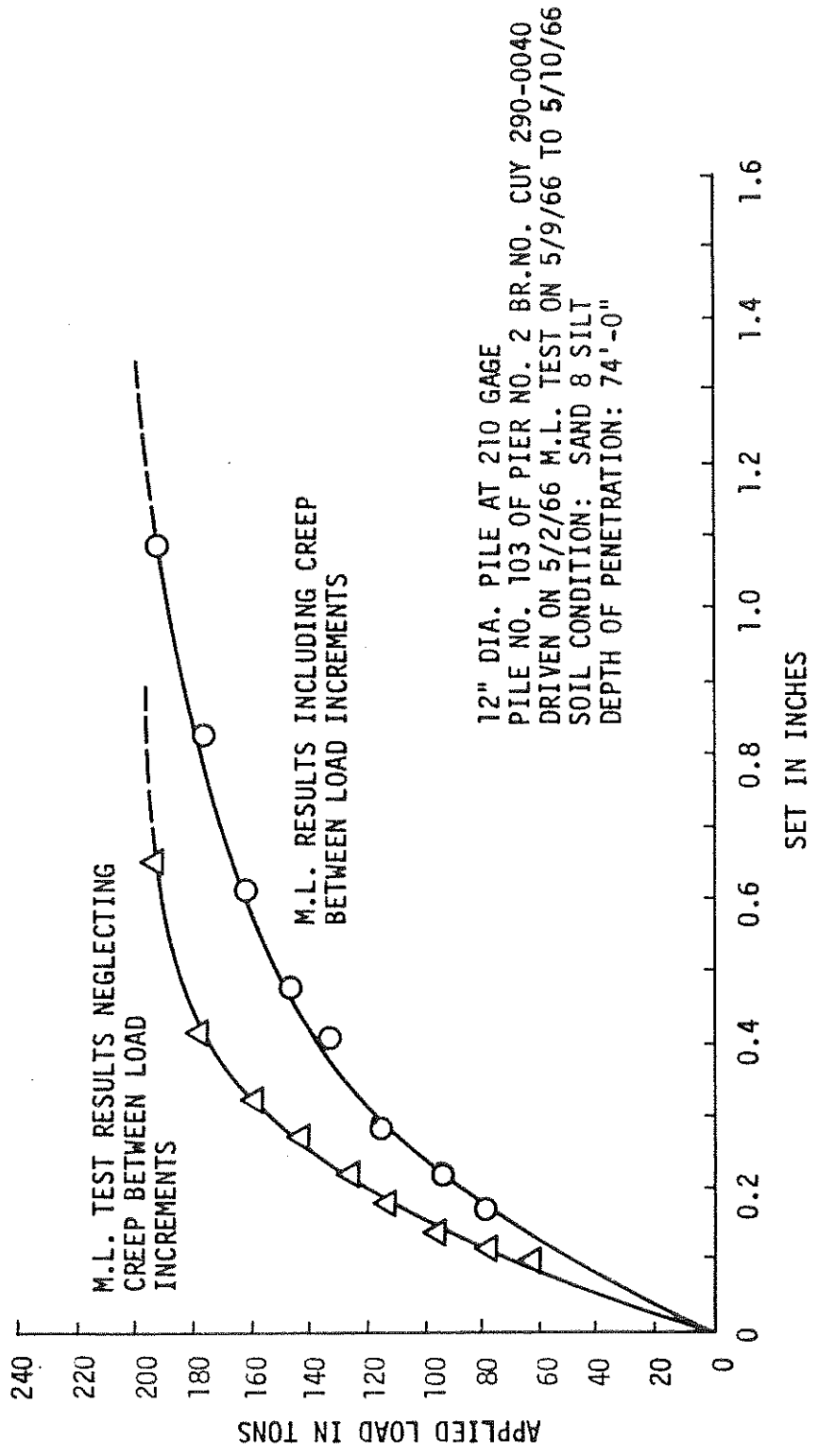


Figure 113 M.L. Test Results of Full-Scale Pile 103 of Pier No. 2

PILE 103 PIER NO. 2

BLOW NO. 1-A DATE JUNE 10 1966

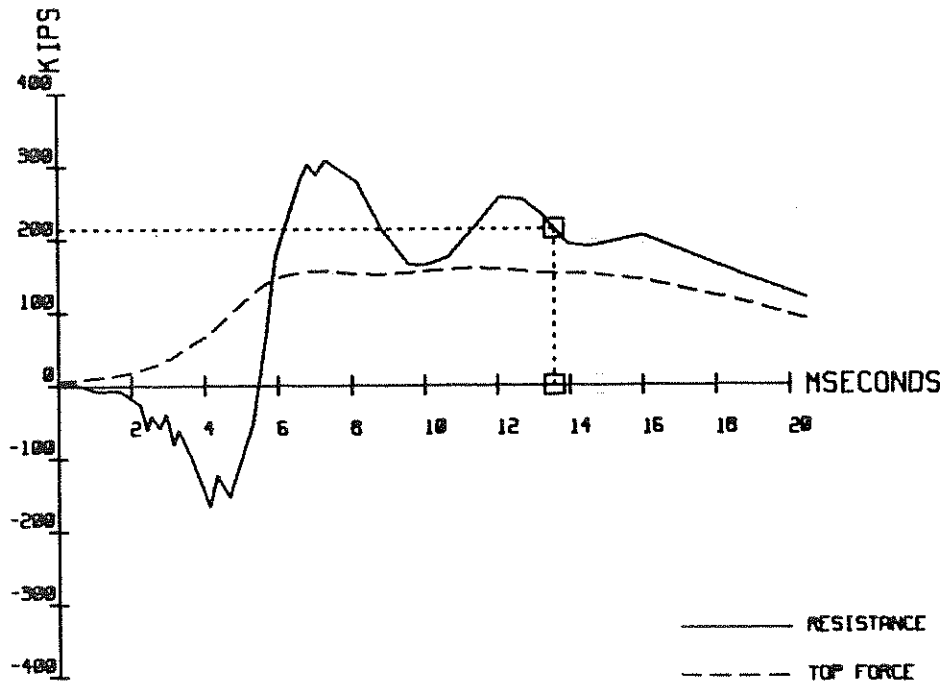
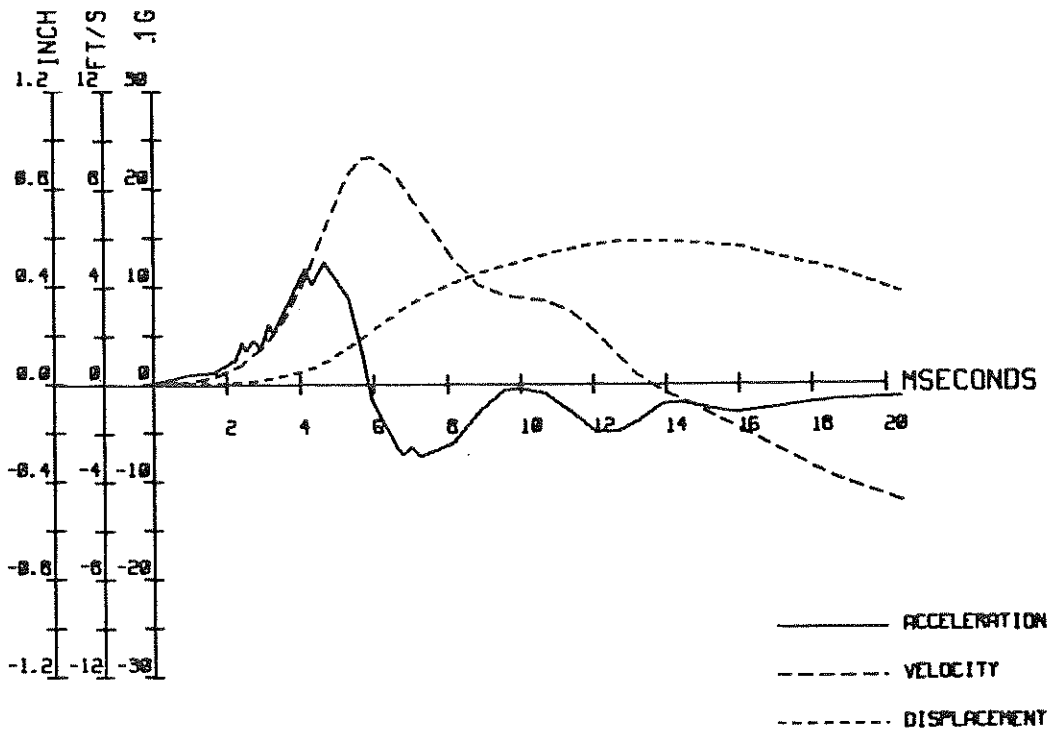


Figure 114 Dynamic Results of Full-Scale Pile 103 of Pier No. 2, Blow 1A

PILE 103 PIER NO. 2

BLOW NO. 2-A DATE JUNE 10 1966

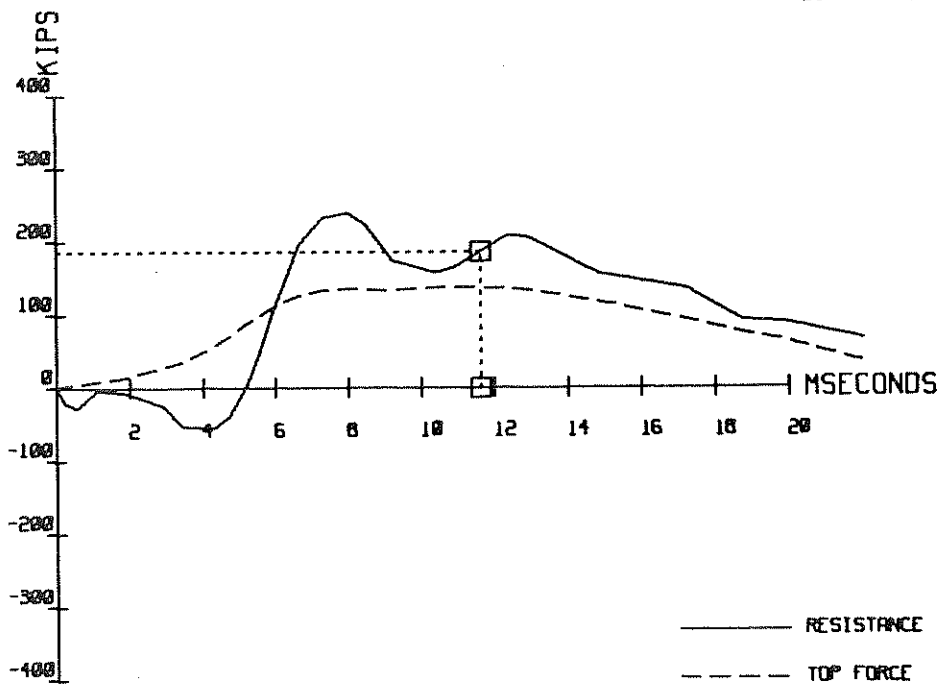
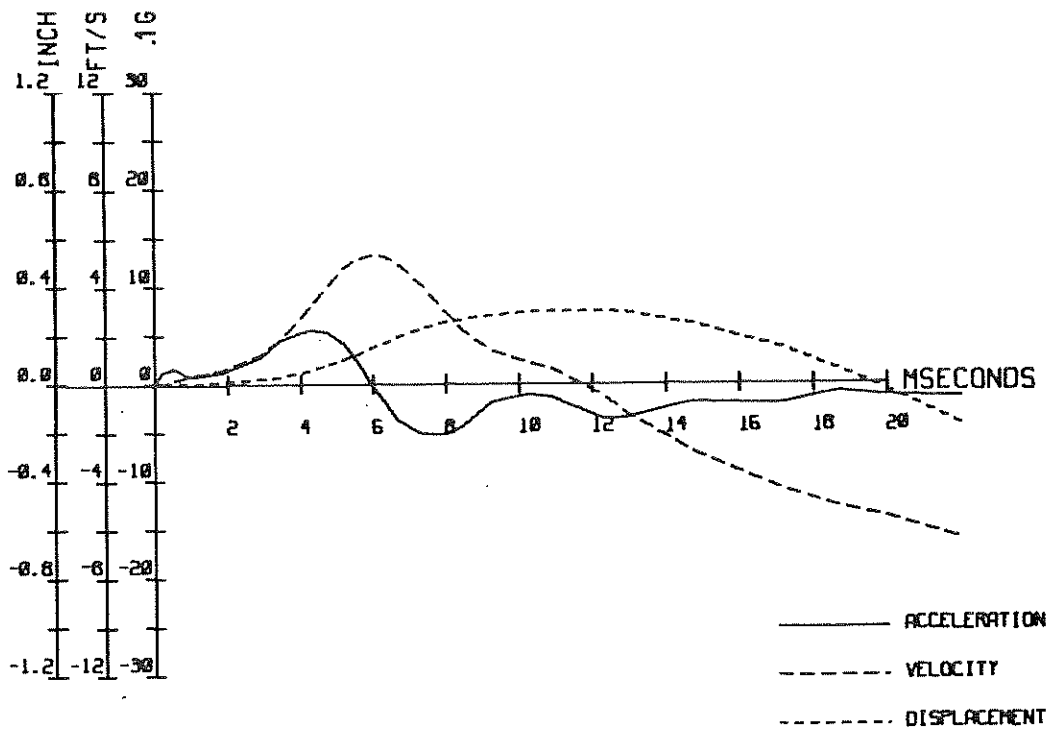


Figure 115 Dynamic Results of Full-Scale Pile 103 of Pier No. 2, Blow No. 2A

PILE 103 PIER NO. 2

BLOW NO. 9-A DATE JUNE 10 1966

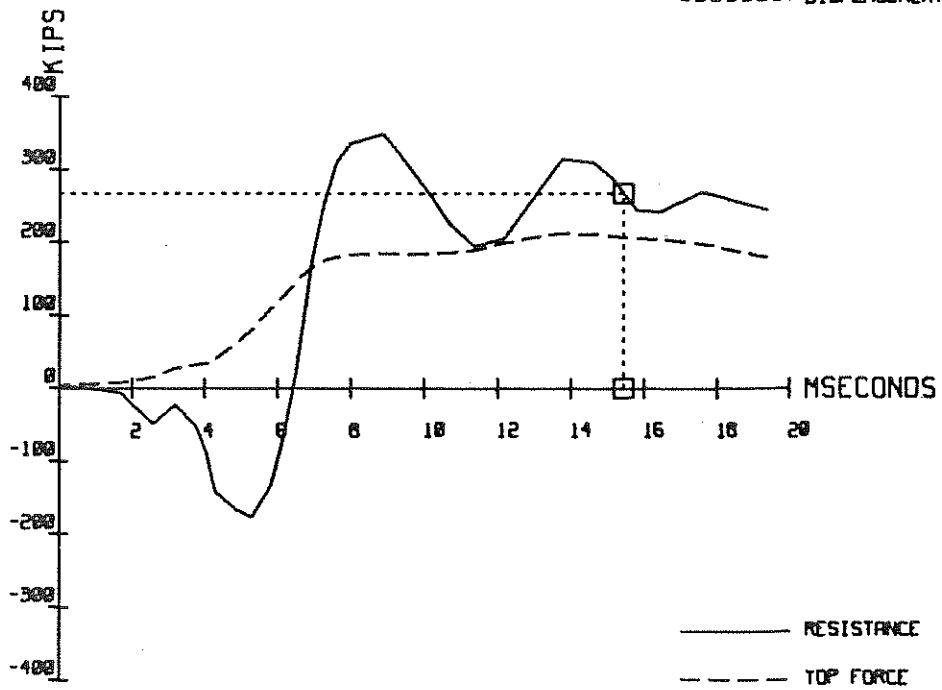
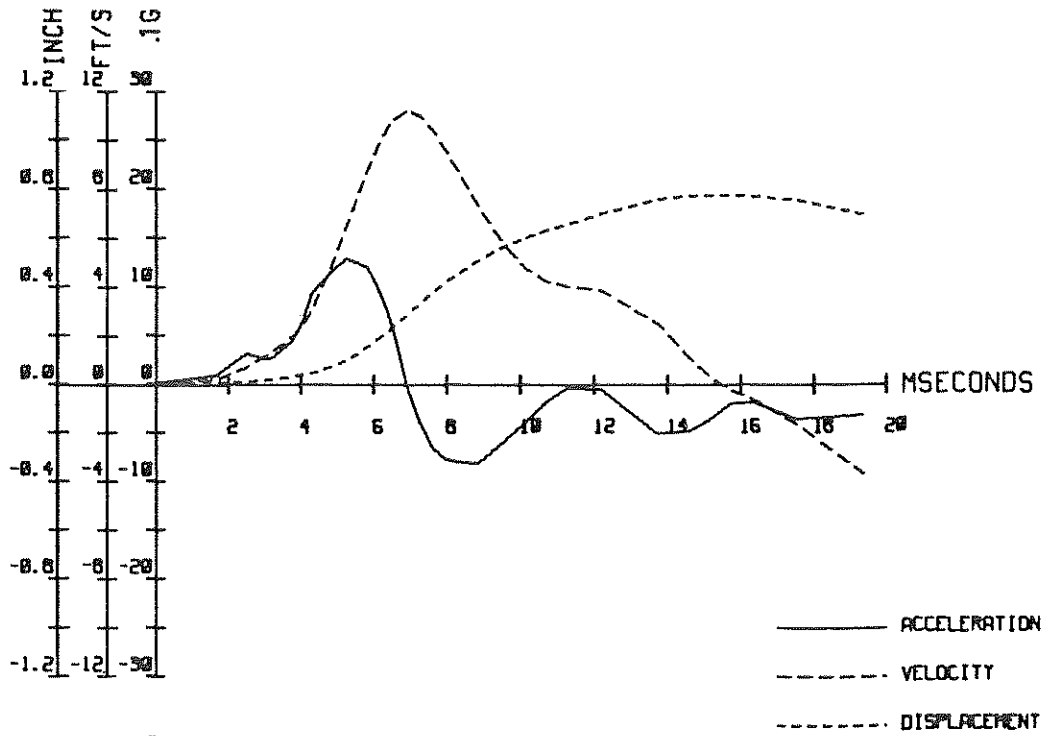


Figure 116 Dynamic Results of Full-Scale Pile 103 of Pier No. 2, Blow 9A

272 *logarithmic*
5.25

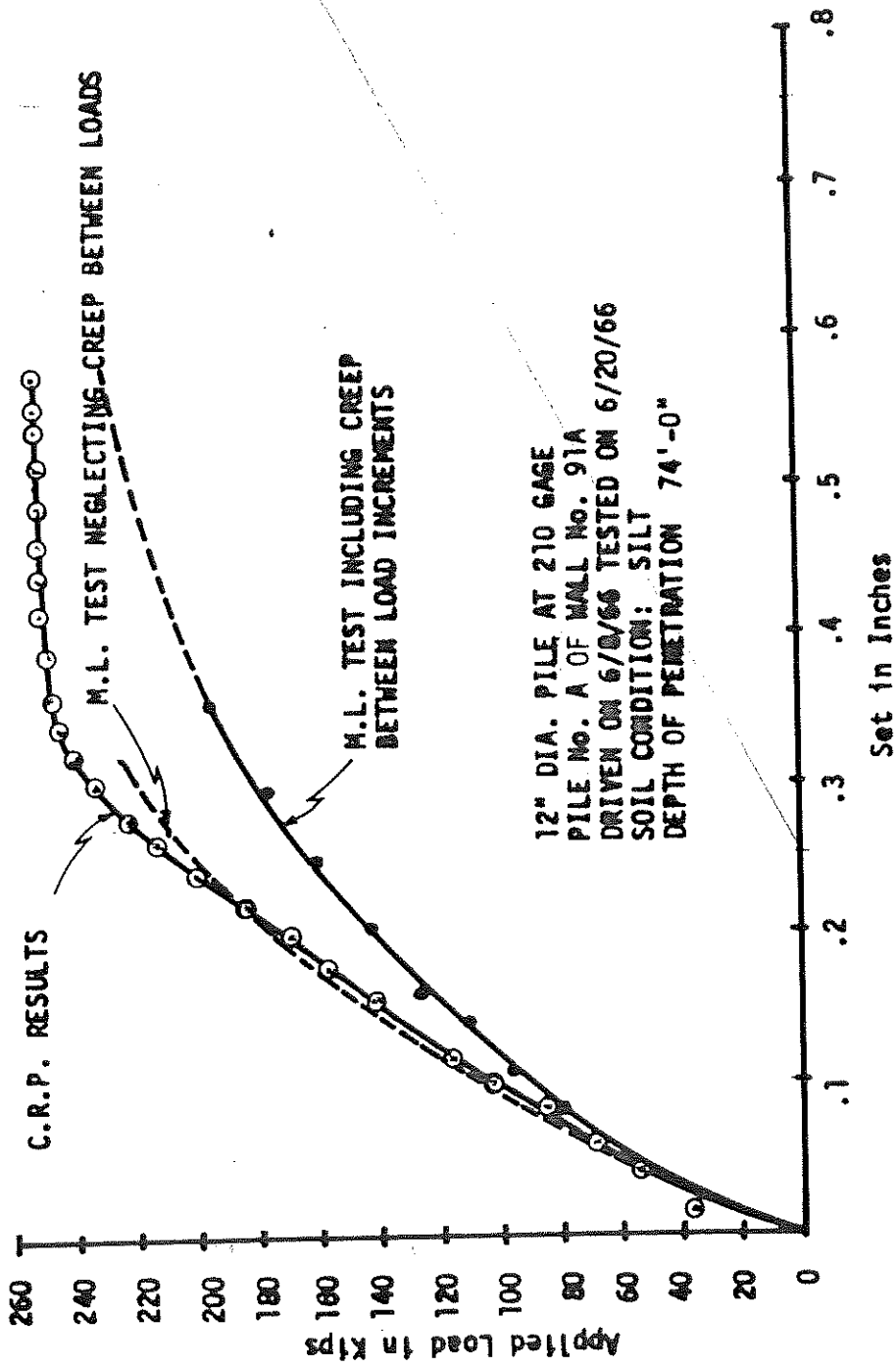


Figure 117 C.R.P. and M.L. Test Results of Full-Scale Pile A of Wall 91A

PILE NO. A WALL NO. 91-A
 BLOW NO. 1A DATE JUNE 20 1966

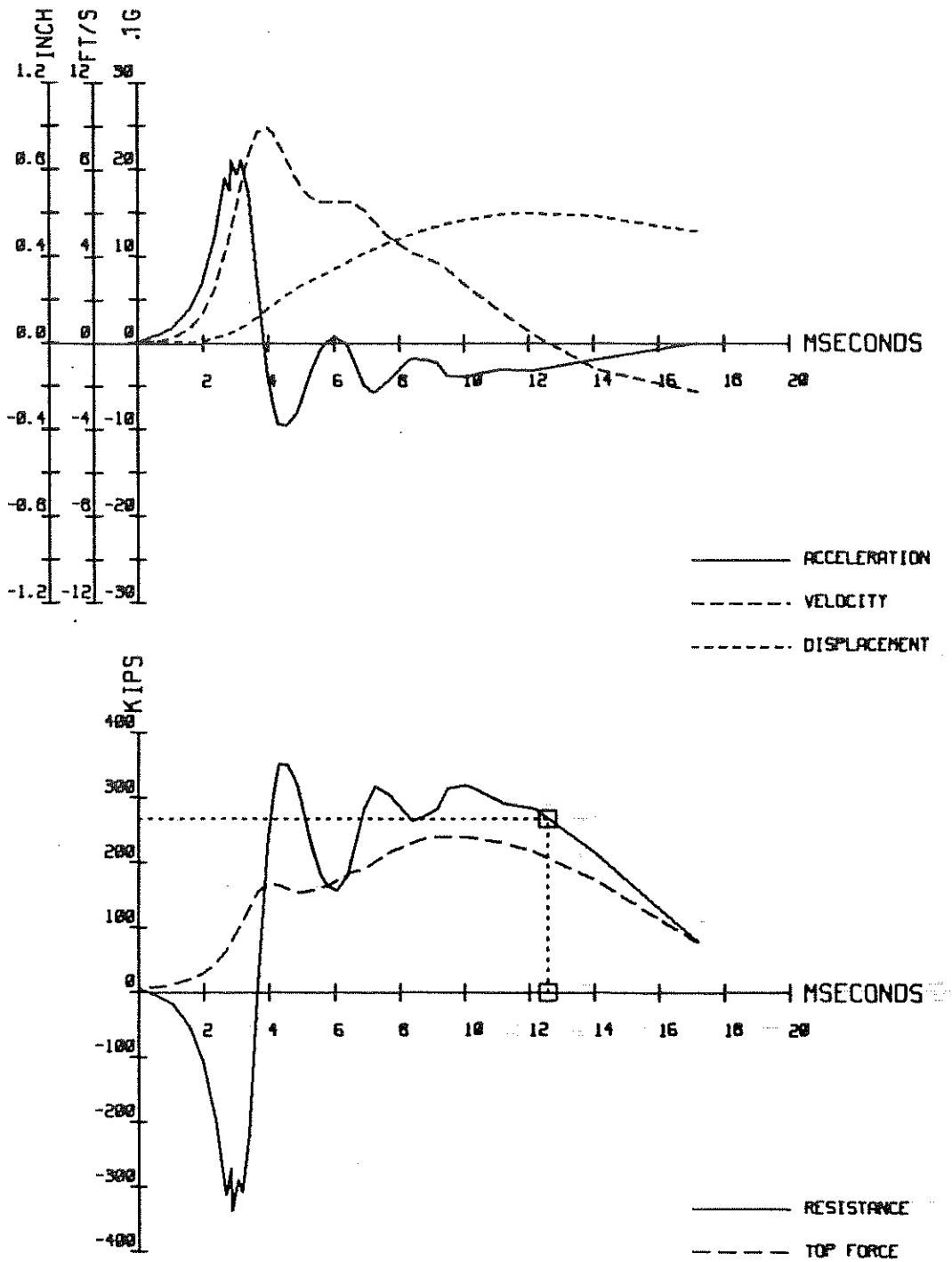


Figure 118 Dynamic Results of Full-Scale Pile A of Wall 91A upon Restriking Blow 1A

PILE NO. A WALL NO. 91-A
 BLOW NO. 3-A DATE JUNE 20 1966

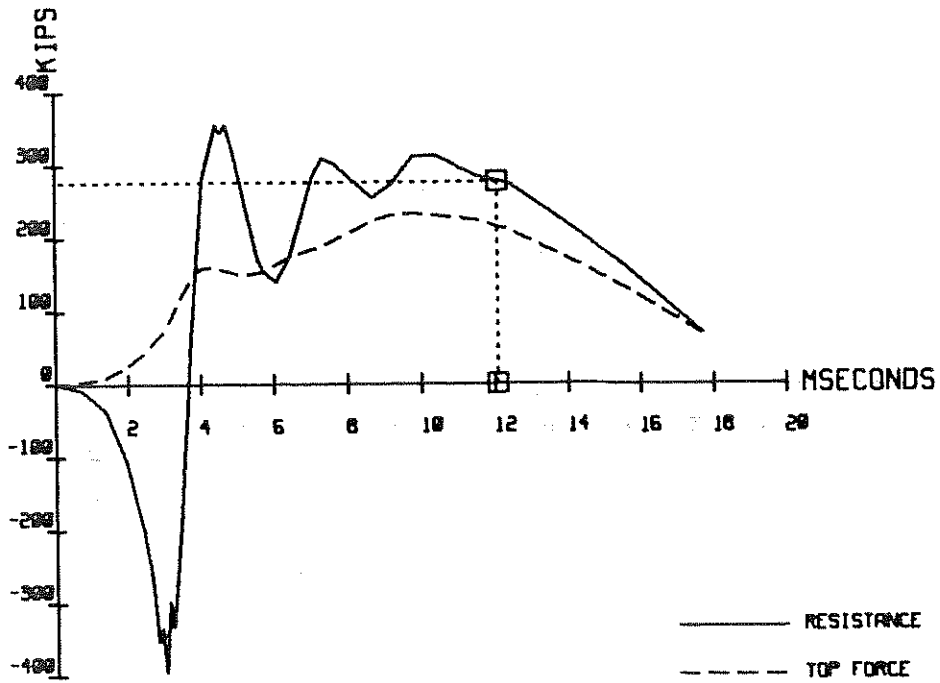
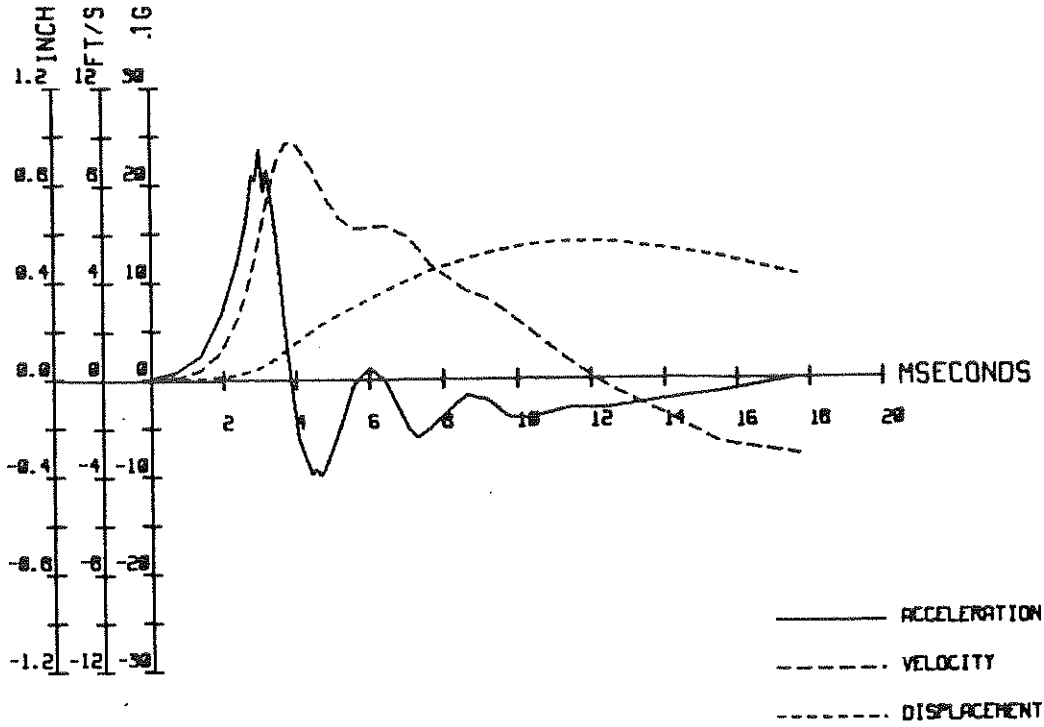


