GEOLOGICAL SURVEY OF CANADA

OPEN FILE 2504

Shallow shear wave velocity-depth data in the Fraser Delta from surface refraction measurements, 1989, 1990, 1991

J.A. Hunter, J.L. Luternauer, K.G. Neave,
S.E. Pullan, R.L. Good, R.A. Burns, M. Douma

1992

SHALLOW SHEAR WAVE VELOCITY-DEPTH DATA IN THE FRASER DELTA FROM SURFACE REFRACTION MEASUREMENTS, 1989, 1990, 1991

Geological Survey of Canada, Open File 2504

by

J.A. Hunter[1], J.L. Luternauer[2], K.G. Neave[3]
S.E. Pullan[1], R.L. Good[1], R.A. Burns[1] and M. Douma[1]

[1] Terrain Sciences Division, Geological Survey of Canada
601 Booth Street, Ottawa, Ontario, K1A 0E8

[2] Cordilleran Division, Geological Survey of Canada,
100 West Pender Street, Vancouver, B.C., V6B 1R8

[3] Northern Seismic,
128 McCarroll Lake Road, Echo Bay, Ontario, P0S 1C0

SHALLOW SHEAR WAVE VELOCITY-DEPTH DATA IN THE FRASER DELTA FROM SURFACE REFRACTION MEASUREMENTS, 1989, 1990, 1991

by

J.A. Hunter, J.L. Luternauer, K.G. Neave
S.E. Pullan, R.L. Good, R.A. Burns and M. Douma

INTRODUCTION

The Geological Survey of Canada is conducting shear wave refraction surveying in the Fraser Delta as an aid in estimating the regional effects of earthquake shaking on thick unconsolidated sediments. Shear wave velocity structure can be utilized in estimates of liquefaction potential of deltaic sediments (Robertson and Woeller, 1992), as well as in the modelling of ground motion amplification effects (Finn and Nichols, 1988).

Various seismic methods are being used to measure shear wave velocities in sediments. These include: downhole well-lock geophone surveying, borehole-to-borehole methods, seismic cone penetrometer, spectral analysis of surface waves (SASW), as well as surface refraction methods.

Downhole surveying is being applied in the Fraser Delta when cased boreholes become available (Hunter et al., 1990). Hole-to hole measurements have been made for specific engineering applications (Dr. Al Brown, BC Dept. of Highways, pers. comm., 1991). Seismic cone penetrometer studies are being carried out (Robertson et al., 1986; Finn et al., 1989), and wherever possible comparative studies have been made (Hunter et al., 1991). Recently, the SASW technique has been tested in the Fraser Delta (Robertson and Addo, 1991), and future tests are planned (D. Woeller, Conetec Ltd, Vancouver, 1992,pers. comm.).

The surface seismic refraction method used here should be considered as a reconnaissance technique only, since, as with any refraction method, it is limited by the requirement that velocity must increase with depth for accurate interpretation. Hence, the refraction method cannot be applied where substantial velocity reversals occur at depth. Also, even with cases of velocity increasing with depth, there may be a possibility of velocity masking as a result of the well-known "hidden-layer" effect. Despite these limitations, surface refraction methods have been in use for over 50 years in engineering geophysical applications. In comparison with other methods, surface refraction can be relatively inexpensive and rapidly executed.

In the context of the Fraser Delta, the shear wave refraction method is being used in a reconnaissance manner with over one kilometer spacing between adjacent sites. The results of this survey should serve only as a guide in the identification of velocity depth structure as well as in the delineation of large-scale anomalous zones; the data given herein should not be utilized directly in any geotechnical site investigation.

THE SURVEY AREA

The study area, shown in Figure 1, is bounded on the north by the south-sloping Pleistocene highlands immediately north of the North Arm of the Fraser River; on the south by the Tsawwassen Pleistocene uplands and Boundary Bay; on the west by the Strait of Georgia; and on the east by the Surrey uplands (Pleistocene) and the N.E. end of Annacis Island. To date, 70 sites have been completed; it is expected that up to 200 sites may be required to complete the coverage.

THE SURVEY TECHNIQUE

The refraction method was conducted in the transverse shear mode, where the orientation of the horizontal geophones is perpendicular to the line of profile. This mode was selected to minimize the effect of "converted" refracted wave interference. "True" reversed refraction procedures were followed, wherein geophones were located at source positions of forward and reversed geophone spreads. Intervals between geophones were maintained at 3 meters, and geophone spread lengths were designed to be in excess of 200 meters in order to obtain velocity-depth structure to at least 30 meters depth. In some locations, due to logistics contraints, such lengths were not possible.

The geophones used throughout the survey were 8 Hz horizontal geophones manufactured by Oyo-Geospace.

Various types of sources were used during the survey. In 1989, the source used was a horizontal firing modification of the "Buffalo Gun" (Pullan and MacAulay, 1987), where a 12-gauge blank shotgun shell was vented sideways into the ground at a depth of 1 meter below surface to produce polarized SH energy.

In 1990, several similar types of surface plate sources were used with a 16 lb sledge hammer to produce horizontally polarized energy. Such sources are generally of low energy requiring "stacking" or summing of individual records to increase the signal-to-noise ratio. This type of source was used during this field season since many of the sites were located in public parks in an urban environment where it was necessary to keep ground disturbance to a minimum.

In 1991, an 8-gauge blank shotgun shell was used in the standard "Buffalo Gun" configuration with the shot located at 1.5 meters depth. Despite the fact that the source was not polarized, it was found that there was minimal interference of compressional and "converted" waves. In general, the signal-to-noise with this source was superior to those previously used, resulting in generally good quality records.

An example of composite seimic records for site #7 is shown in Figure 2. Dominant frequencies of SH energy are in the range of 20 to 80 Hz. Since cultural noise was often in the same frequency range, the operators were sometimes required to reshoot a record to maintain an acceptable signal-to-noise ratio.

Seismic data were recorded using a variety of different engineering seismographs including: EG&G NIMBUS 1210F, Scintrex Echo-2, Bison 9000 and EG&G 2401. Records were usually 1 second in length with time delays to start-of-record where necessary. The digital sampling rate was maintained at 1 millisecond giving a possible seismic pass-band of 0 to 250 Hz.

DATA INTERPRETATION

All composite seismic records were re-played on wide computer paper in variable area format for picking of first arrival events. This mode was used instead of the usual computer-interactive screen display to allow the interpreter maximum latitude in aspect ratio. Travel times were picked to 1 millisecond accuracy from the print-outs. Large scale travel time vs distance plots were computer-generated for both forward and reverse record suites at each site, and conventional layered-case line-segment interpretation was performed graphically by one of us (Hunter). Additionally, in order to remove operator bias, the travel-time distance data were analysed using a computer program VELDEP (Hunter, 1971). This routine fits a smoothed curve to the travel-time-distance data where velocity gradients are evident, yet maintains abrupt velocity boundaries where they exist.

RESULTS

The results are shown in the following two sections. Section I is a compilation of travel-time distance plots for the forward and reverse data of each site. Data points shown are those picked by the interpreter; the solid line is the smoothed curve obtained from the VELDEP computer routine. The graphical layered interpretation using velocity segments is not shown, since experience has shown that different interpreters will choose different line segments, especially with data where velocity-depth gradients are apparent. The reader is encouraged to attempt his own interpretation for comparison with the layered interpretation and the VELDEP results given in Section II.

Section II shows the velocity-depth interpretations for both forward and reverse profiles at each site for both the layered-case graphical method and the computer-fitted velocity-depth function using VELDEP. The data point symbols have been suppressed on these plots for clarity. Also shown with the site number is a short description of the site location and the UTM co-ordinates of the center of the geophone spread at the site. Positioning was done from surface reference using 1:25000 topographic maps available for the Fraser Delta area. Occasional field checks of locations were carried out using a GPS receiver; observed errors were less than 50 meters.

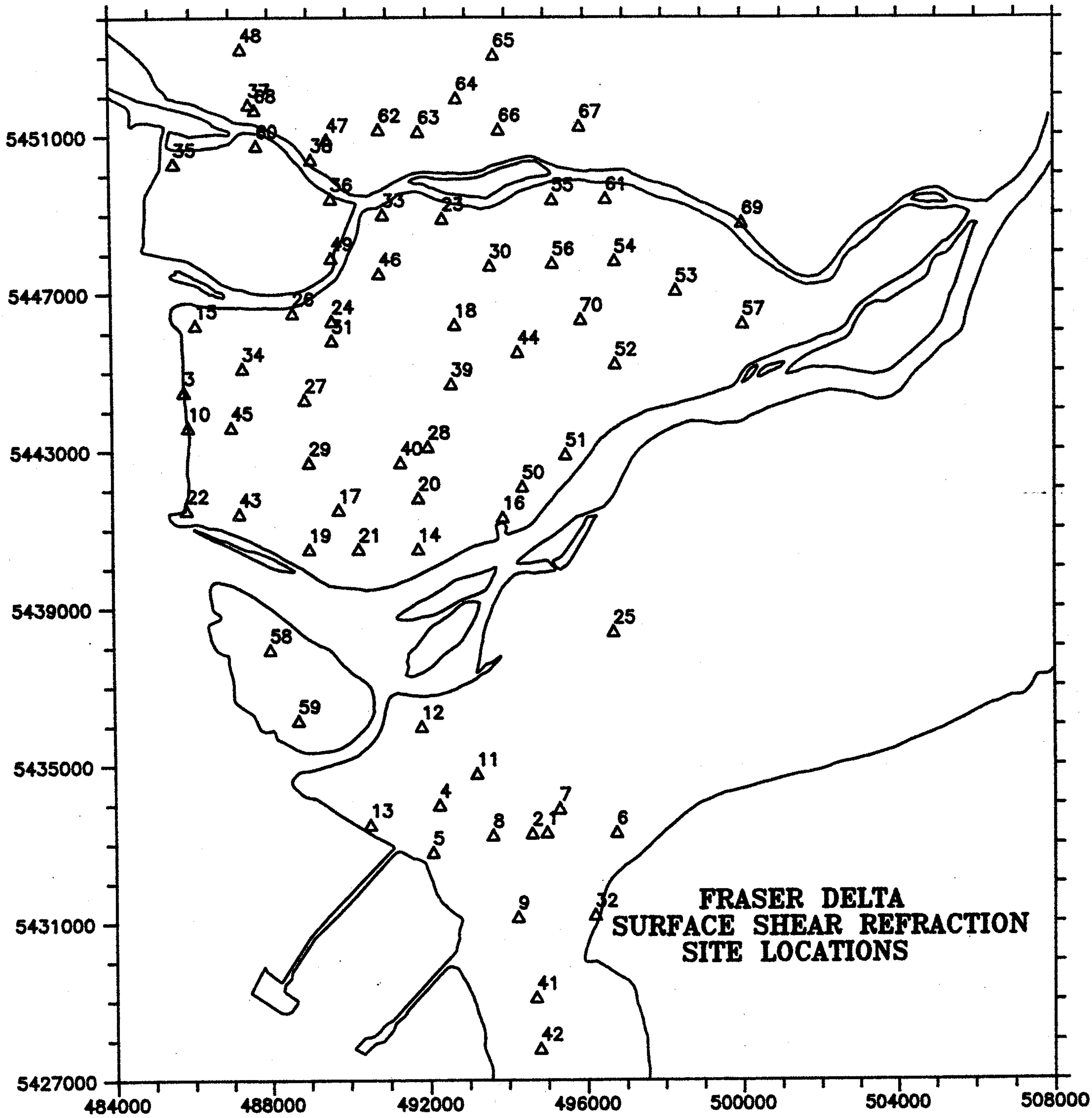


Figure 1. Fraser Delta shallow surface shear refraction site locations for 1989, 1990, and 1991.

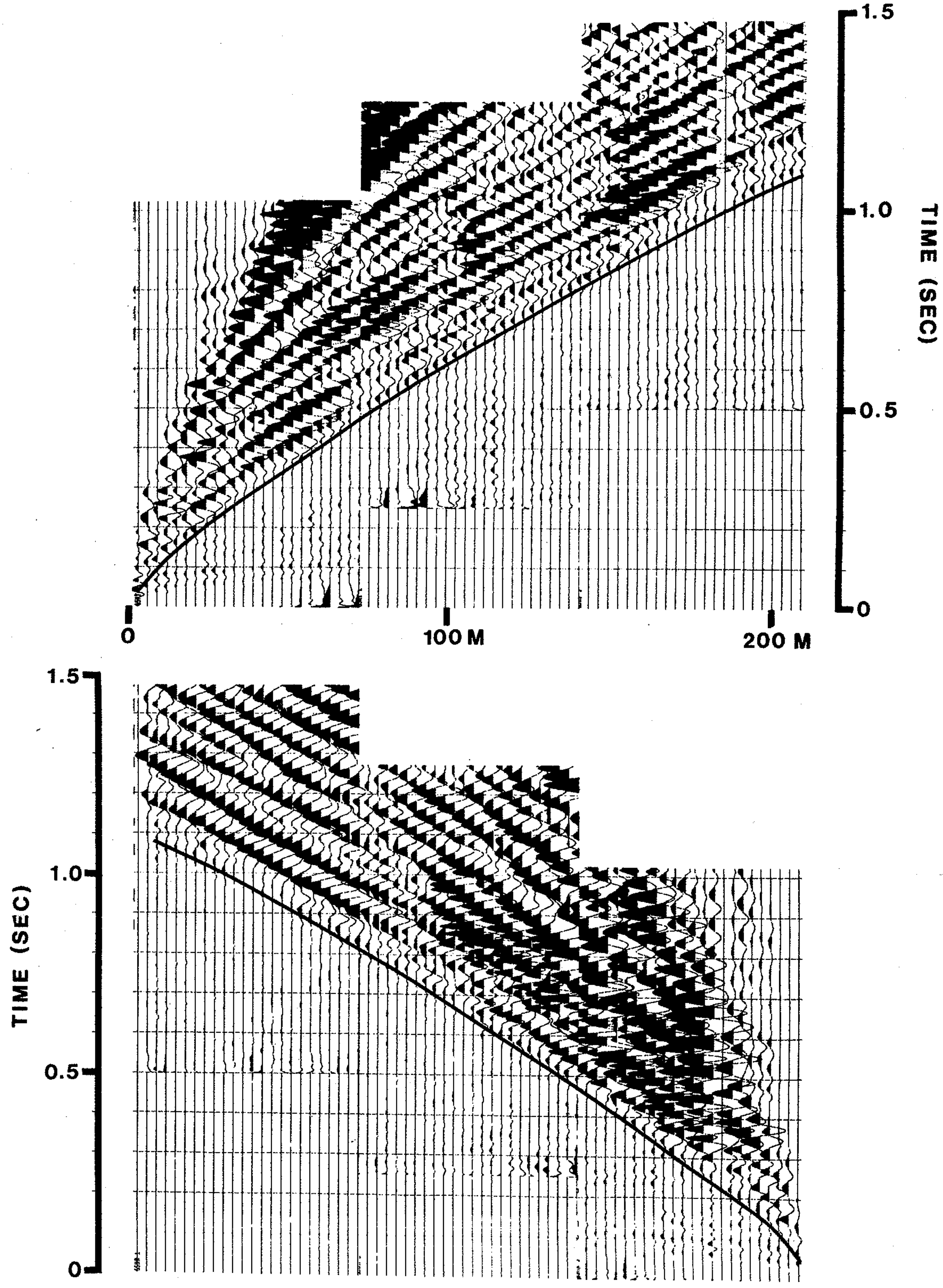


Figure 2. Example composite shear wave refraction seismic records from site 7. The forward profile is shown in the upper portion of the figure; the reverse profile below.

REFERENCES

Finn, W.D.L., and Nichols, A.M., (1988),
Seismic Response of Long-Period Sites: Lessons from the September 19, 1985 Mexican Earthquake; Can. Geotech. J., v. 25, p. 128-137.

Finn, W.D.L., Woeller, D.J., Davies, M.P., Luternauer, J.L., Hunter, J.A., and Pullan, S.E., (1989),
New Approaches for Assessing Liquefaction Potential of the Fraser River Delta, British Columbia; **in** Current Research, Part E, Geol. Surv. Can., Paper 89-1E, p. 221-231.

Hunter, J.A., (1971),
A Computer Method to Obtain the Velocity-Depth Function from Seismic Refraction Data; **in** Report of Activities, Part B, Geol. Surv. Can., Paper 71-1B, p. 40-48.

Hunter, J.A., Burns, R.A., and Good, R.L., (1990),
Borehole Shear Wave Velocity Measurements, Fraser Delta, 1989; Geol. Surv. Can., Open File 2229.

Hunter, J.A., Woeller, D.J., and Luternauer, J.L., (1991),
Comparison of Surface, Borehole and Seismic Cone Penetrometer Methods of Determining the Shallow Shear Wave Velocity Structure in the Fraser River Delta, British Columbia; **in** Current Research, Part A, Geol. Surv. Can., Paper 91-1A, p. 23-26.

Pullan, S.E., and MacAulay, H.A., (1987)
An In-Hole Shotgun Source for Engineering Seismic Surveys; Geophysics, v. 52, p.985-996.

Robertson, P.K., Campanella, R.G., Gillespie, D., and Rice, A., (1986),
Seismic CPT to Measure In Situ Shear Wave Velocity; J. Geotech. Engineering Div., ASCE, v. 112, p. 791-803.

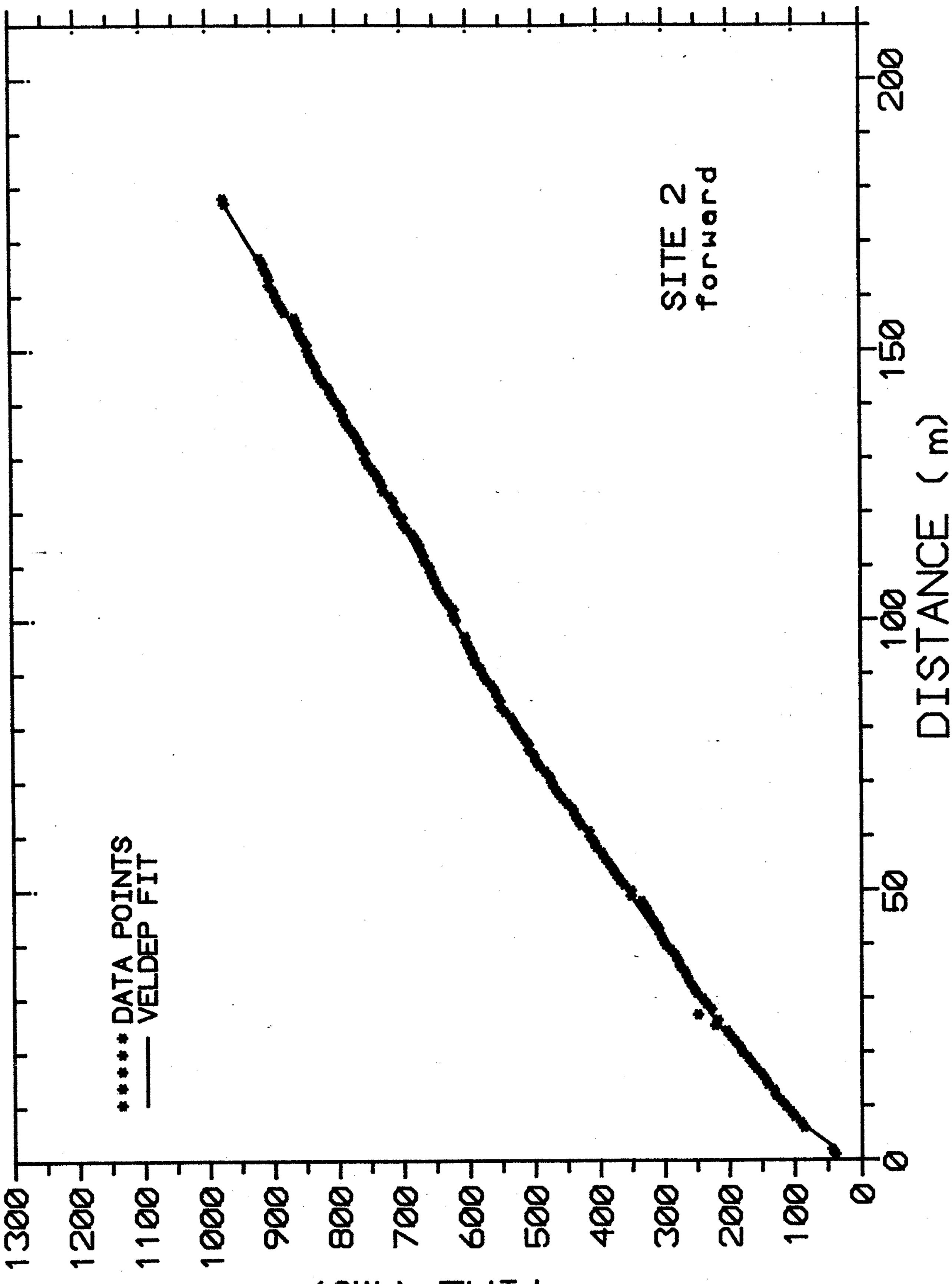
Robertson, P.K., and Addo, K.O., (1991),
Recent In-Situ Methods to Determine Seismic Velocity Profiles; **in** Geotechnical News, Can. Geotech. Soc., September 1991, p. 26-30.

Robertson, P.K., and Woeller, D.J., (1992),
Seismic Cone Penetration Test for Evaluating Liquefaction Potential; Can. Geotech. J., in press.