Figure 119 Dynamic Results of Full-Scale Pile A of Wall 91A upon Restricting Blow 3A

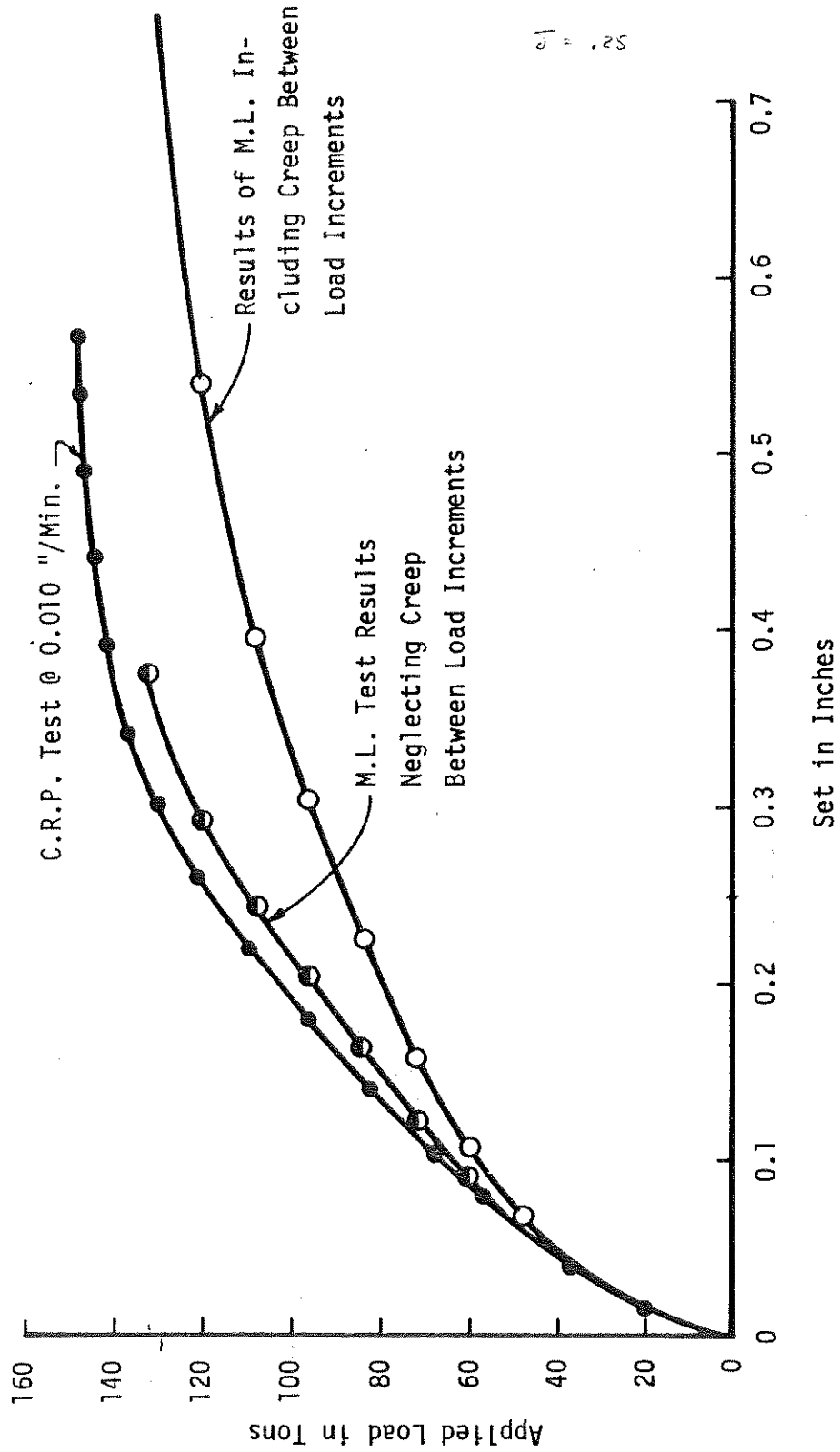


Figure 120

C.R.P. and M.L. Test results of Full-Scale Pile 692 in Youngstown, Ohio

PILE 692 ON I-80
 BLOW NO. 12A DATE AUG. 15 1966

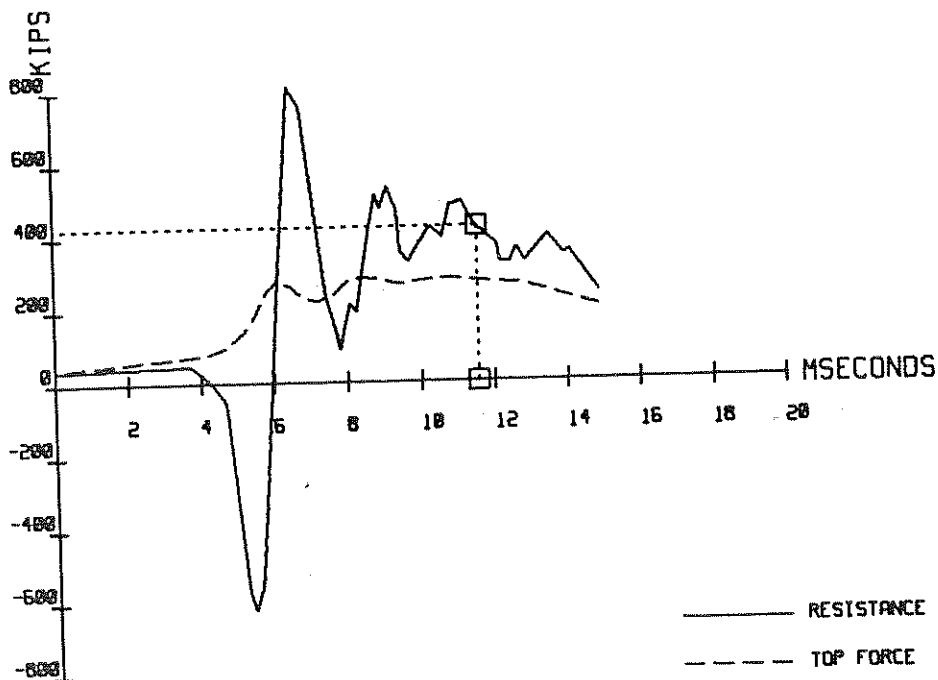
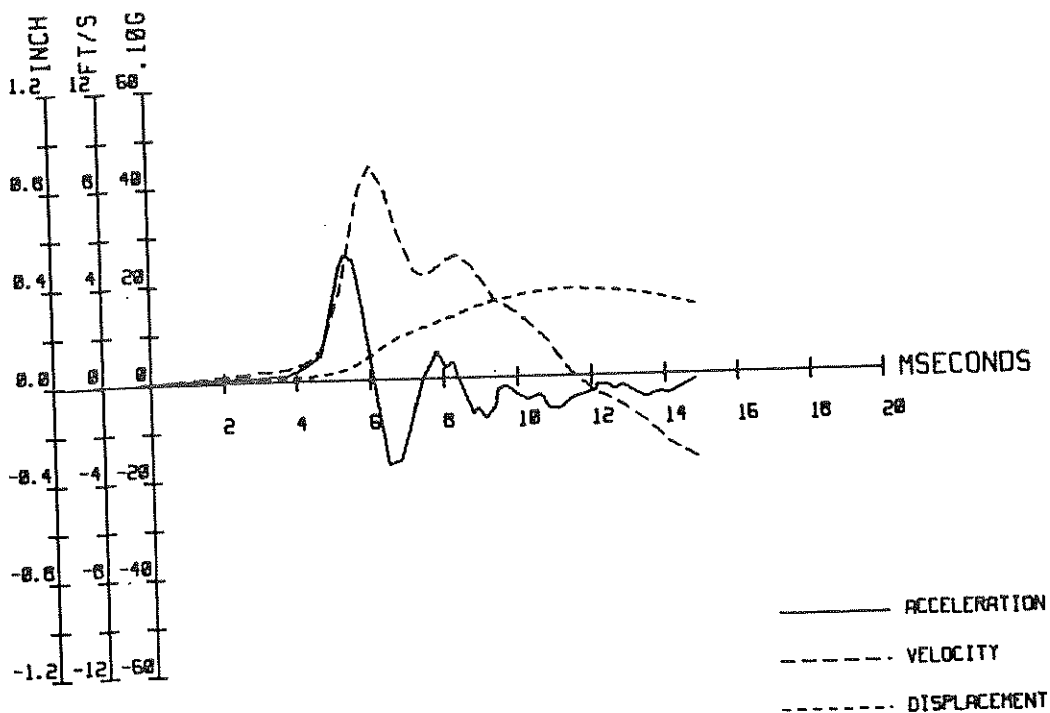


Figure 121 Dynamic Results of Full-Scale Pile 692 in Youngstown, Ohio; Blow 12A

PILE 692 ON I-80

LAST BLOW DATE AUG. 15 1966

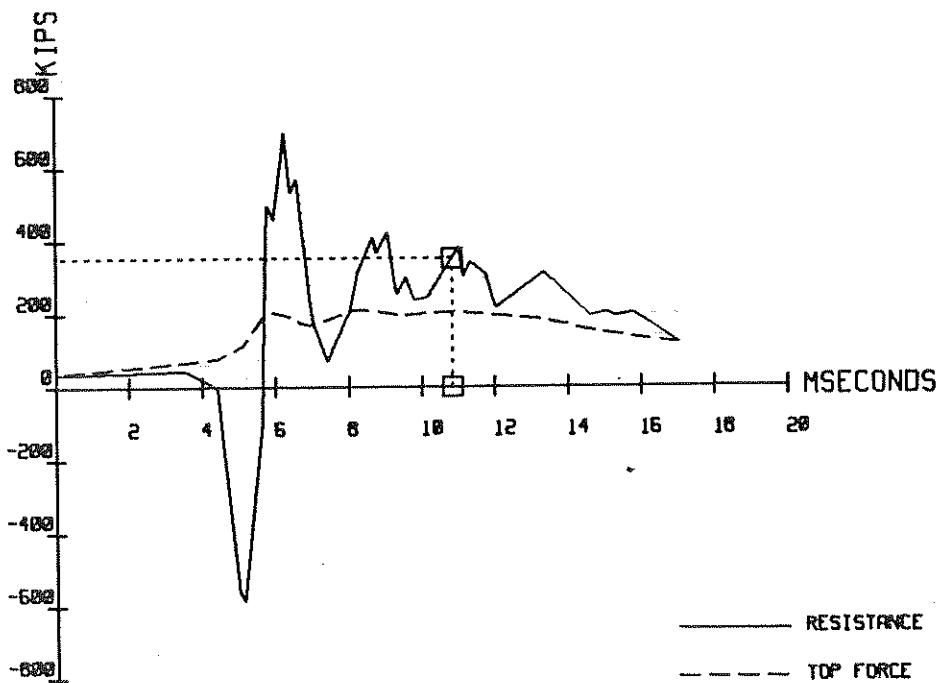
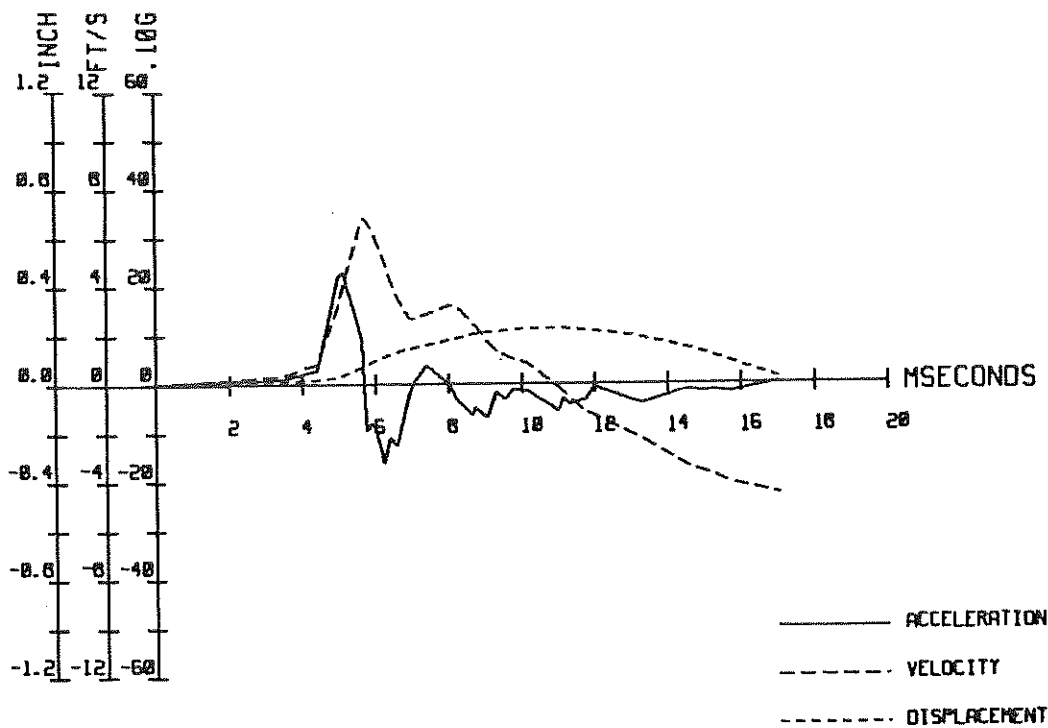


Figure 122 Dynamic Results of Full-Scale Pile 692 upon re-striking, Blow 15A

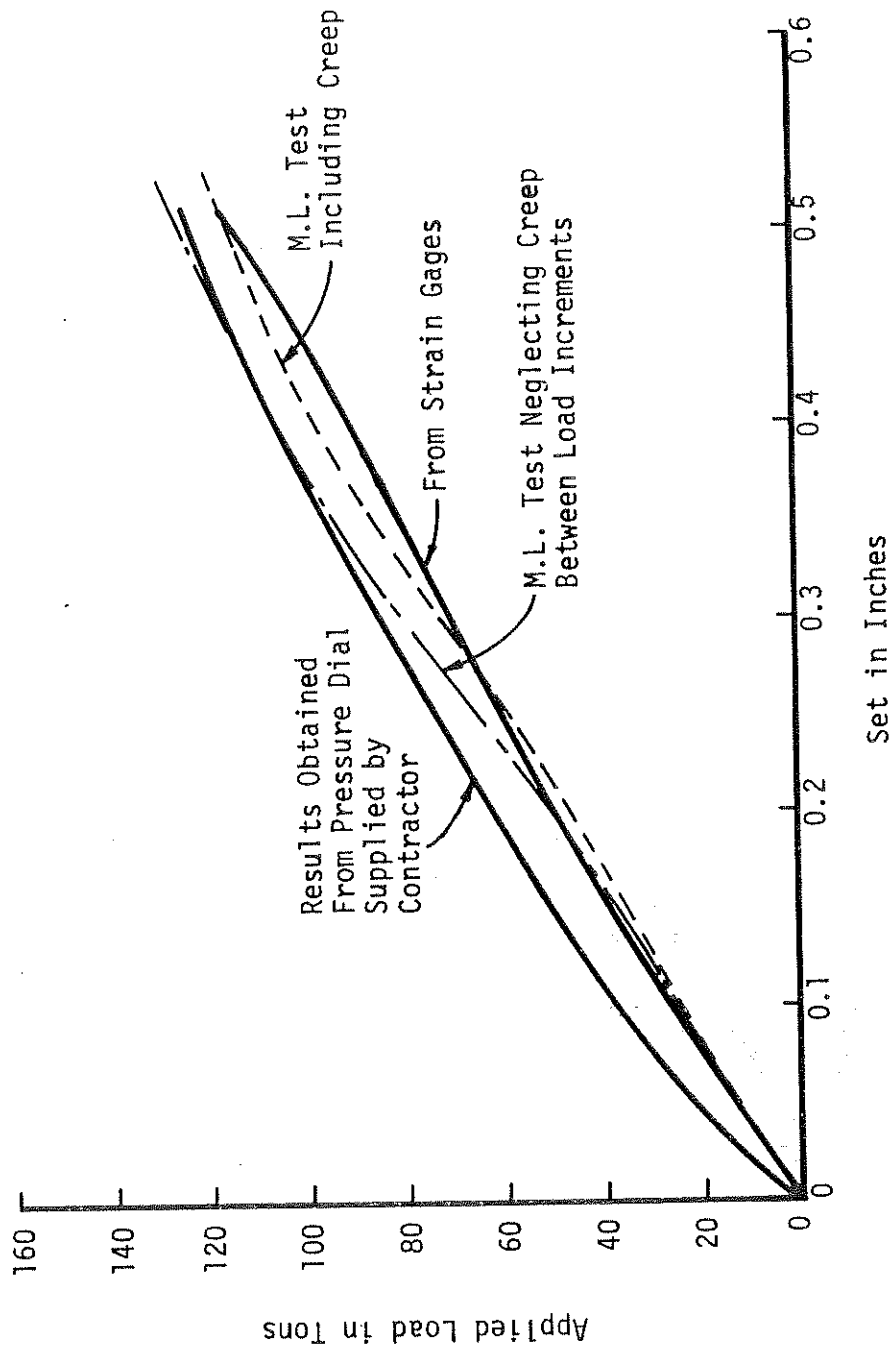


Figure 123 C.R.P. and M.L. Test Results of Pile 506 in Uhrichville, Ohio

FULL SCALE PILE UHRICHVILLE

BLOW NO. 2-R DATE SEP. 13 1966

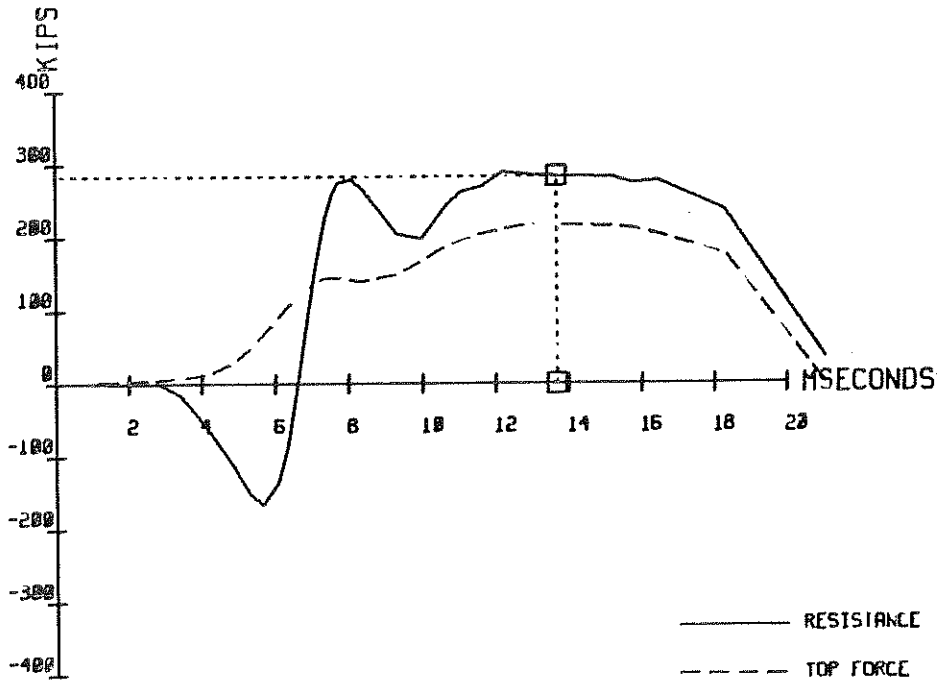
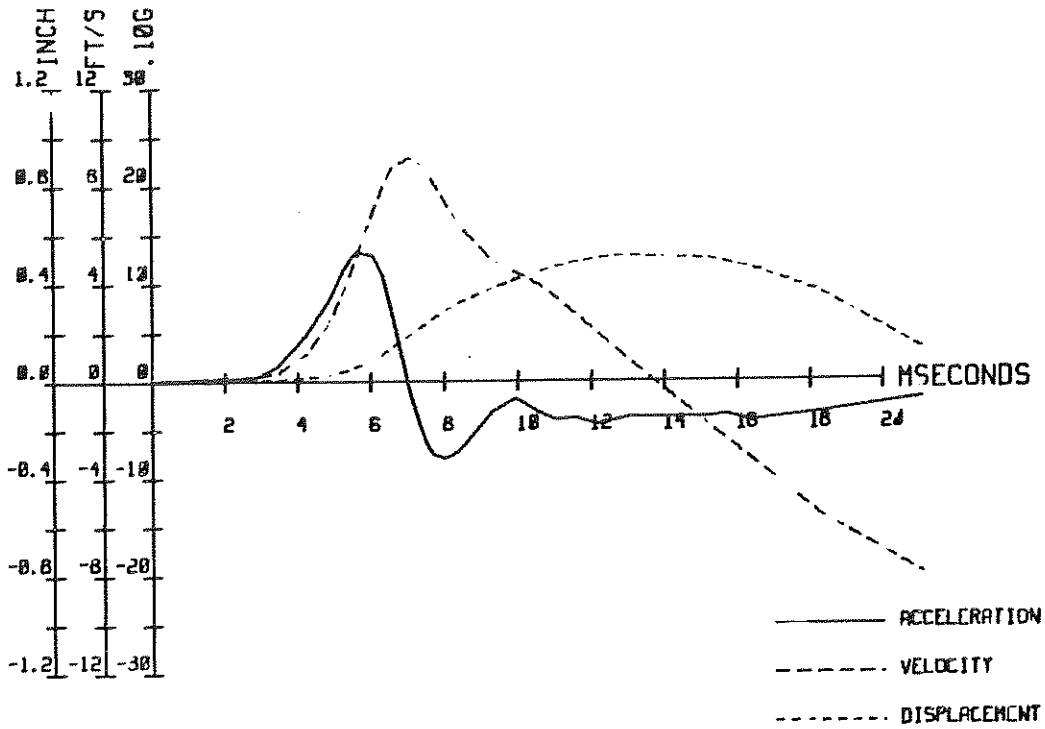


Figure 124 Dynamic Results of Full-Scale Pile 506 in Urichville, Ohio, Blow No. 2A

FULL SCALE PILE UHRICHVILLE

BLOW NO. 6-A DATE SEP. 13 1966

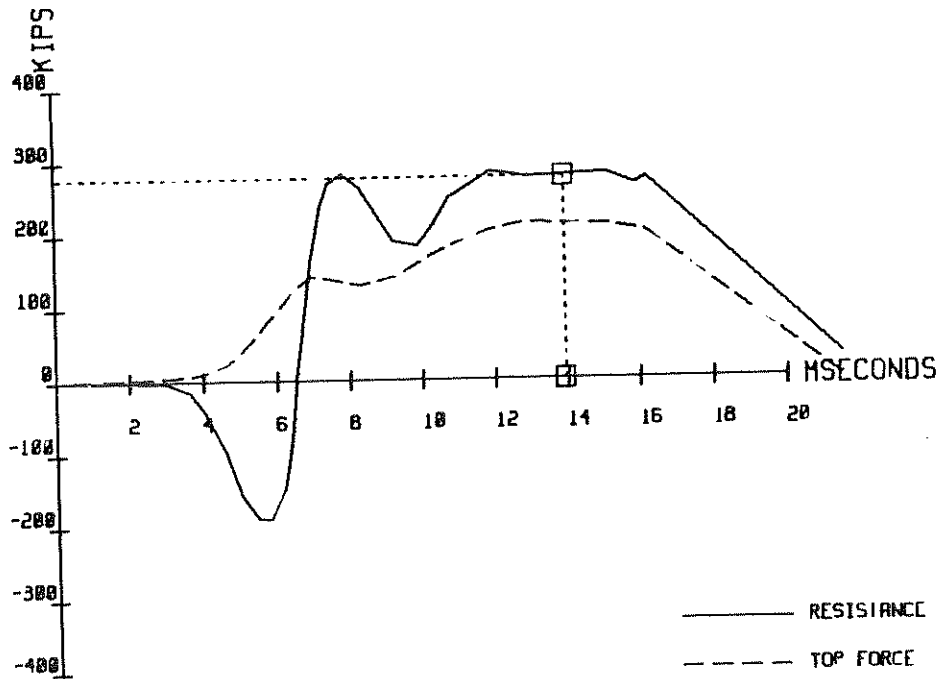
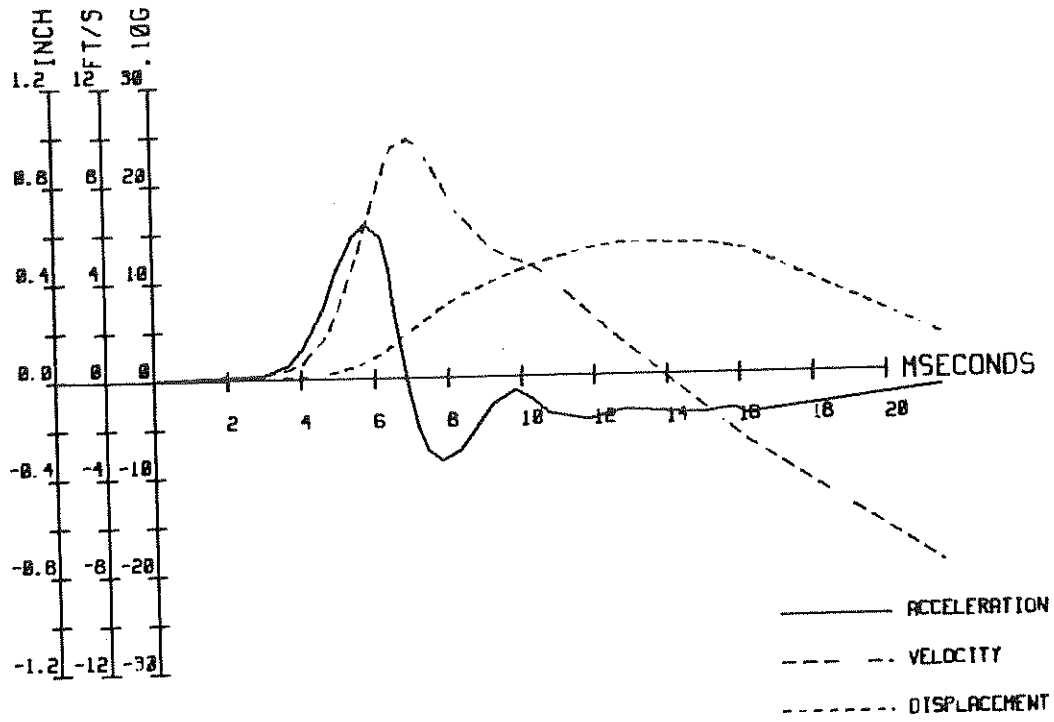


Figure 125 Dynamic Results of Full-Scale Pile 506 in Urichville, Ohio, Blow No. 6A

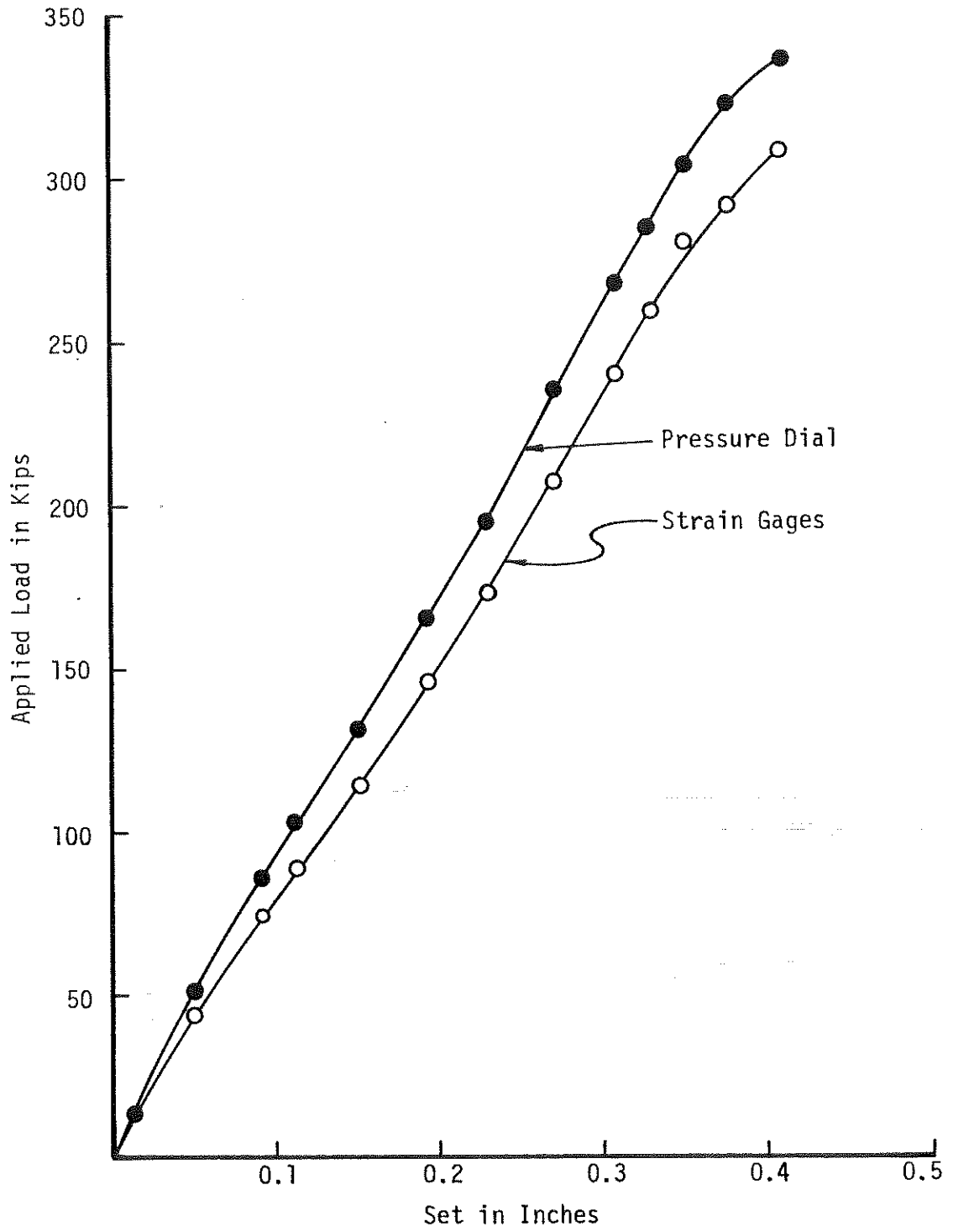


Figure 126

C.R.P. Test Results of Full-Scale Pile in Toledo, Ohio

FULL SCALE PILE TOLEDO

BLOW NO. 22-A DATE SEP. 22 1966

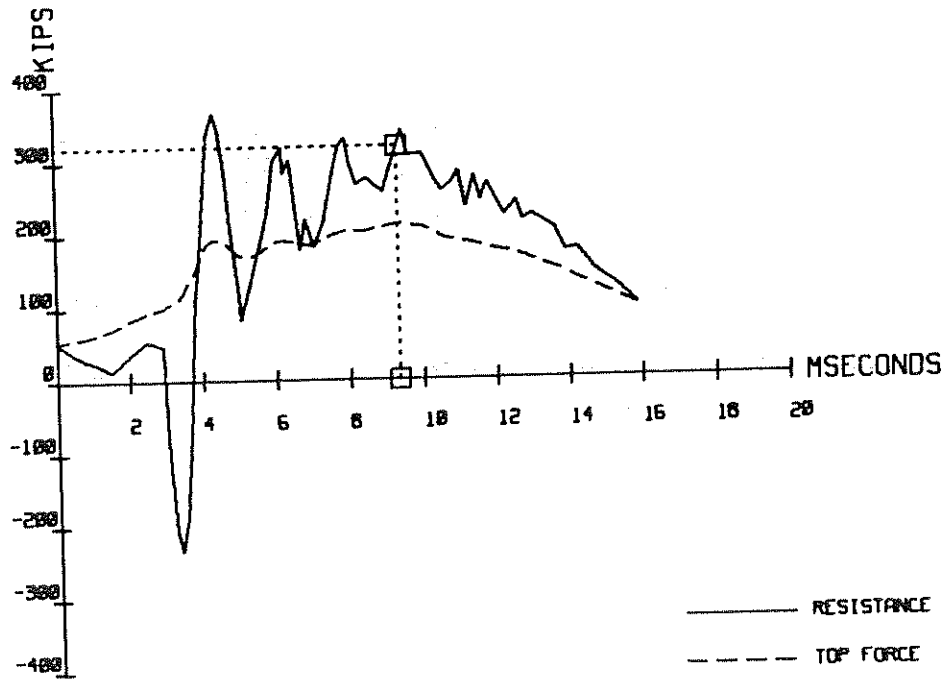
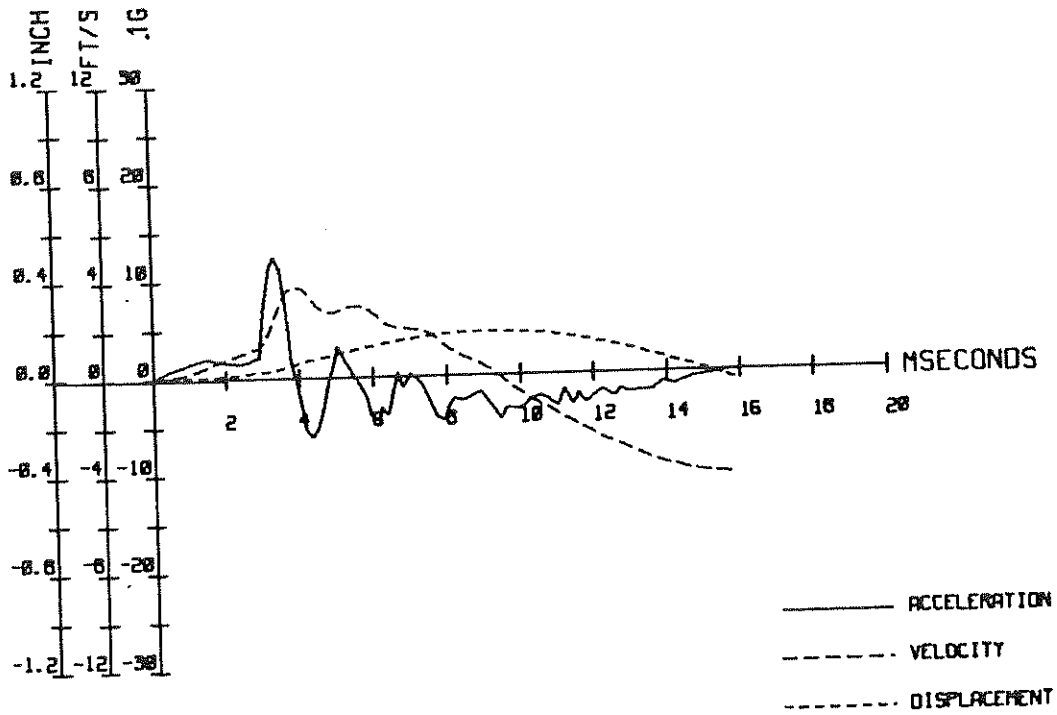


Figure 127 Dynamic Results of Full-Scale Pile in Toledo, Ohio upon Restriking, Blow 22A

FULL SCALE PILE TOLEDO

BLOW NO. 23-A DATE SEP. 22 1966

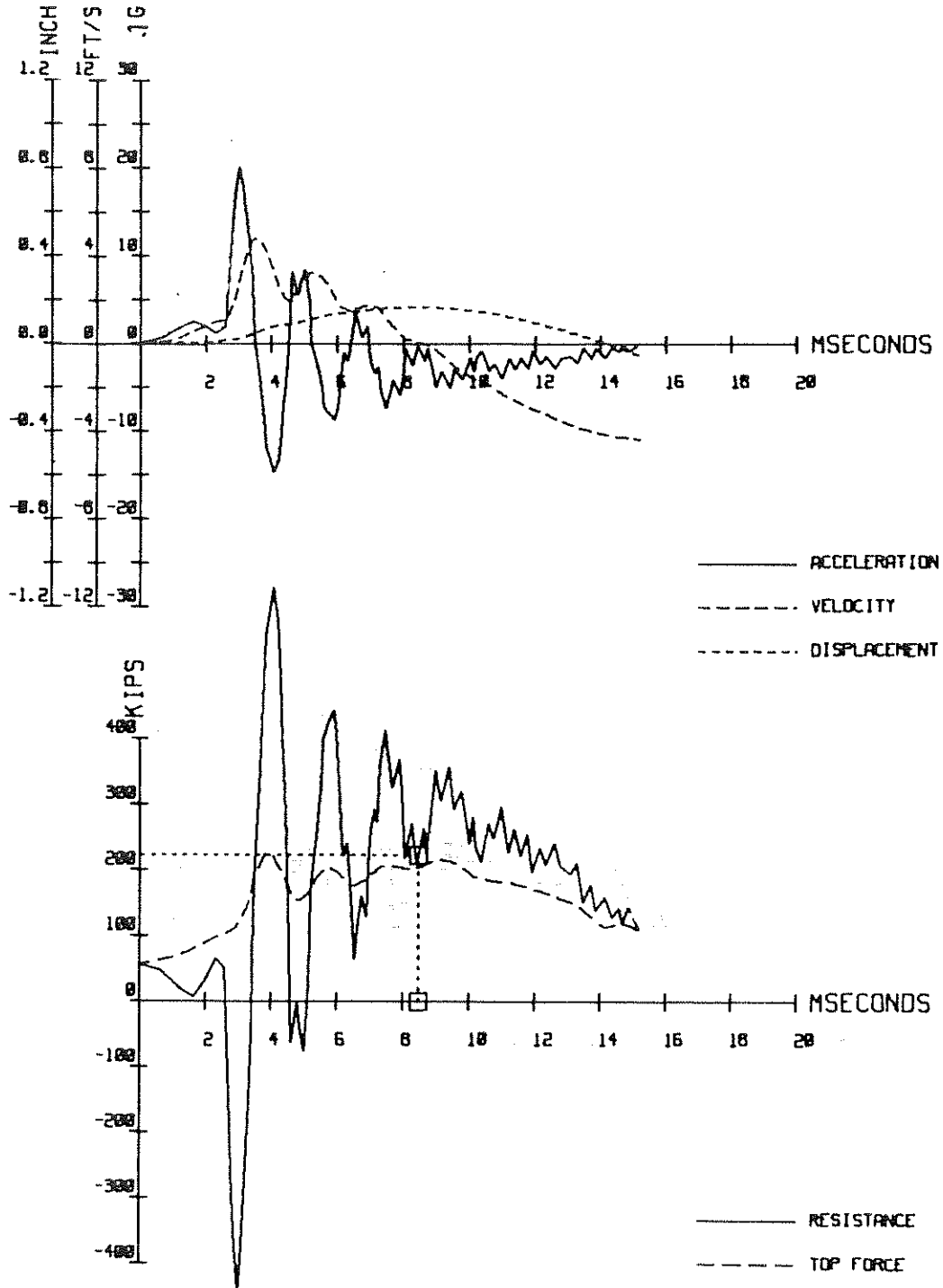


Figure 12C Dynamic Results of Full-Scale Pile in Toledo, Ohio upon Restriking, Blow 23A

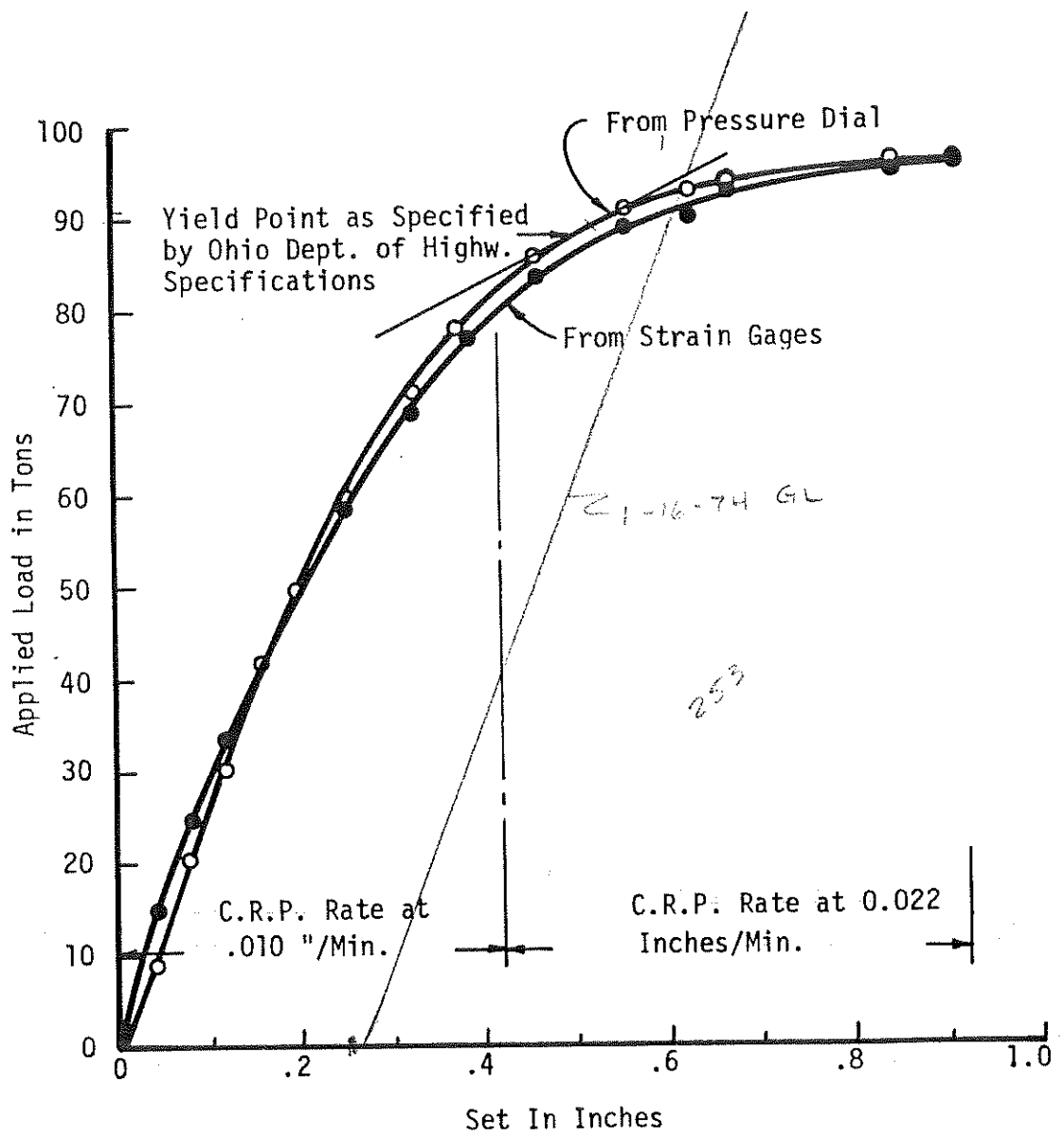


Figure 129

C.R.P. Test Results of Full-Scale Pile C1 in Canton, Ohio

FULL SCALE PILE CANTON
 PILE C-1 BLOW NO. 2-A DATE JAN. 3 1967

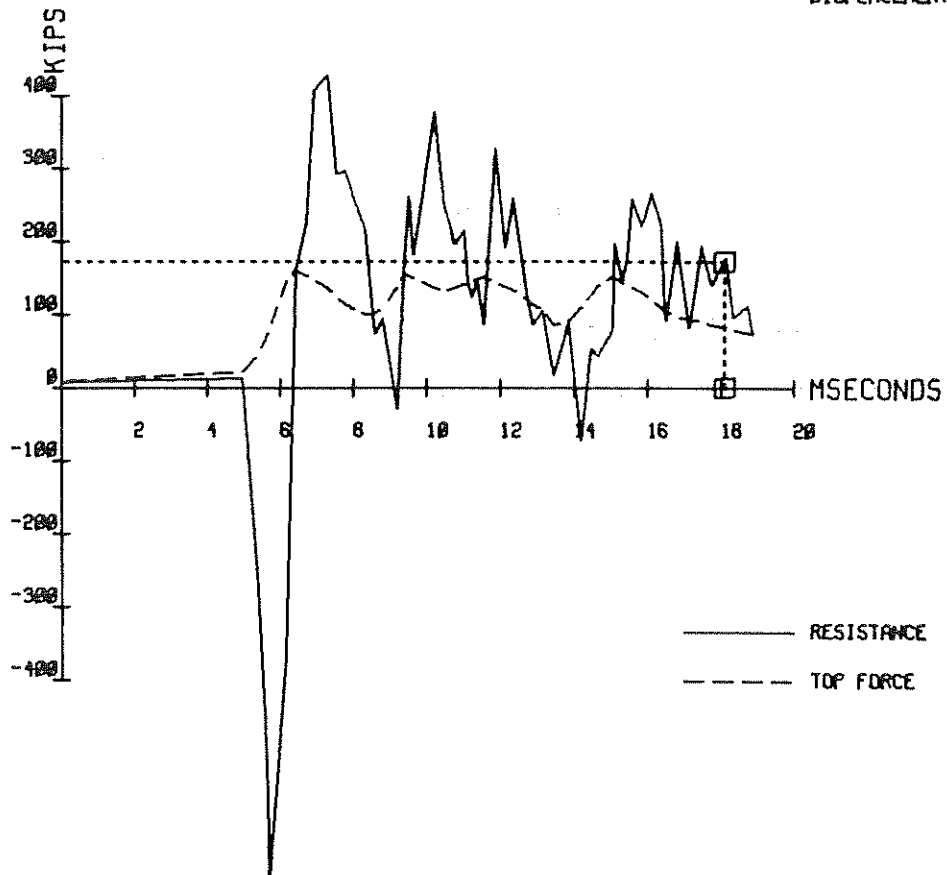
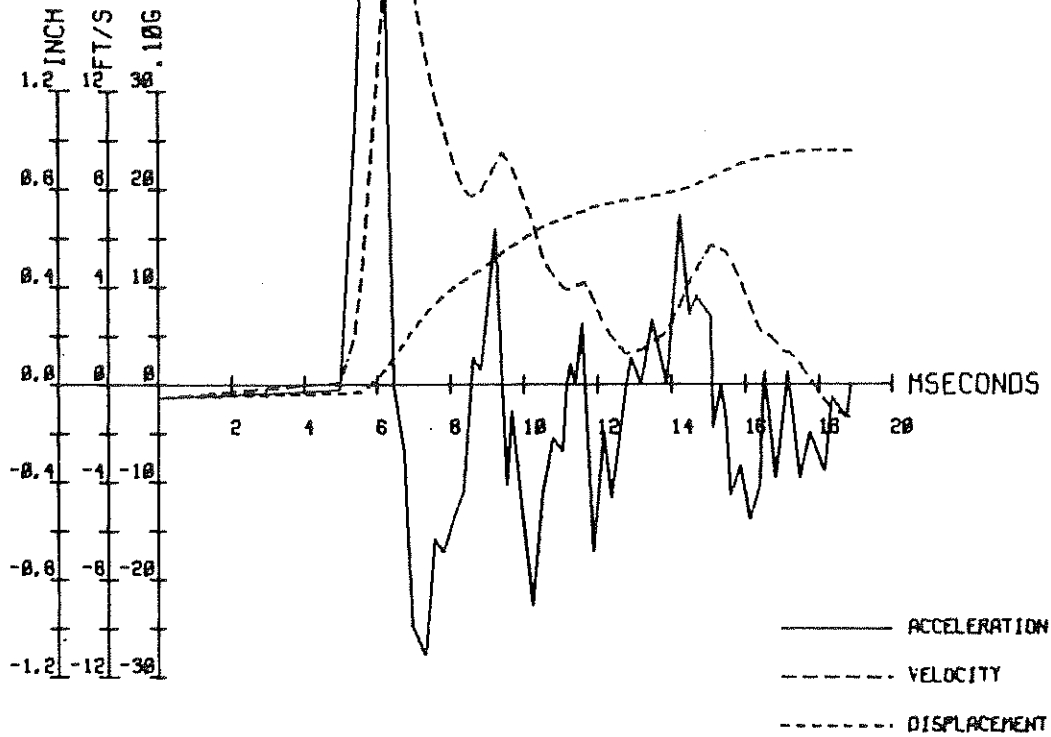