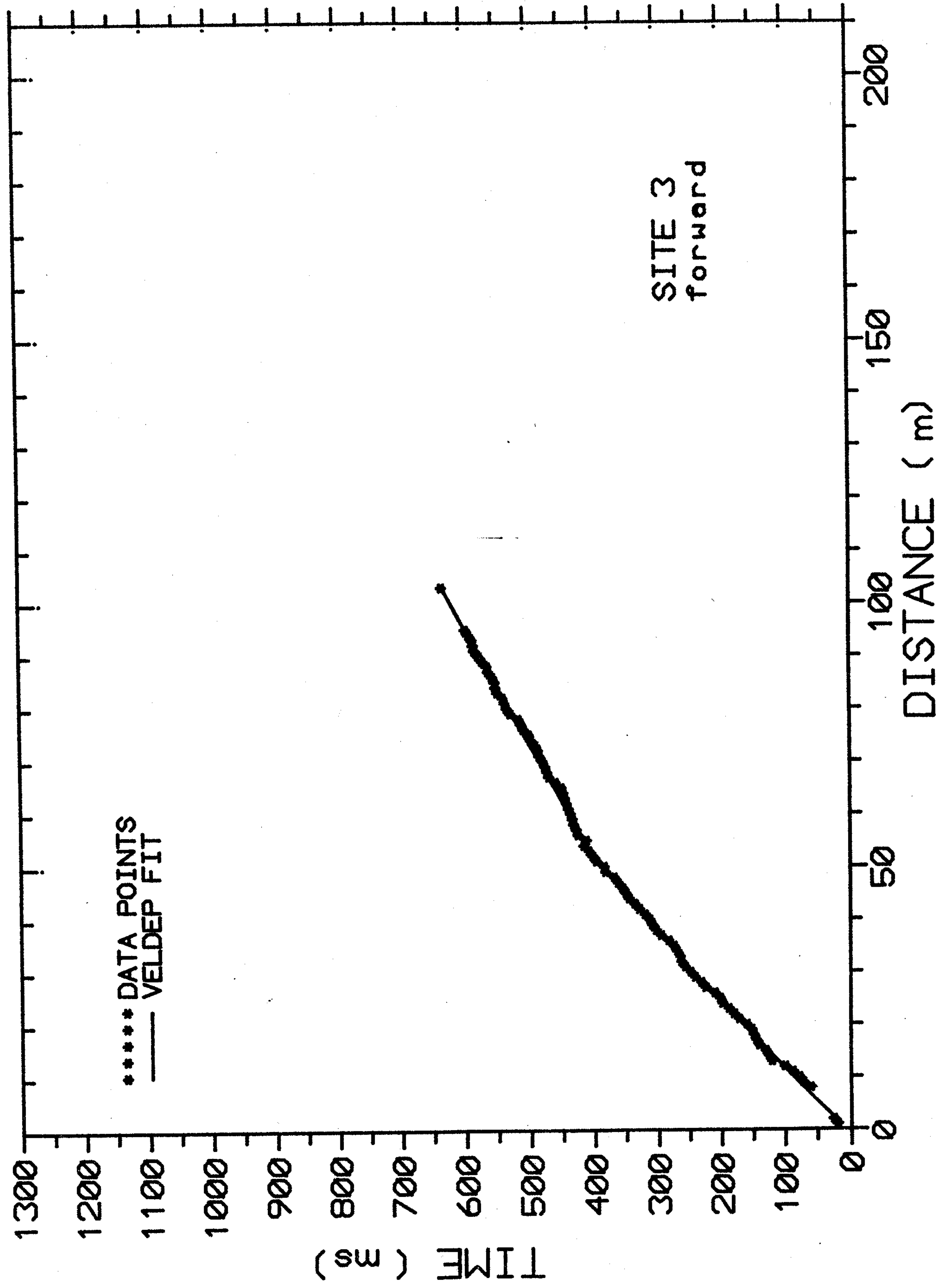
SECTION I

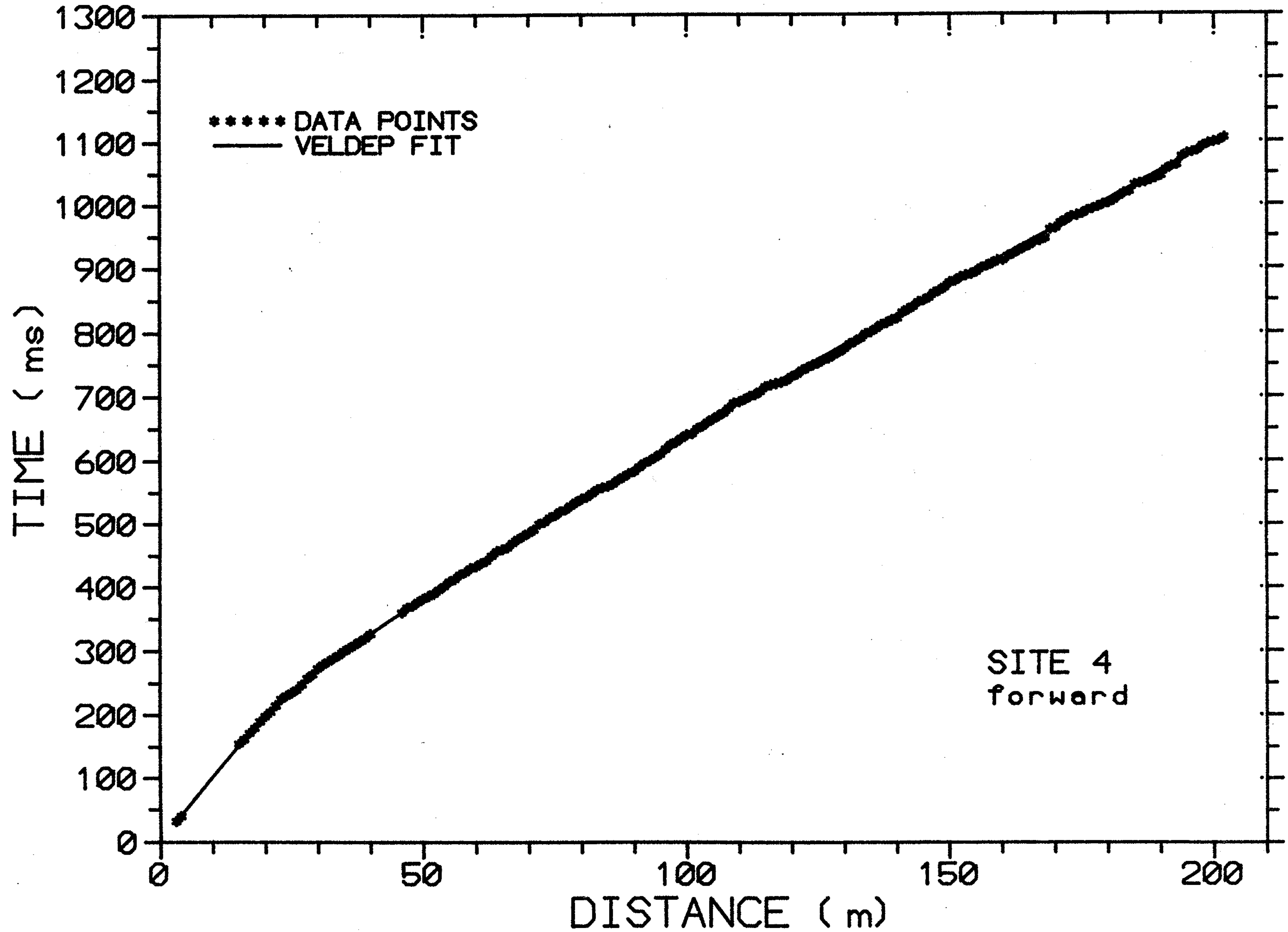
TRAVEL TIME - DISTANCE PLOTS

SITES 1 TO 70

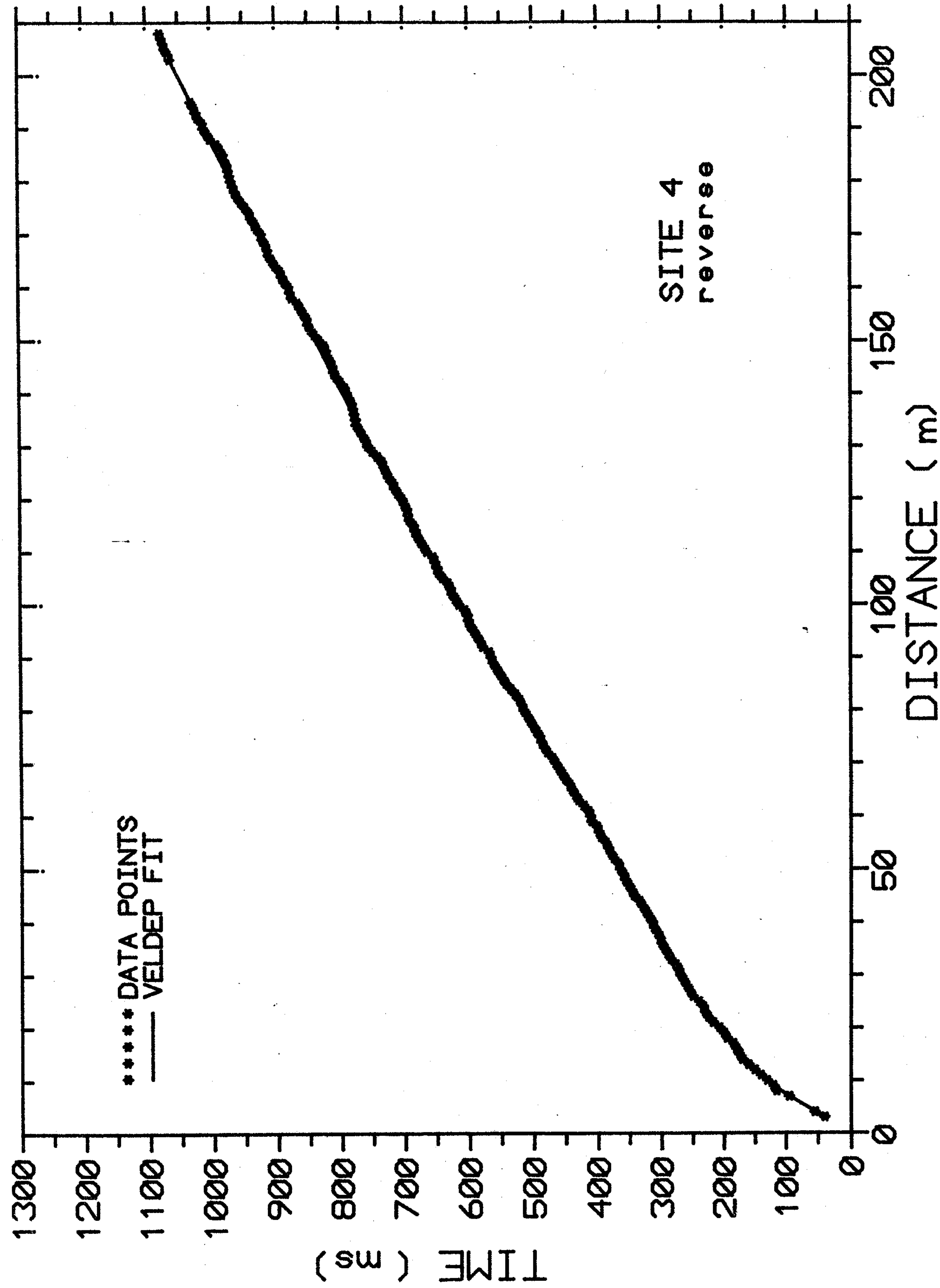


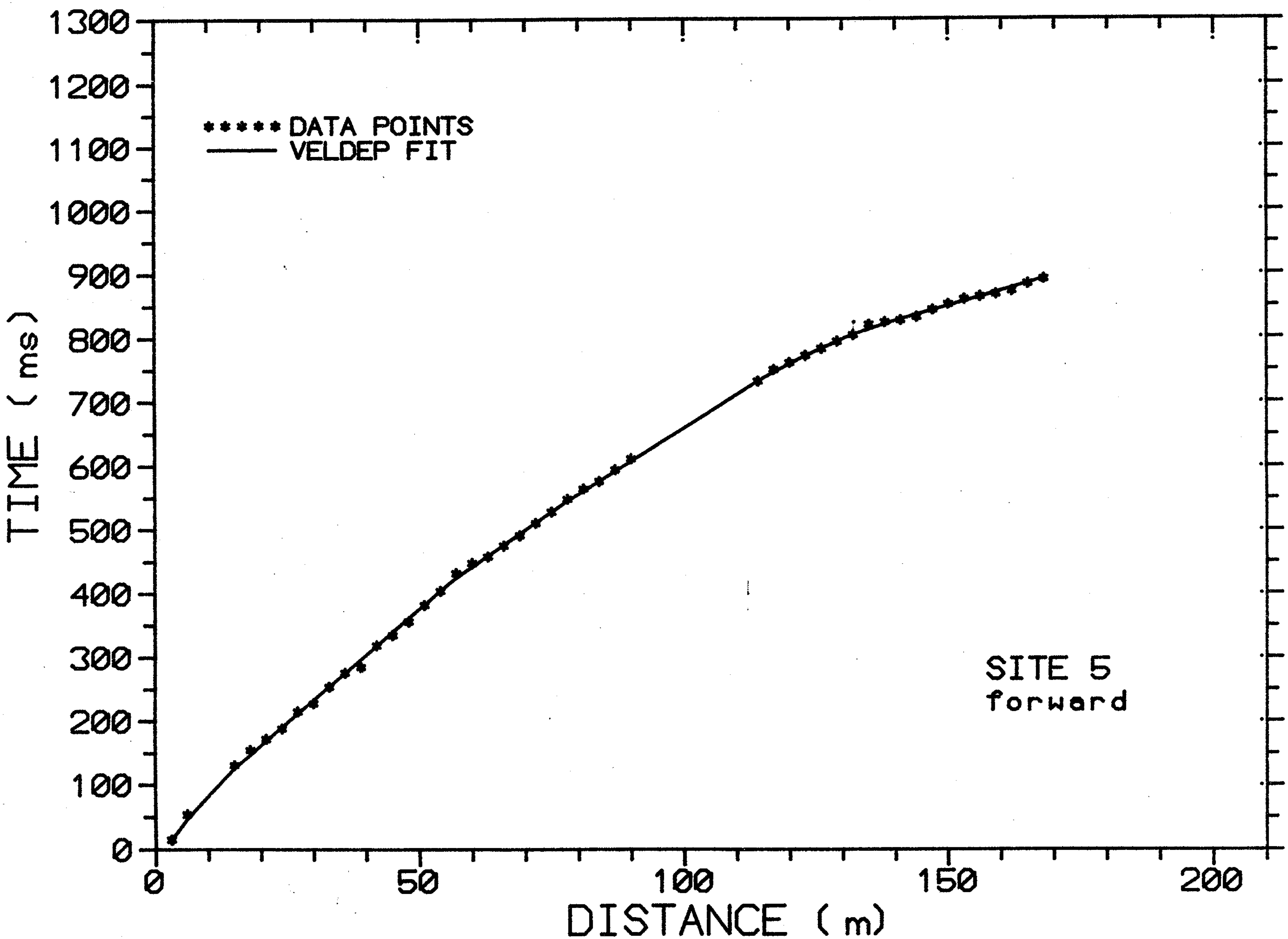
SITE 2
forward
***** DATA POINTS
—— VELDEP FIT
DISTANCE (m)
TIME (ms)
0
50
100
150
200
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300

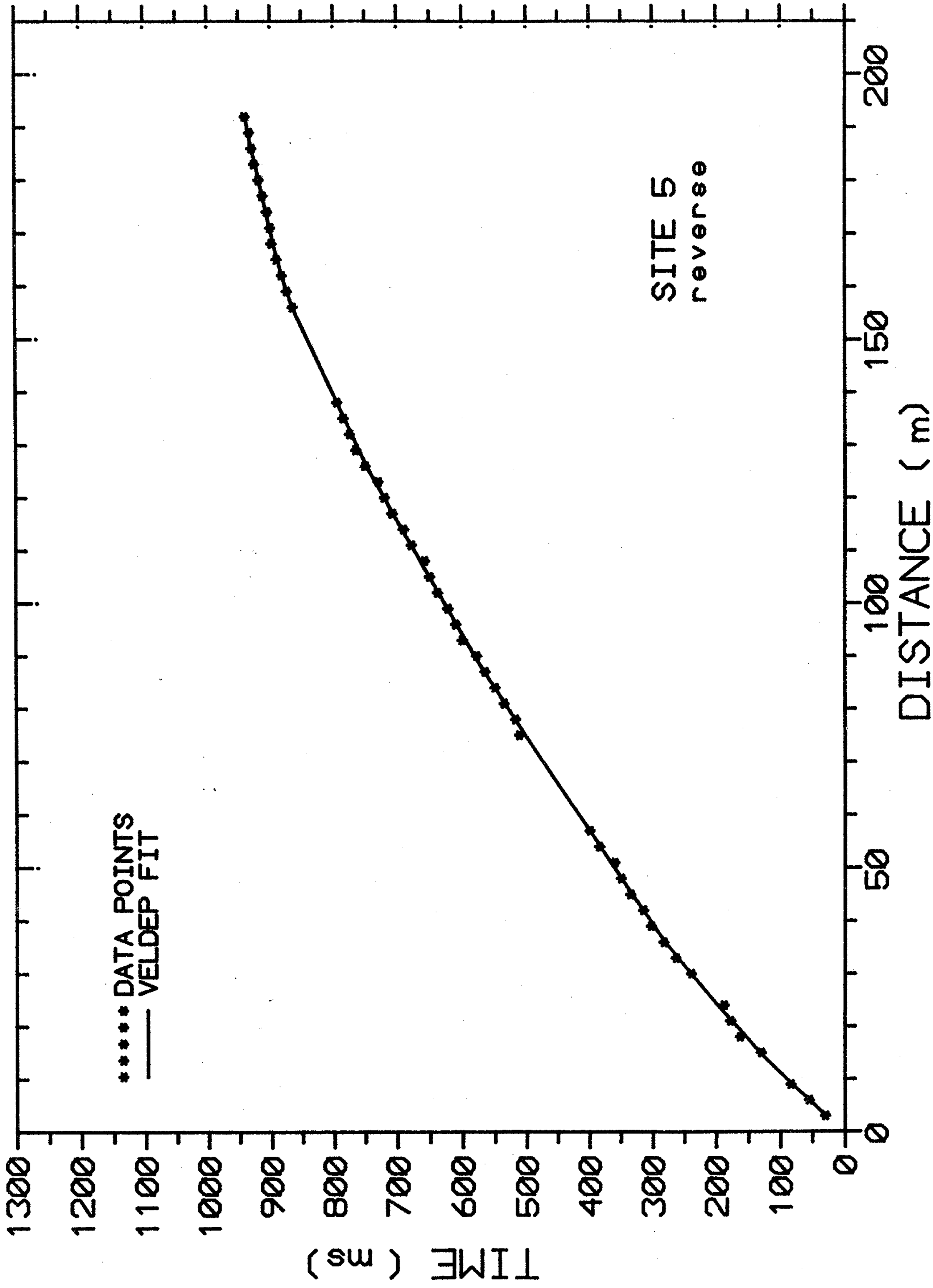

SITE 3
forward
***** DATA POINTS
—— VELDEP FIT
DISTANCE (m)
TIME (ms)
0
50
100
150
200
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300



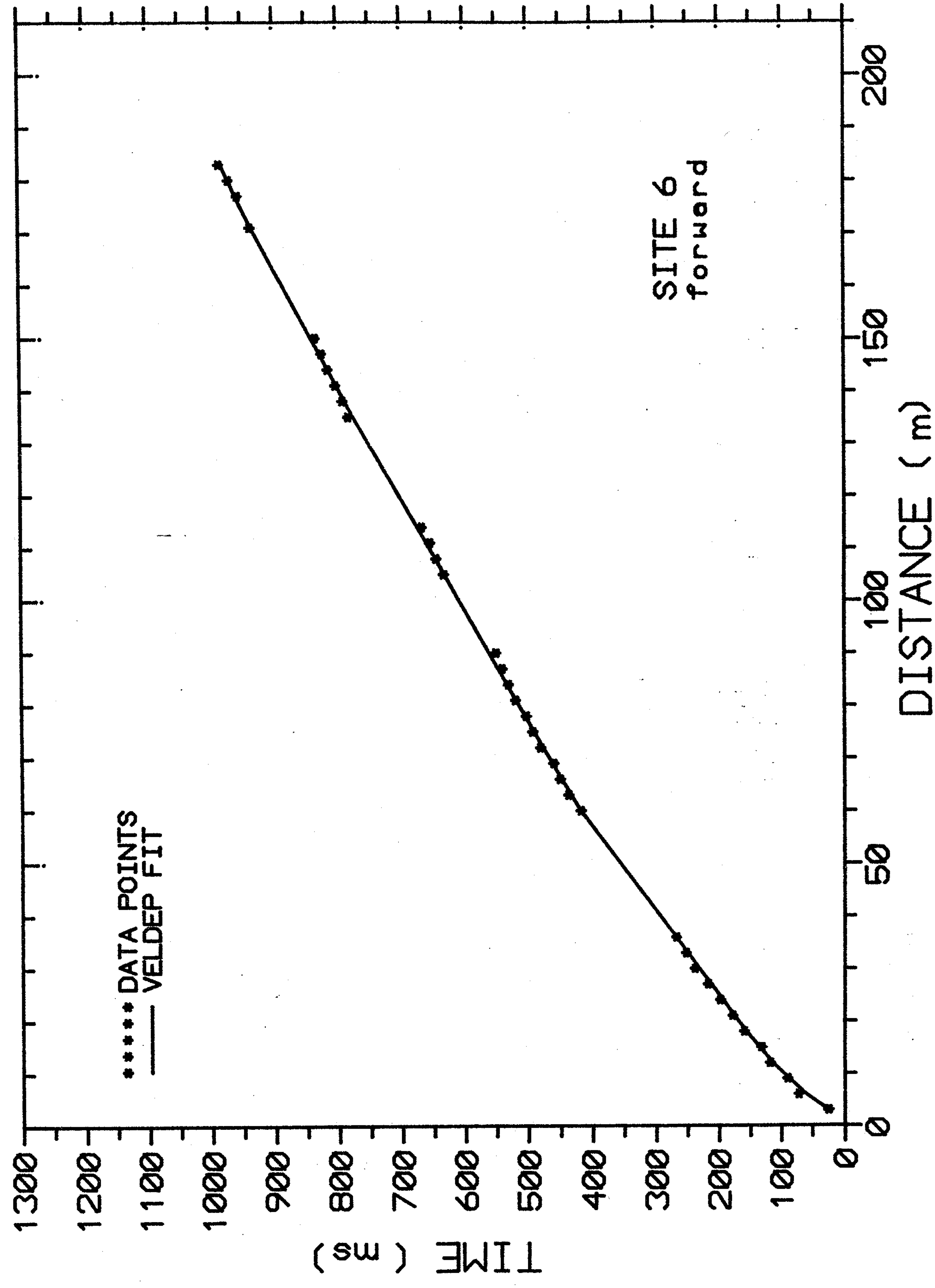
TIME (ms)
1300
1200
1100
1000
900
800
700
600
500
400
300
200
100
0
DISTANCE (m)
0
50
100
150
200
***** DATA POINTS
VELDEP FIT
SITE 4
forward