Figure 130 Dynamic Results of Full-Scale Pile C1, Canton, Ohio:
 Blow 2A

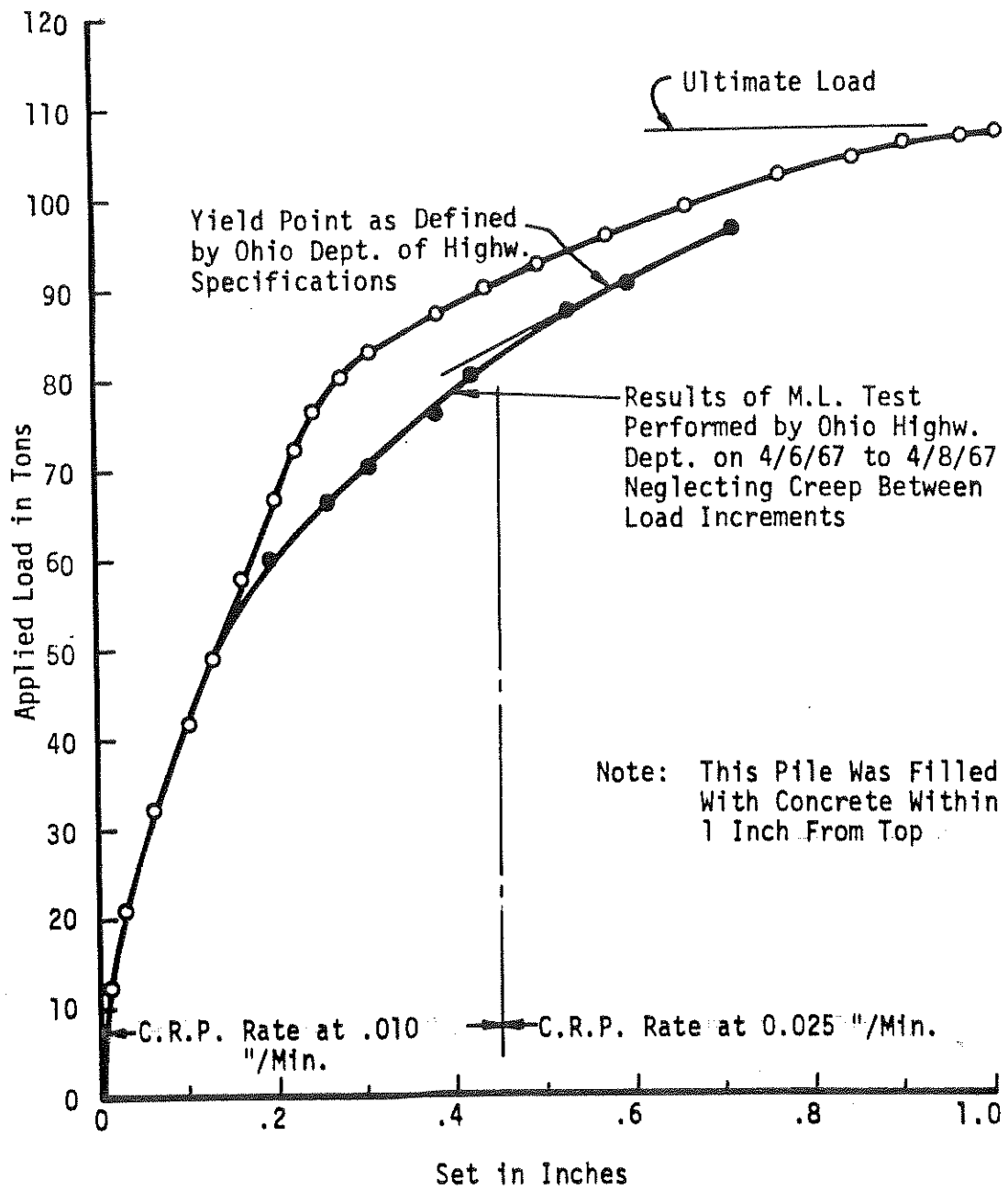


Figure 131
 C.R.P. Test Results of Full-Scale Pile 534, in Canton, Ohio

FULL SCALE PILE CANTON

PILE 534 BLOW NO. 1-A DATE APRIL 11 1967

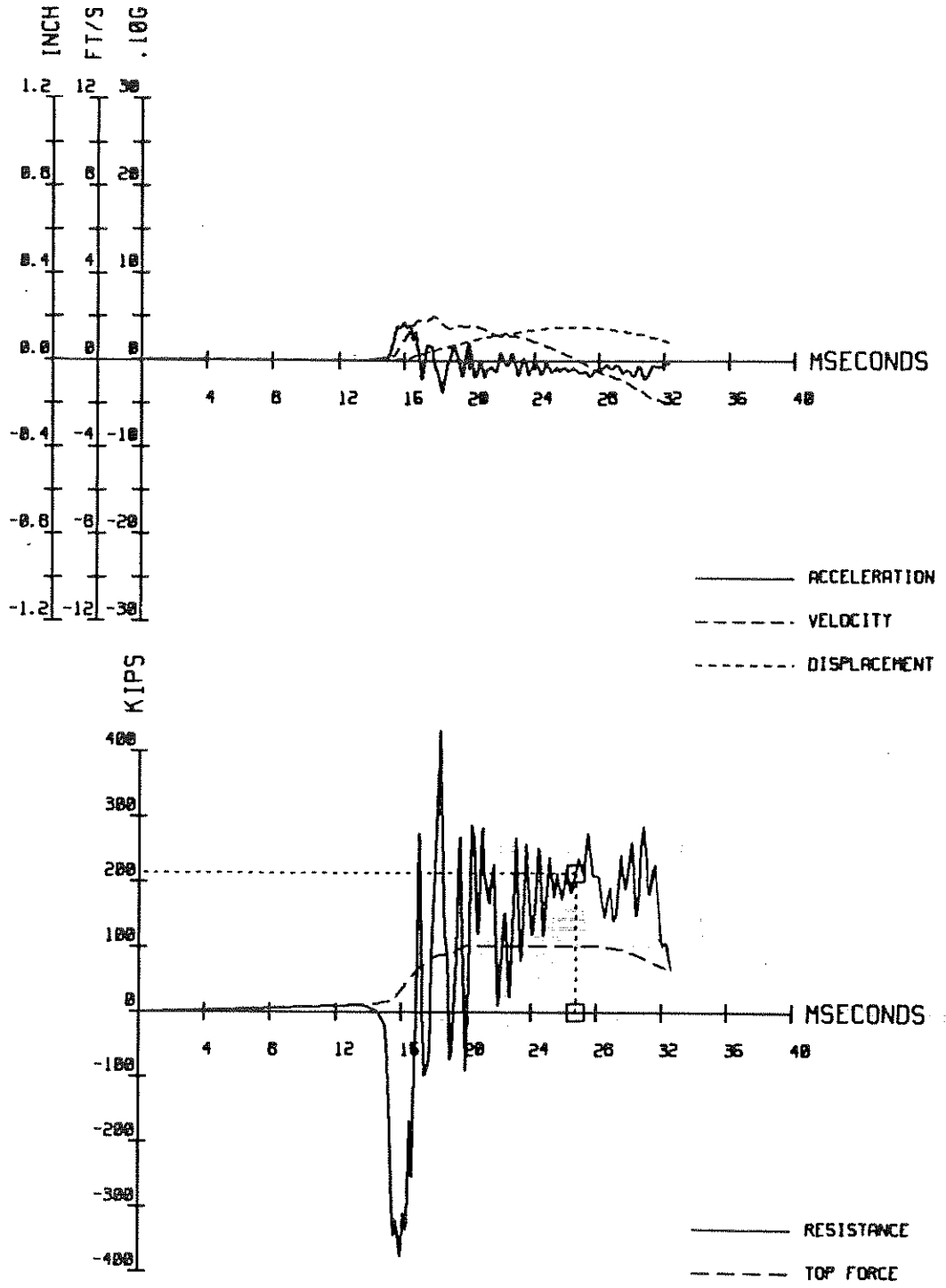


Figure 132 Dynamic Results of Full-Scale Pile 534, Blow 1A

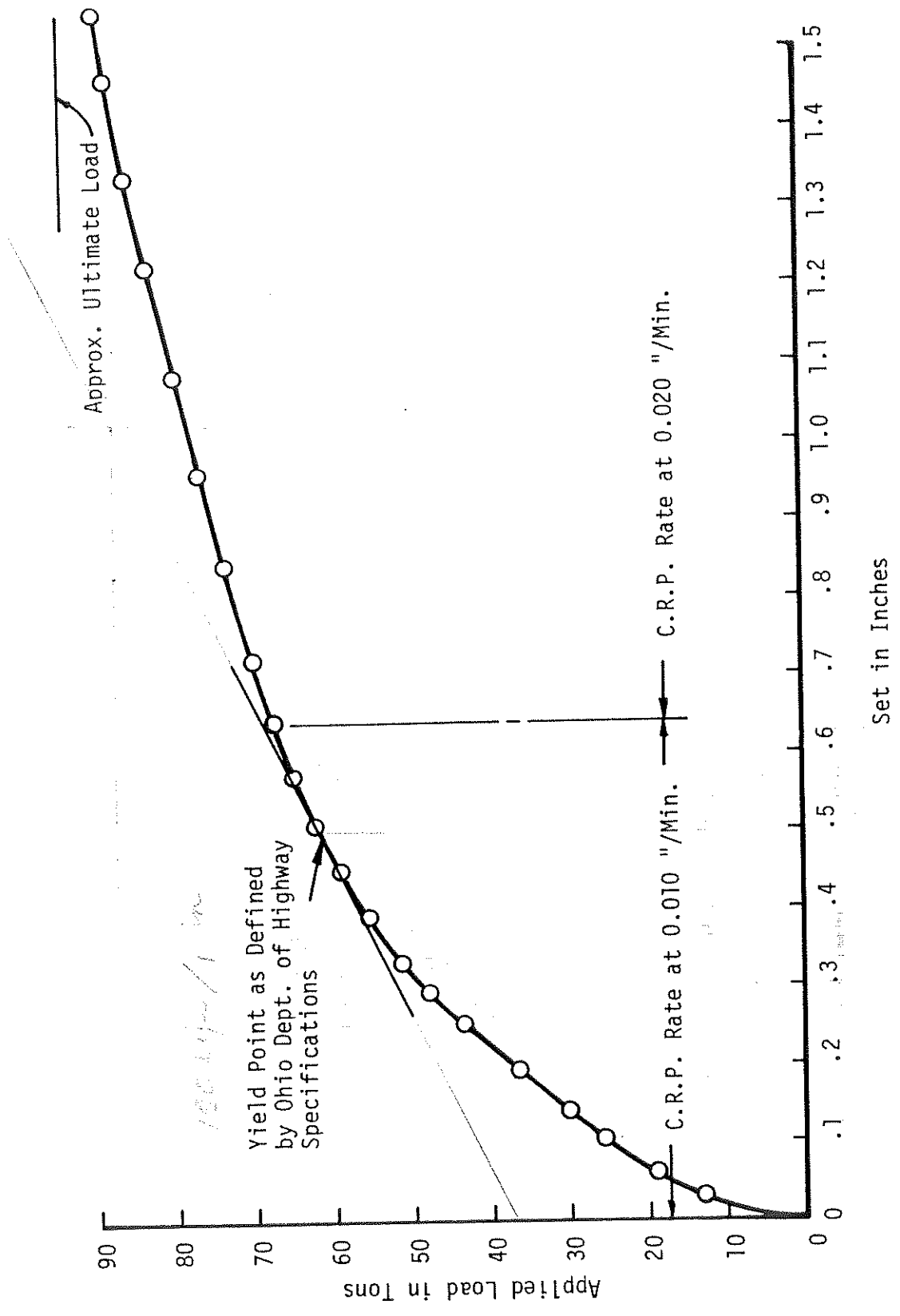


Figure 133 C.R.P. Test Results of Full-Scale Pile 531-70

FULL SCALE PILE CANTON

PILE 531-70 BLOW NO. 1-A DATE APRIL 13 1967

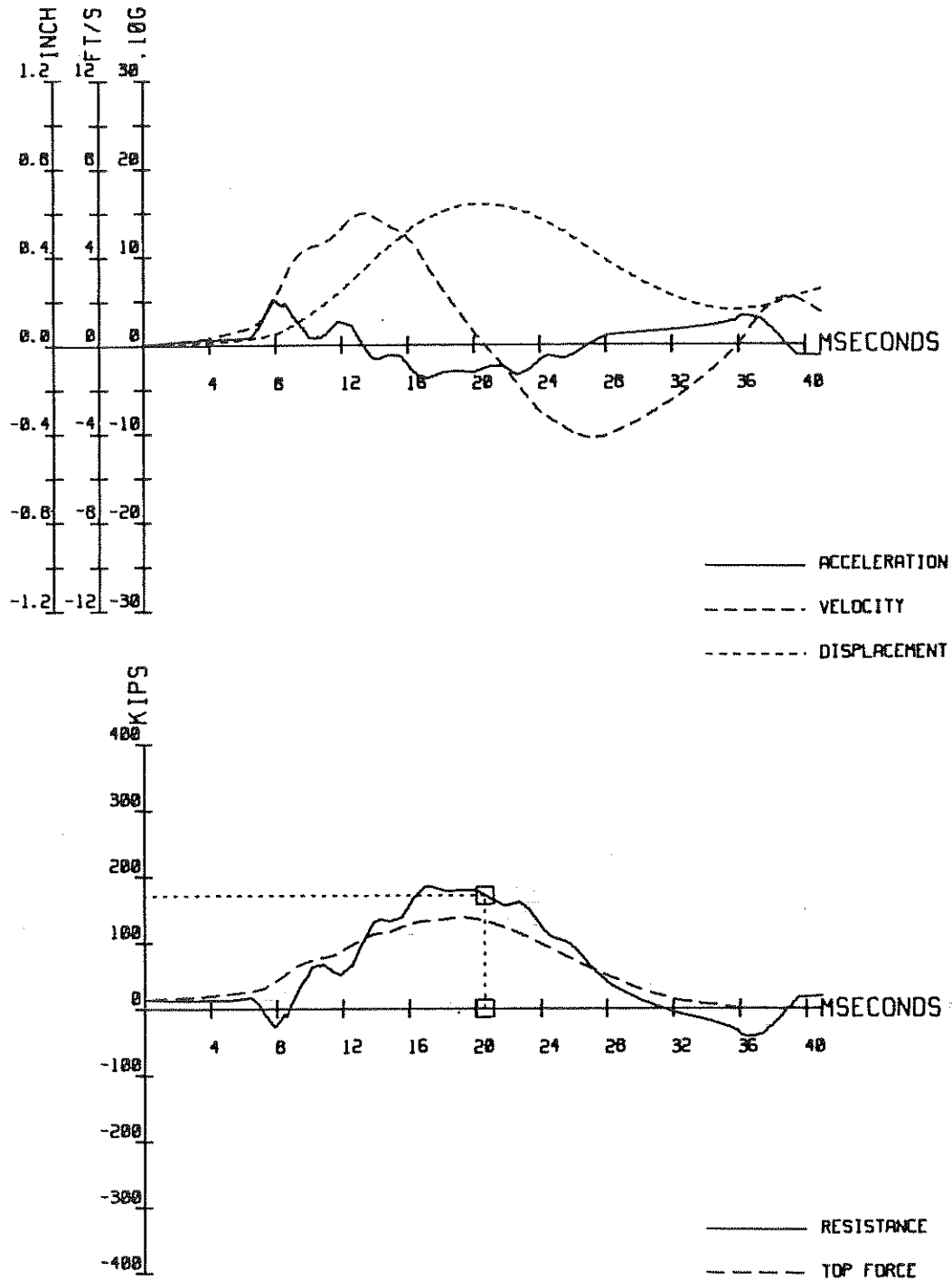


Figure 134 Dynamic Results of Full-Scale Pile 531-70, Blow 1A upon Restriking

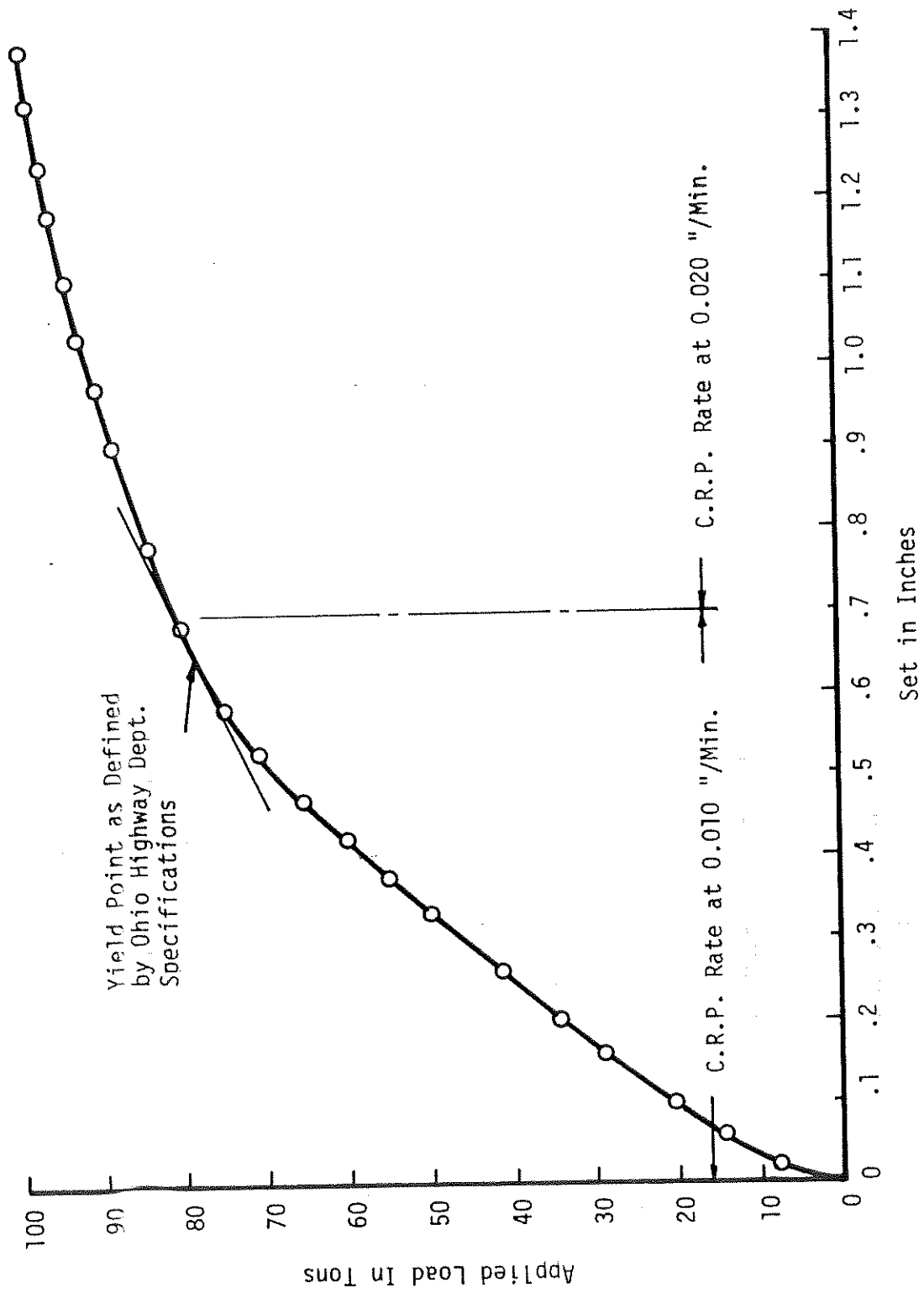


Figure 135 C.R.P. Test Results of Pile 531-70 after a 3-Day Set-up Period

FULL SCALE PILE CANTON

PILE 531-70 BLOW NO. 31-A DATE APRIL 17 1967

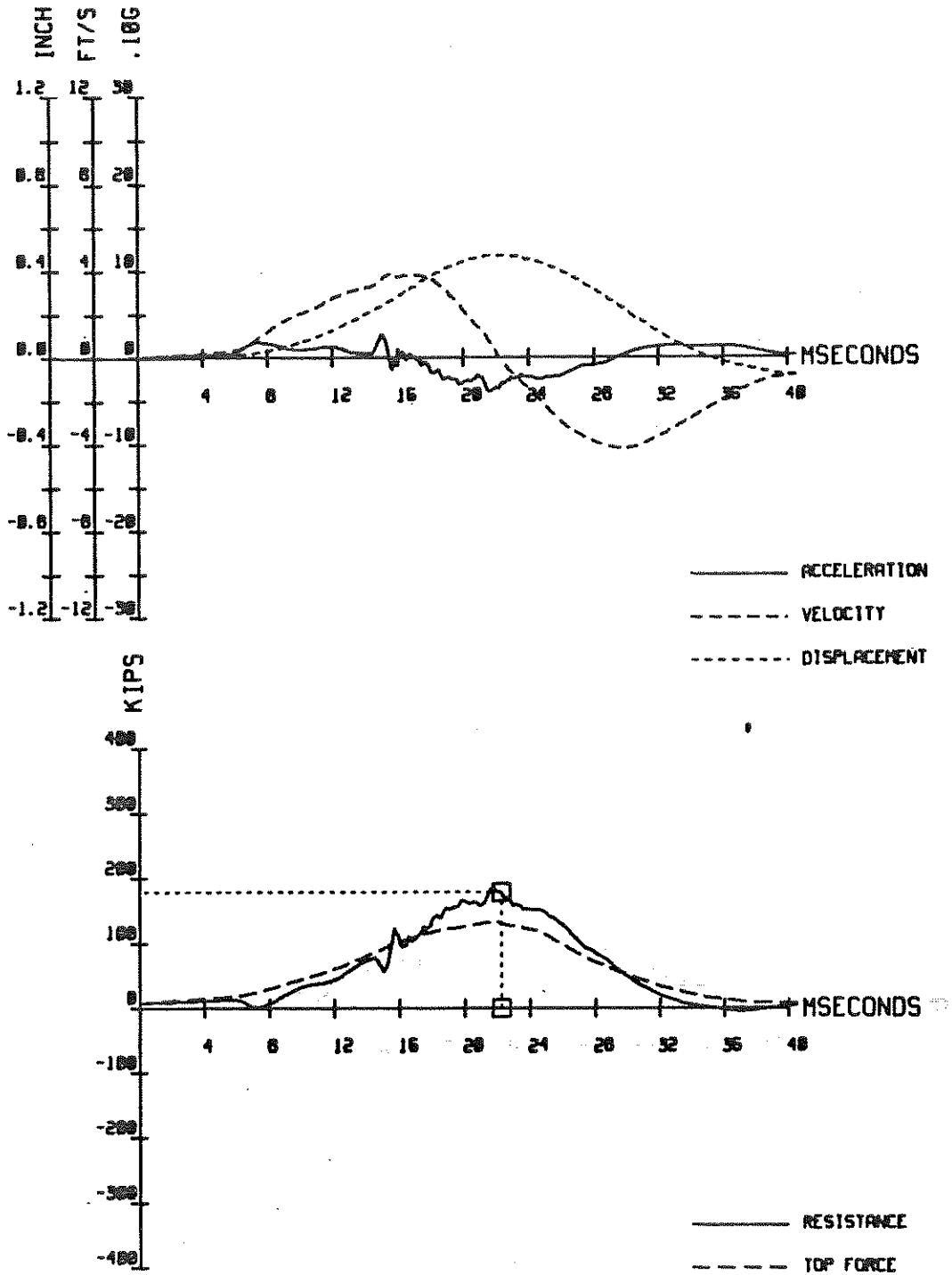


Figure 136 Dynamic Results of Pile 531-70 Blow 31A upon Restriking on 4/17/67

FULL SCALE PILE CANTON

PILE 531-70 BLOW NO. 33-A DATE APRIL 17 1967

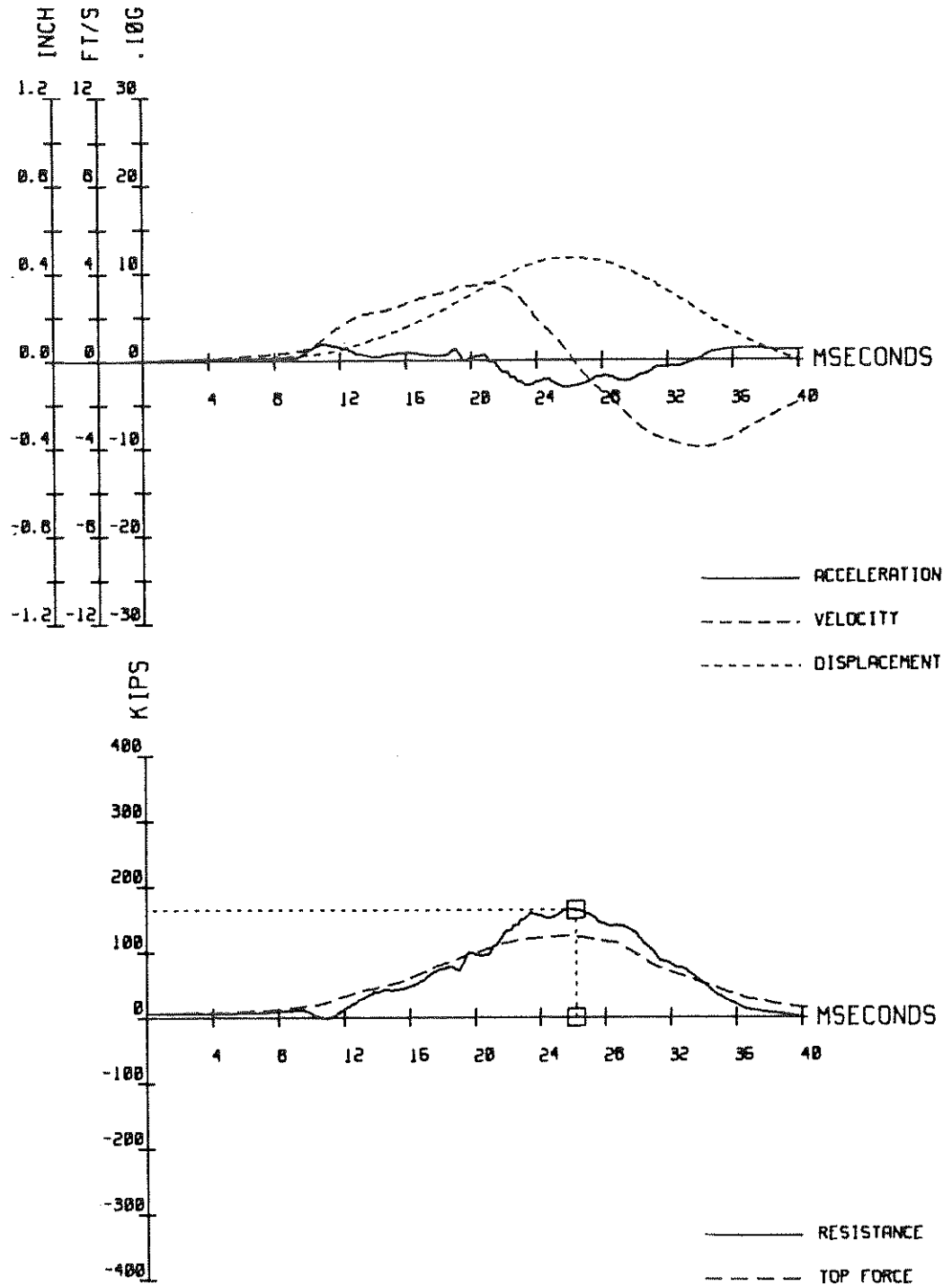


Figure 137 Dynamic Results of Pile 531-70, Blow 33A upon Restriking on 4/17/67

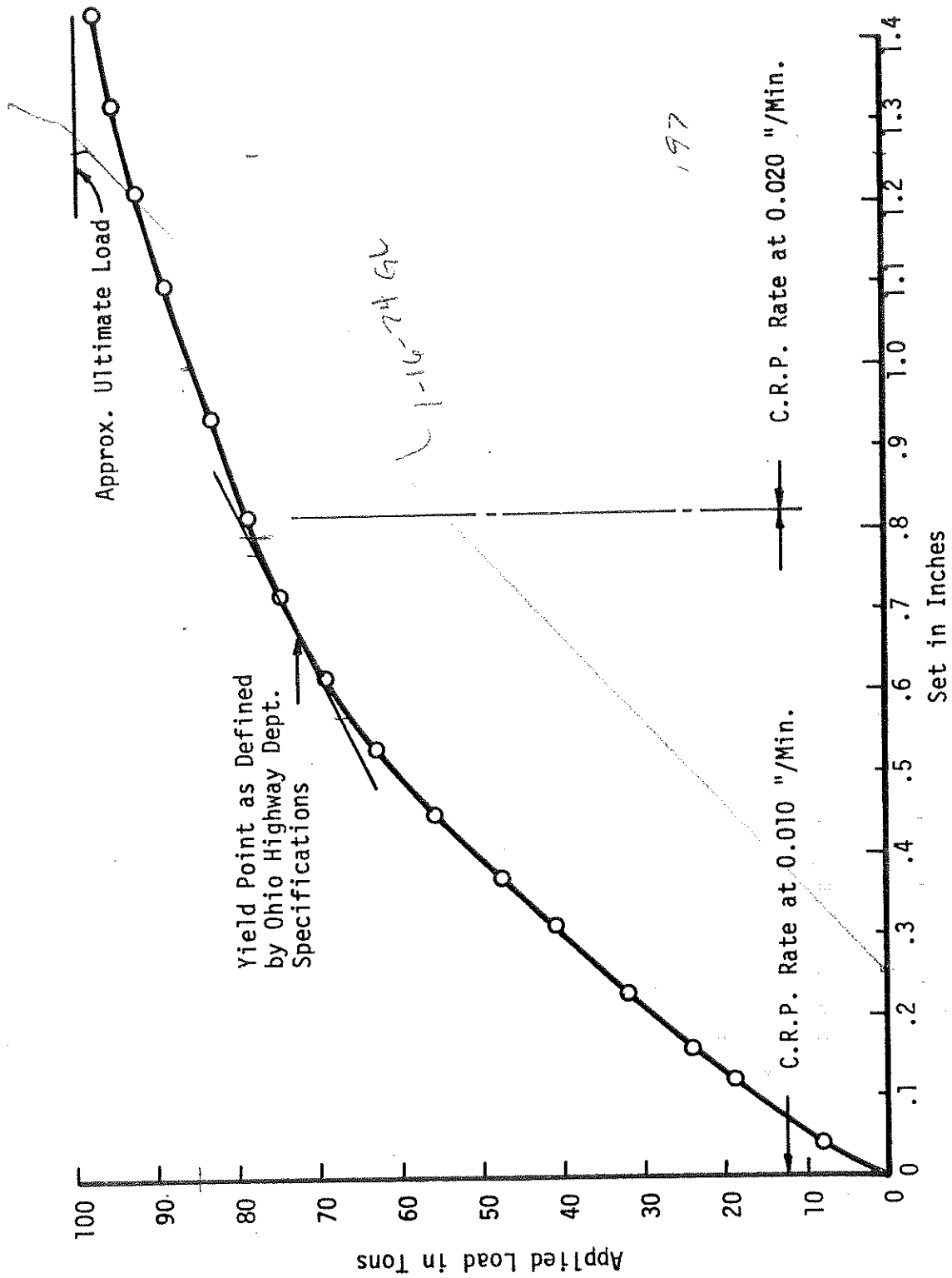


Figure 138 C.R.P. Test Results of Full-Scale Pile 531-76

FULL SCALE PILE CANTON

PILE 531-76 BLOW NO. 3-A DATE APRIL 18 1967

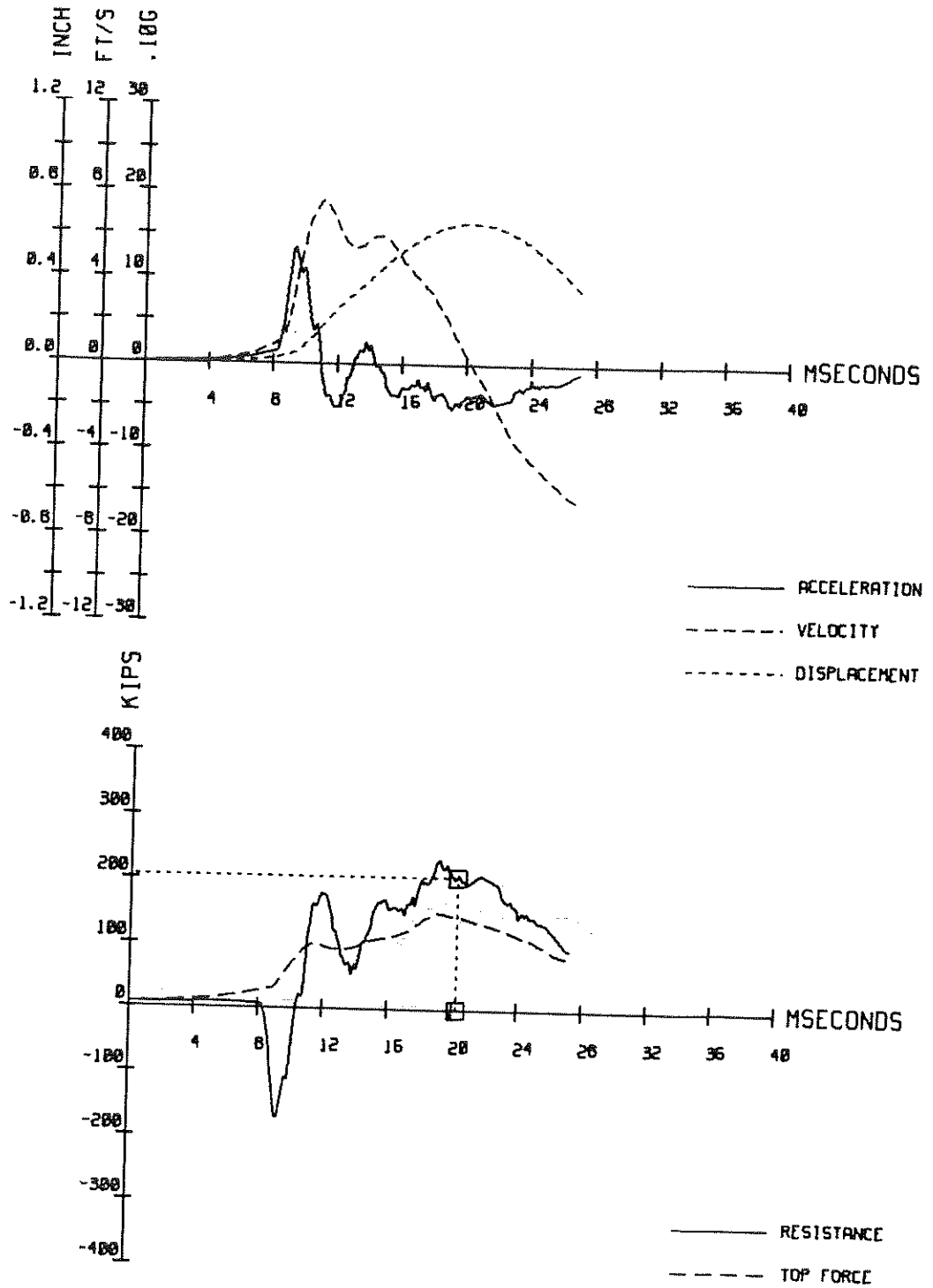


Figure 139 Dynamic Results of Pile 531-76, Blow 3A on 4/18/67

FULL SCALE PILE CANTON

PILE 531-76 BLOW NO. 5-A DATE APRIL 18 1967

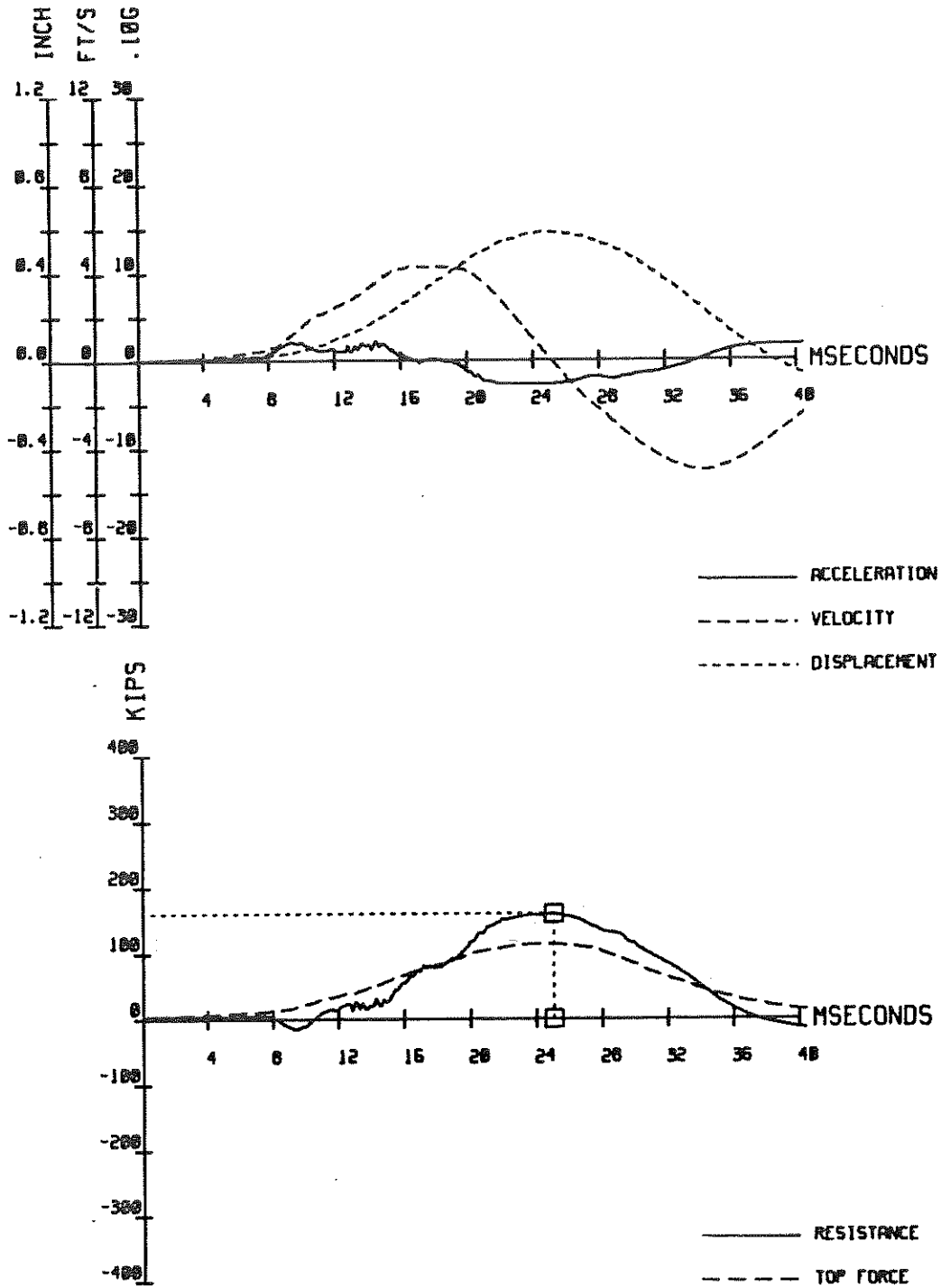


Figure 140 Dynamic Results of Pile 531-76, Blow 5A on 4/18/67

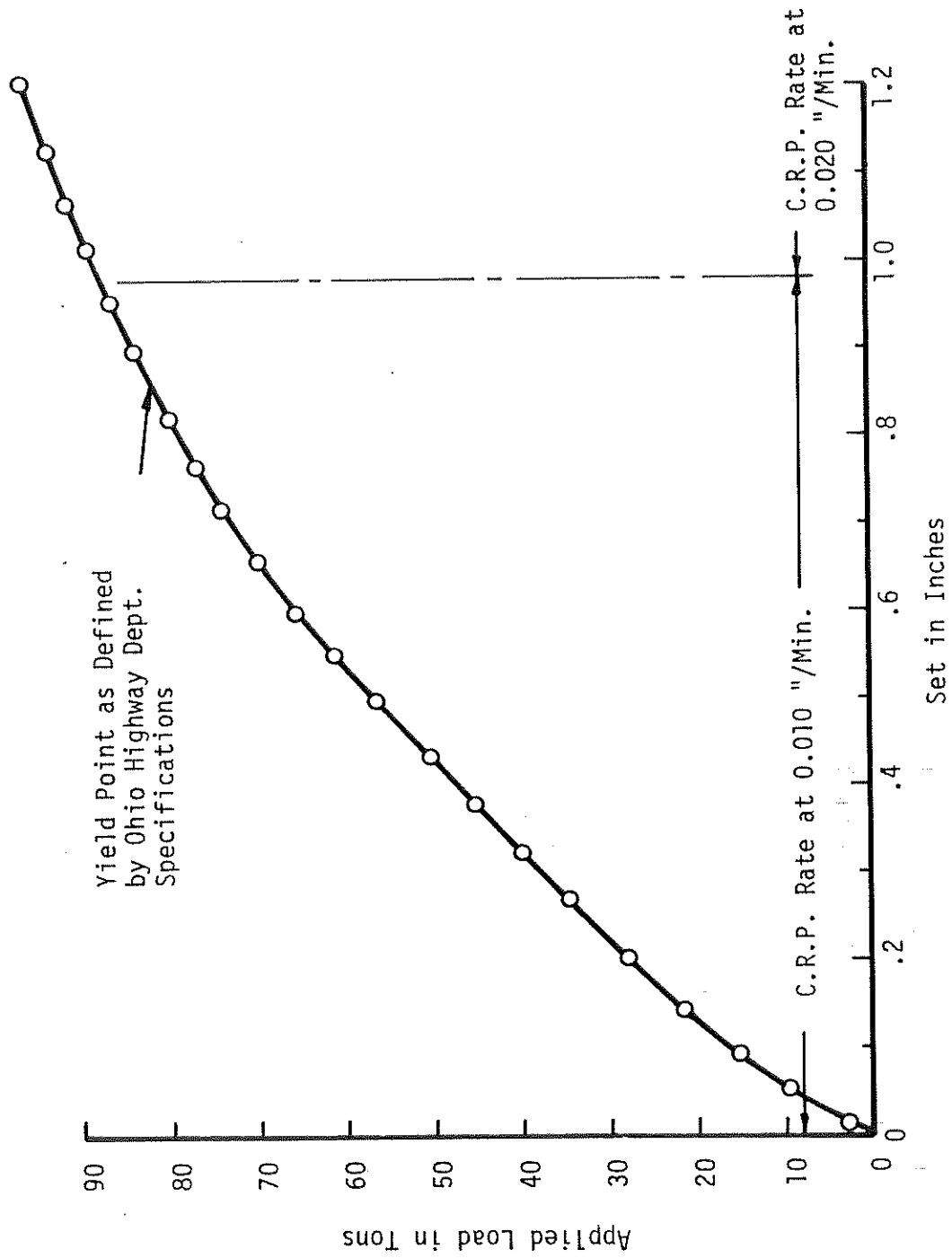


Figure 141 C.R.P. Test Results of Pile 531-83 upon Completion of Driving

FULL SCALE PILE CANTON

PILE 531-83 BLOW NO. 5 DATE APRIL 18 1967

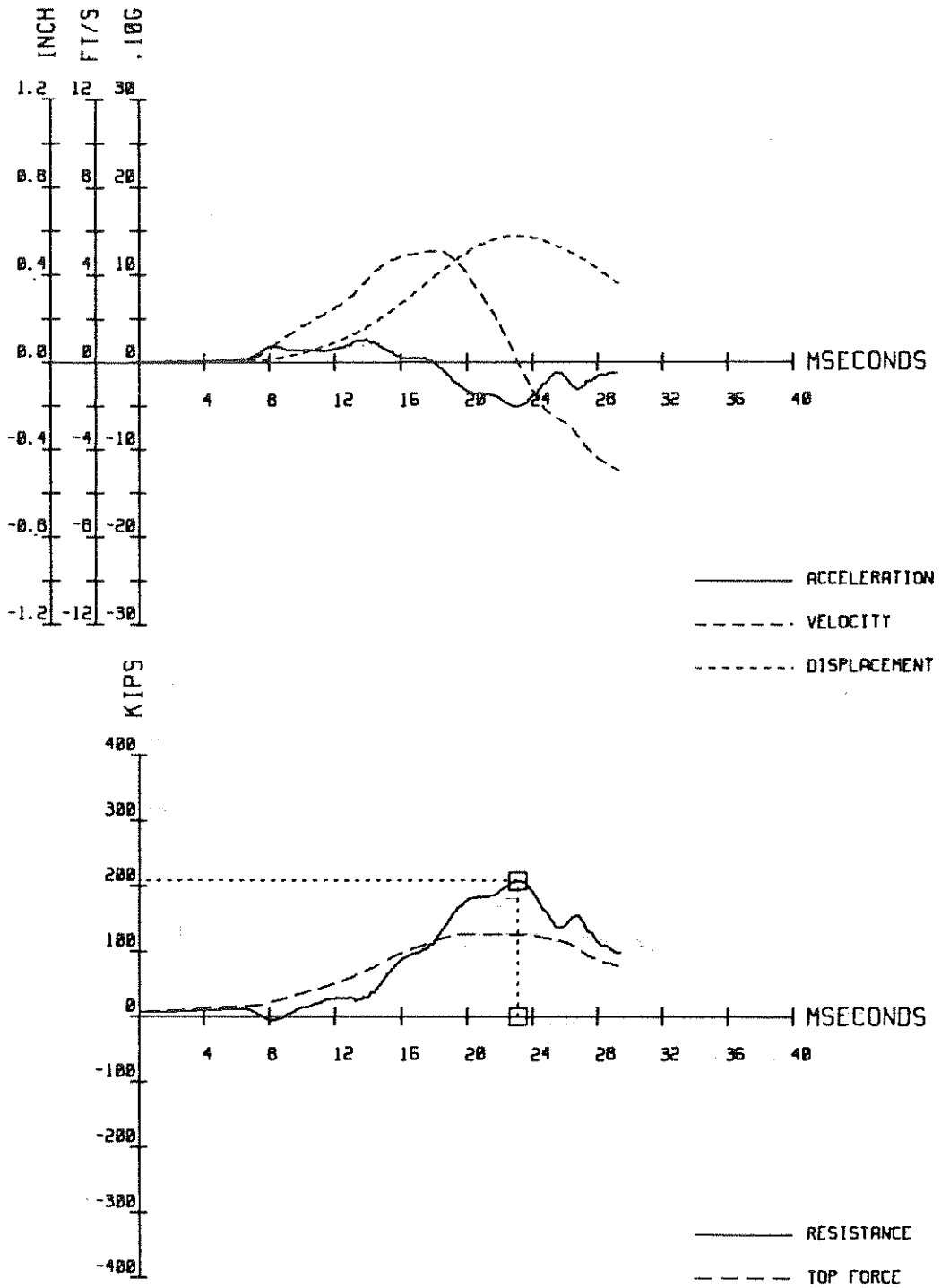


Figure 142 Dynamic Results of Pile 531-83, Blow No. 5
at the End of Driving

FULL SCALE PILE AKRON

PILE F-30 BLOW NO. 13 DATE JUNE 21 1967

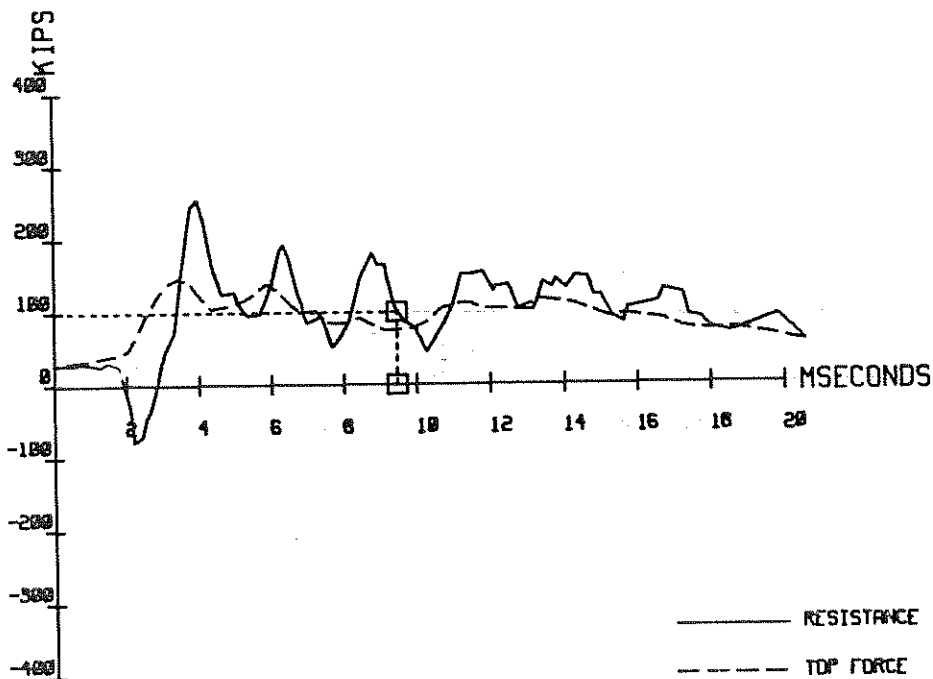
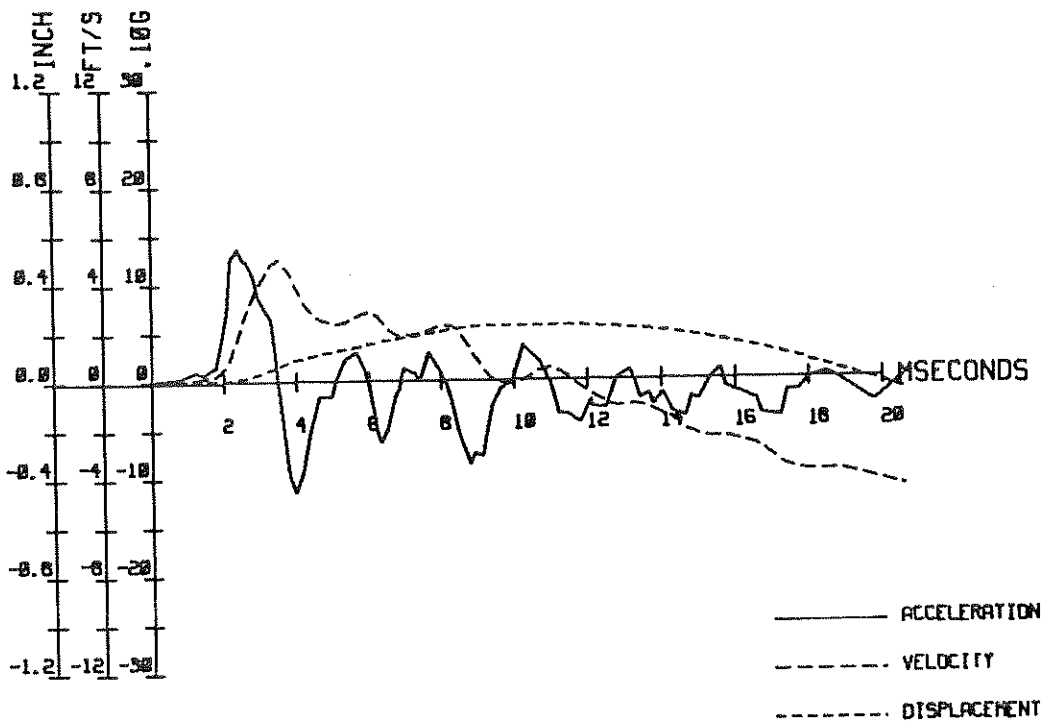


Figure 143 Dynamic Results of Full-Scale Pile F-30, Akron, Ohio at the End of Driving

FULL SCALE PILE AKRON

PILE F-30 BLOW NO. 14 DATE JUNE 21 1967

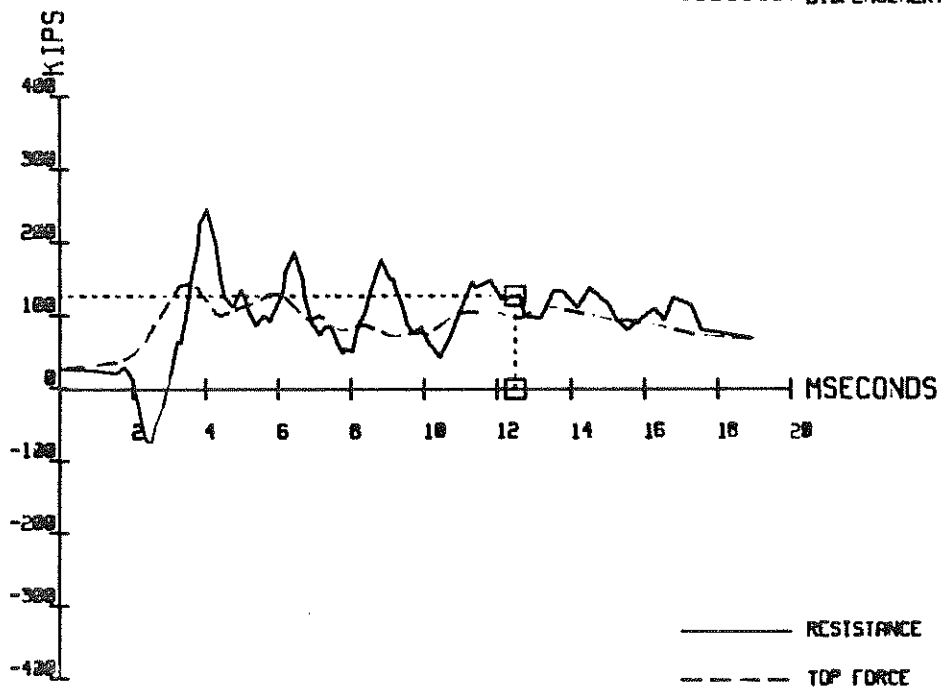
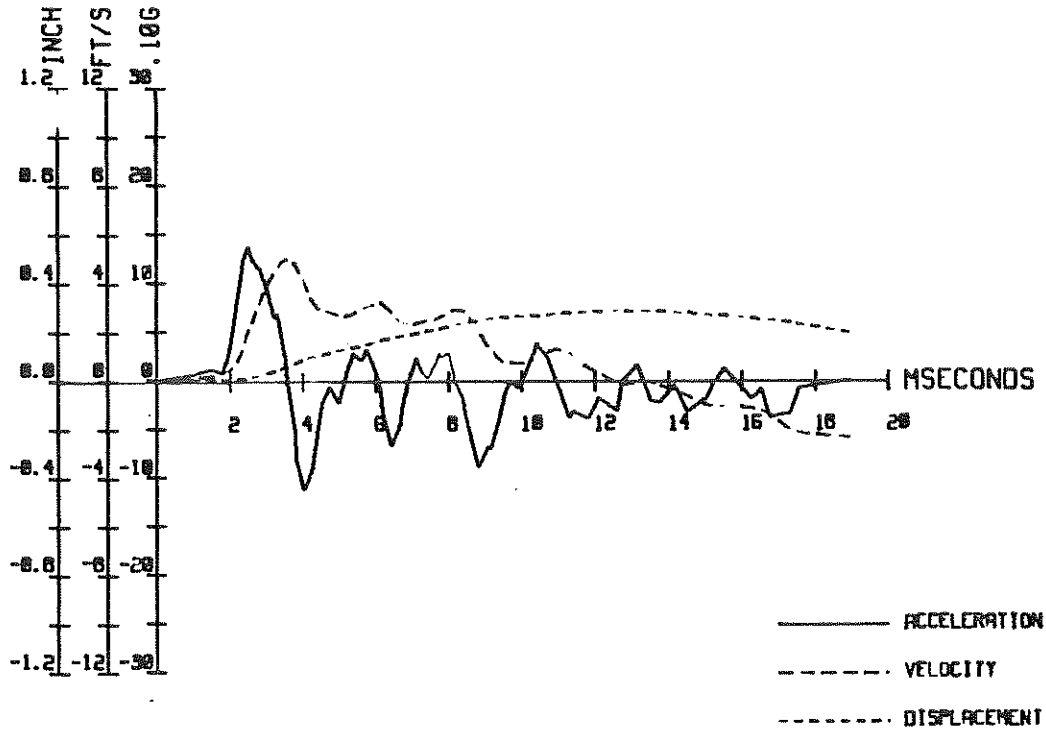


Figure 144. Dynamic Results of Full-Scale Pile F-30 Akron, Ohio at the End of Driving

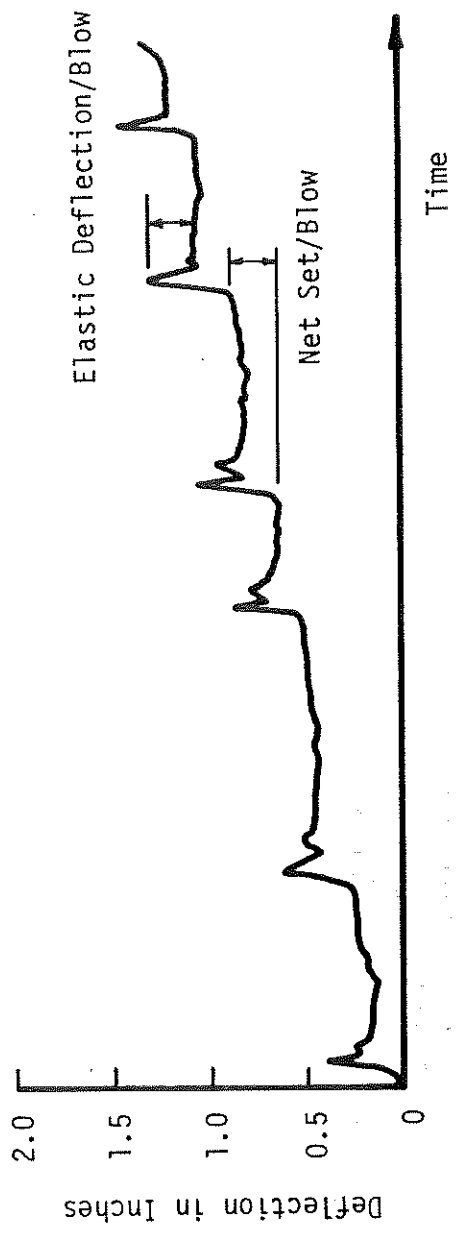


Figure 145 Typical Mechanically Recorded Deflection at the Top of Full-Scale Pile F-50 at the Completion of Driving

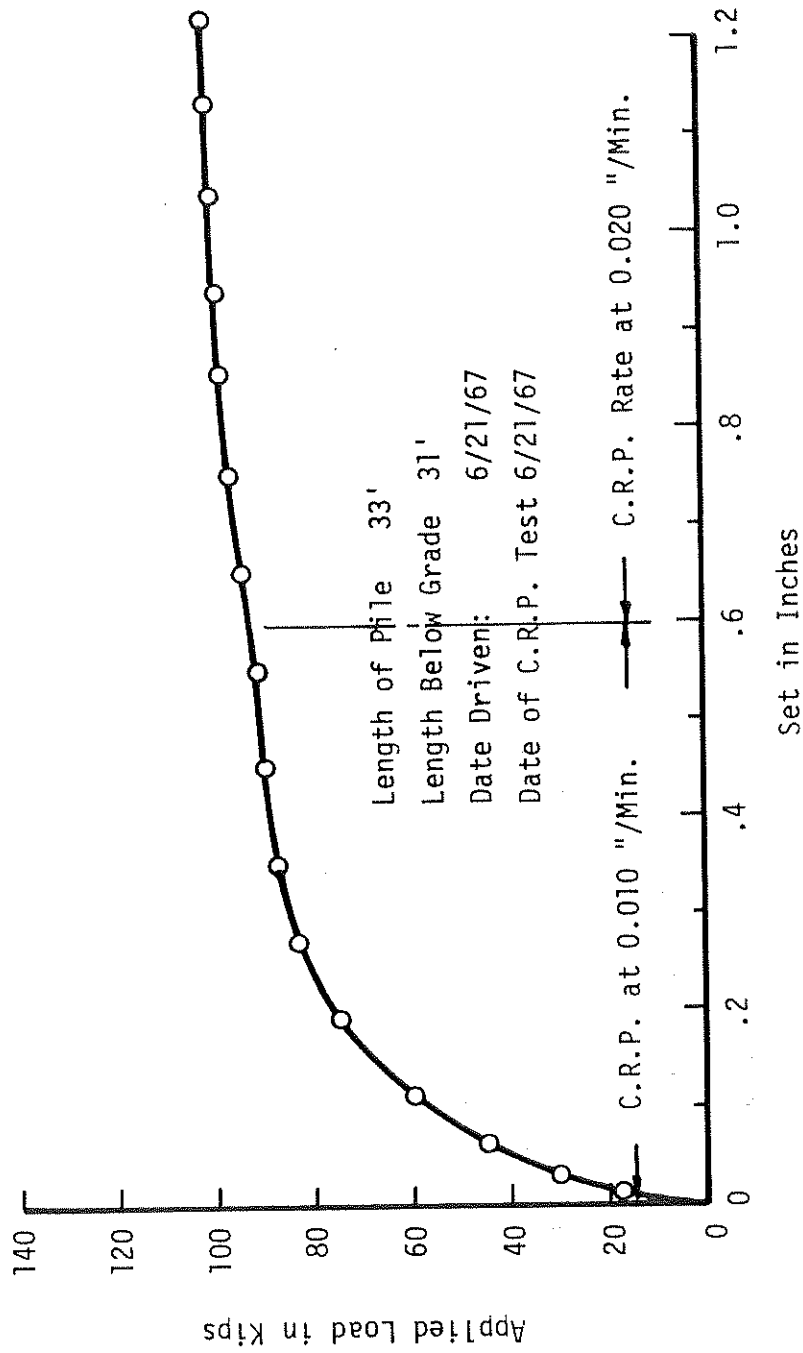


Figure 146 C.R.P. Test of Full-Scale Pile F-30 in Akron, Ohio
 after Completion of Driving

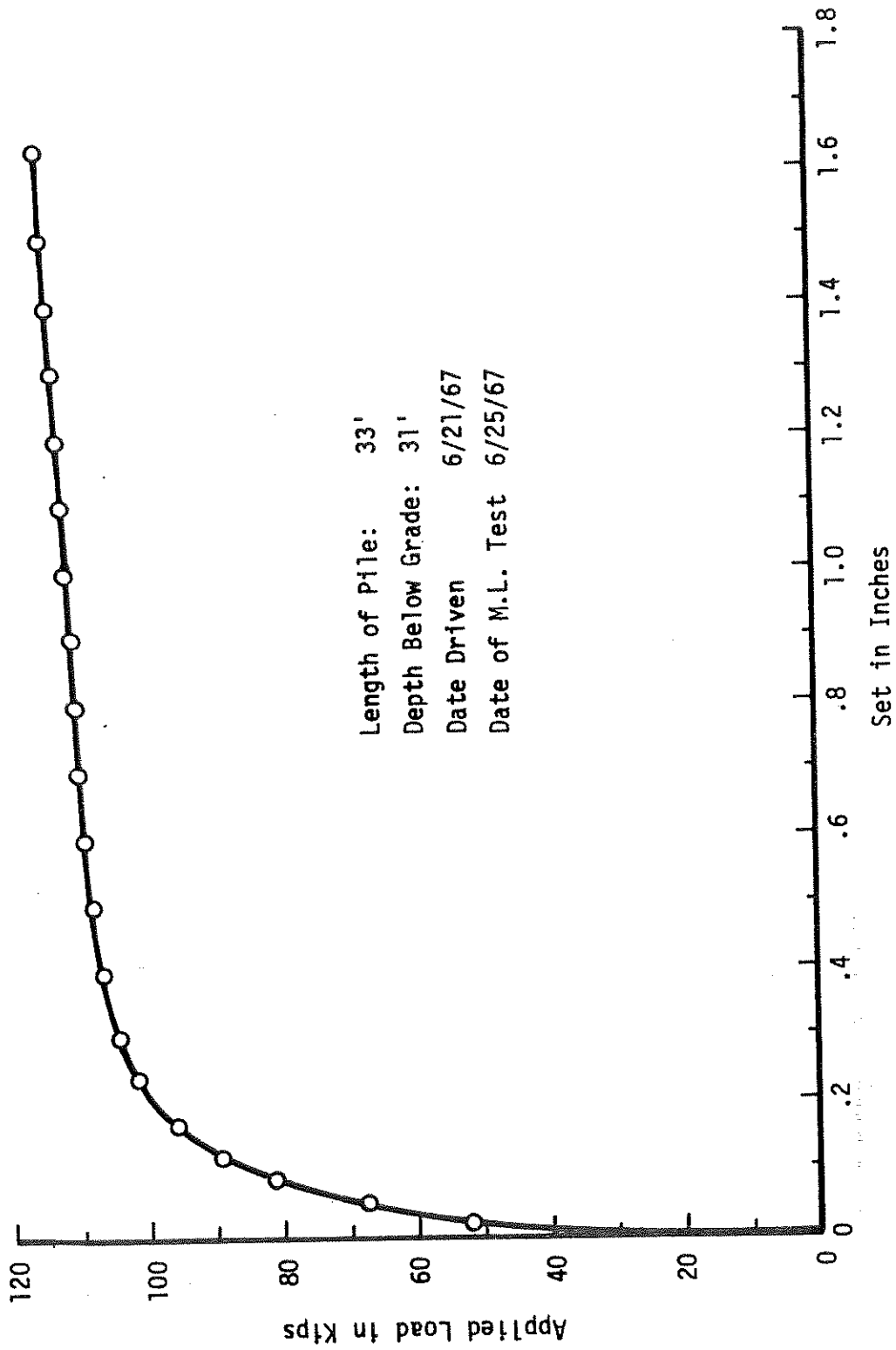


Figure 147 M.L. Test Results Performed on Full-Scale Pile F-30 in Akron, Ohio

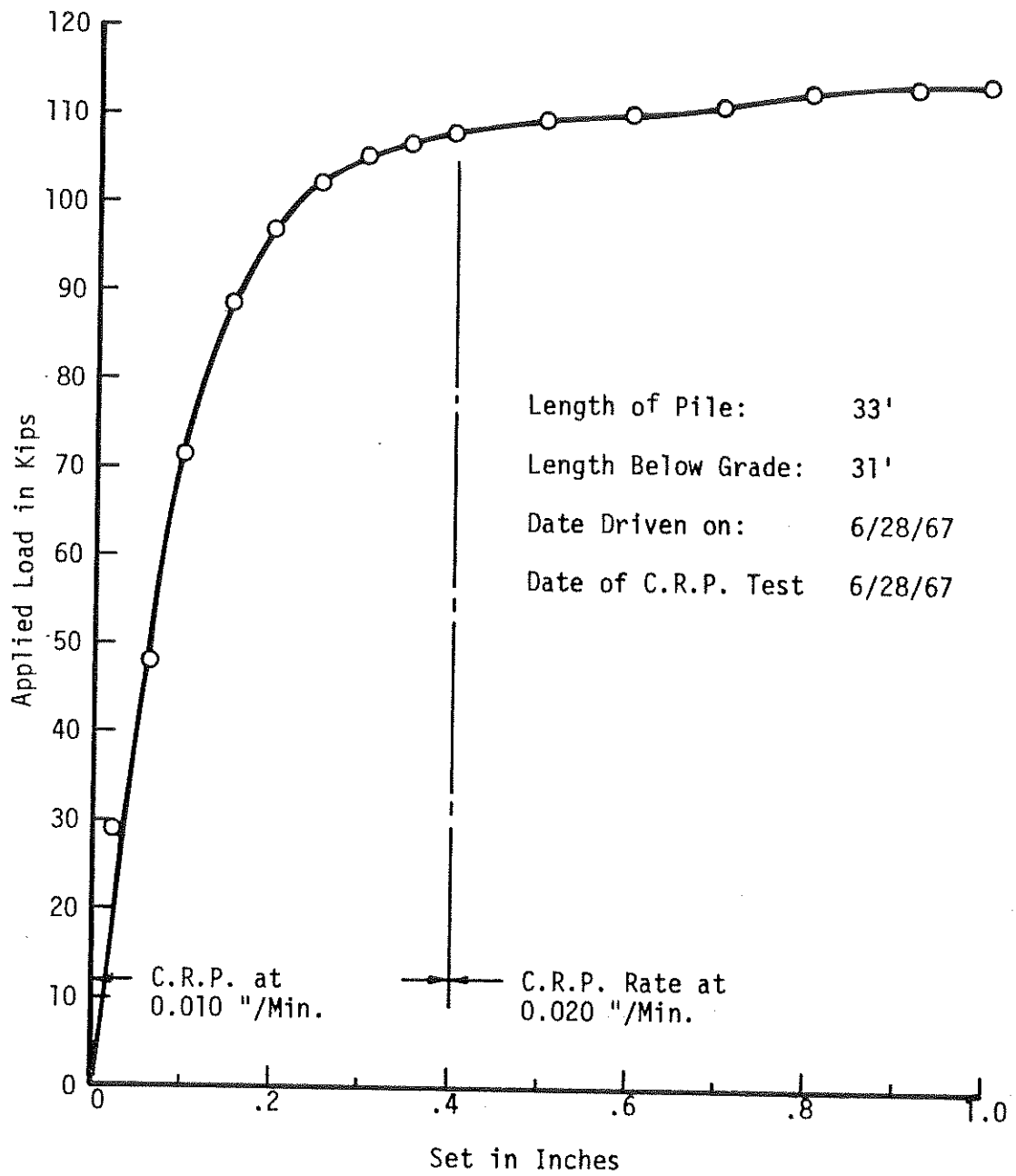


Figure 148 C.R.P. Test Results of F-30 a Few Hours after Completion of M.L. Test

FULL SCALE PILE AKRON

PILE F-30 BLOW NO. 5-A DATE JUNE 28 1967

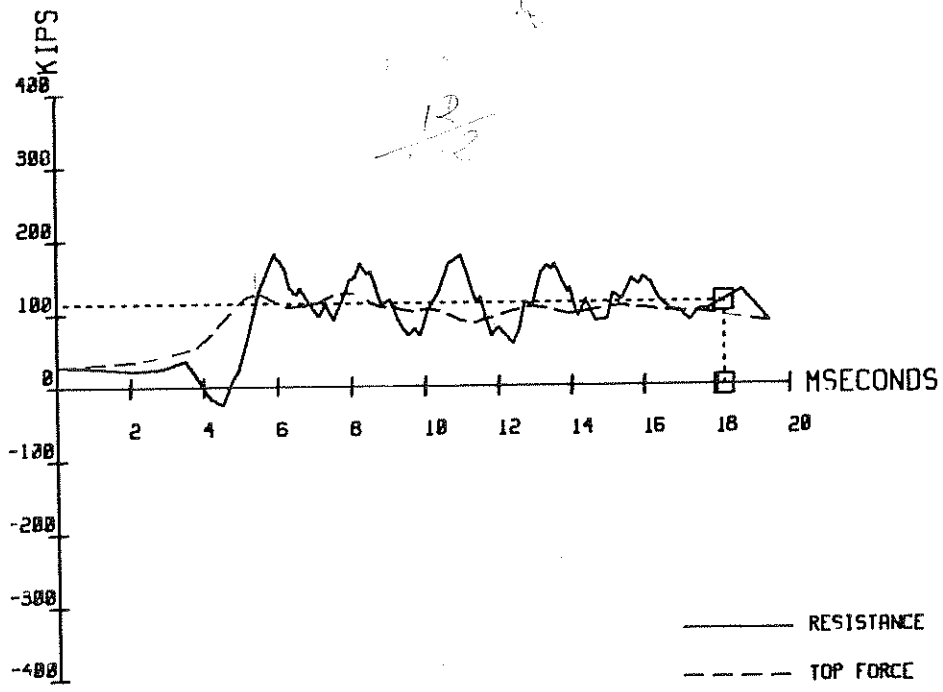
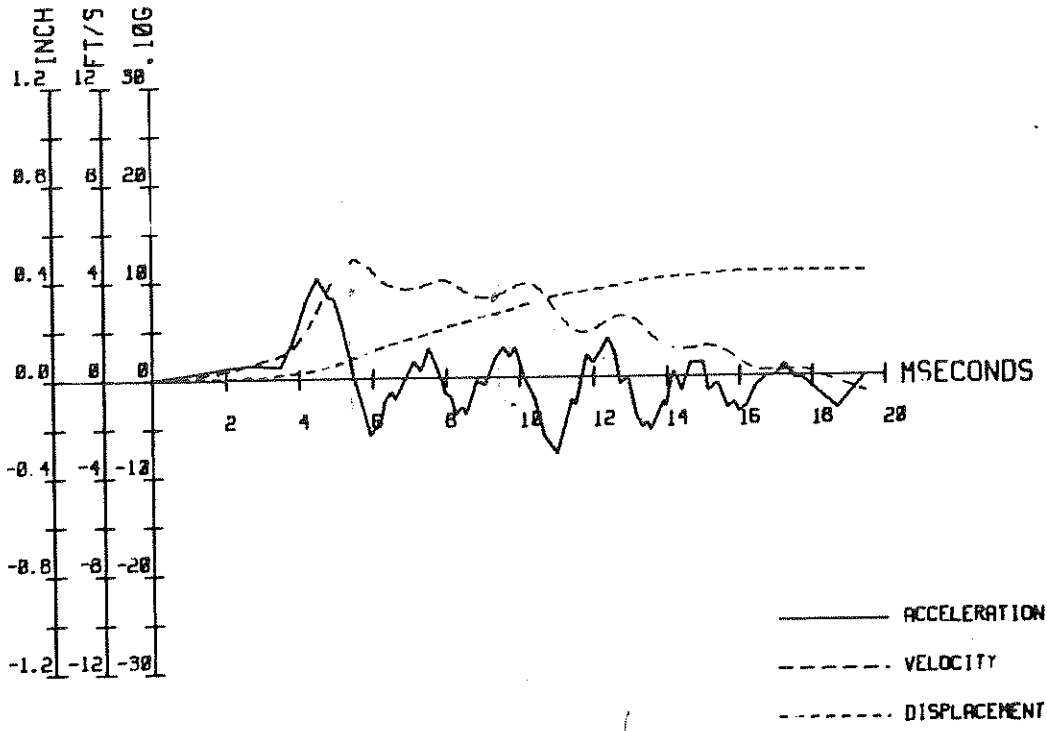


Figure 149 Dynamic Results of Full-Scale Pile F-30, Blow 5A of Restriking.