SITE 4
reverse
***** DATA POINTS
—— VELDEP FIT
DISTANCE (m)
TIME (ms)
0
50
100
150
200
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300

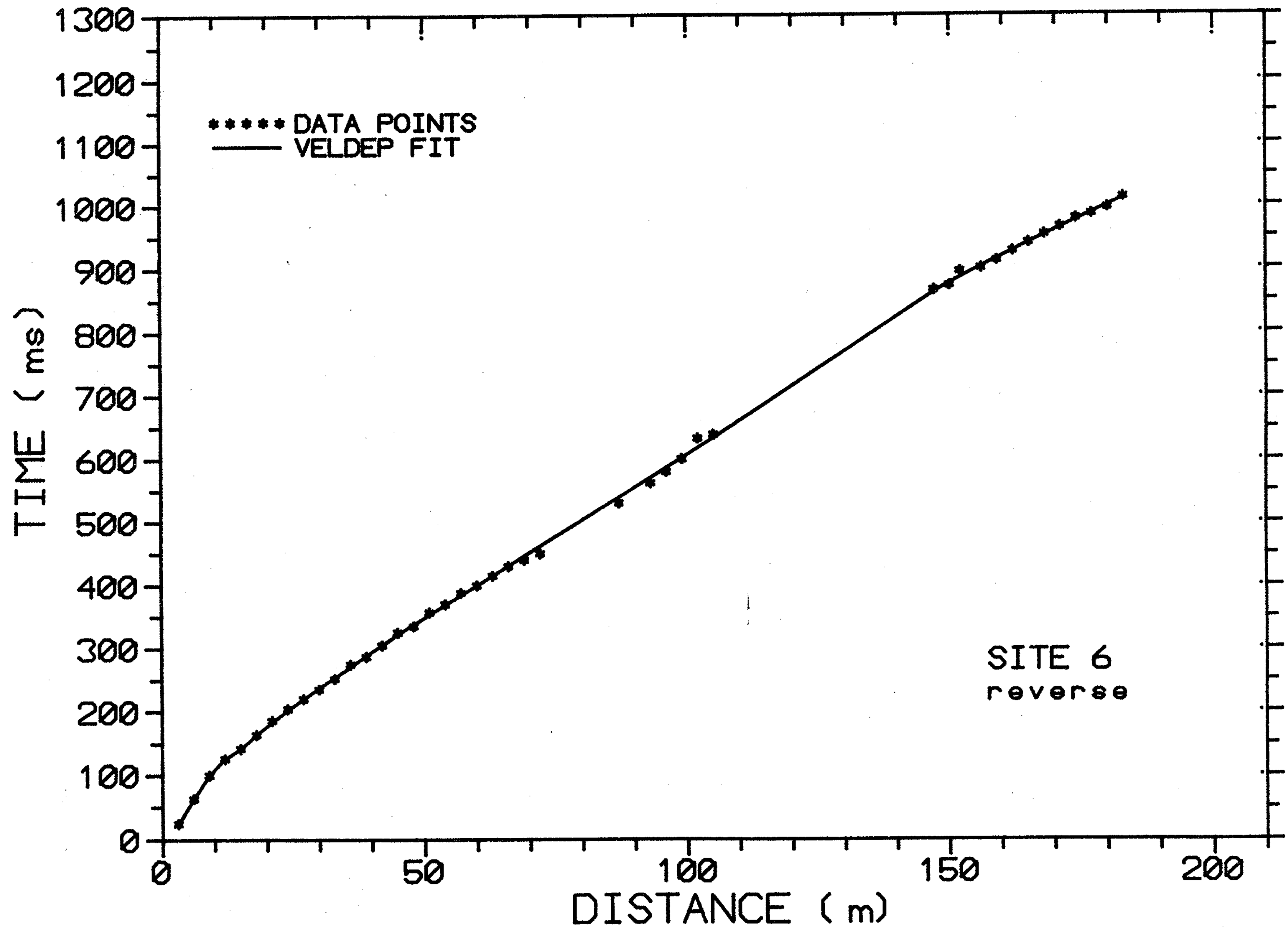

1300
1200
1100
1000
900
800
700
600
500
400
300
200
100
0
TIME (ms)
***** DATA POINTS
VELDEP FIT
SITE 5
forward
0
50
100
150
200
DISTANCE (m)

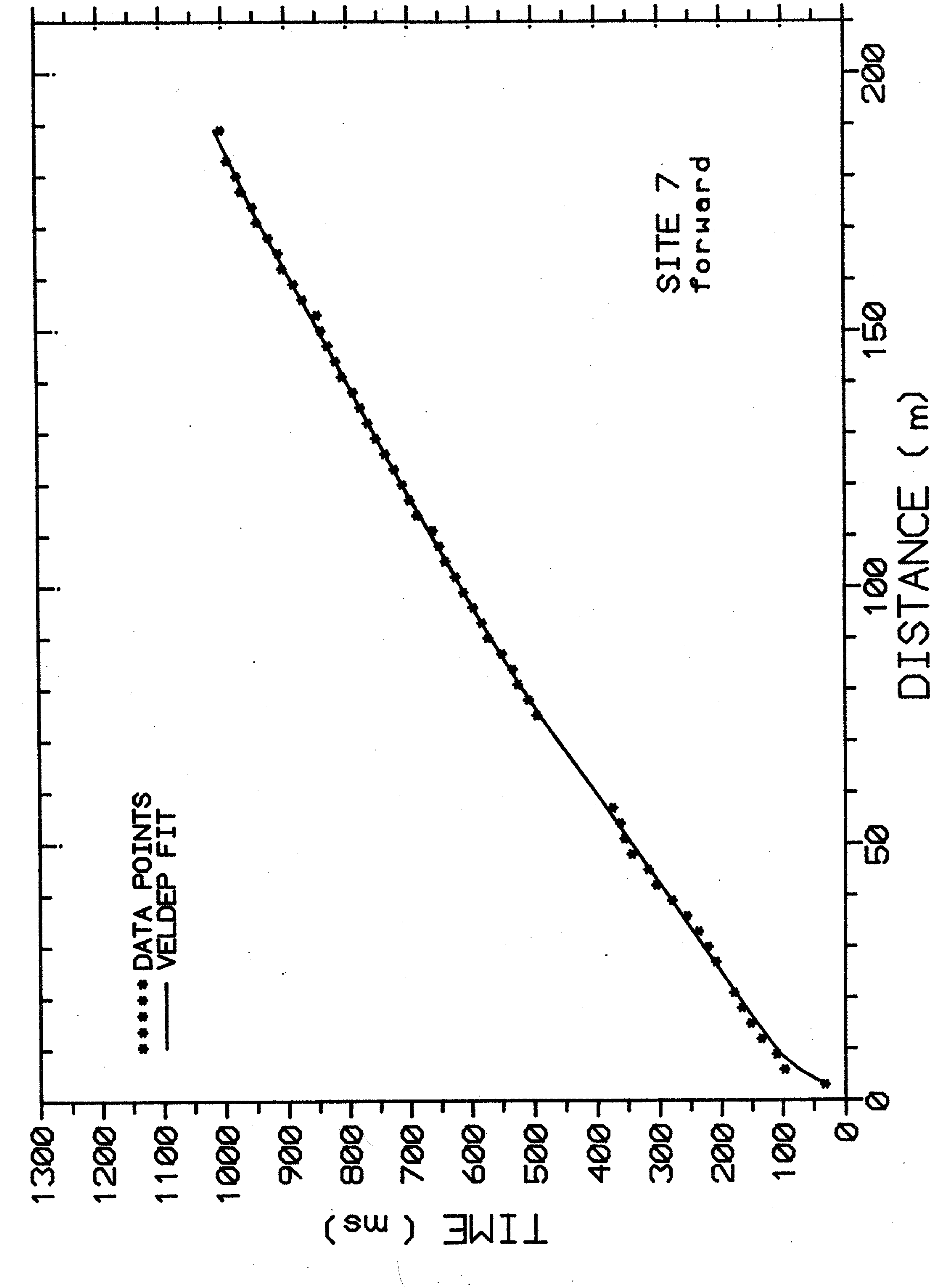


TIME (ms)
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
DISTANCE (m)
0
50
100
150
200
***** DATA POINTS
—— VELDEP FIT
SITE 5
reverse

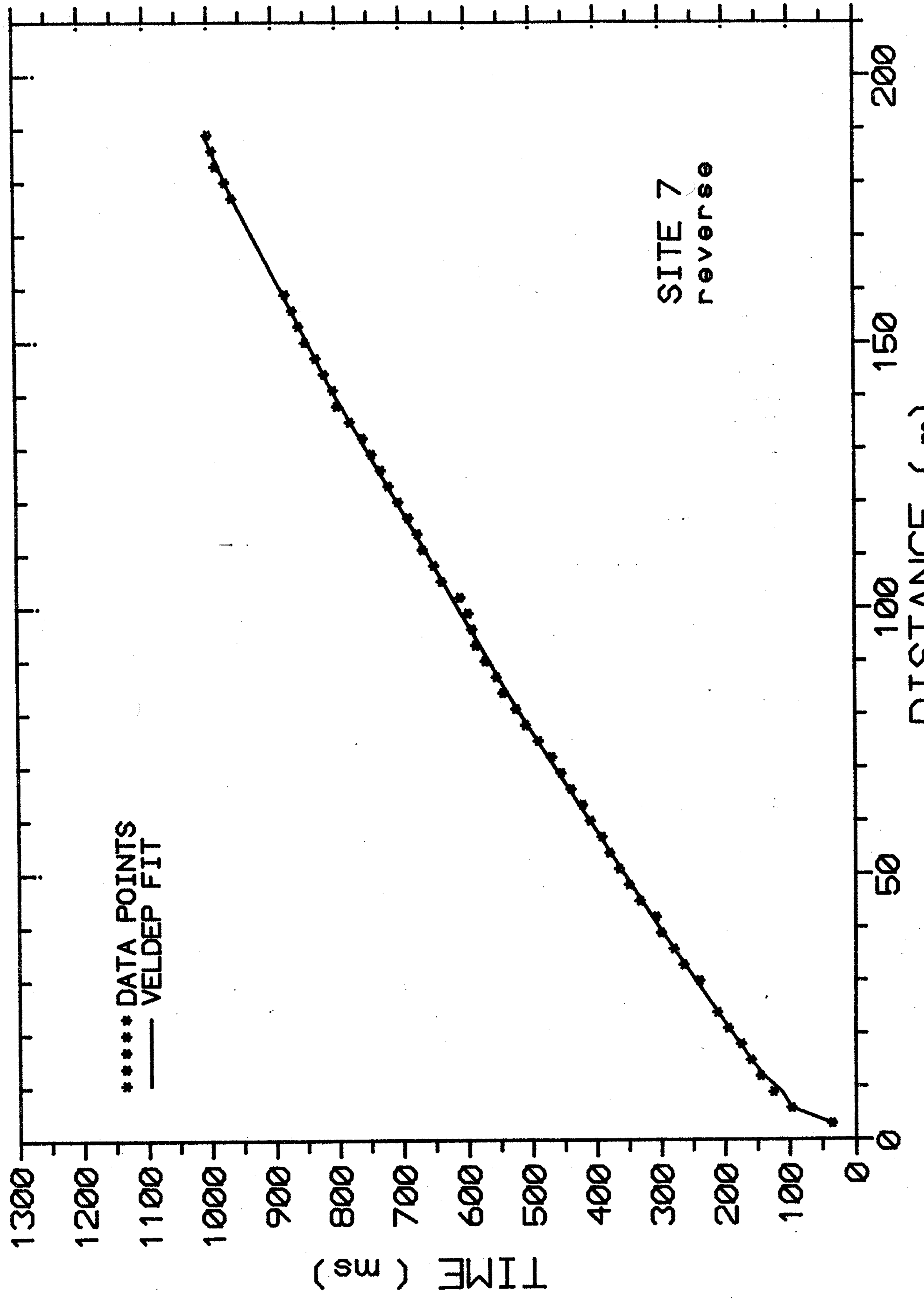


SITE 6
forward
***** DATA POINTS
—— VELDEP FIT
DISTANCE (m)
TIME (ms)
0
50
100
150
200
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300

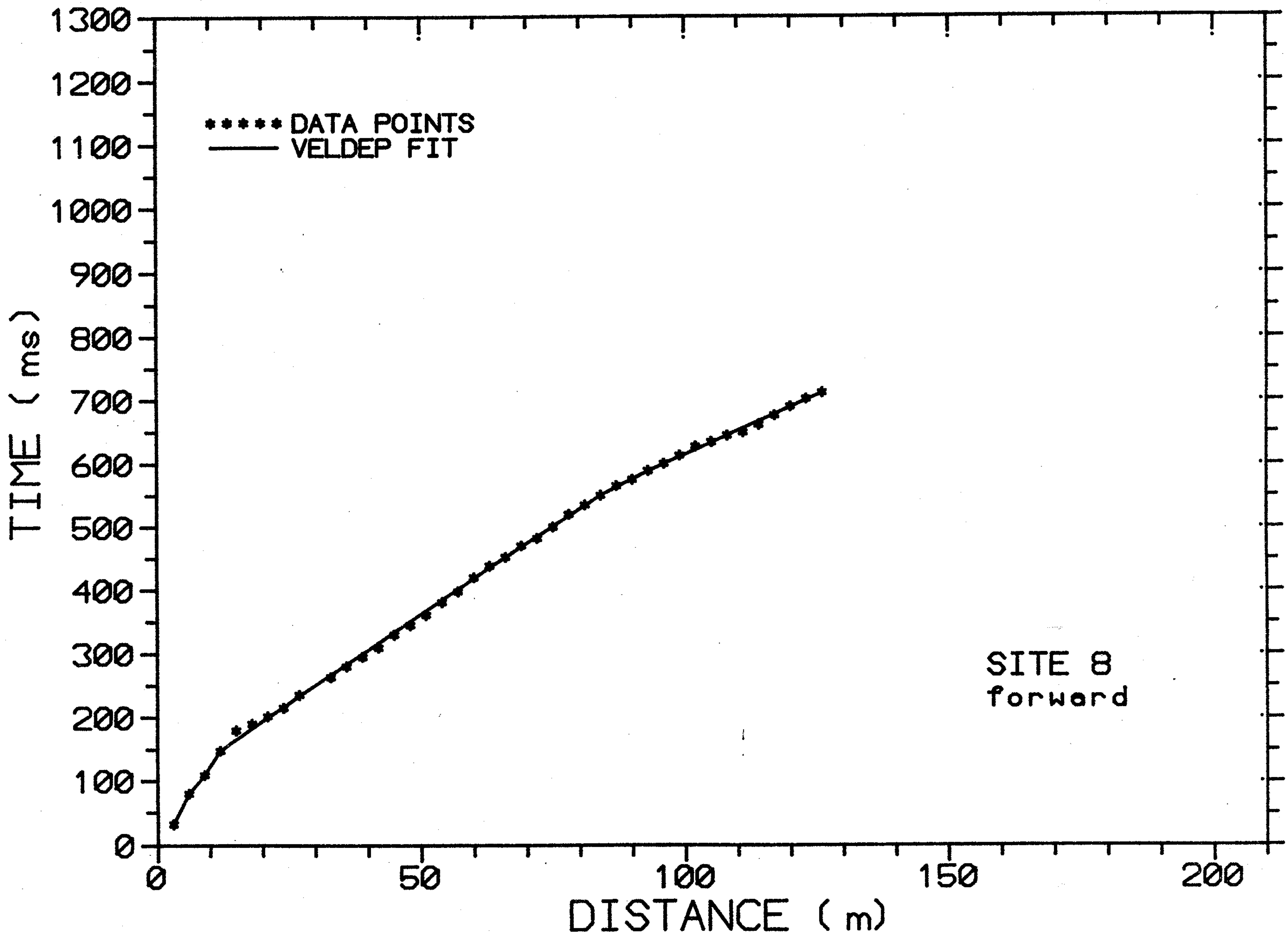

***** DATA POINTS
——— VELDEP FIT
SITE 6
reverse
TIME (ms)
DISTANCE (m)
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
0
50
100
150
200



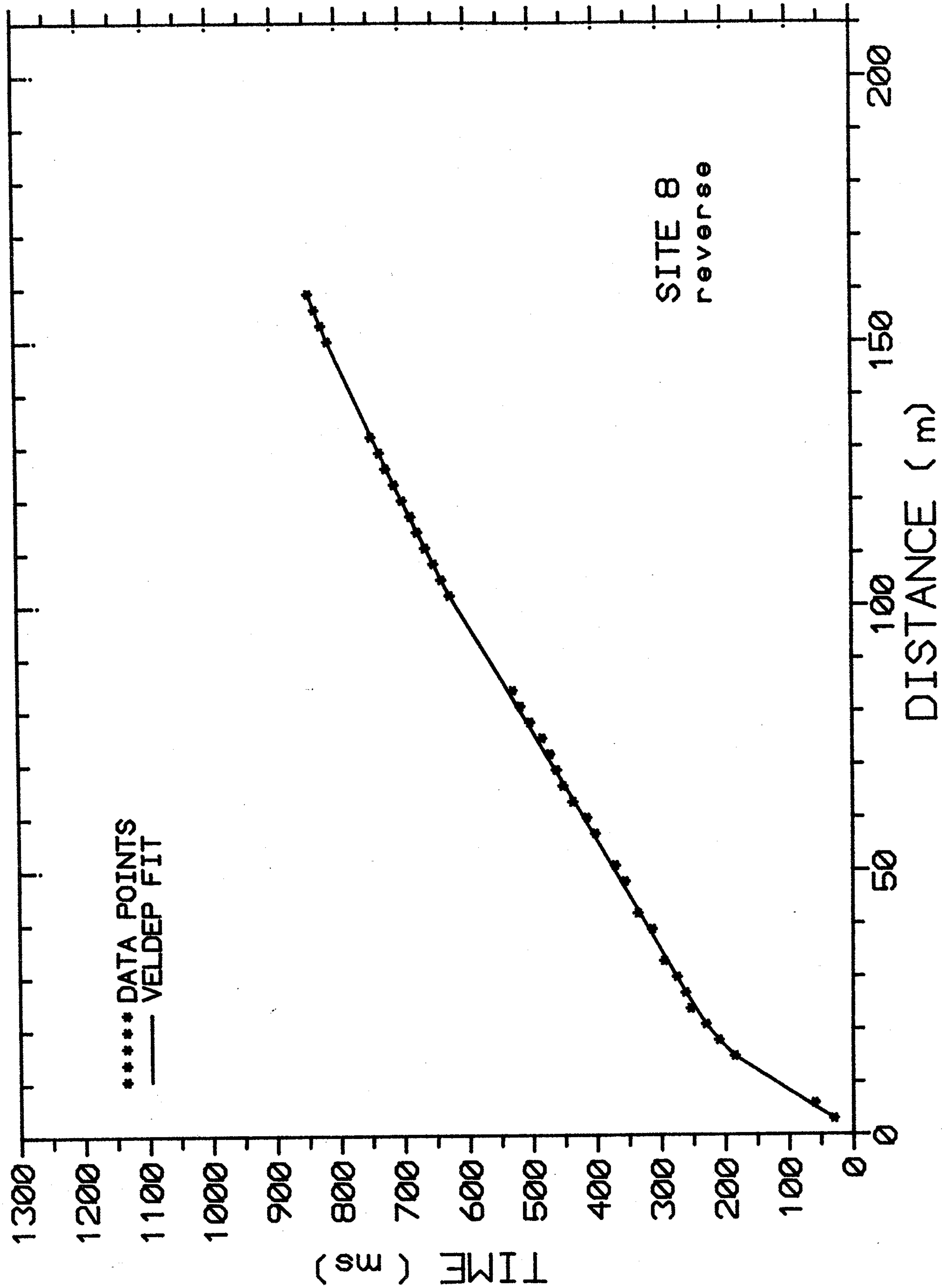
SITE 7
forward
***** DATA POINTS
—— VELDEP FIT
DISTANCE (m)
TIME (ms)
0
50
100
150
200
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300