FULL SCALE PILE AKRON

PILE F-30 BLOW NO. 6-A DATE JUNE 28 1967

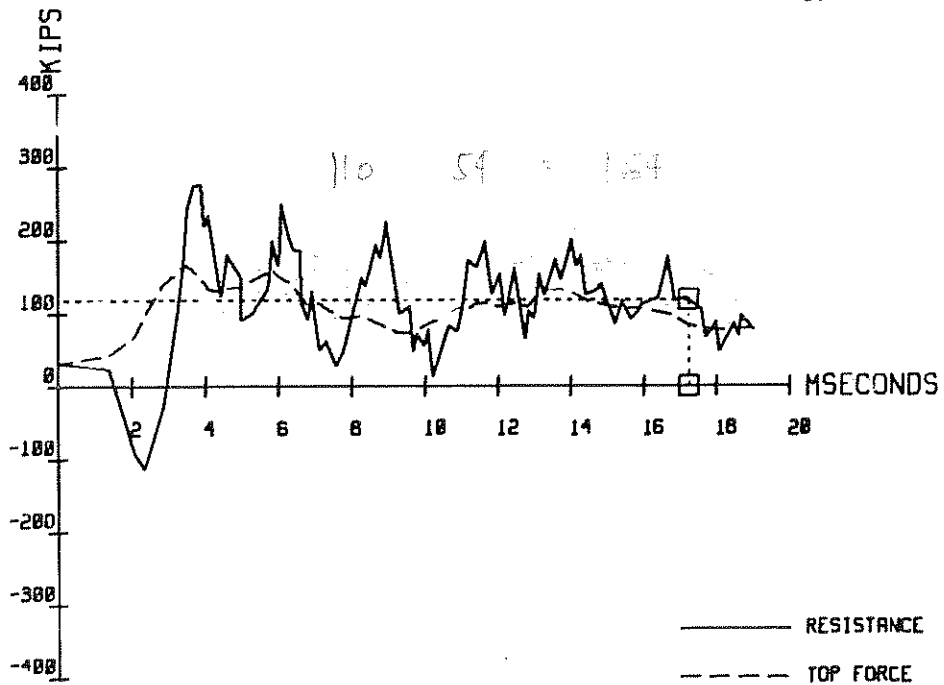
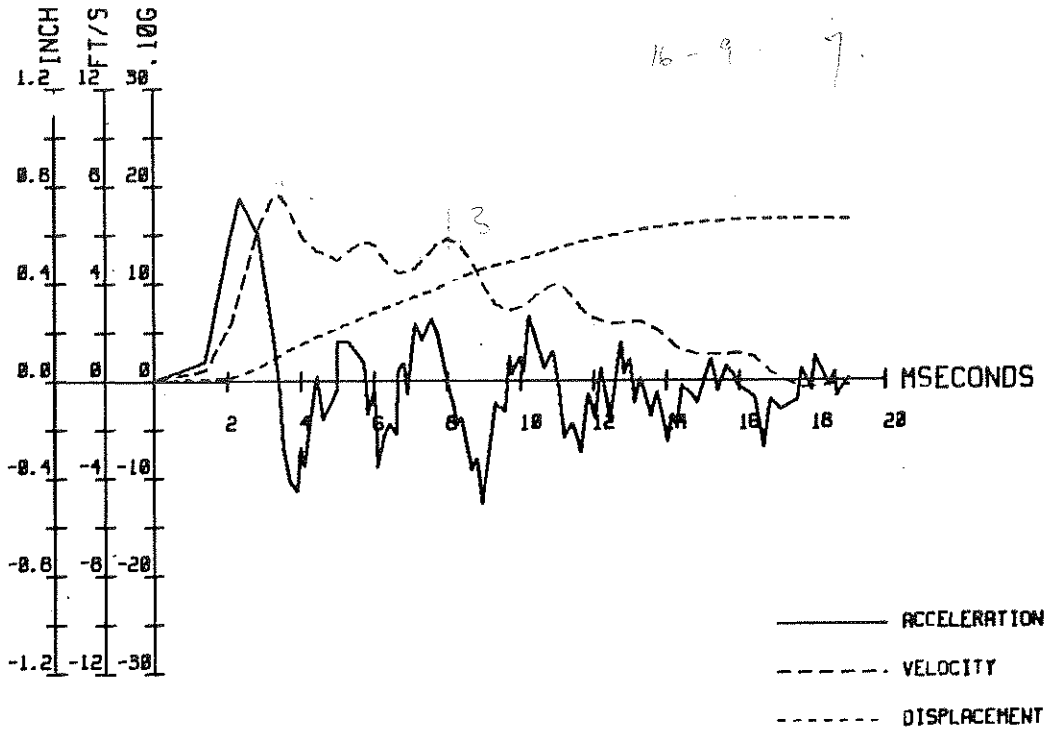


Figure 150 Dynamic Results of Full-Scale Pile F-30, Blow 6A of Restriking.

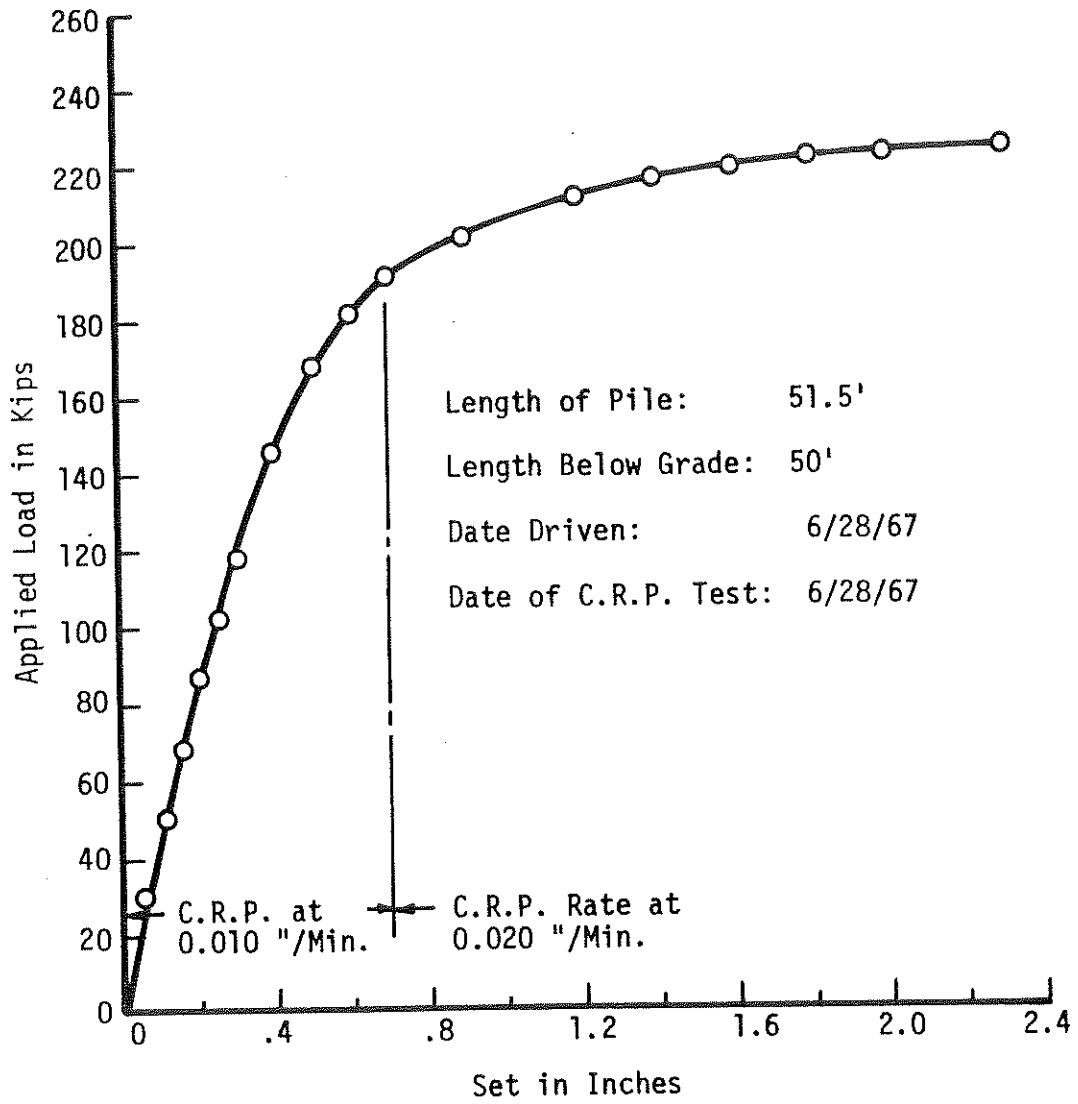


Figure 151: C.R.P. Test Results of Pile F-50 upon Completion of Driving.

FULL SCALE PILE AKRON

PILE F-50 BLOW NO. 19 DATE JUNE 28 1967

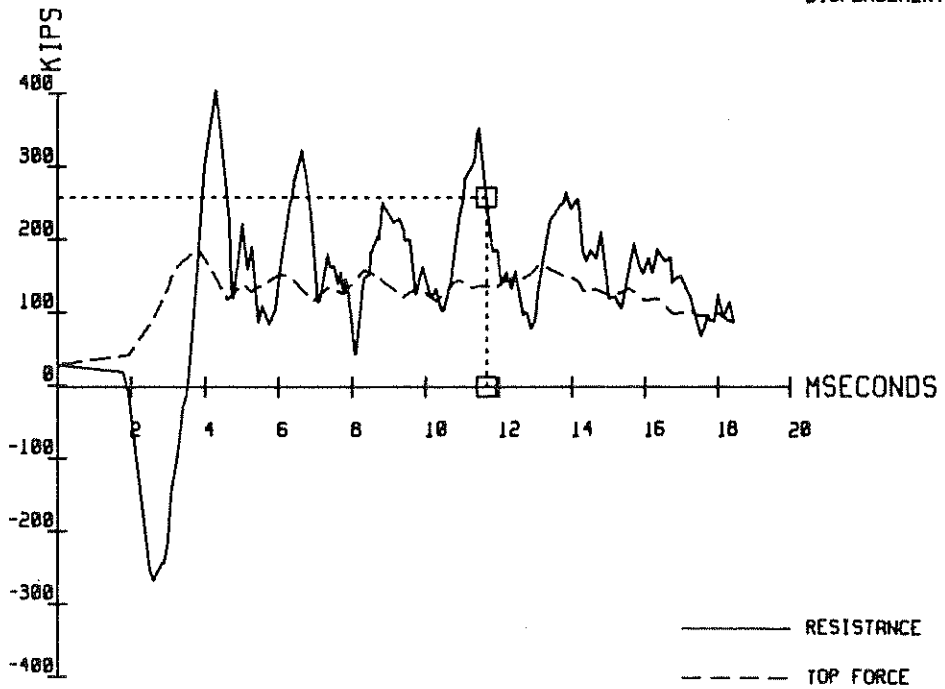
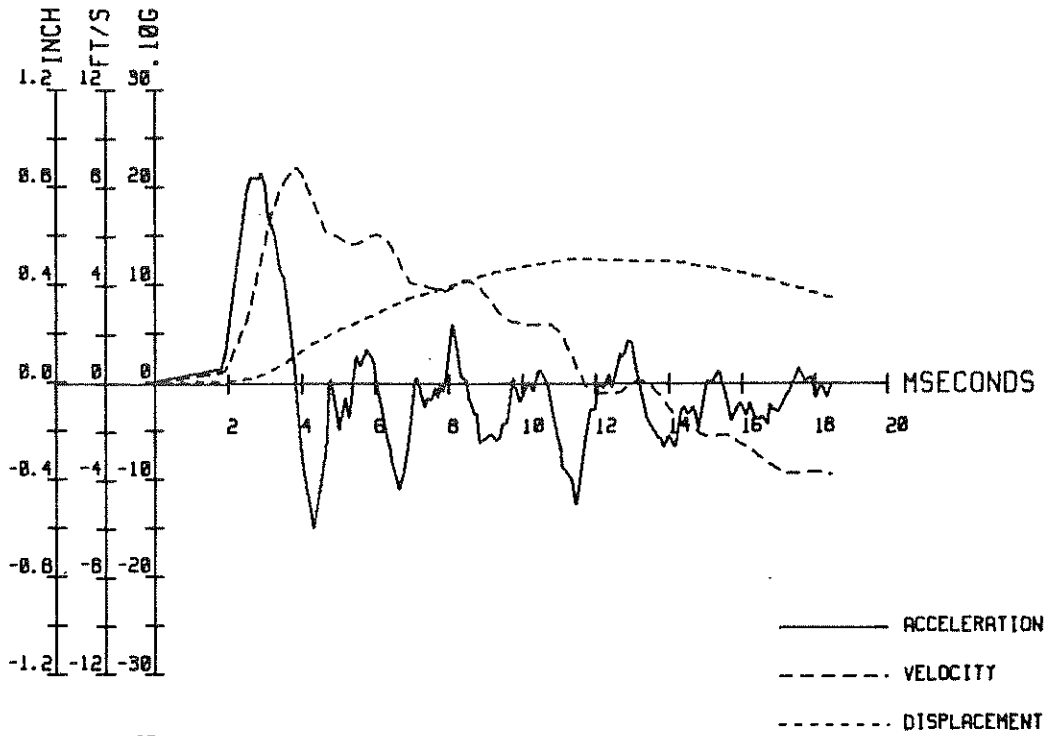


Figure 152 Dynamic Results of Pile F-50, Blow 19 at the End of Driving

FULL SCALE PILE AKRON

PILE F-50 BLOW NO. 20 DATE JUNE 28 1967

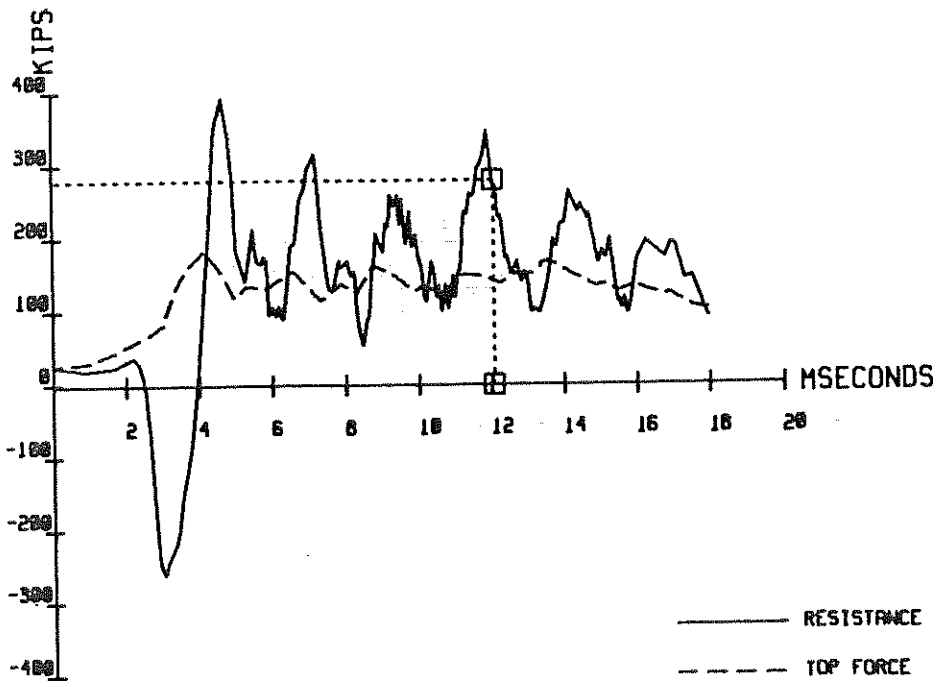
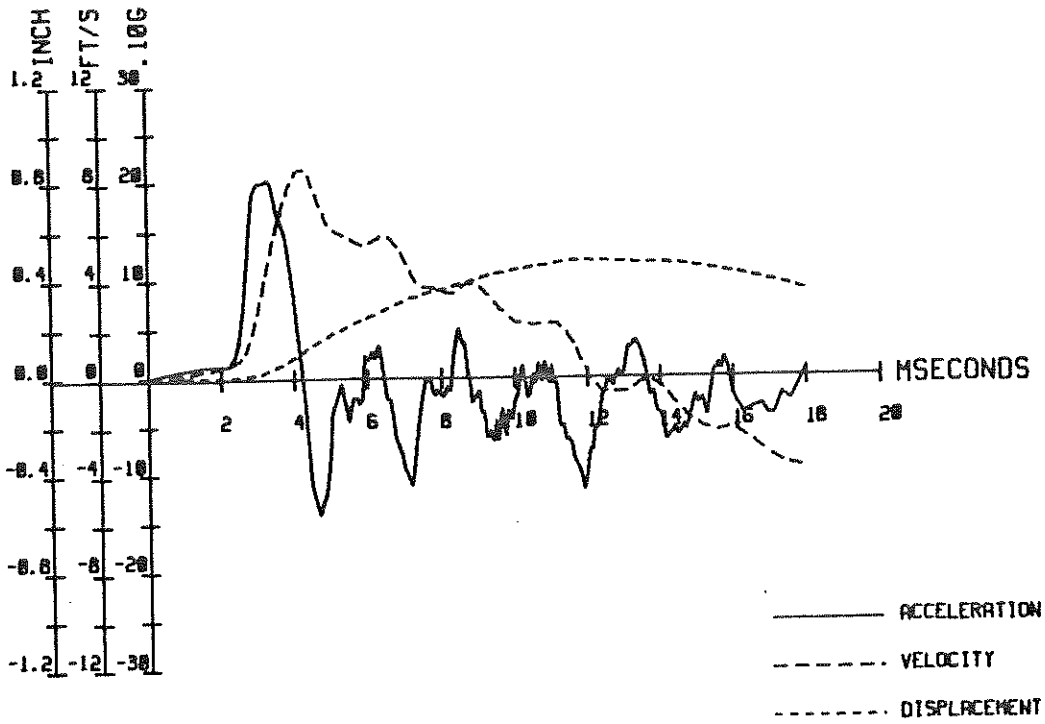


Figure 153 Dynamic Results of Pile F-50, Blow 20, at the End of Driving

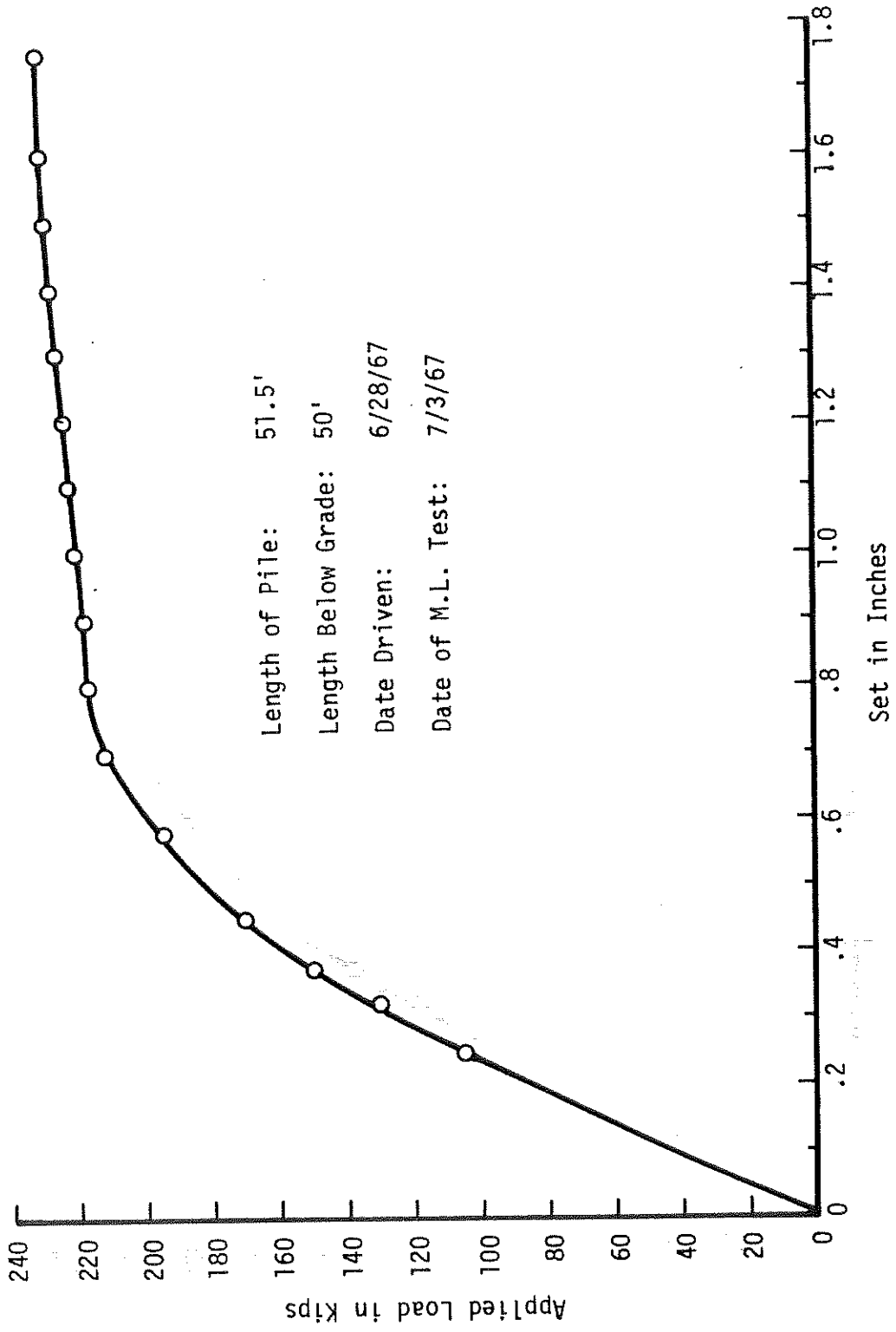


Figure 154 M.L. Test Results of Pile F-50 after a 5-Day Set-up Period

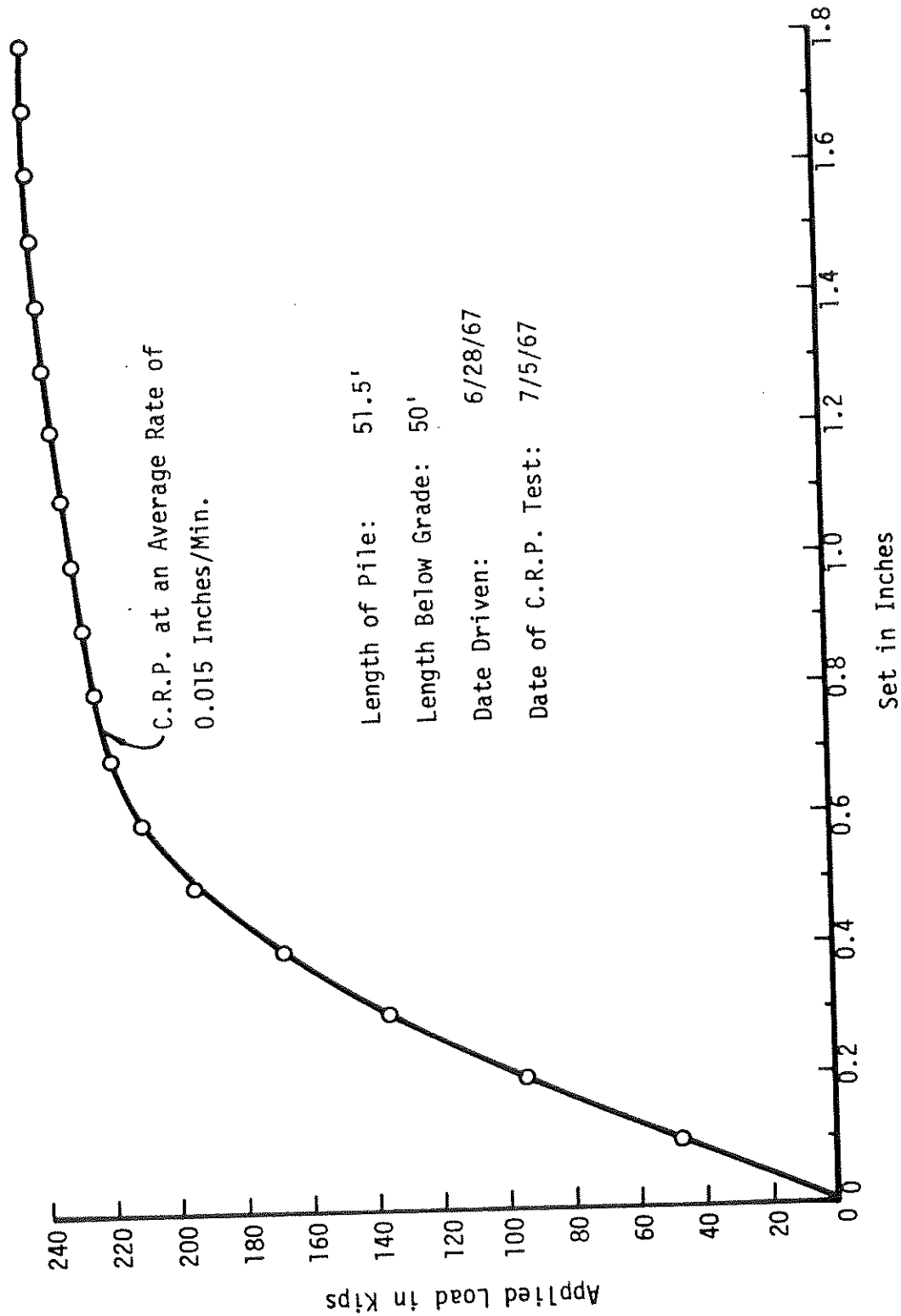


Figure 155 C.R.P. Test Results of Pile F-50 after Completion of the M.L. Test

FULL SCALE PILE AKRON

PILE F-50 BLOW NO. 13-A DATE JULY 6 1967

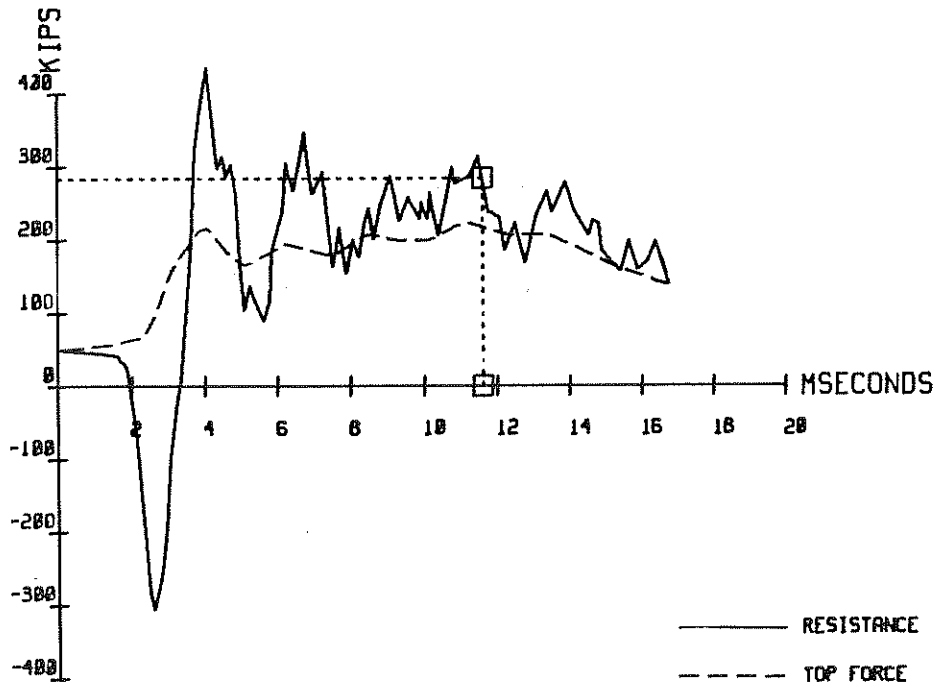
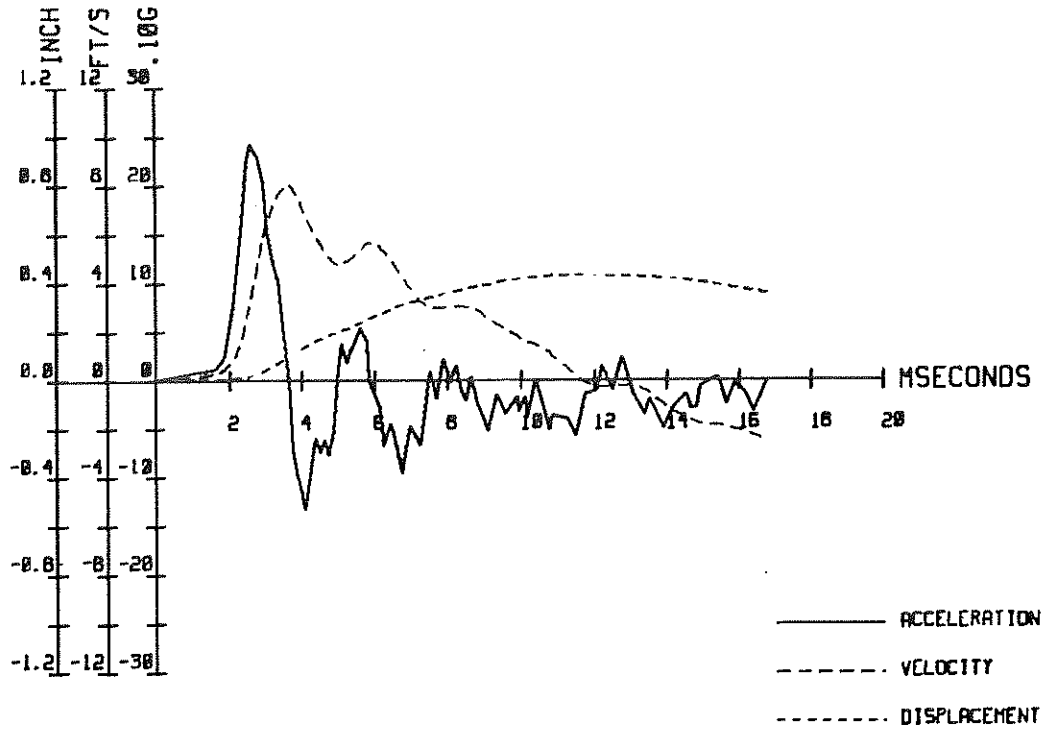