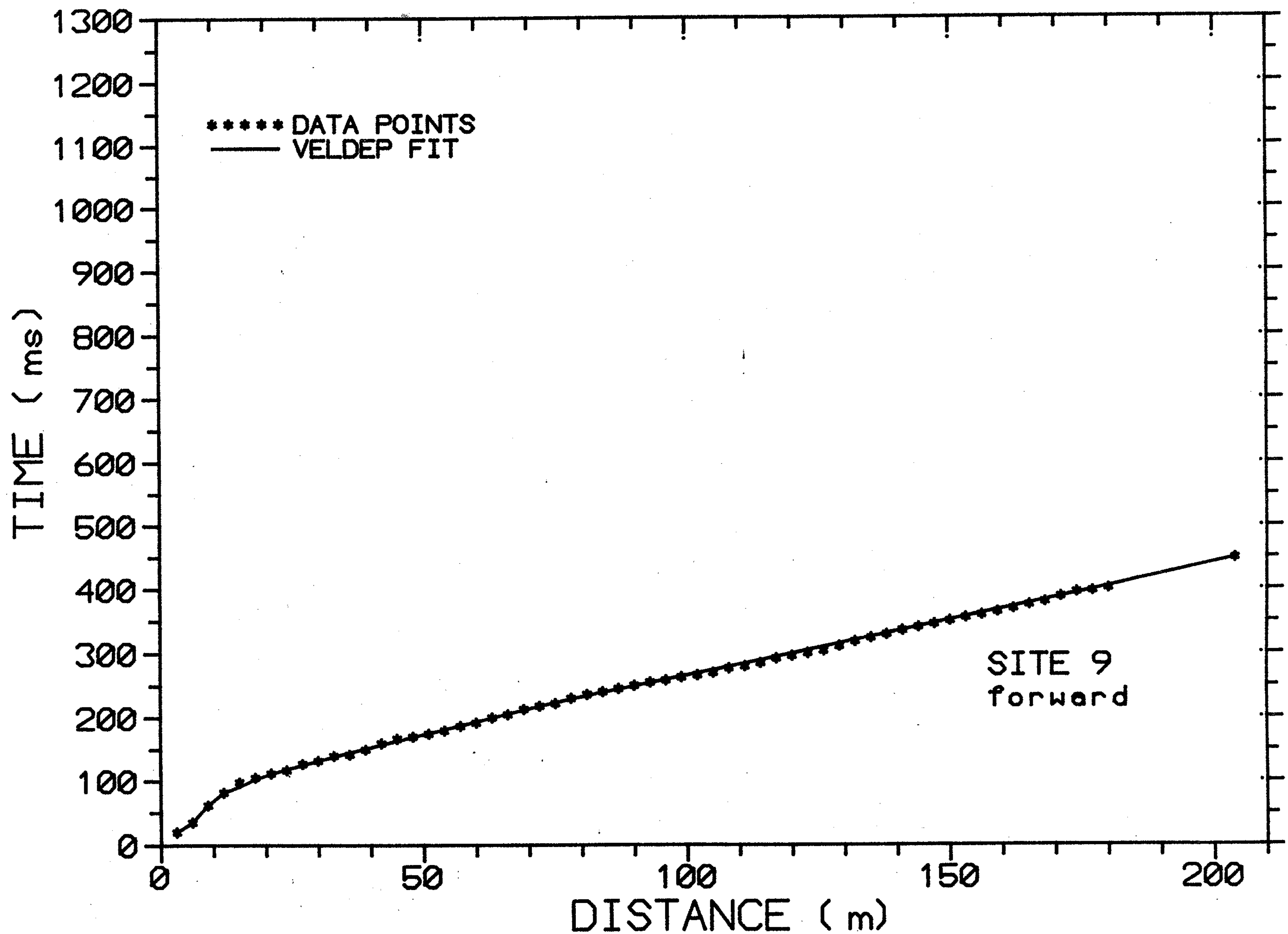


SITE 7
reverse
***** DATA POINTS
—— VELDEP FIT
DISTANCE (m)
TIME (ms)
0
50
100
150
200
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300

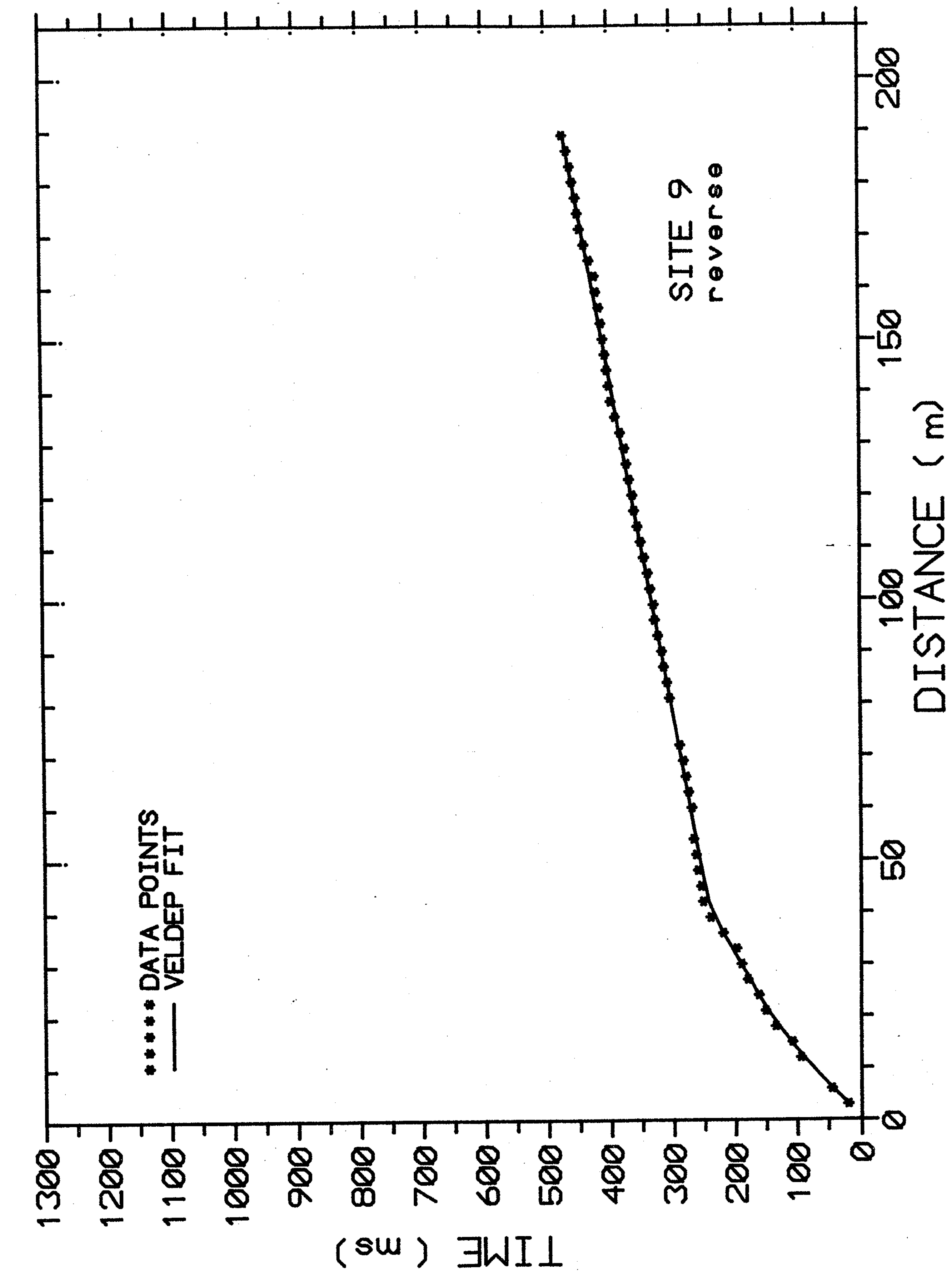


***** DATA POINTS
VELDEP FIT
SITE 8
forward
TIME (ms)
1300
1200
1100
1000
900
800
700
600
500
400
300
200
100
0
0
50
100
150
200
DISTANCE (m)

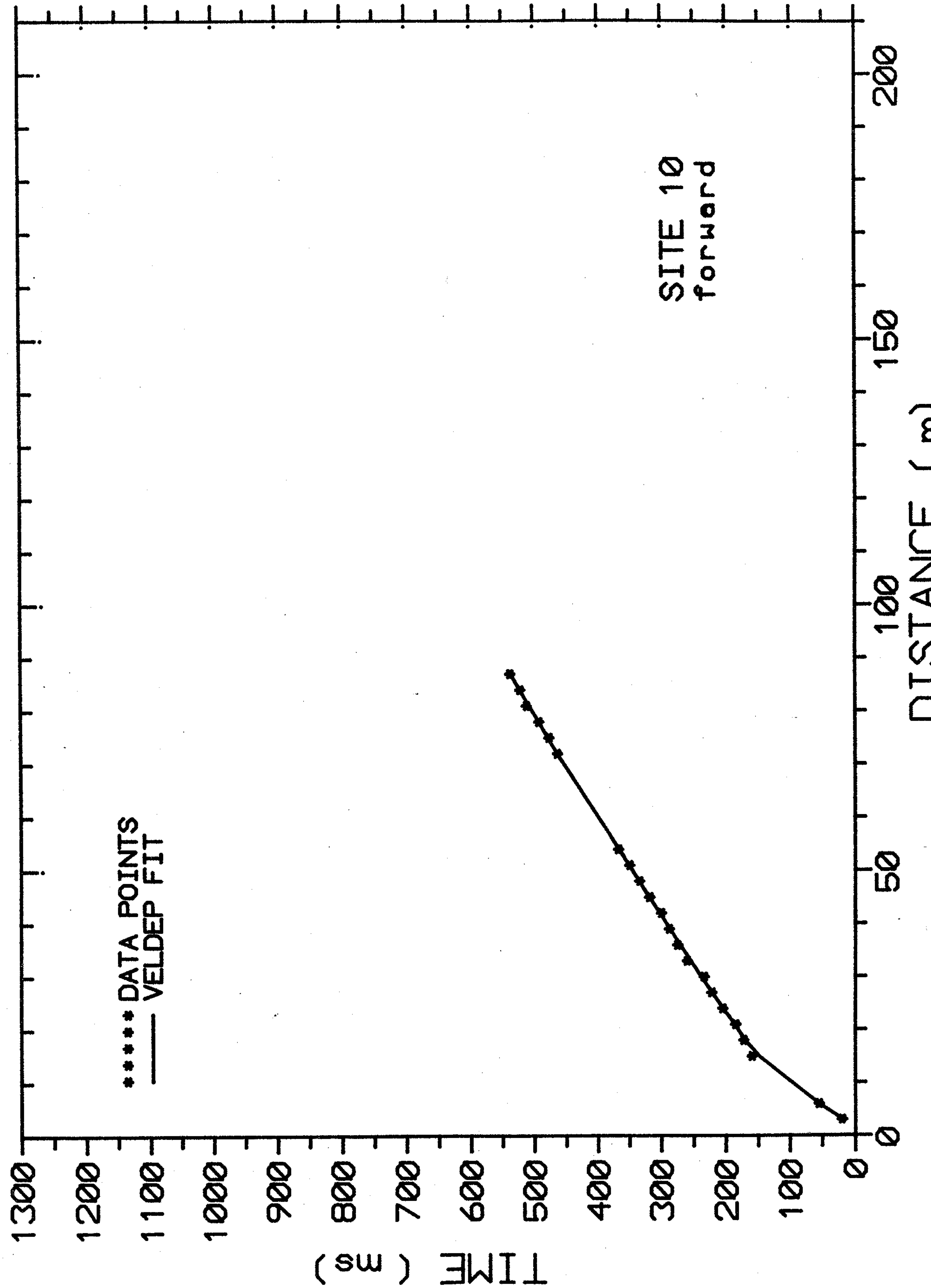

SITE 8
reverse
***** DATA POINTS
—— VELDEP FIT
TIME (ms)
DISTANCE (m)
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
0
50
100
150
200



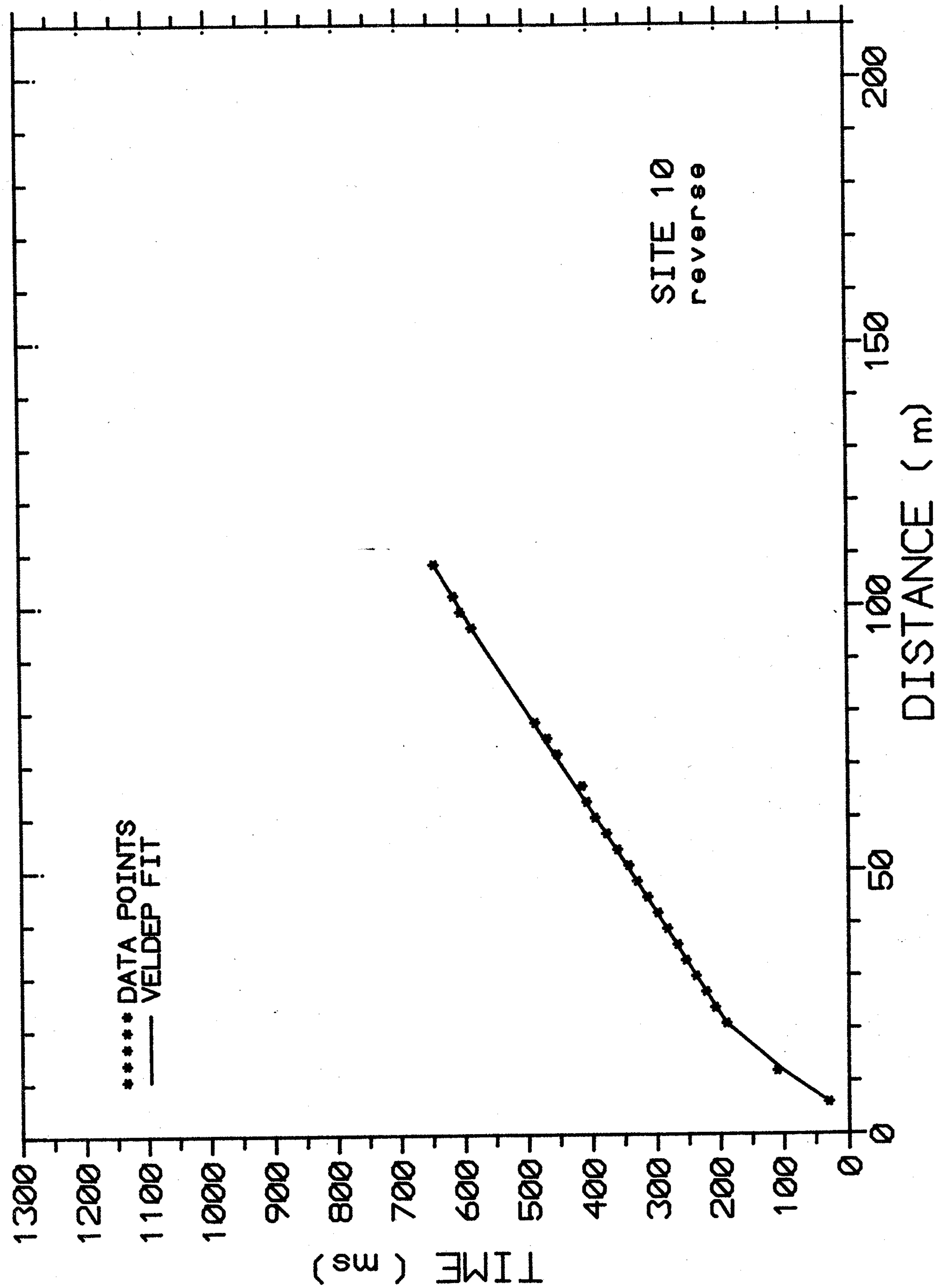
TIME (ms)
1300
1200
1100
1000
900
800
700
600
500
400
300
200
100
0
DISTANCE (m)
0
50
100
150
200
***** DATA POINTS
—— VELDEP FIT
SITE 9
forward

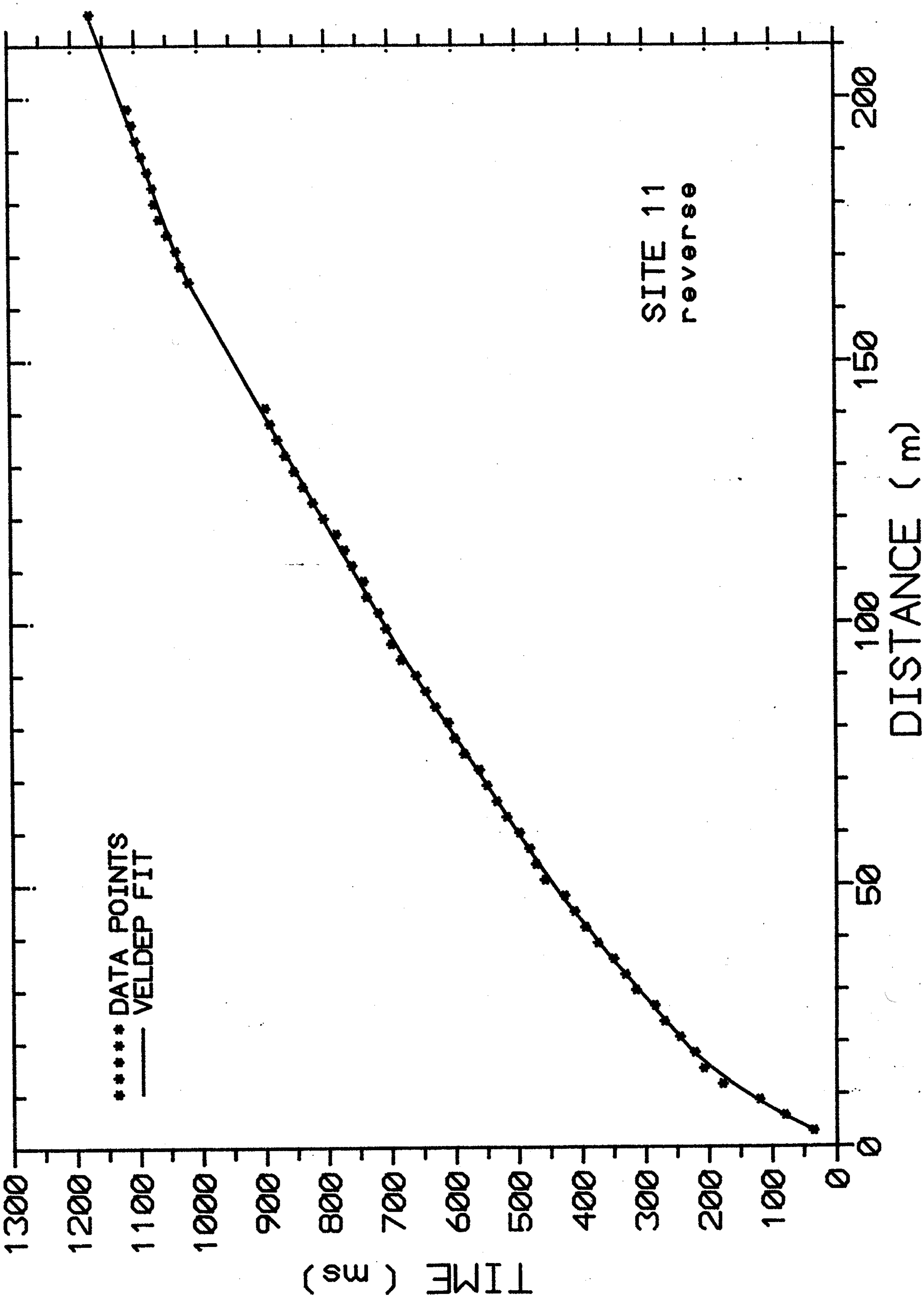


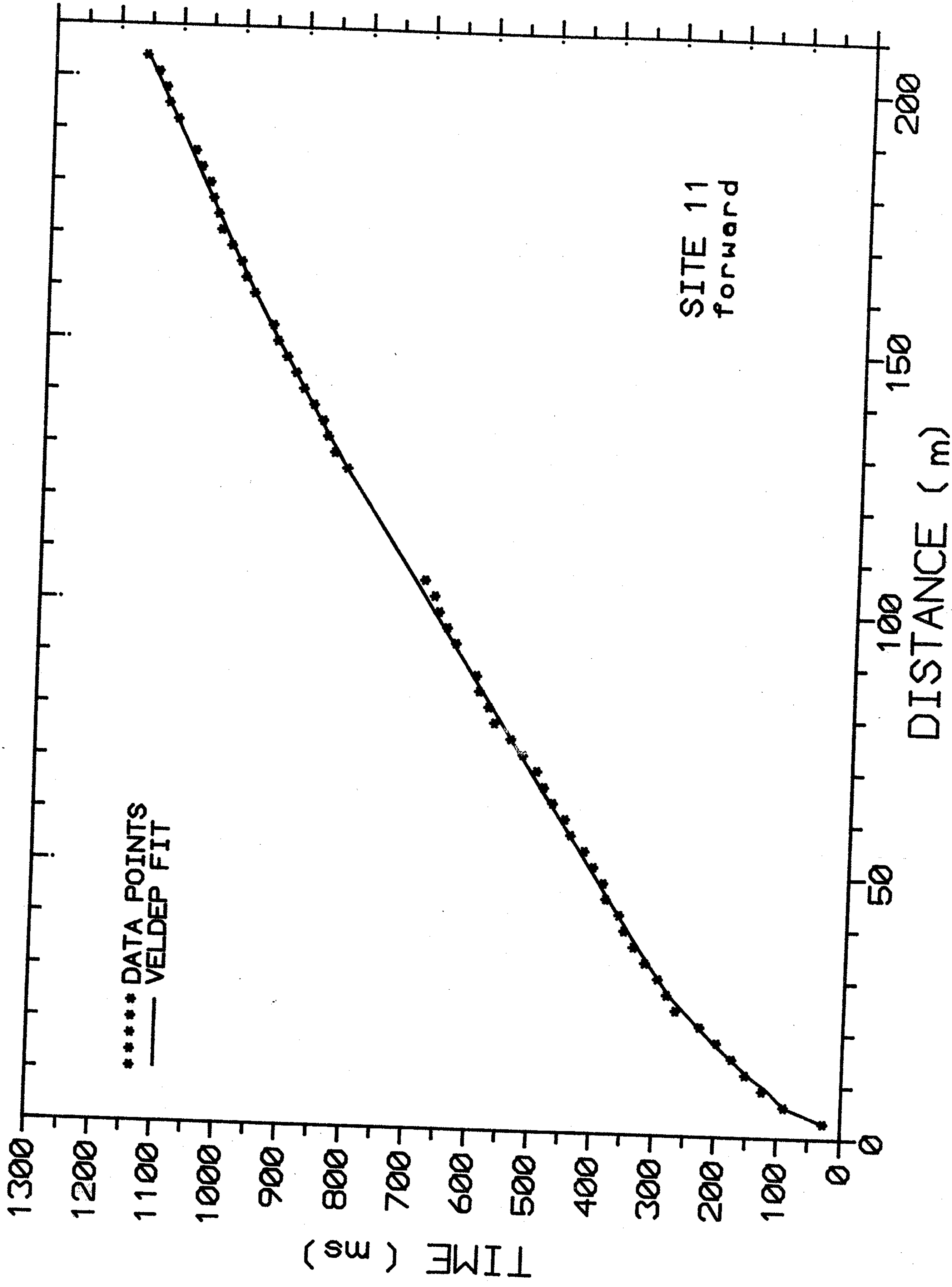
TIME (ms)
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
DISTANCE (m)
0
50
100
150
200
SITE 9
reverse
***** DATA POINTS
—— VELDEP FIT



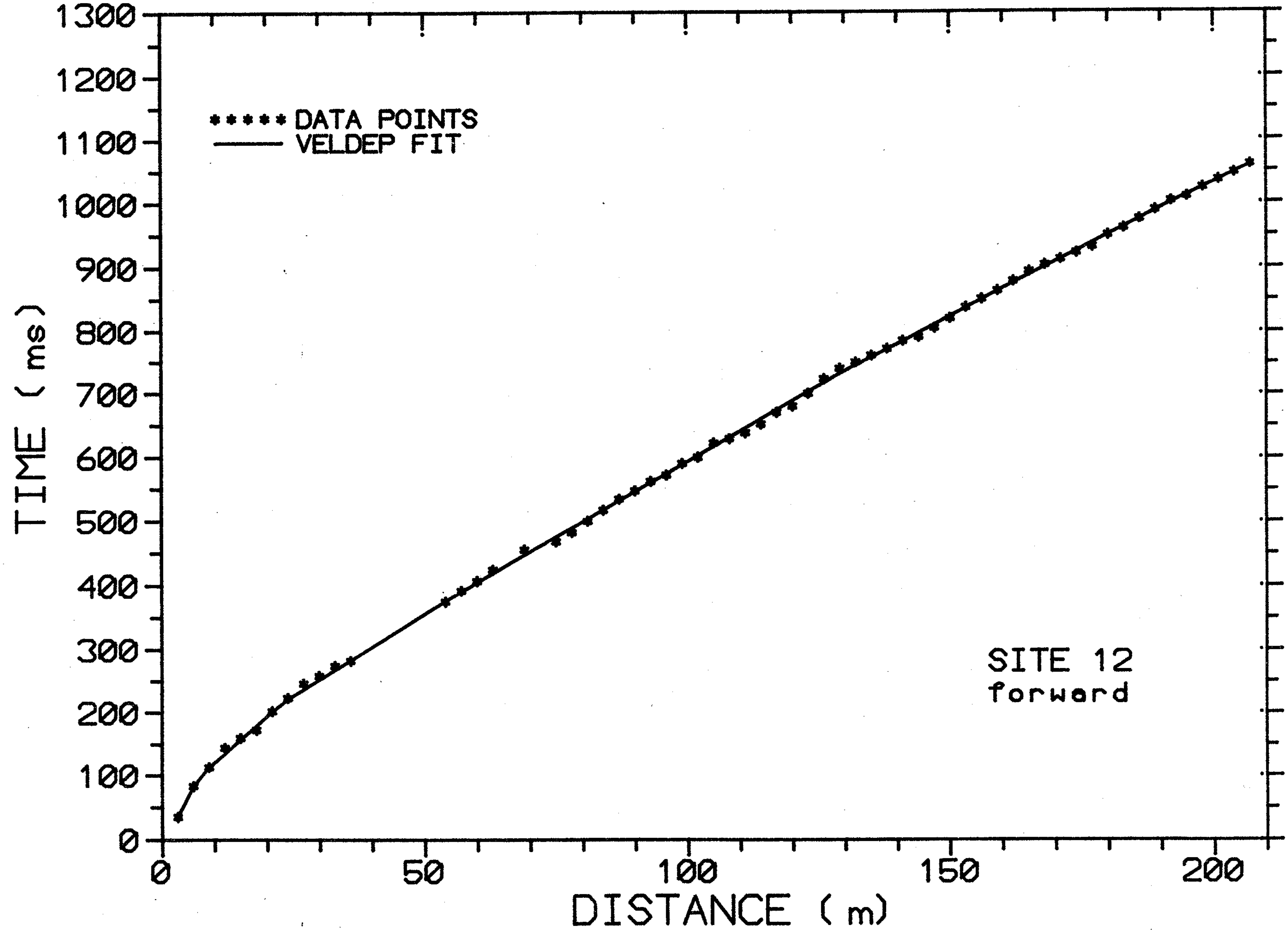
SITE 10
forward
***** DATA POINTS
—— VELDEP FIT
TIME (ms)
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
DISTANCE (m)
0
50
100
150
200


TIME (ms)
DISTANCE (m)
SITE 10
reverse
***** DATA POINTS
—— VELDEP FIT
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
0
50
100
150
200

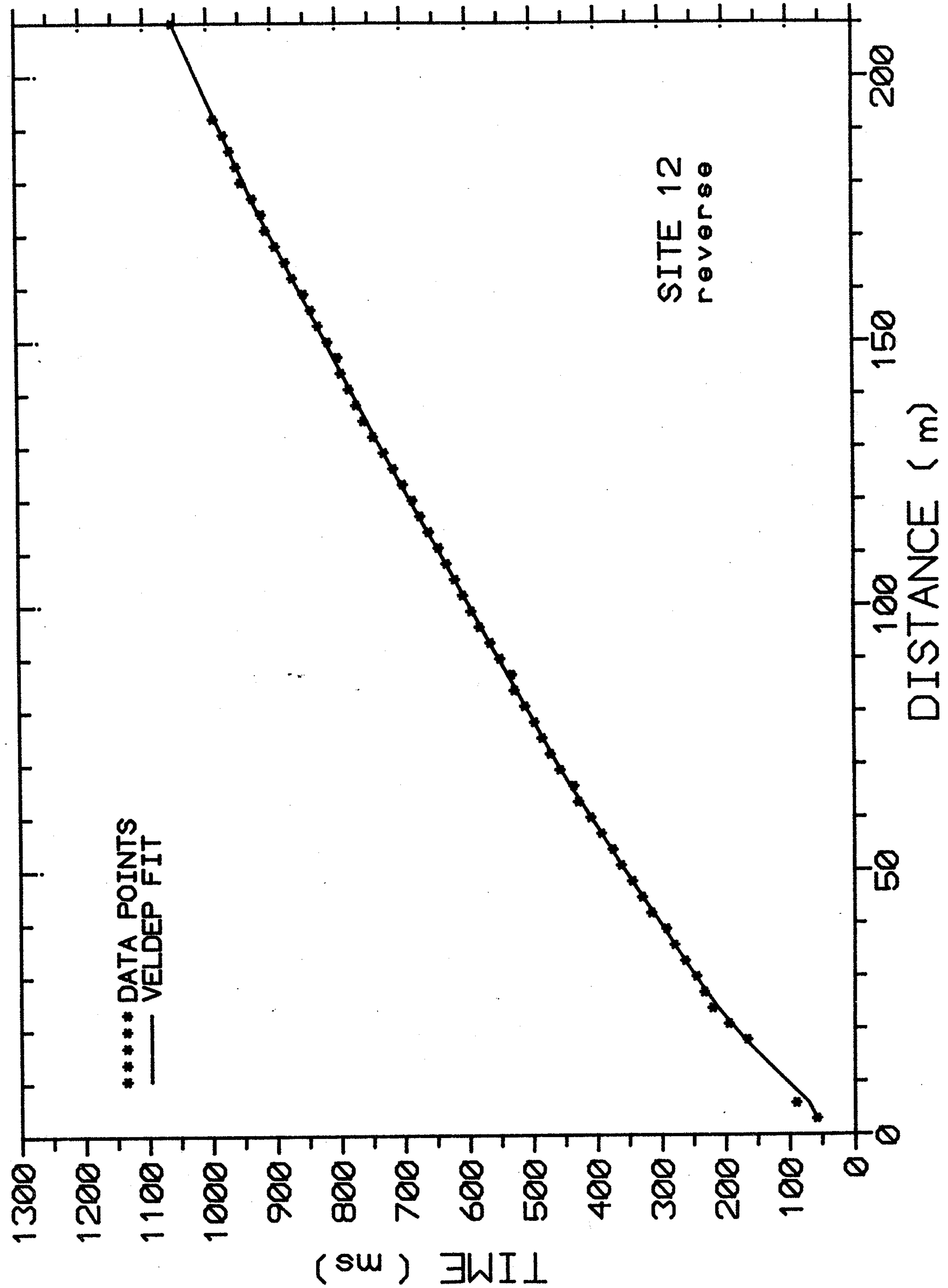

SITE 11
reverse
***** DATA POINTS
—— VELDEP FIT
TIME (ms)
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
DISTANCE (m)
0
50
100
150
200



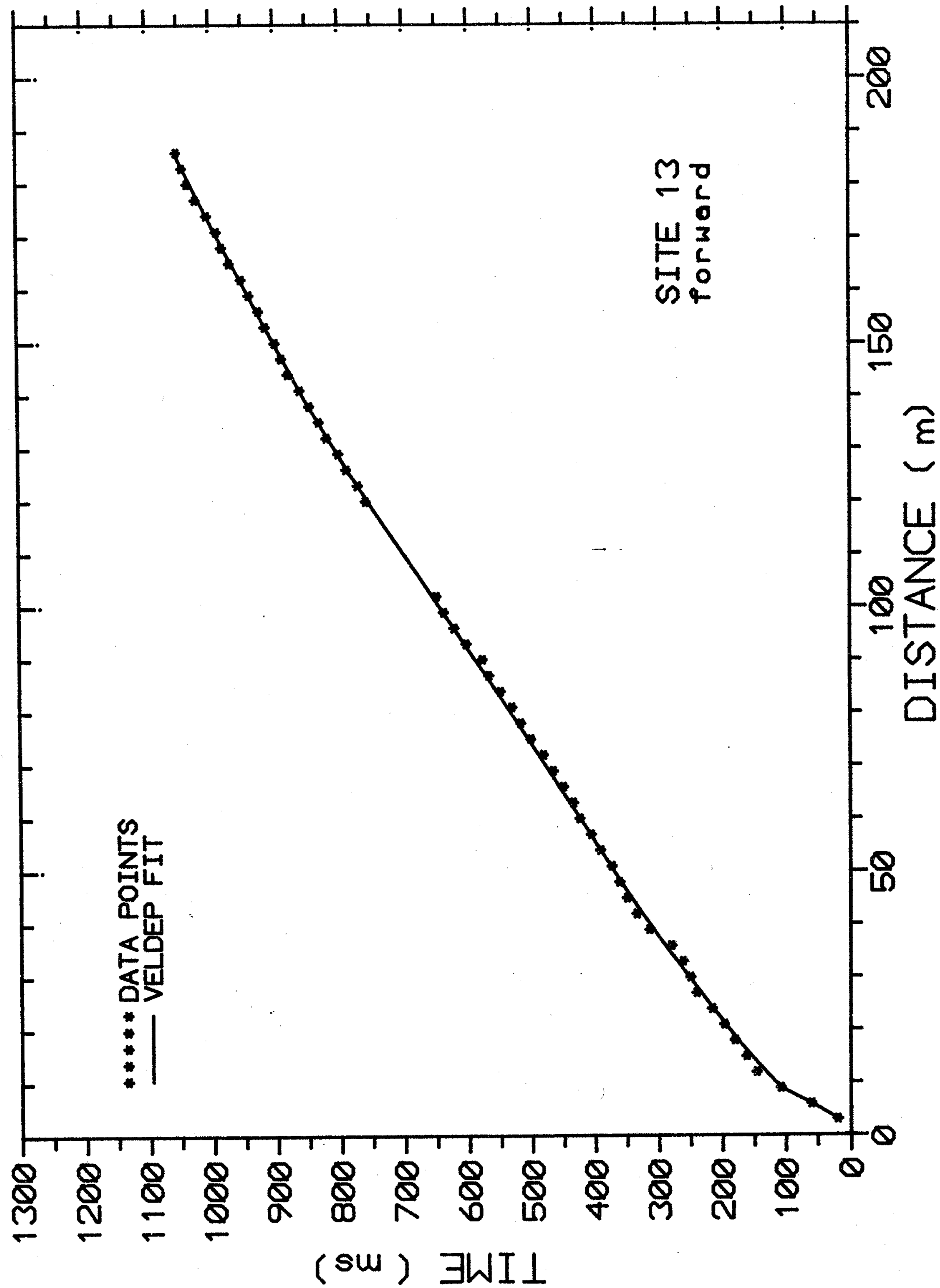
***** DATA POINTS
—— VELDEP FIT
SITE 11
forward
DISTANCE (m)
TIME (ms)
0
50
100
150
200
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300

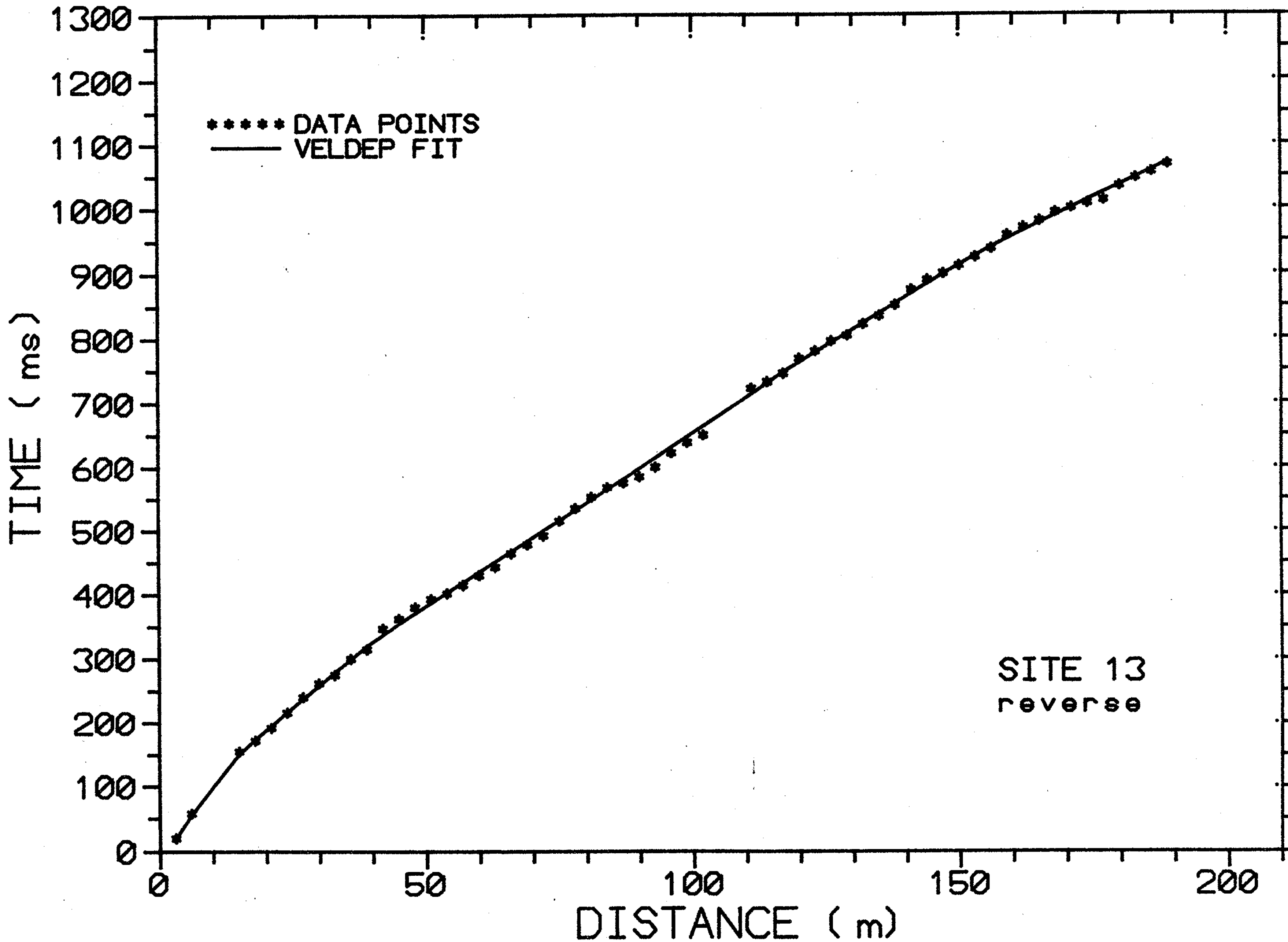


***** DATA POINTS
VELDEP FIT
SITE 12
forward
TIME (ms)
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
DISTANCE (m)
0
50
100
150
200

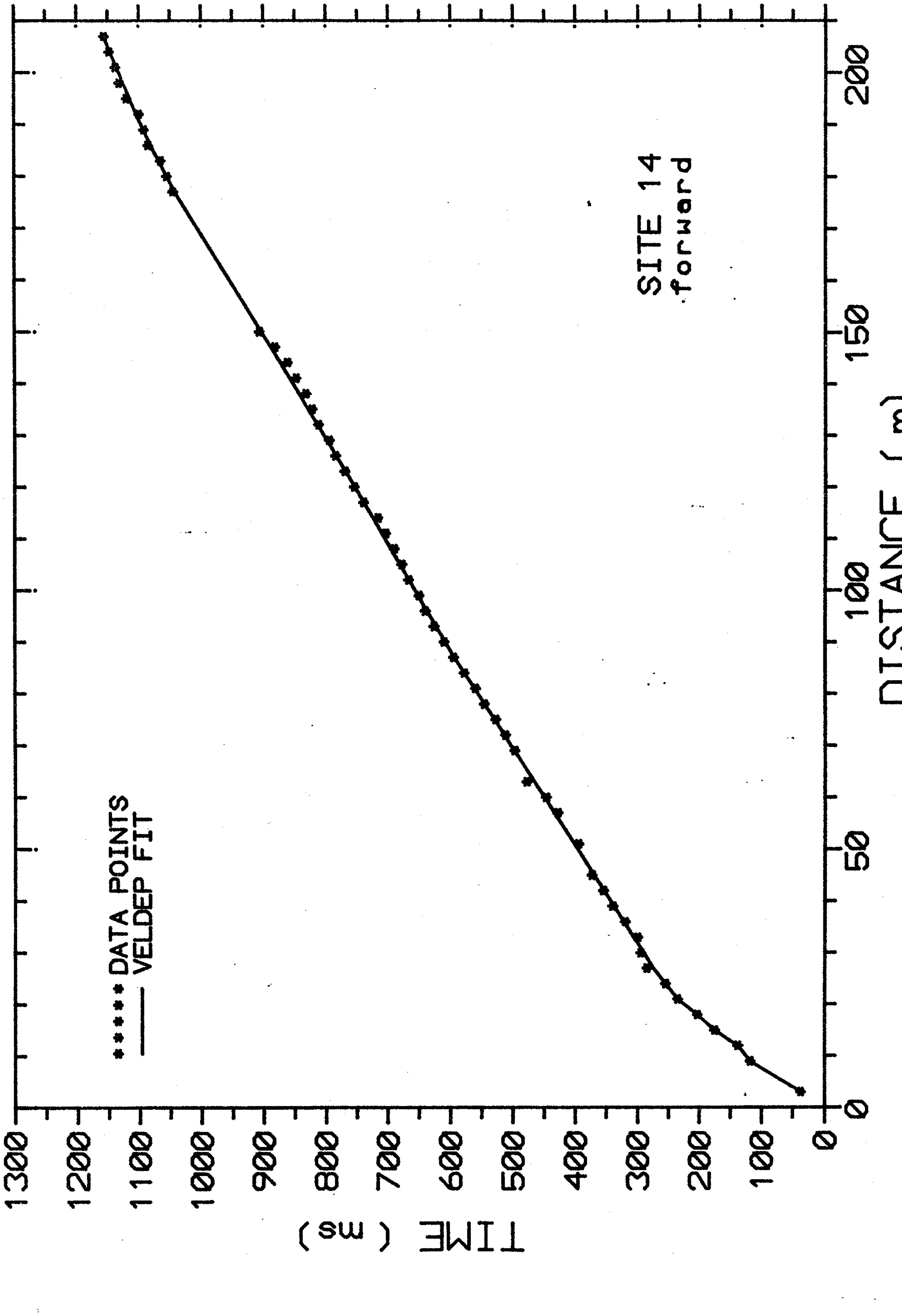


SITE 12
reverse
***** DATA POINTS
—— VELDEP FIT
TIME (ms)
DISTANCE (m)
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
0
50
100
150
200