Figure 156 Dynamic Results of Pile F-50, Blow 13A of Restriking

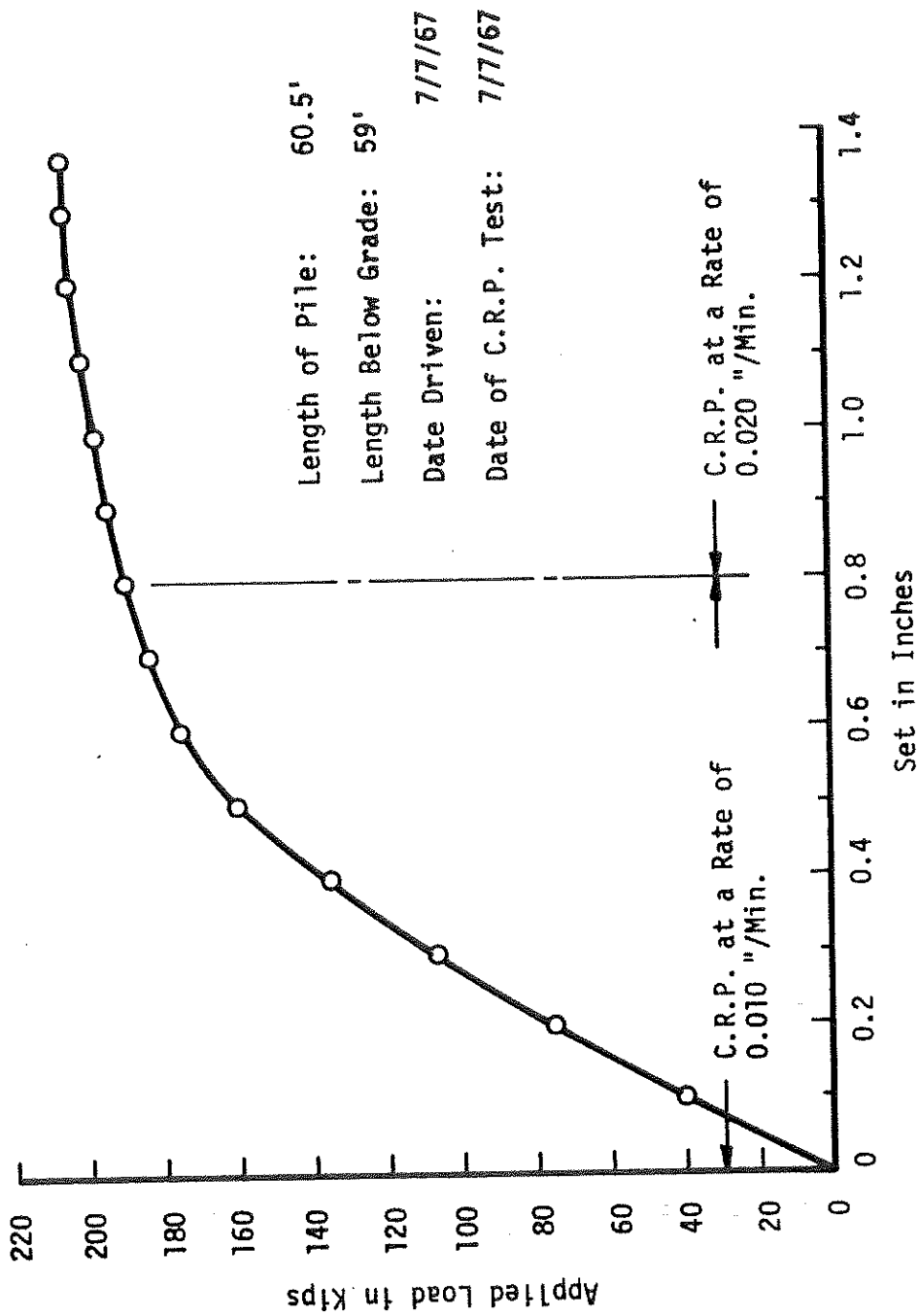


Figure 157 C.R.P. Test Results of Pile F-60 upon Completion of Driving

FULL SCALE PILE AKRON

PILE F-60 BLOW NO. 17 DATE JULY 7 1967

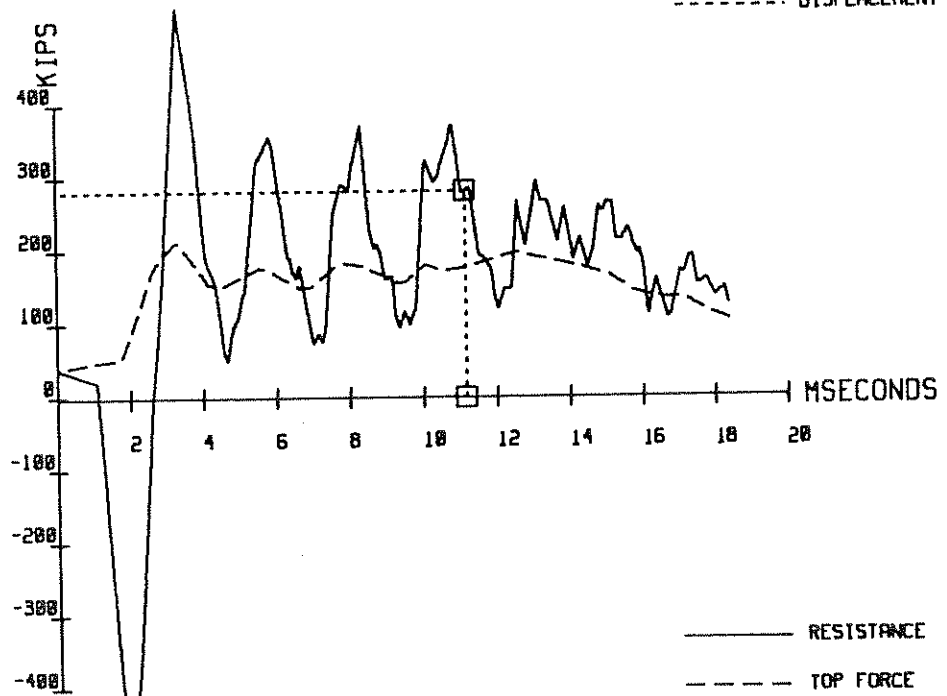
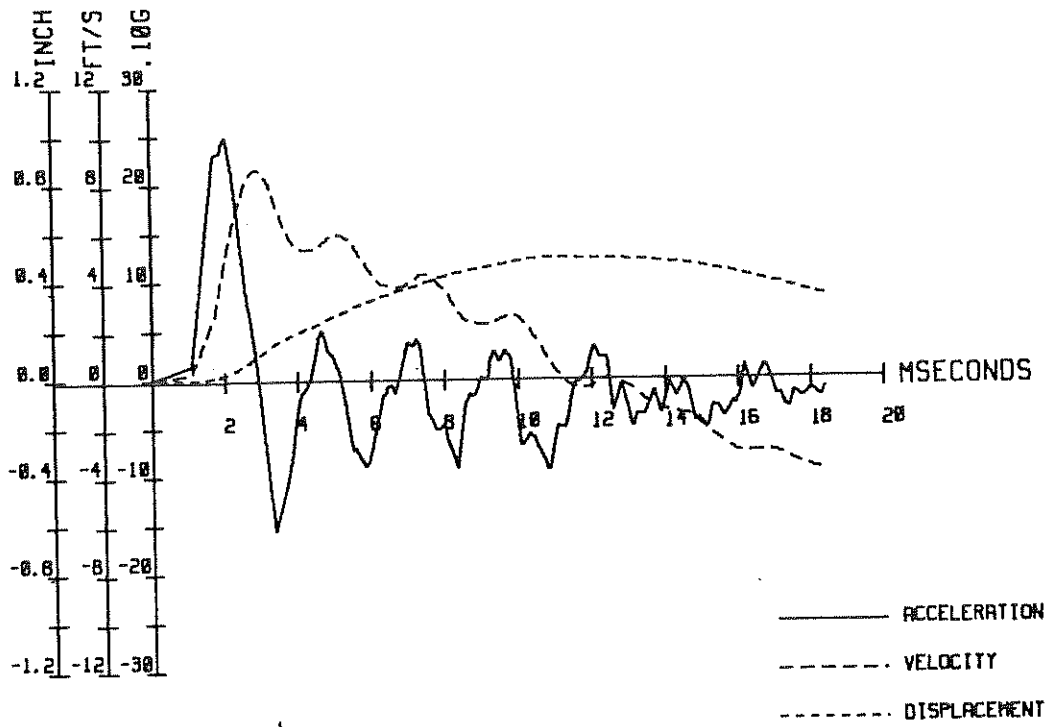


Figure -158 Dynamic Results of Pile F-60 at the End of Driving

42°
50°
45°

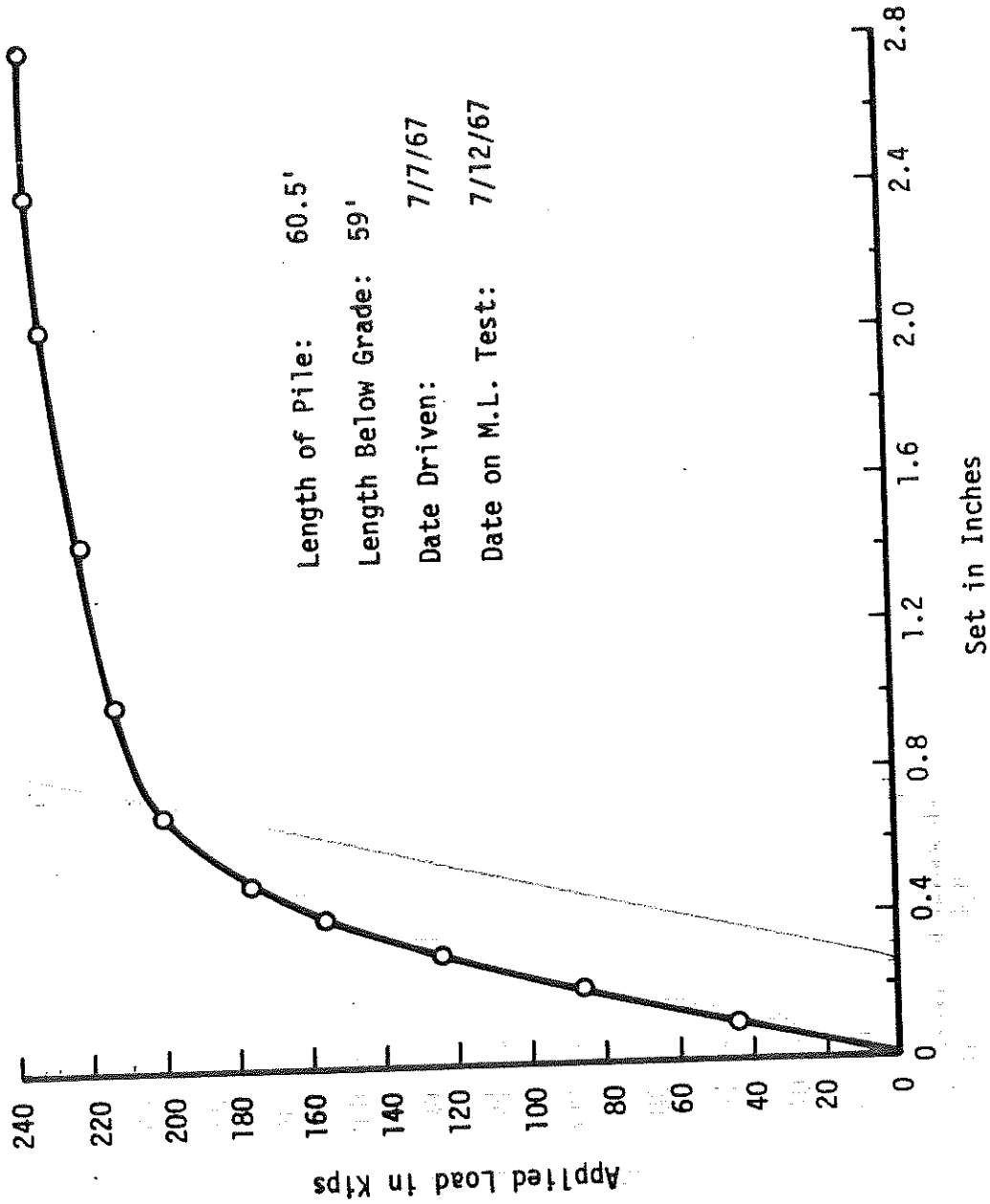


Figure 159 M.L. Test Results of Full-Scale Pile F-60 after a 5-Day Set-up Period

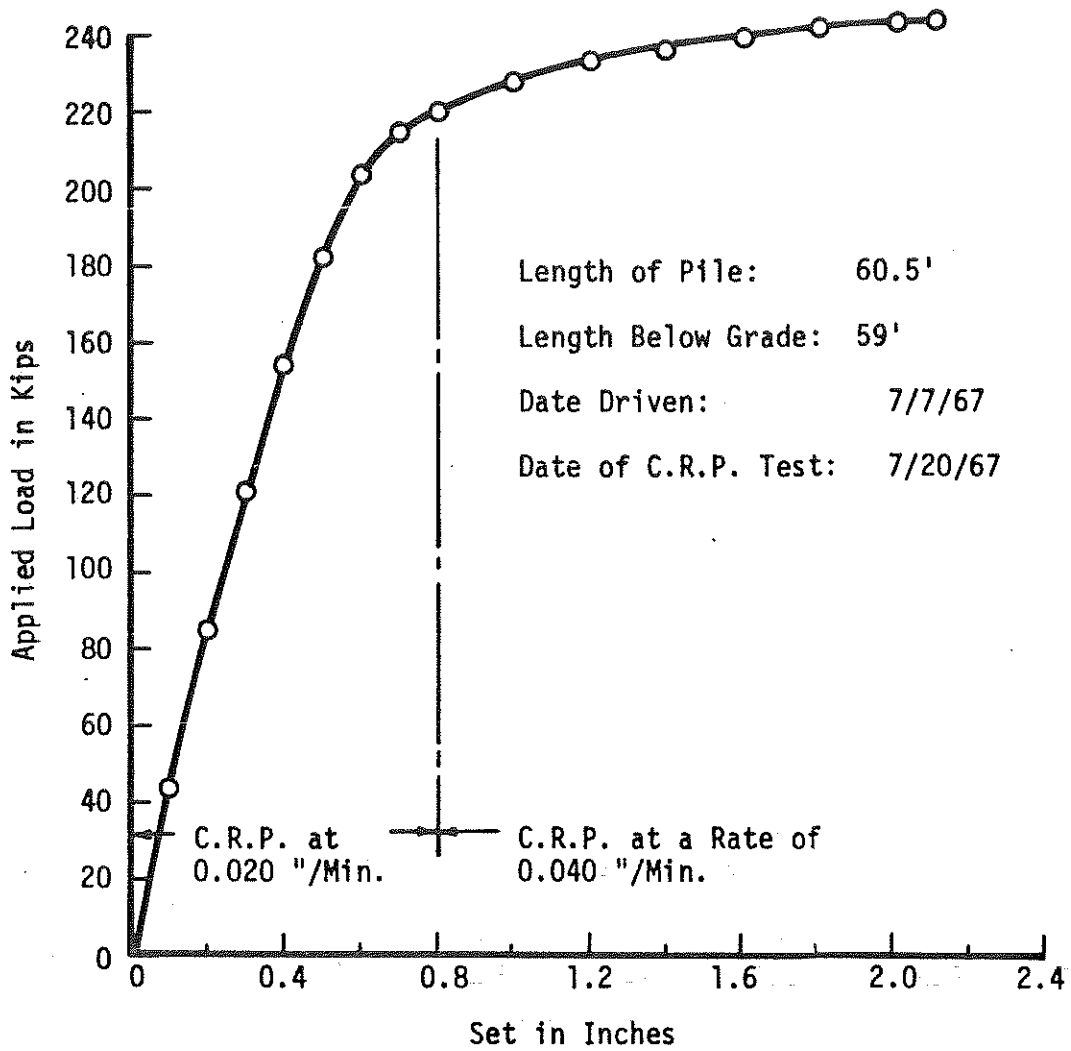


Figure 160 C.R.P. Test Results of Full-Scale Pile F-60
One Week after M.L. Test

FULL SCALE PILE AKRON

PILE F-60 BLOW NO. 26-A DATE JULY 20 1967

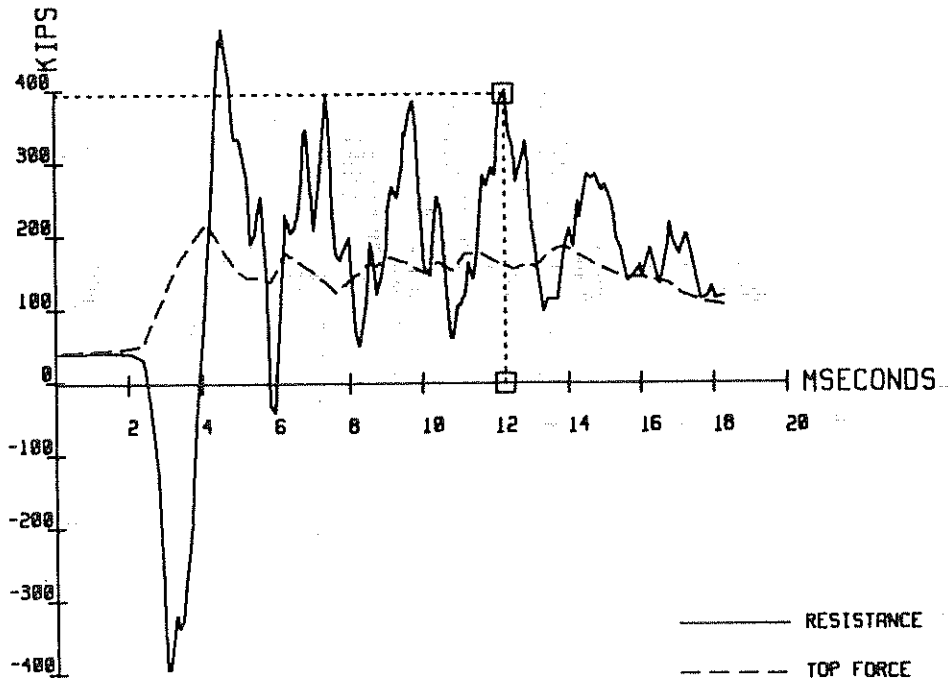
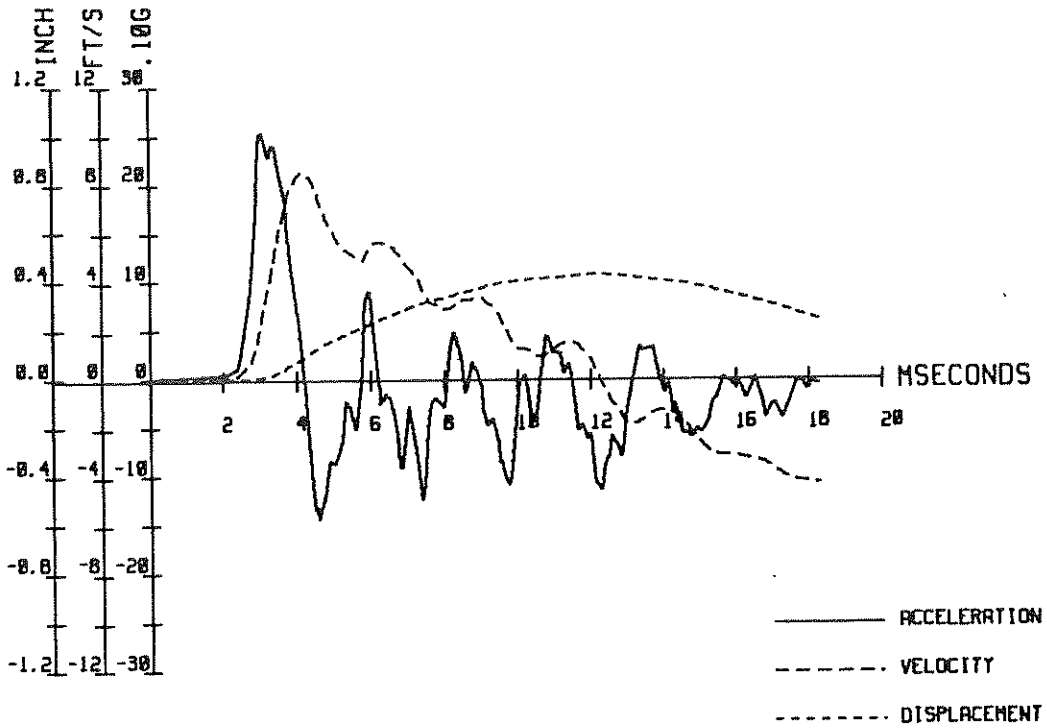


Figure 161 Dynamic Results of Pile F-60 Blow 26A
Upon Restriking

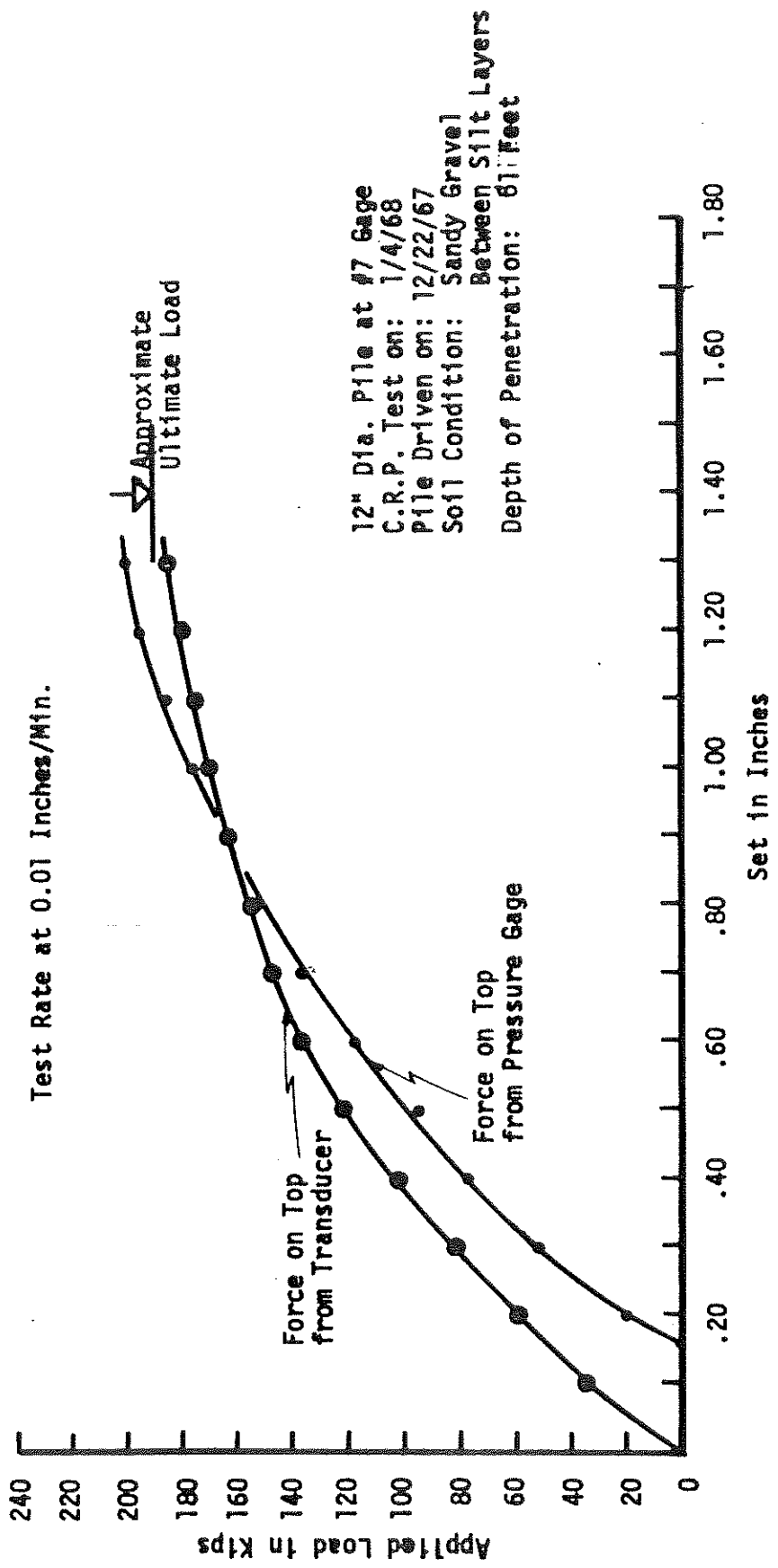


Figure 162: C.R.P. Test Results for Full-Scale Pile in Hamilton County of Bridge No. Ham-27-1799

FULL SCALE PILE CINCINNATI

BLOW= 3 DATE=JAN. 4 1968

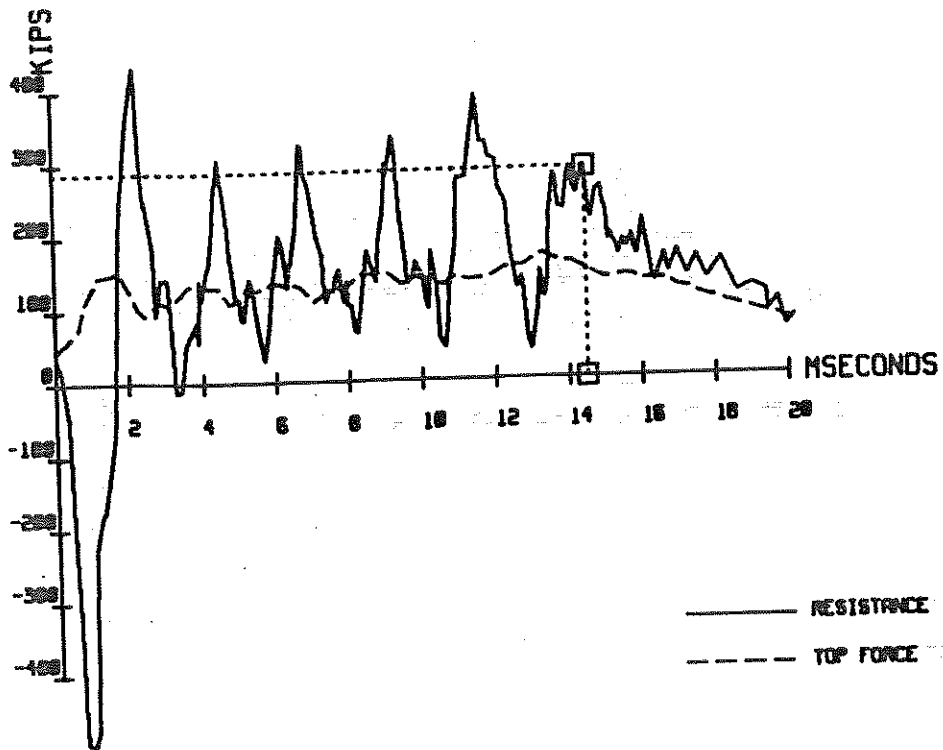
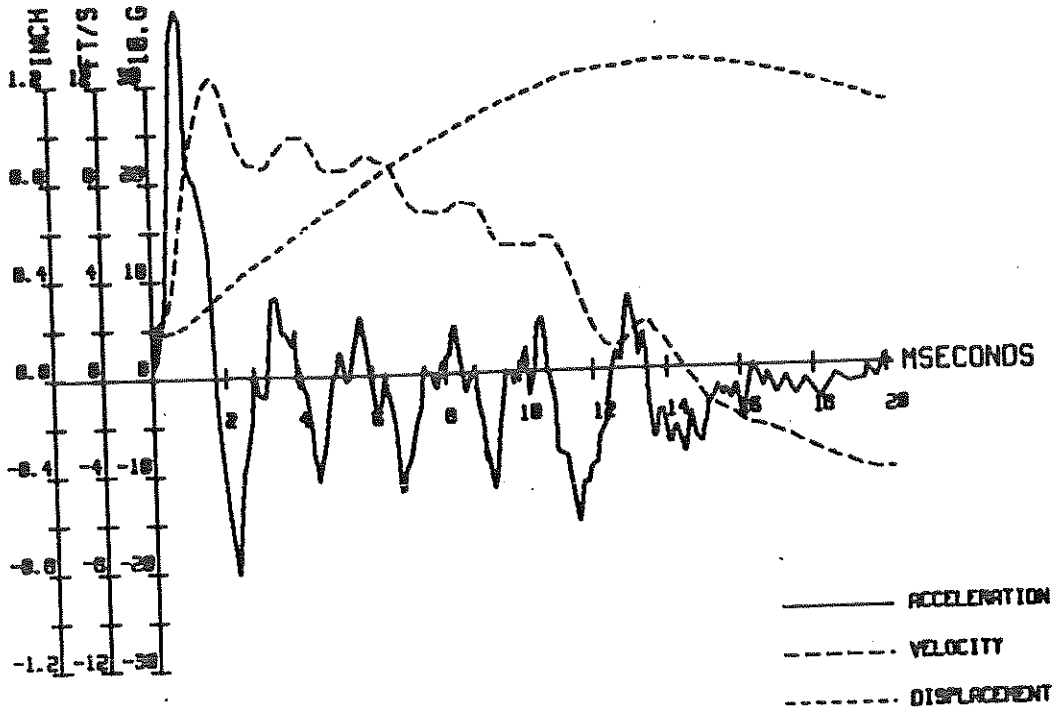


Figure 163 Dynamic Results of Full-Scale Pile in Cincinnati, Upon Restriking Pile, Blow 3.