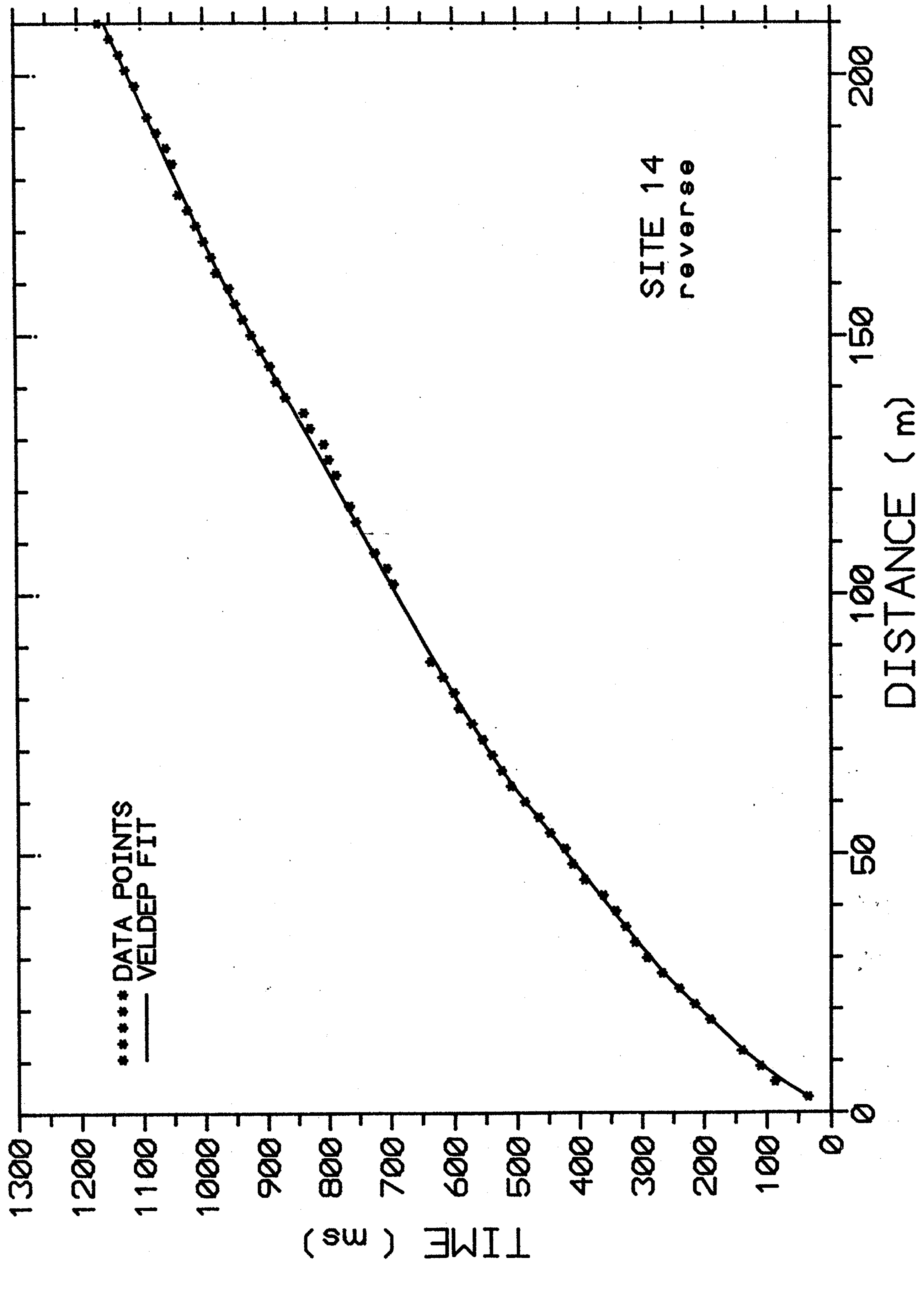

SITE 13
forward
***** DATA POINTS
—— VELDEP FIT
TIME (ms)
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
DISTANCE (m)
0
50
100
150
200



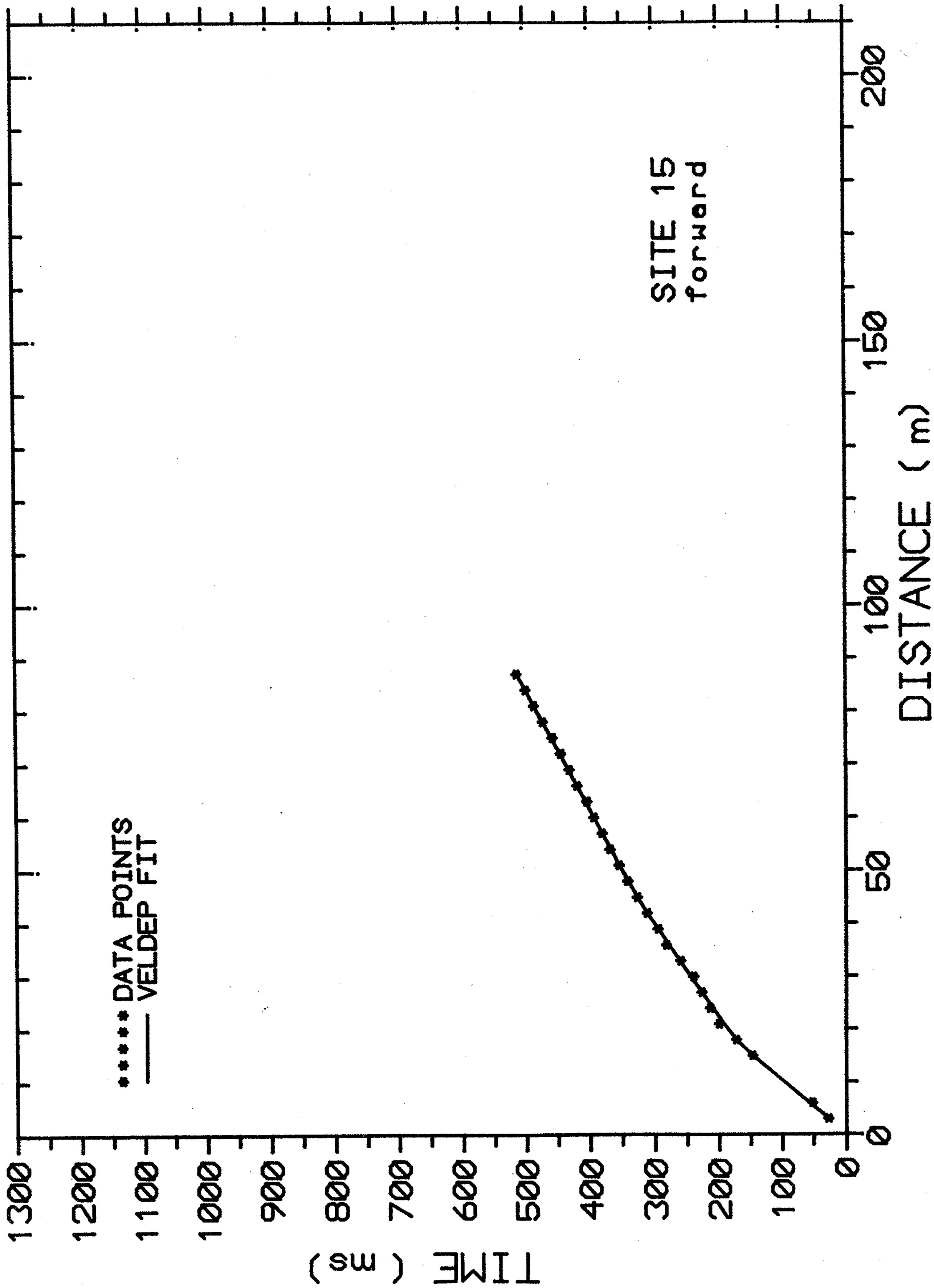
TIME (ms)
DISTANCE (m)
***** DATA POINTS
VELDEP FIT
SITE 13
reverse
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
0
50
100
150
200



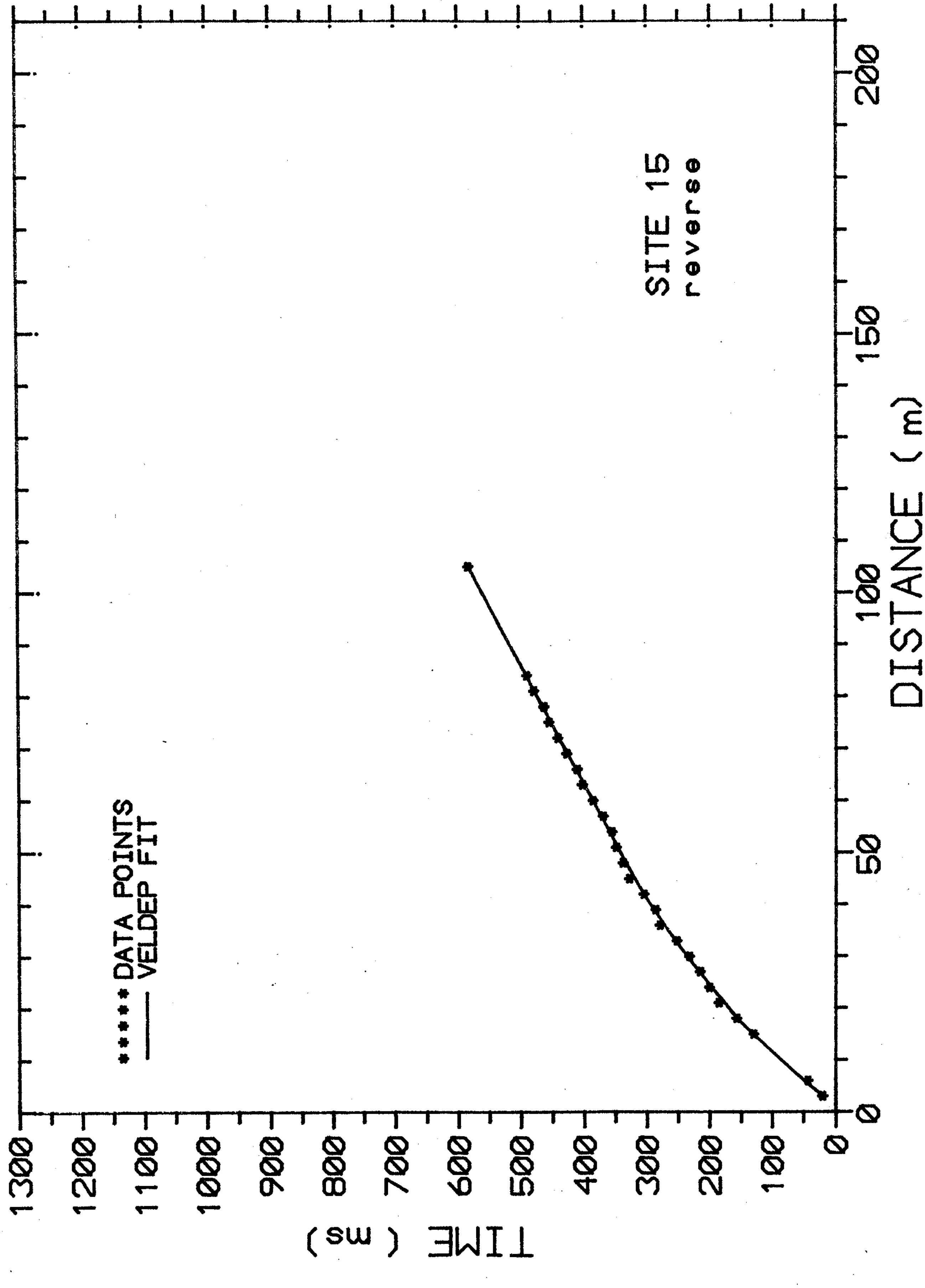
SITE 14
forward
***** DATA POINTS
—— VELDEP FIT
DISTANCE (m)
TIME (ms)
0
50
100
150
200
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300

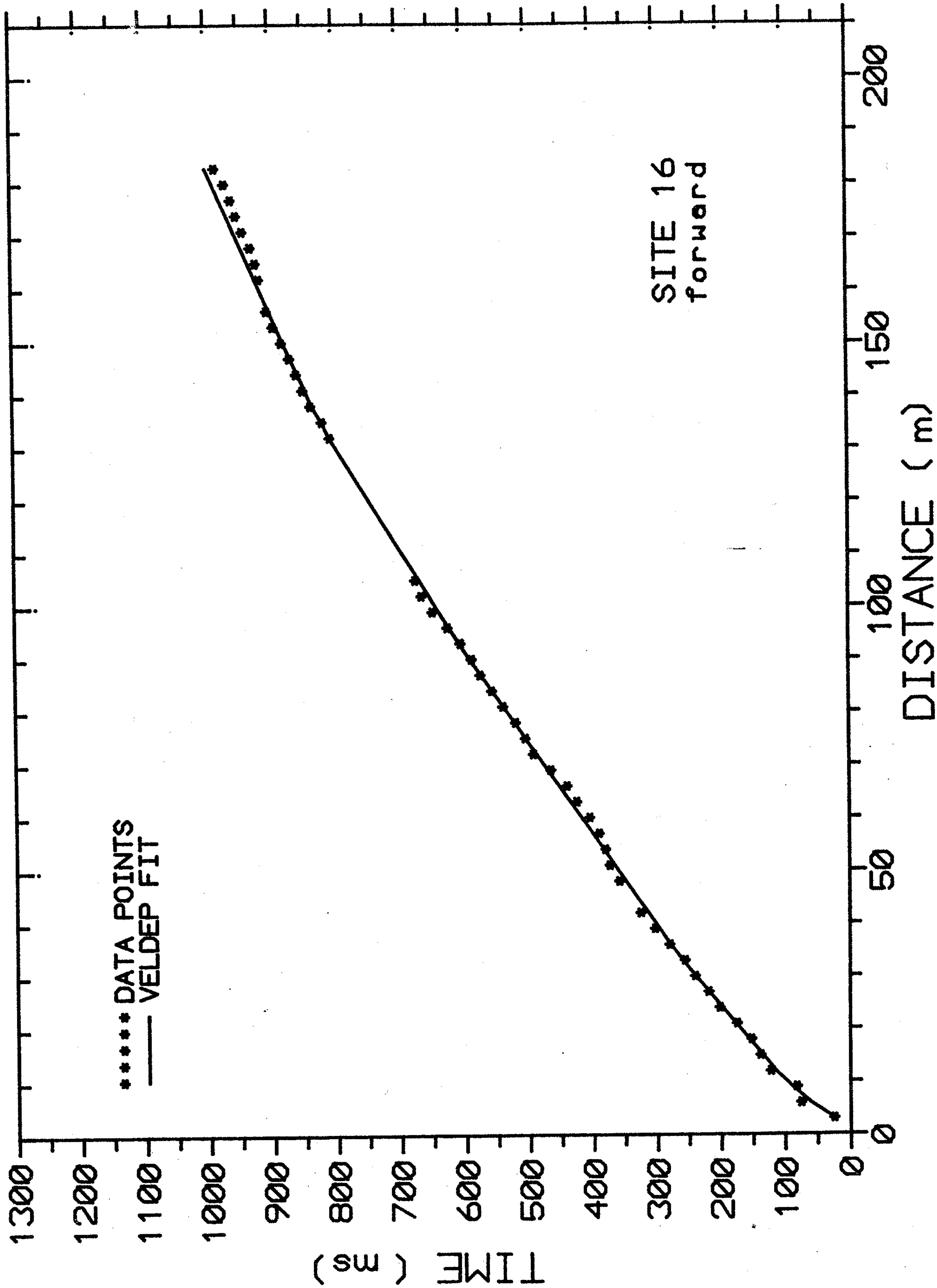


SITE 14
reverse
***** DATA POINTS
—— VELDEP FIT
TIME (ms)
DISTANCE (m)
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
0
50
100
150
200

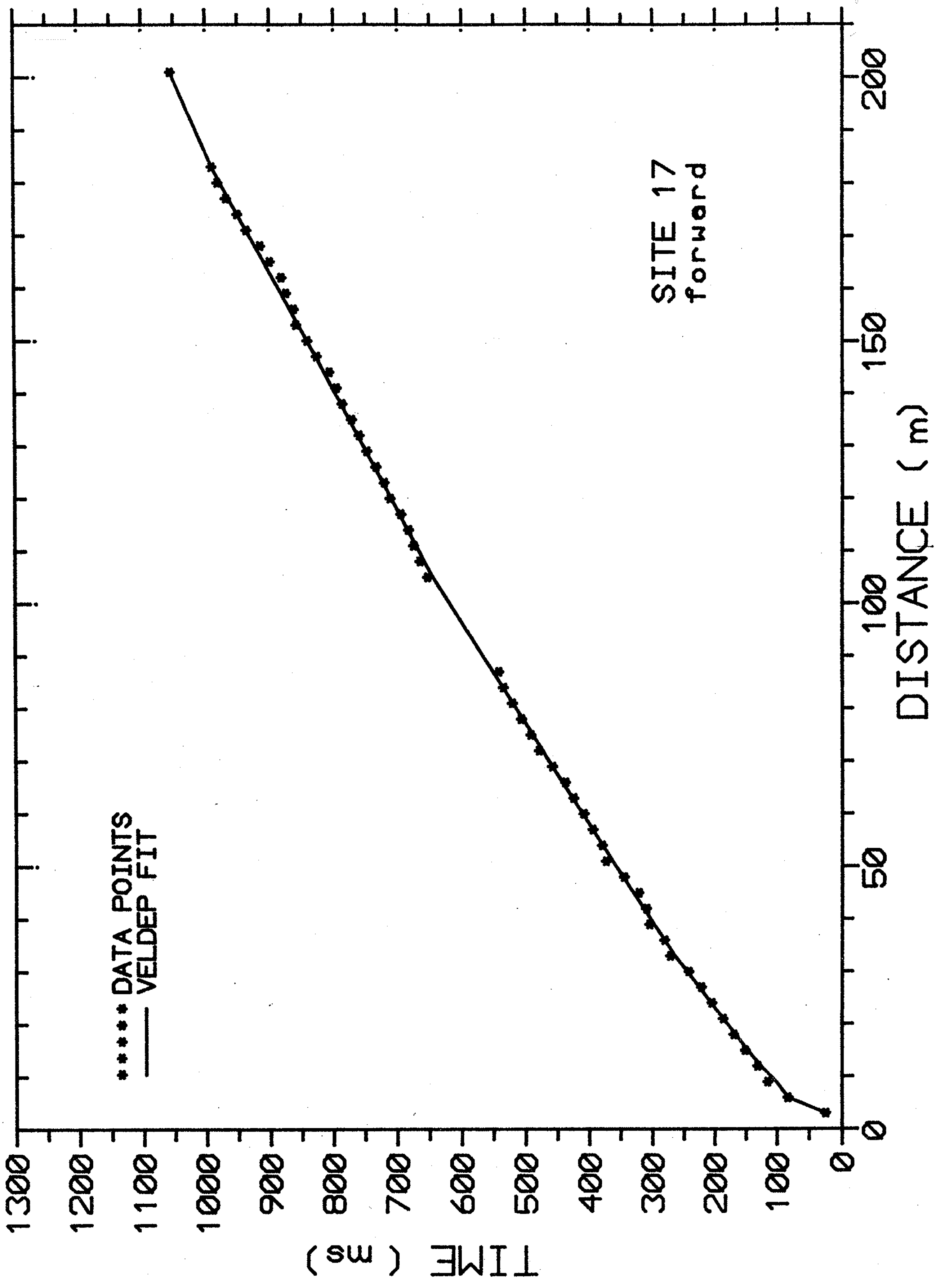


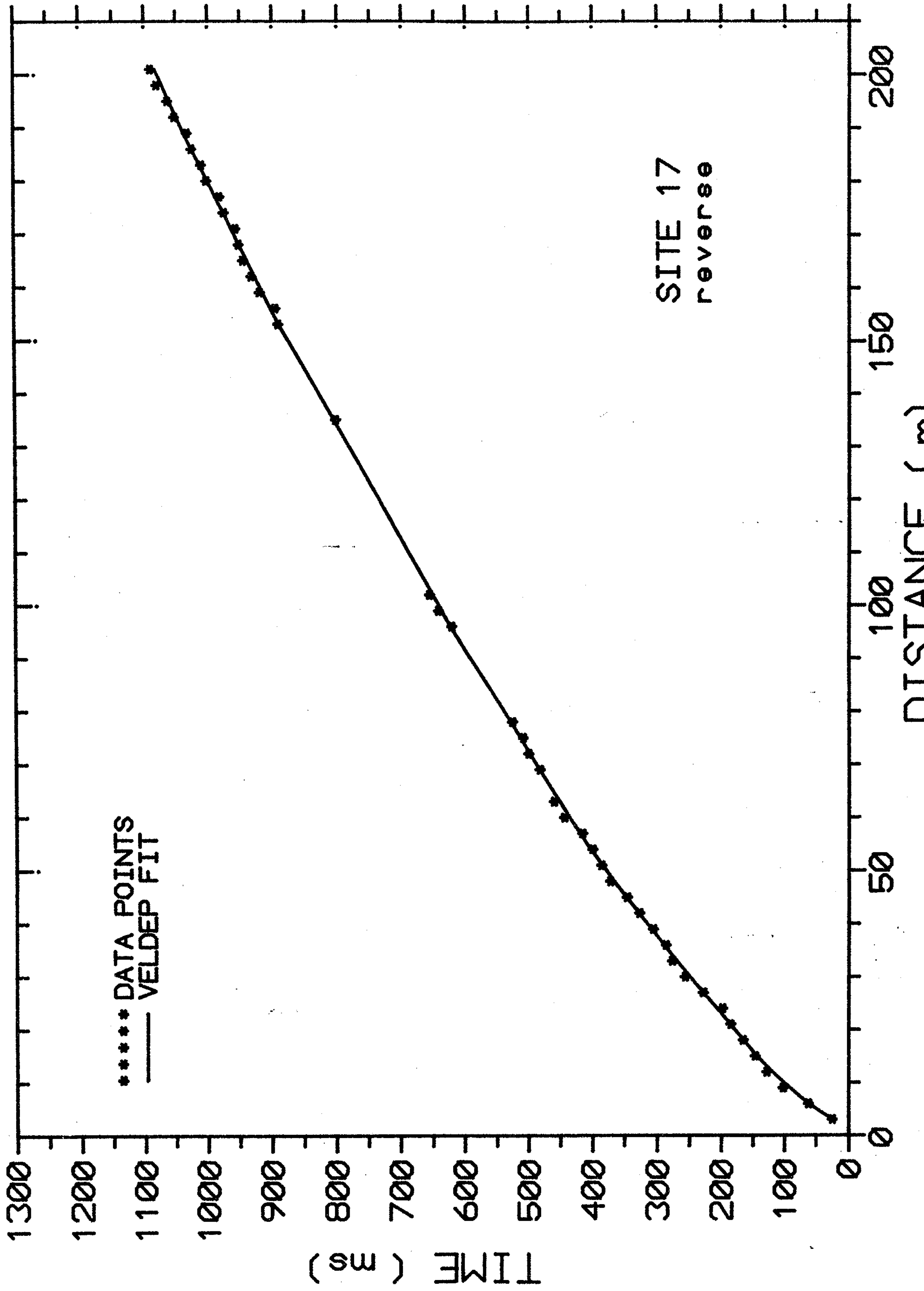
SITE 15
forward
DATA POINTS
VELDEP FIT
DISTANCE (m)
TIME (ms)
0
50
100
150
200
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300


SITE 15
reverse
***** DATA POINTS
—— VELDEP FIT
TIME (ms)
DISTANCE (m)
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
0
50
100
150
200

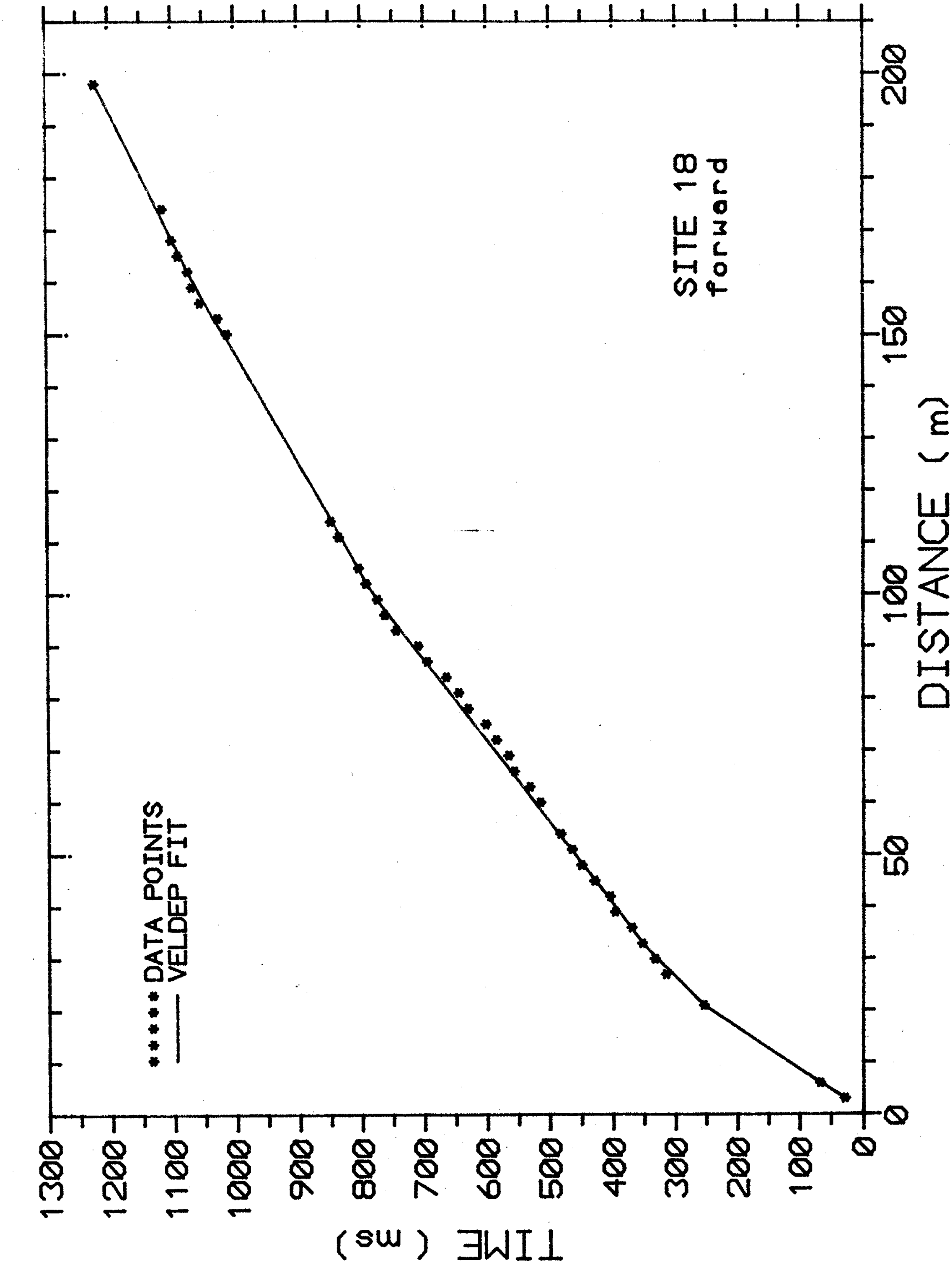


SITE 16
forward
***** DATA POINTS
—— VELDEP FIT
DISTANCE (m)
TIME (ms)
0
50
100
150
200
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300

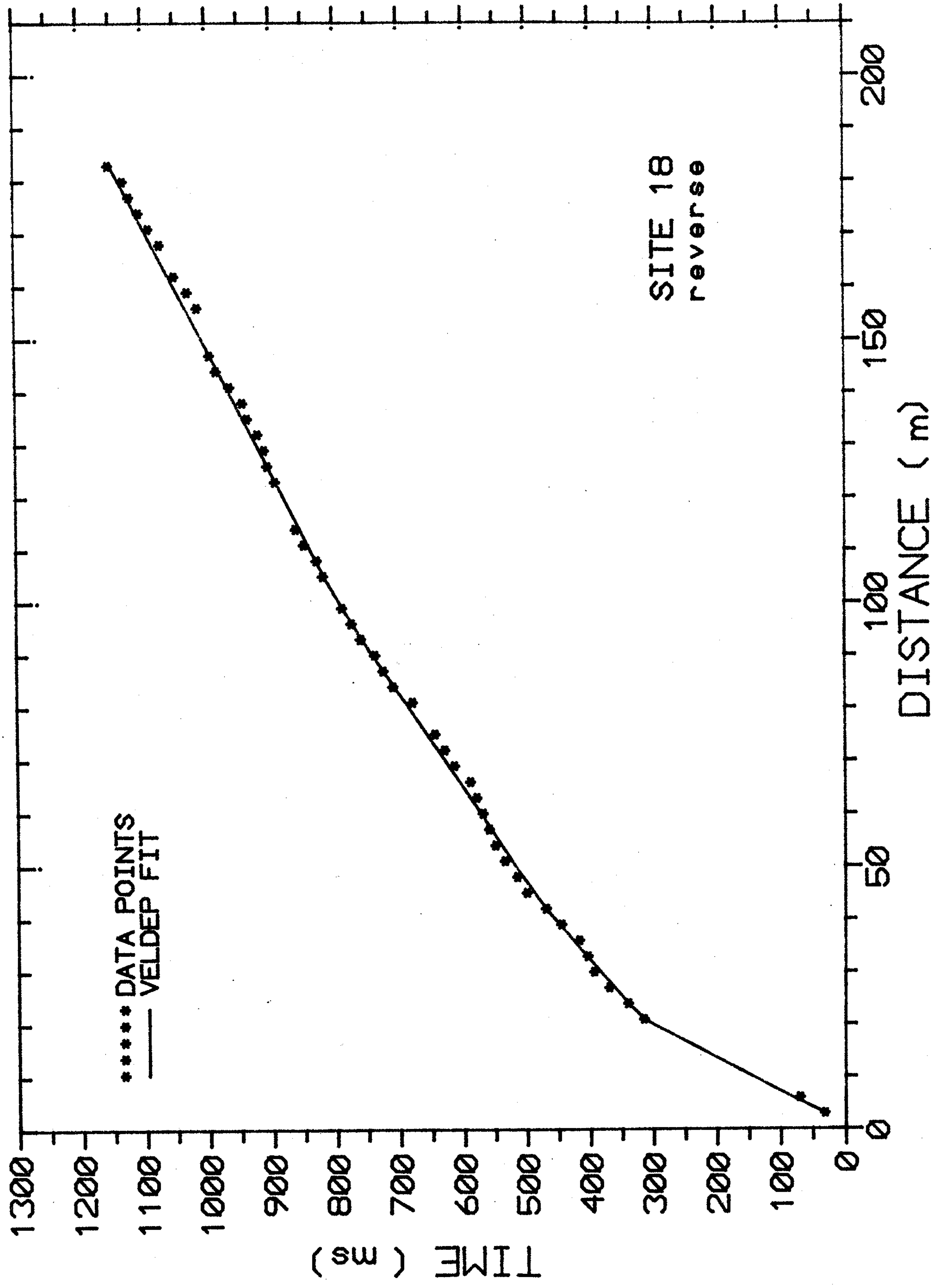

SITE 17
forward
***** DATA POINTS
—— VELDEP FIT
DISTANCE (m)
TIME (ms)
0
50
100
150
200
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300

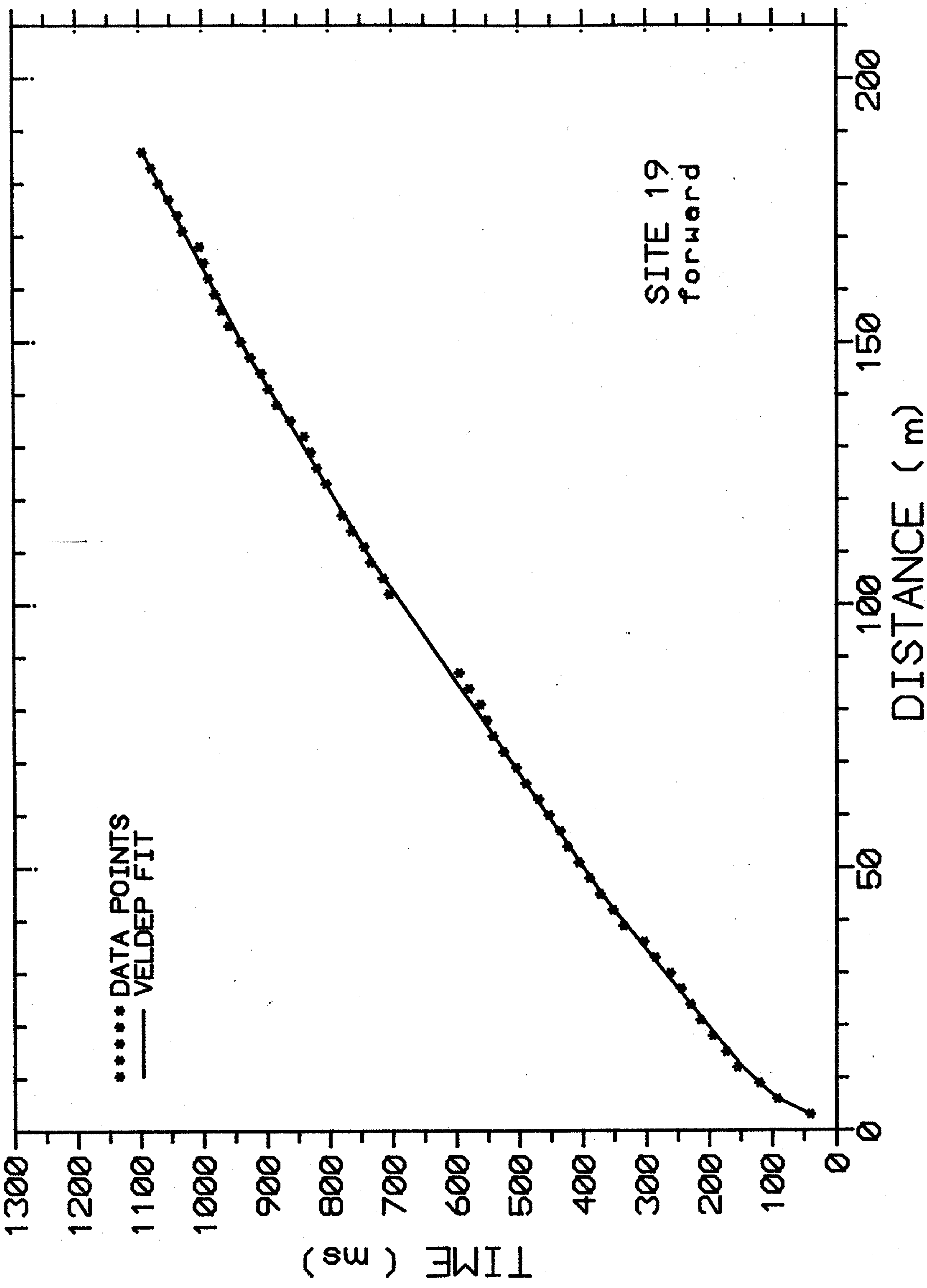


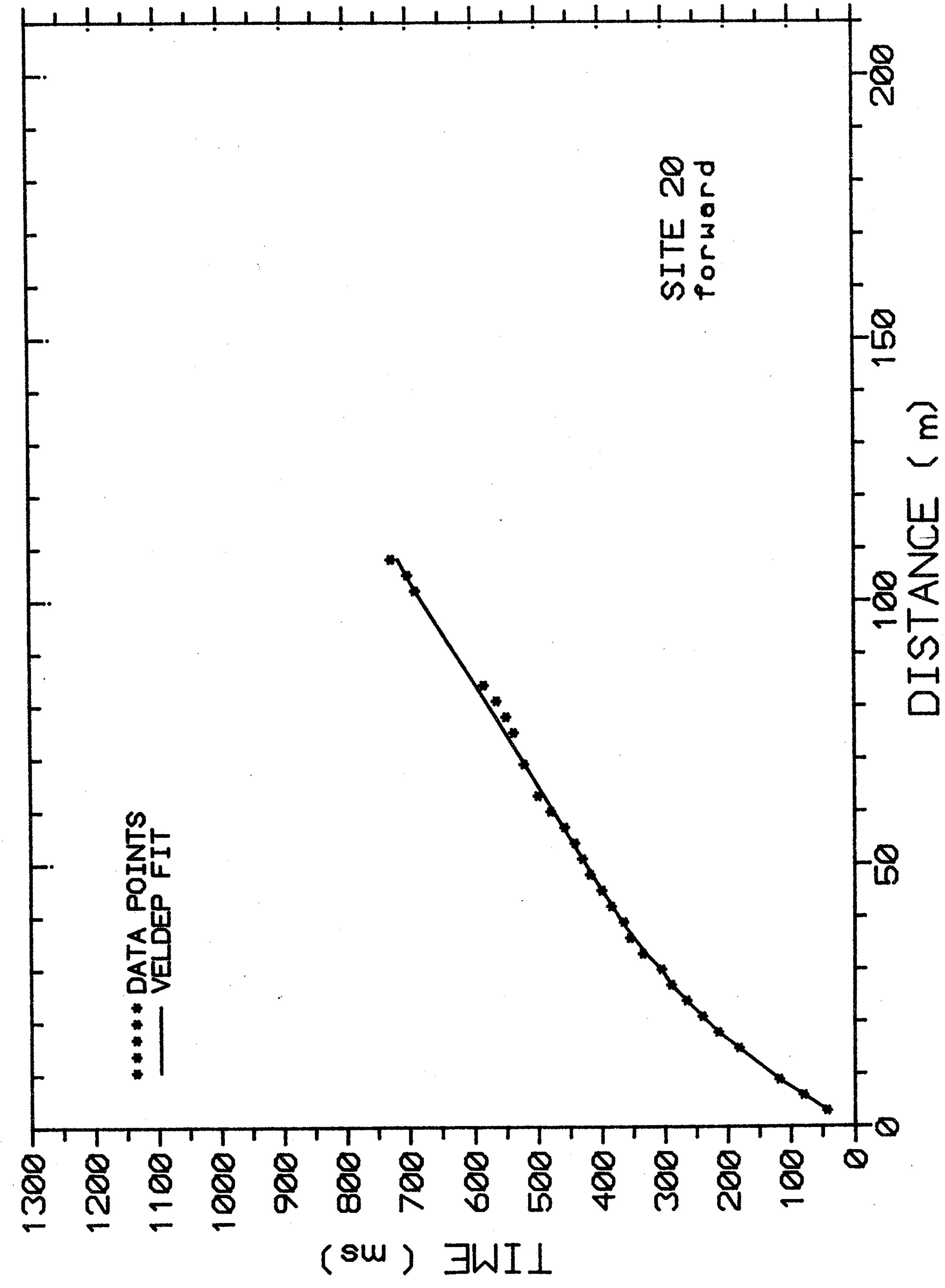
TIME (ms)
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
DISTANCE (m)
0
50
100
150
200
***** DATA POINTS
—— VELDEP FIT
SITE 17
reverse



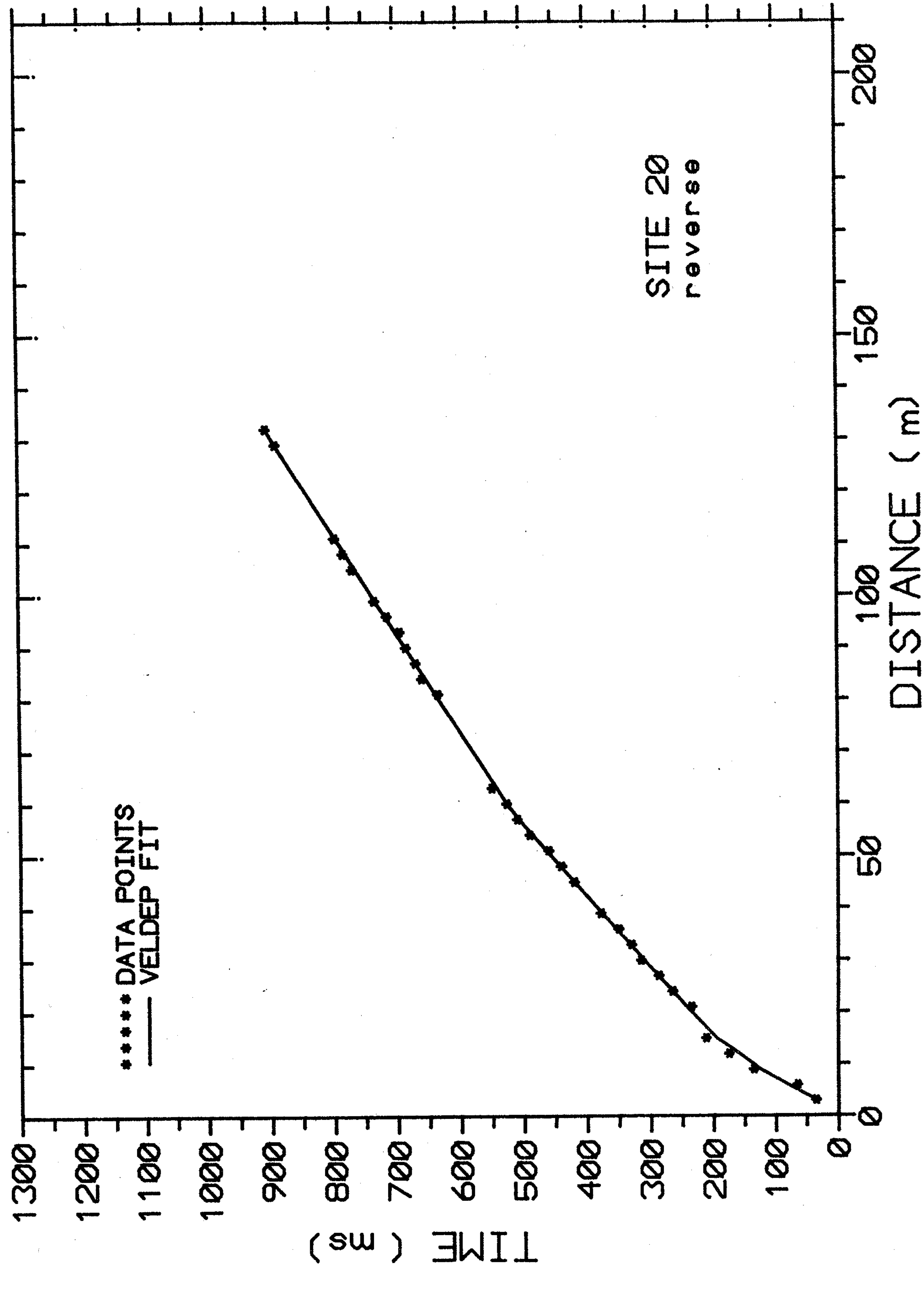
SITE 18
forward
***** DATA POINTS
—— VELDEP FIT
DISTANCE (m)
TIME (ms)
0
50
100
150
200
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300