FULL SCALE PILE CINCINNATI
 BLOW NO. 4 DATE JAN. 4 1968

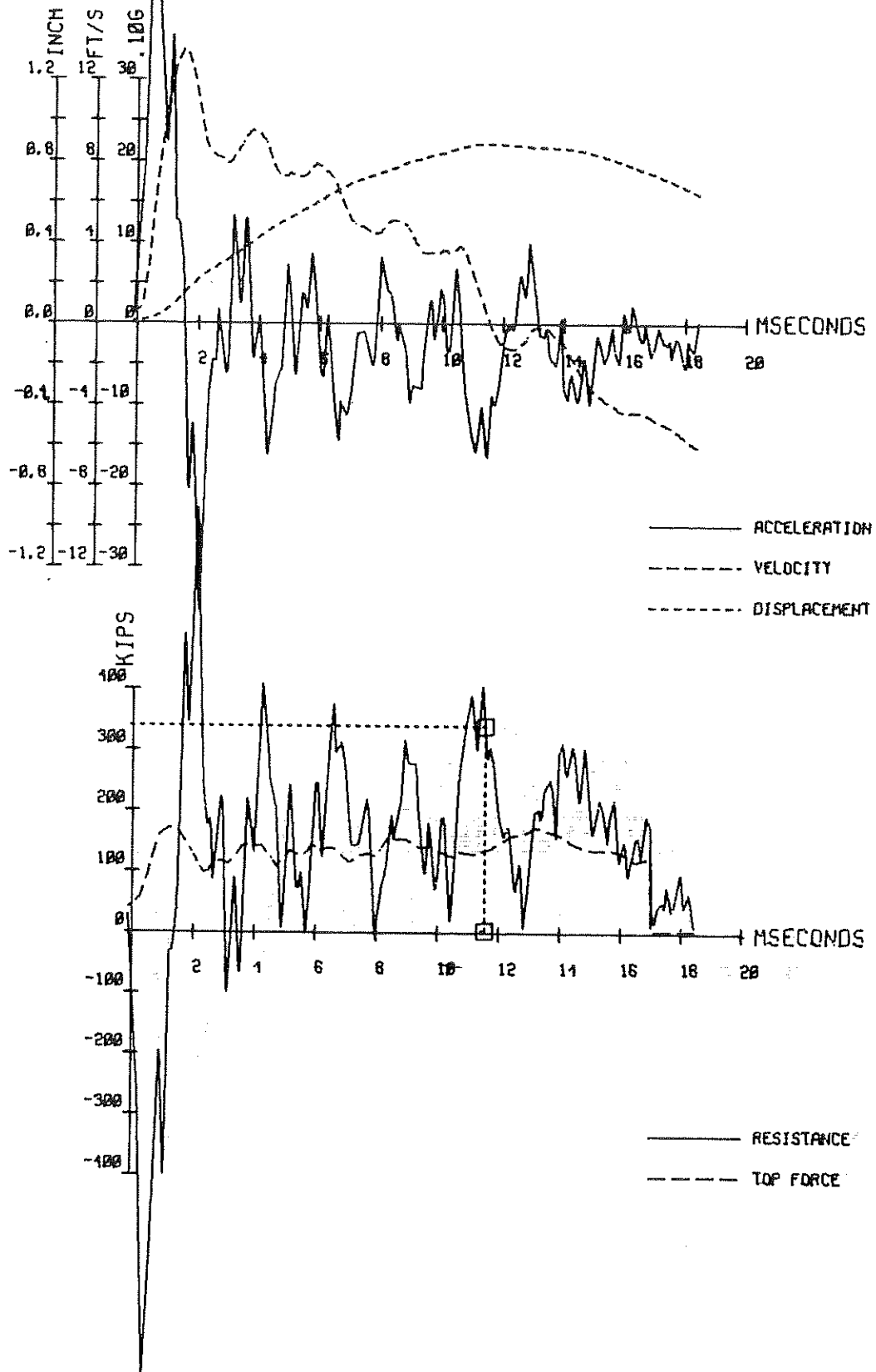


Figure 164 Dynamic Results of Full-Scale Pile in Cincinnati, Upon Restriking Pile, Blow 4.

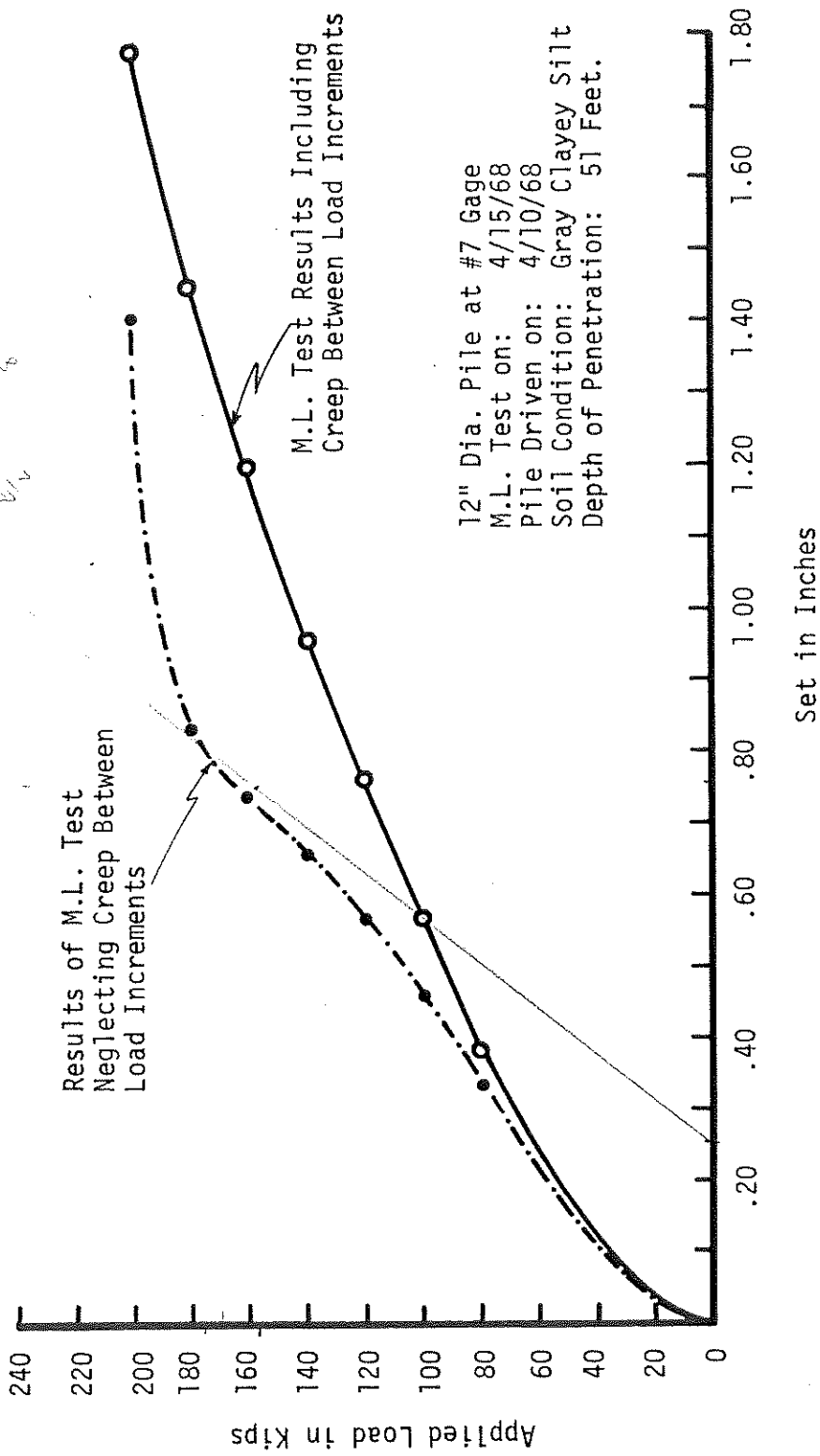


Figure 165: M.L. Test Result for Full-Scale Pile 272 of Bridge No. Luc-75-0427 Performed by Ohio Highway Personnel

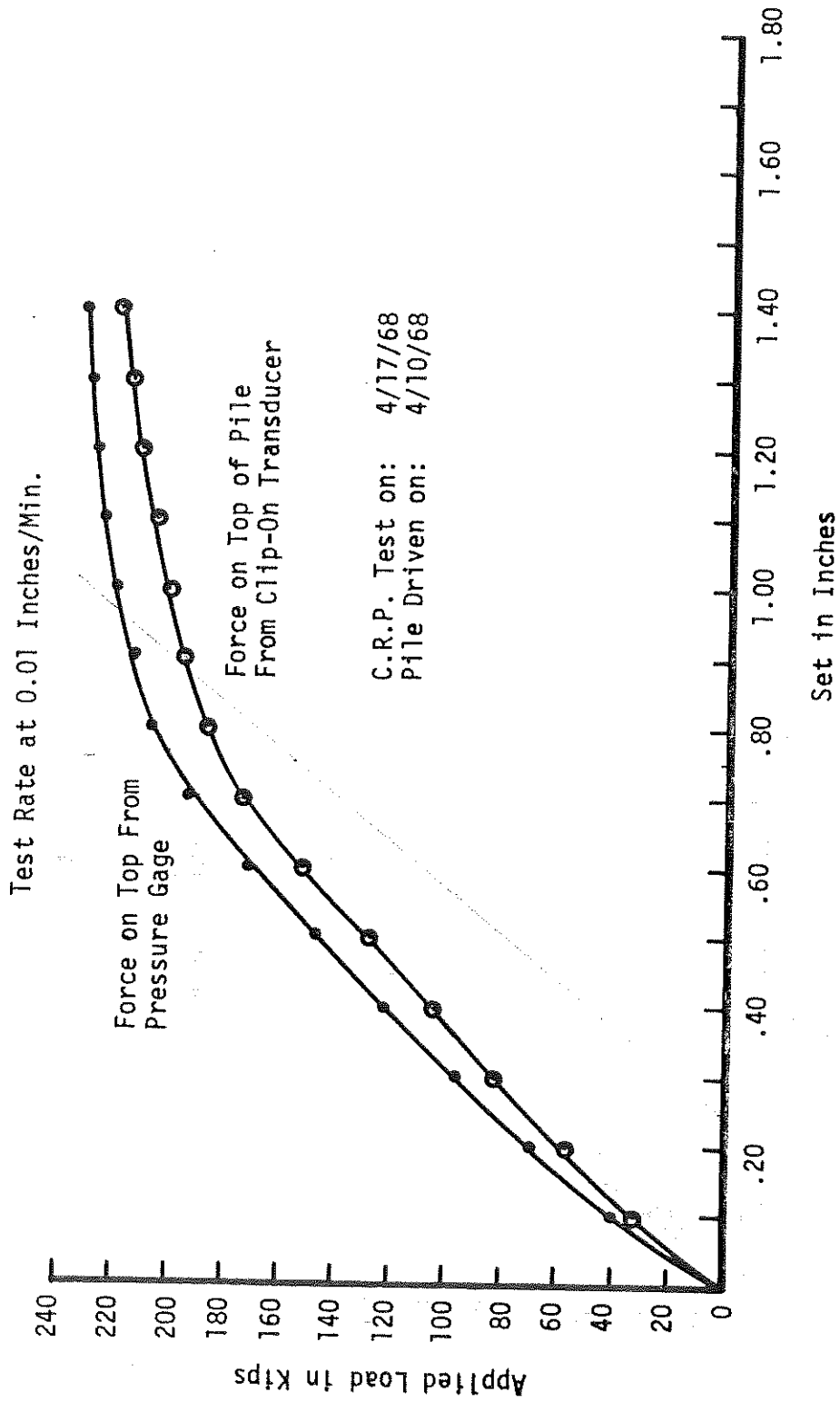


Figure 166: C.R.P. Test Results for Full-Scale Pile No. 272 of Bridge No. Luc-75-0427

FULL SCALE PILE NO. 272 TOLEDO

BLOW NO. 11-A DATE APRIL 18 1968

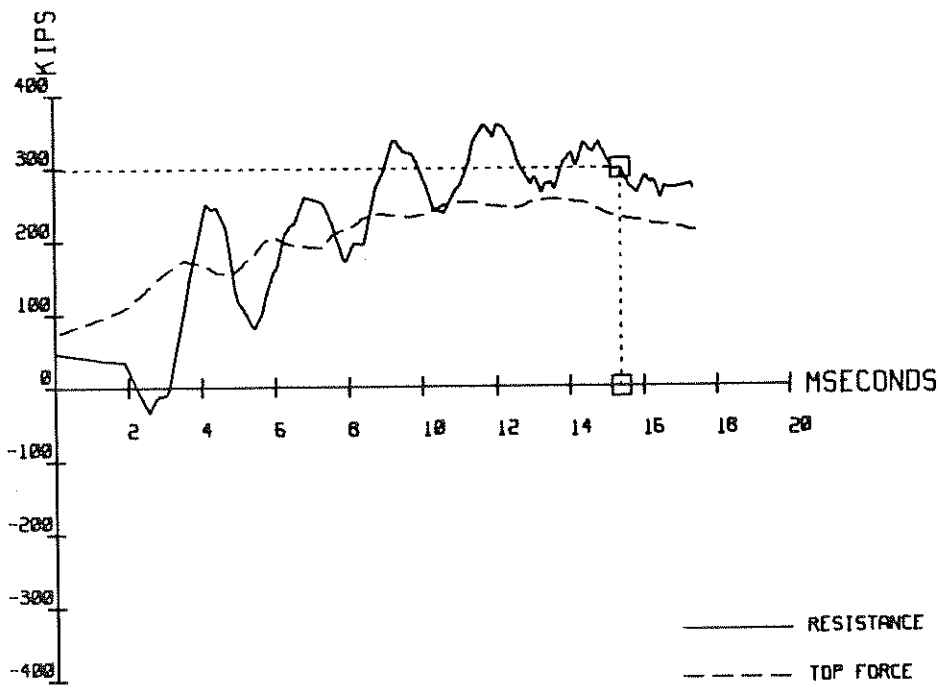
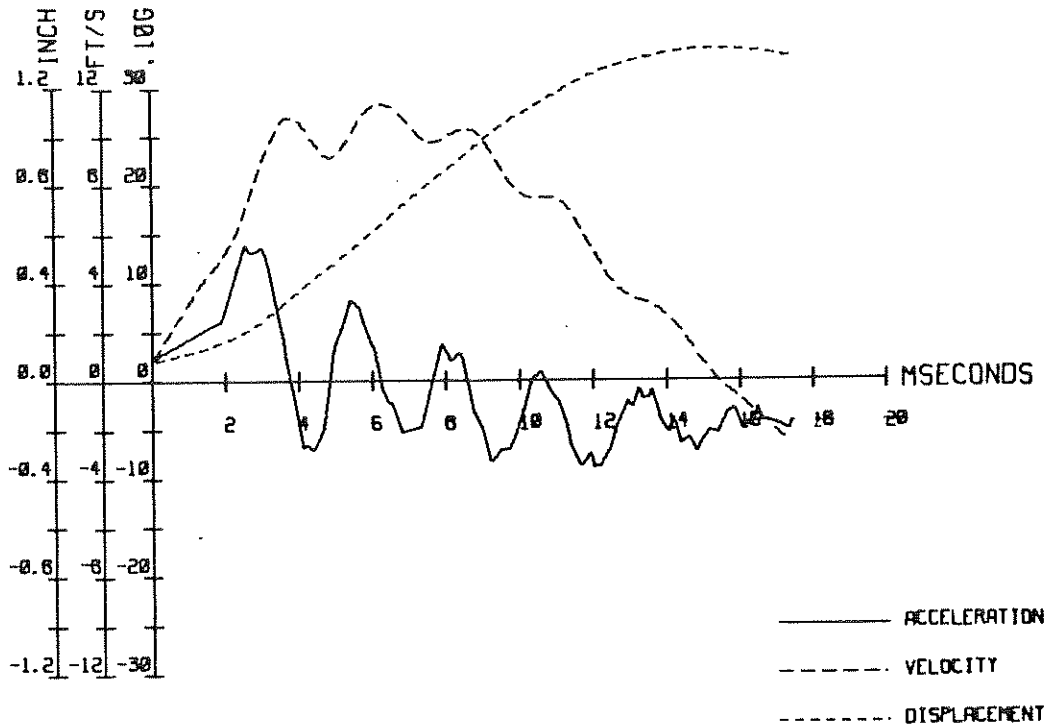


Figure 167 Dynamic Results of Pile 272 in Toledo, Upon Restriking, Blow 11-A.

FULL SCALE PILE NO. 272 TOLEDO

BLOW NO. 12-A DATE APRIL 18 1968

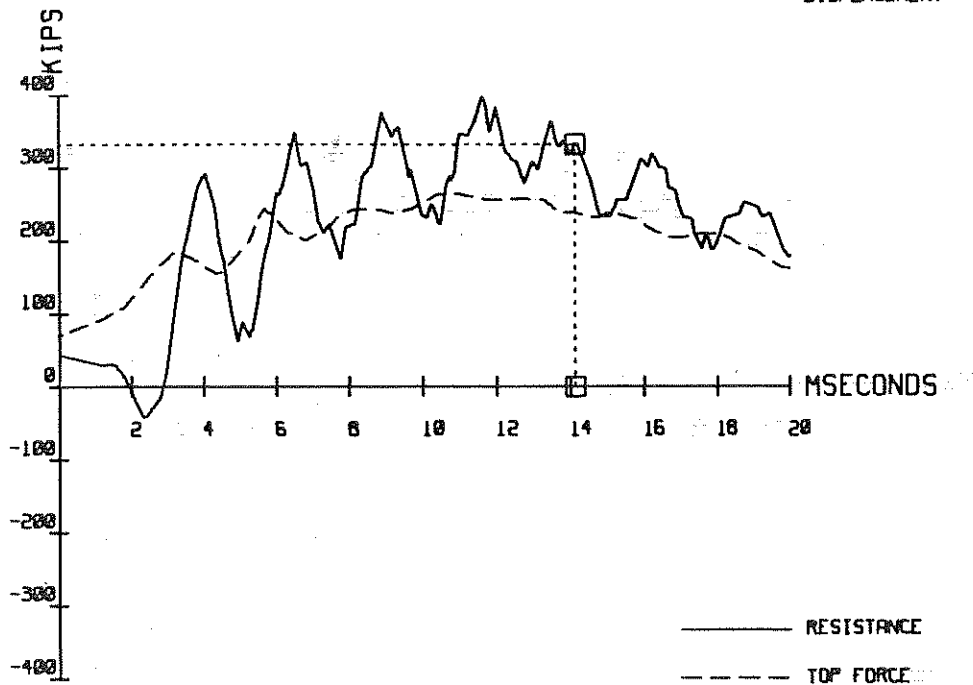
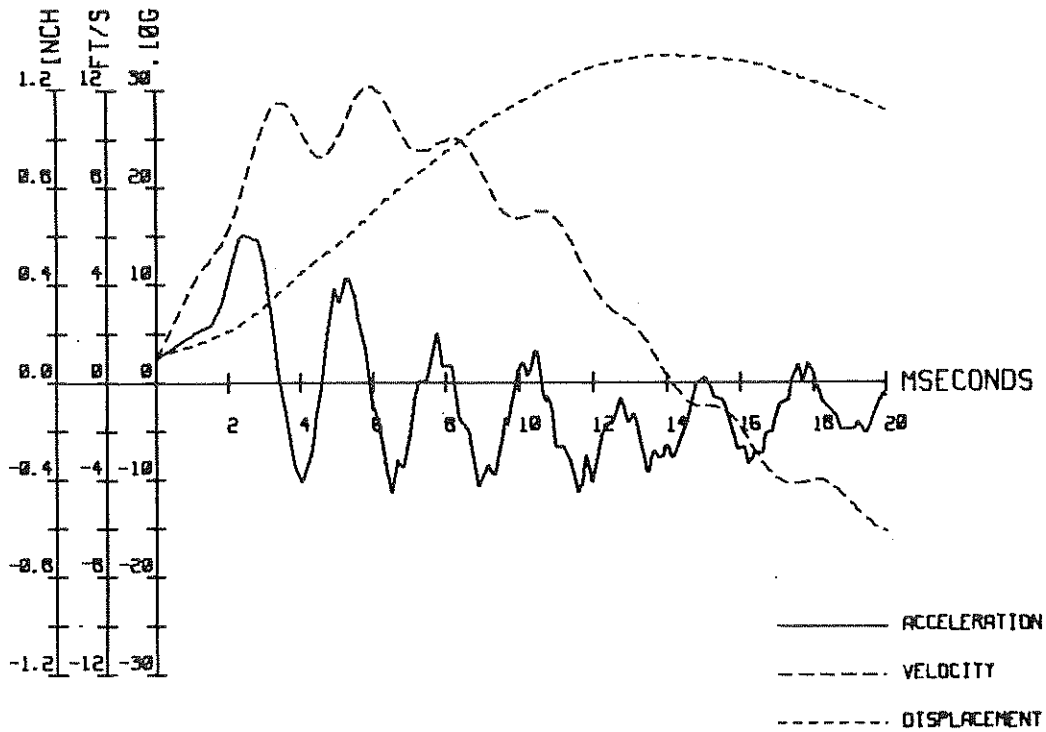


Figure 168 Dynamic Results of Pile 272 in Toledo, Upon Restriking, Blow 12-A.

FULL SCALE PILE NO. 272 TOLEDO

BLOW NO. 14-A DATE APRIL 18 1968

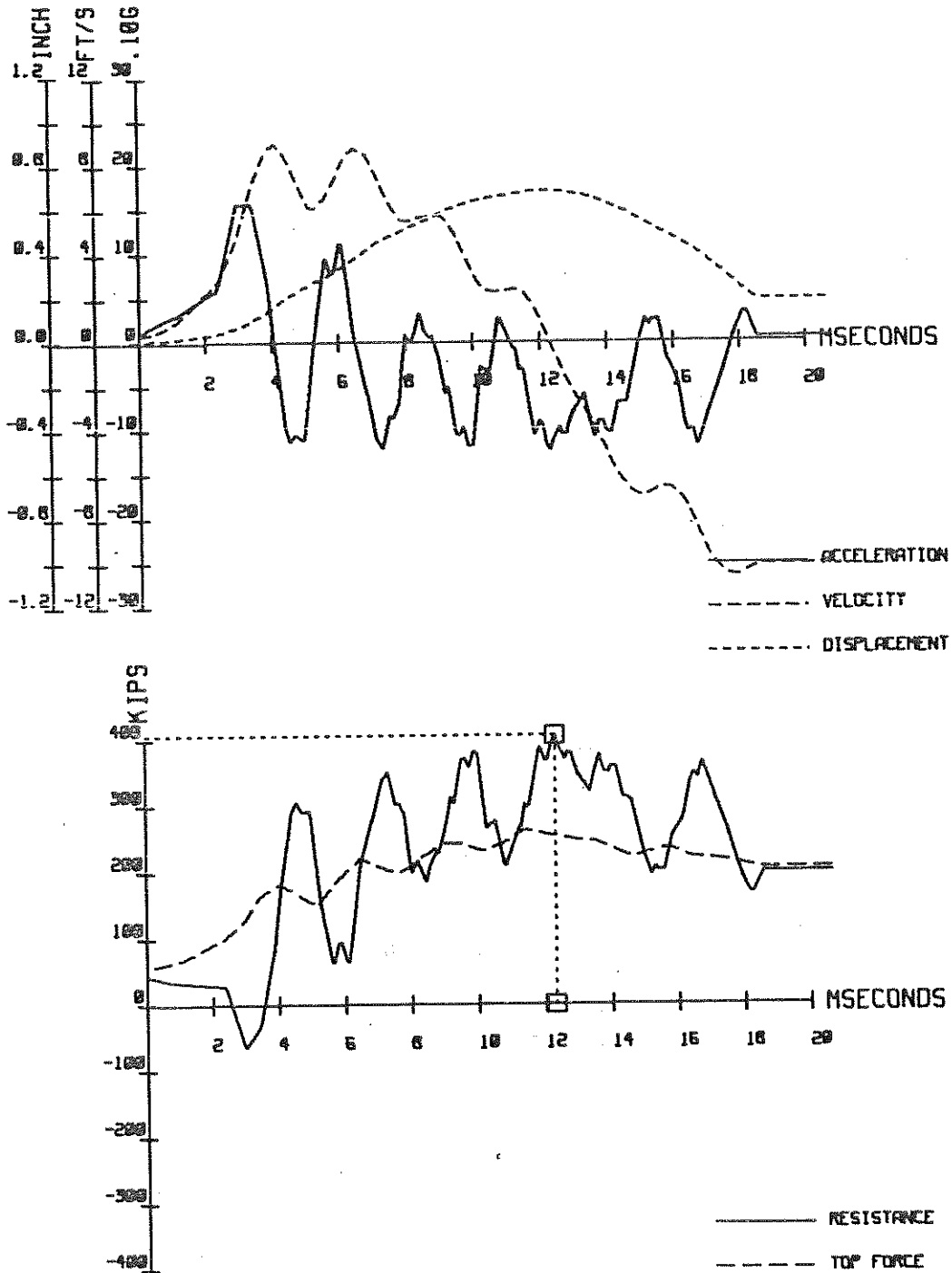


Figure 169 Dynamic Results of Pile 272 in Toledo, Upon Restriking, Blow 14-A.

FULL SCALE PILE NO. 272 TOLEDO

BLOW NO. 17-A DATE APRIL 18 1968

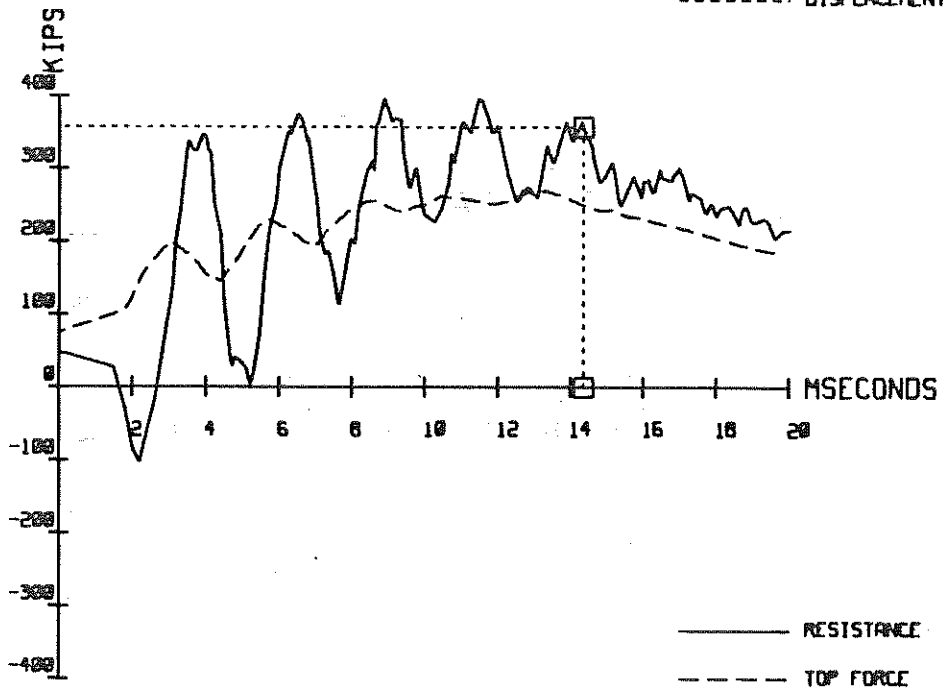
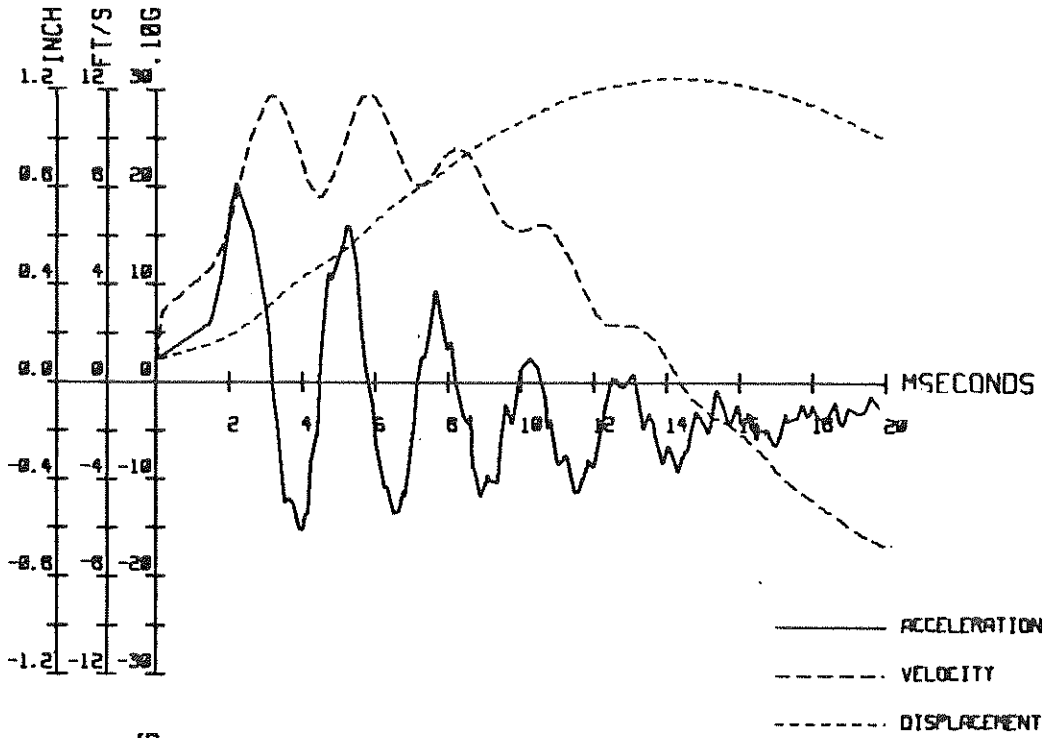


Figure 170 Dynamic Results of Pile 272 in Toledo, Upon Restriking, Blow 17-A.