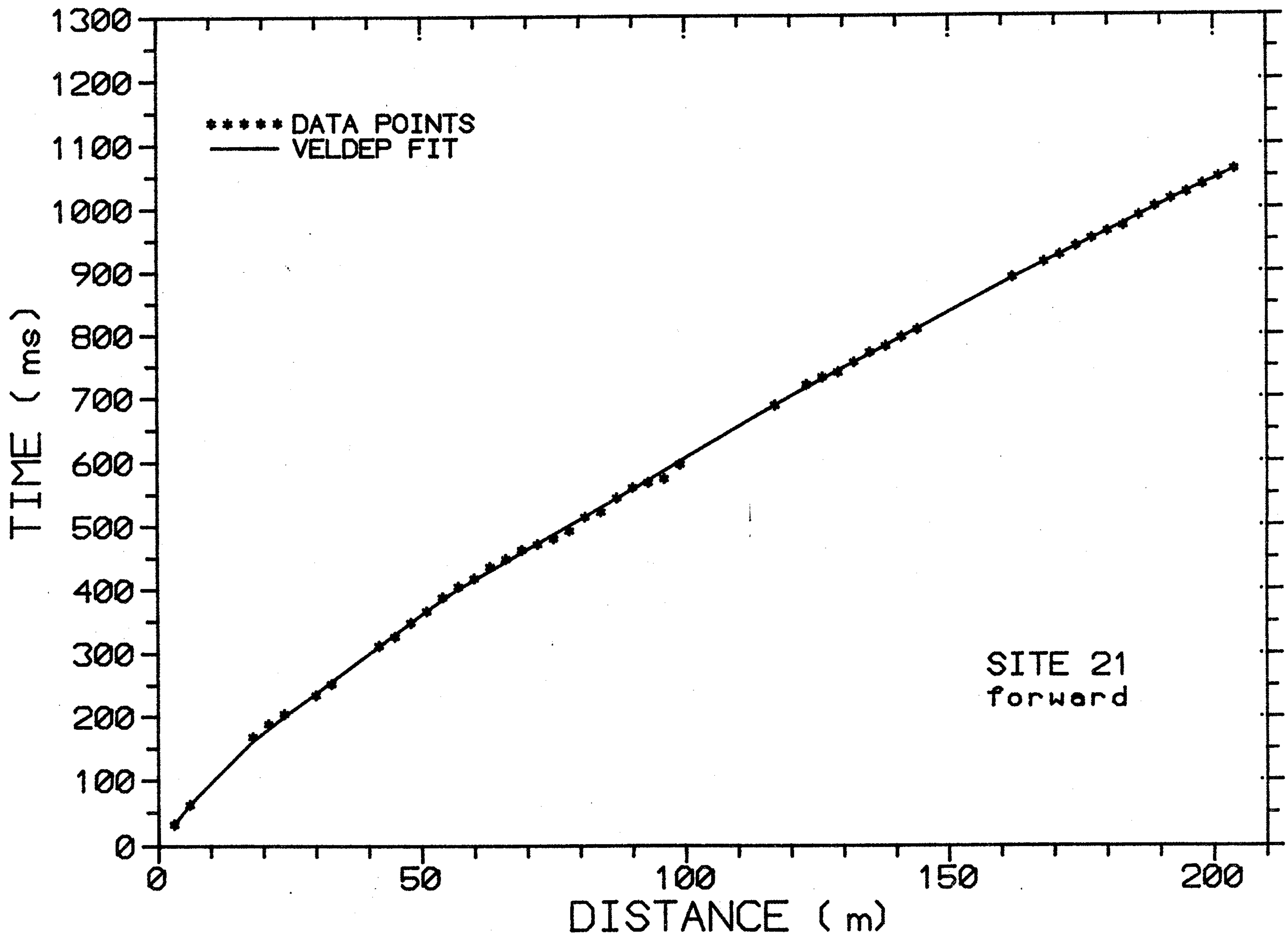

SITE 18
reverse
***** DATA POINTS
—— VELDEP FIT
DISTANCE (m)
0
50
100
150
200
TIME (ms)
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300

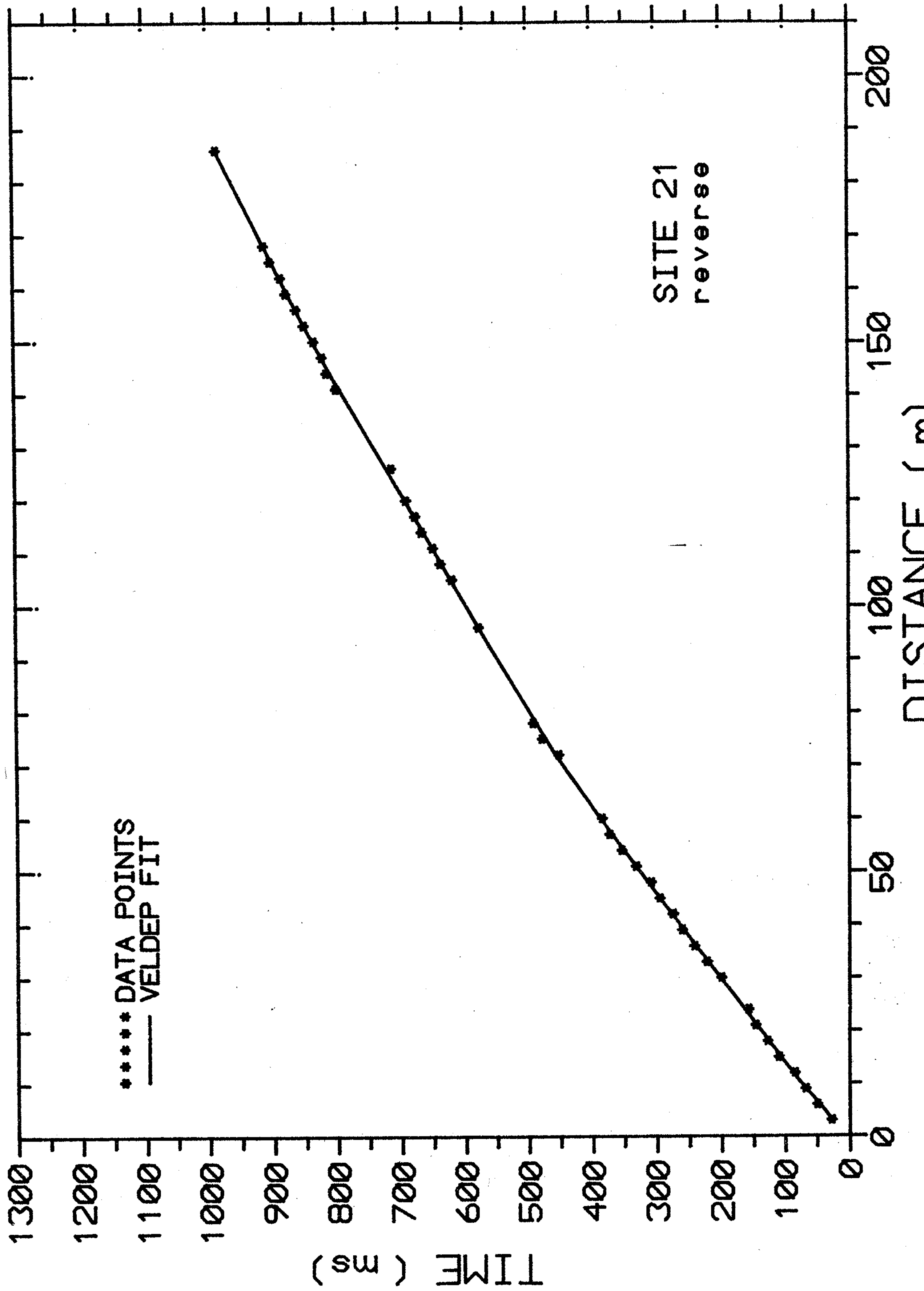

SITE 19
forward
***** DATA POINTS
—— VELDEP FIT
DISTANCE (m)
TIME (ms)
0
50
100
150
200
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300

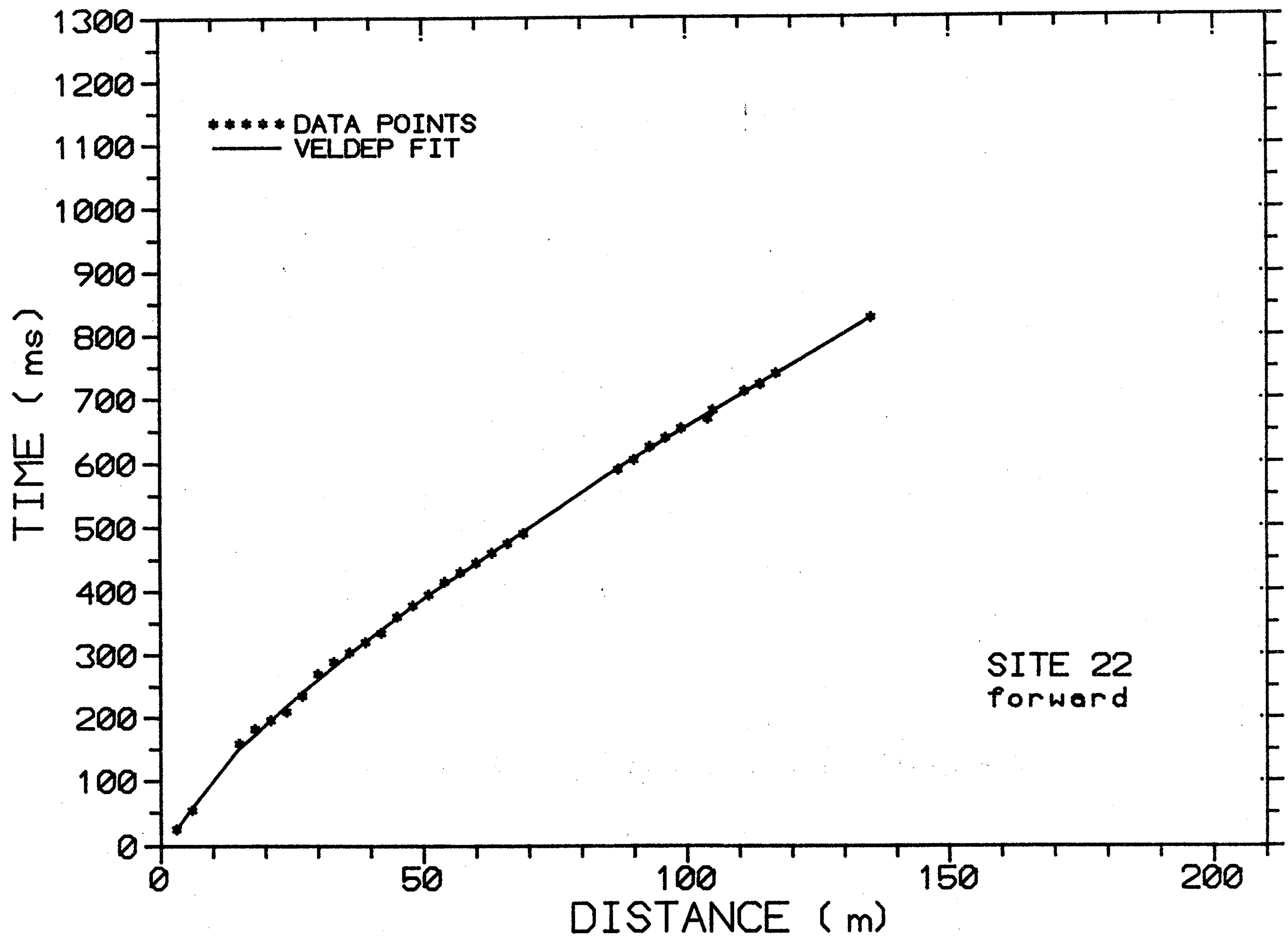


SITE 20
forward
***** DATA POINTS
—— VELDEP FIT
DISTANCE (m)
TIME (ms)
0
50
100
150
200
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300

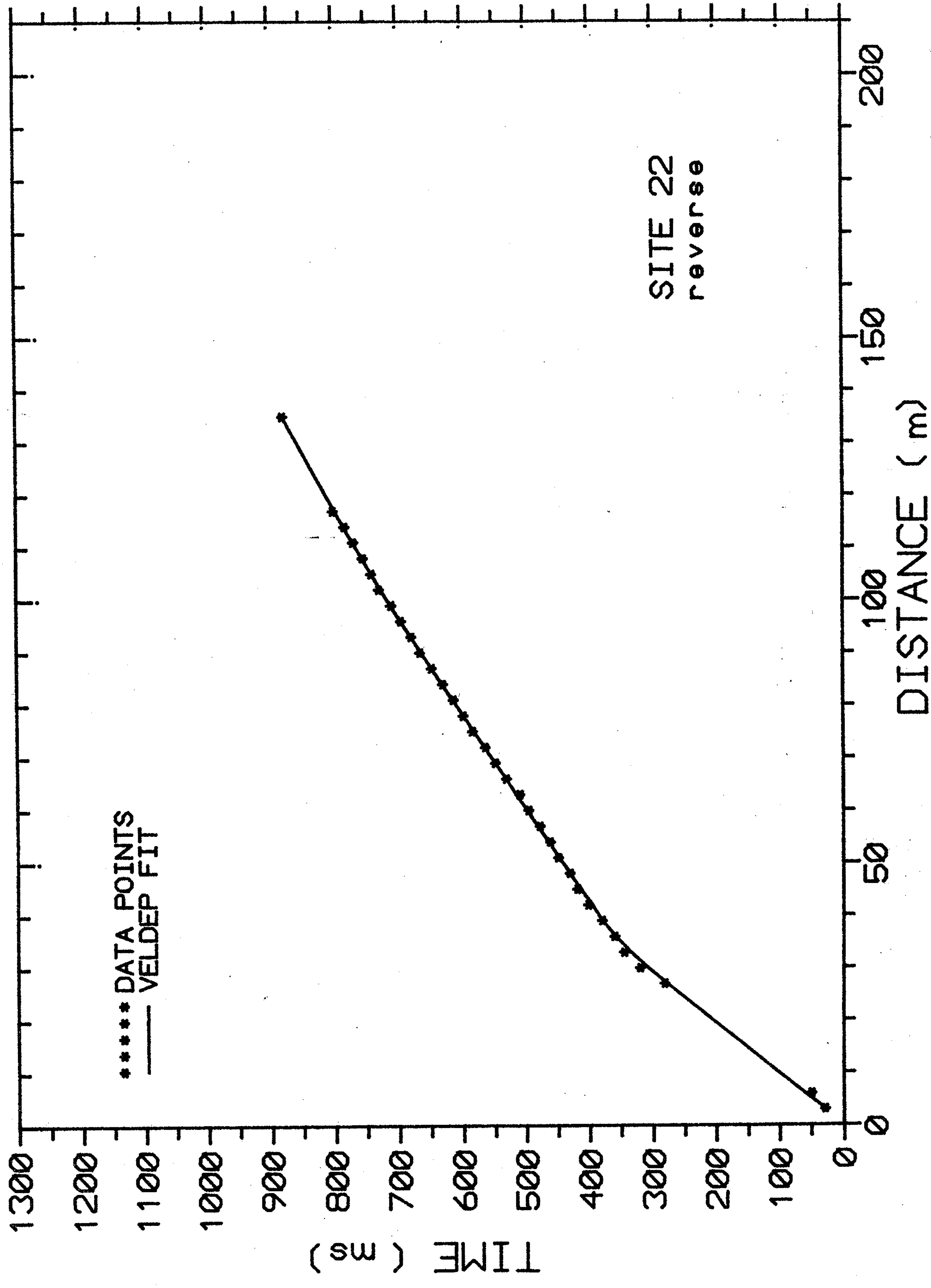

SITE 20
reverse
***** DATA POINTS
—— VELDEP FIT
DISTANCE (m)
0
50
100
150
200
TIME (ms)
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300


1300
1200
1100
1000
900
800
700
600
500
400
300
200
100
0
TIME (ms)
***** DATA POINTS
——— VELDEP FIT
SITE 21
forward
0
50
100
150
200
DISTANCE (m)

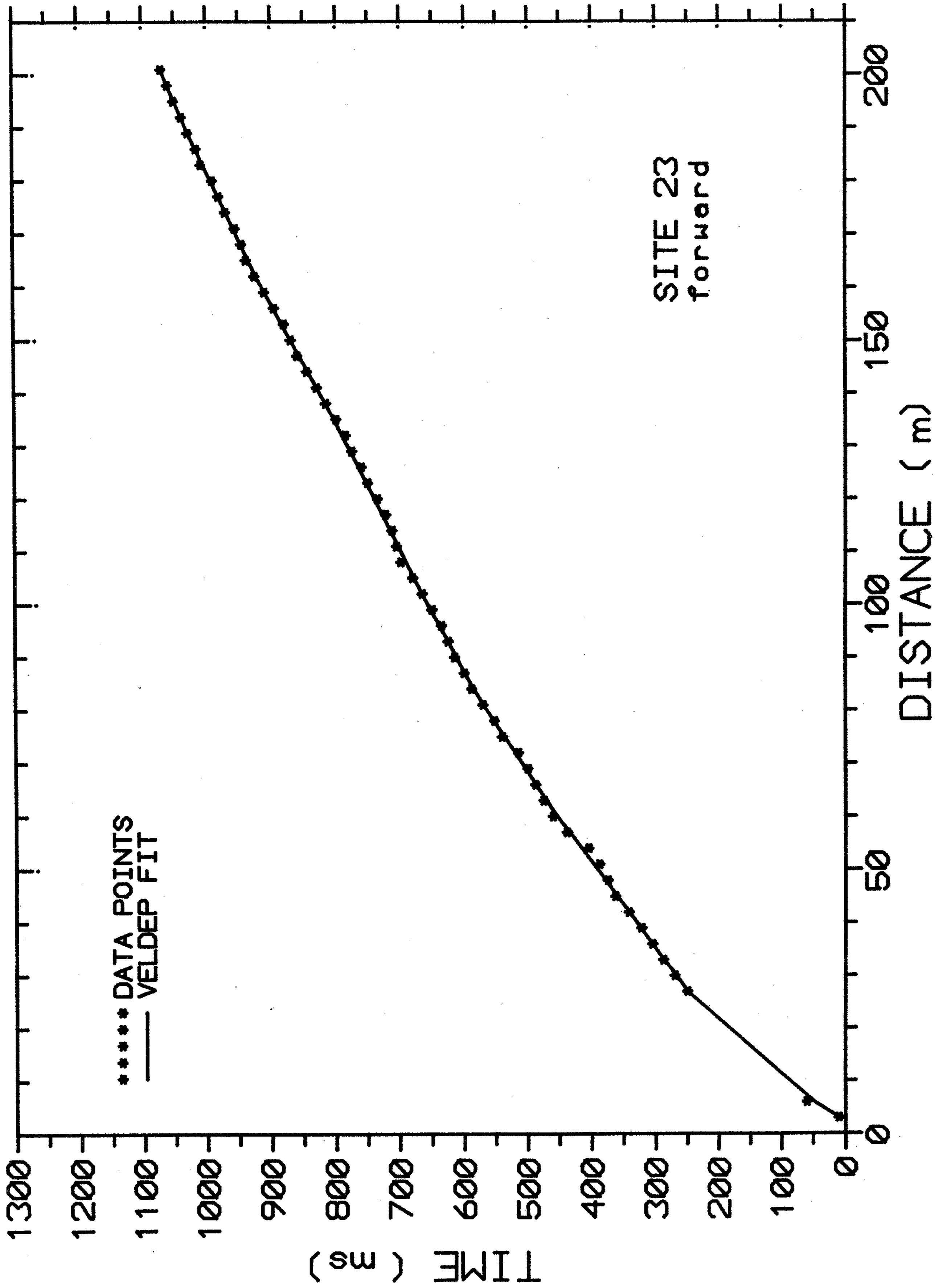

SITE 21
reverse
***** DATA POINTS
—— VELDEP FIT
DISTANCE (m)
TIME (ms)
0
50
100
150
200
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300



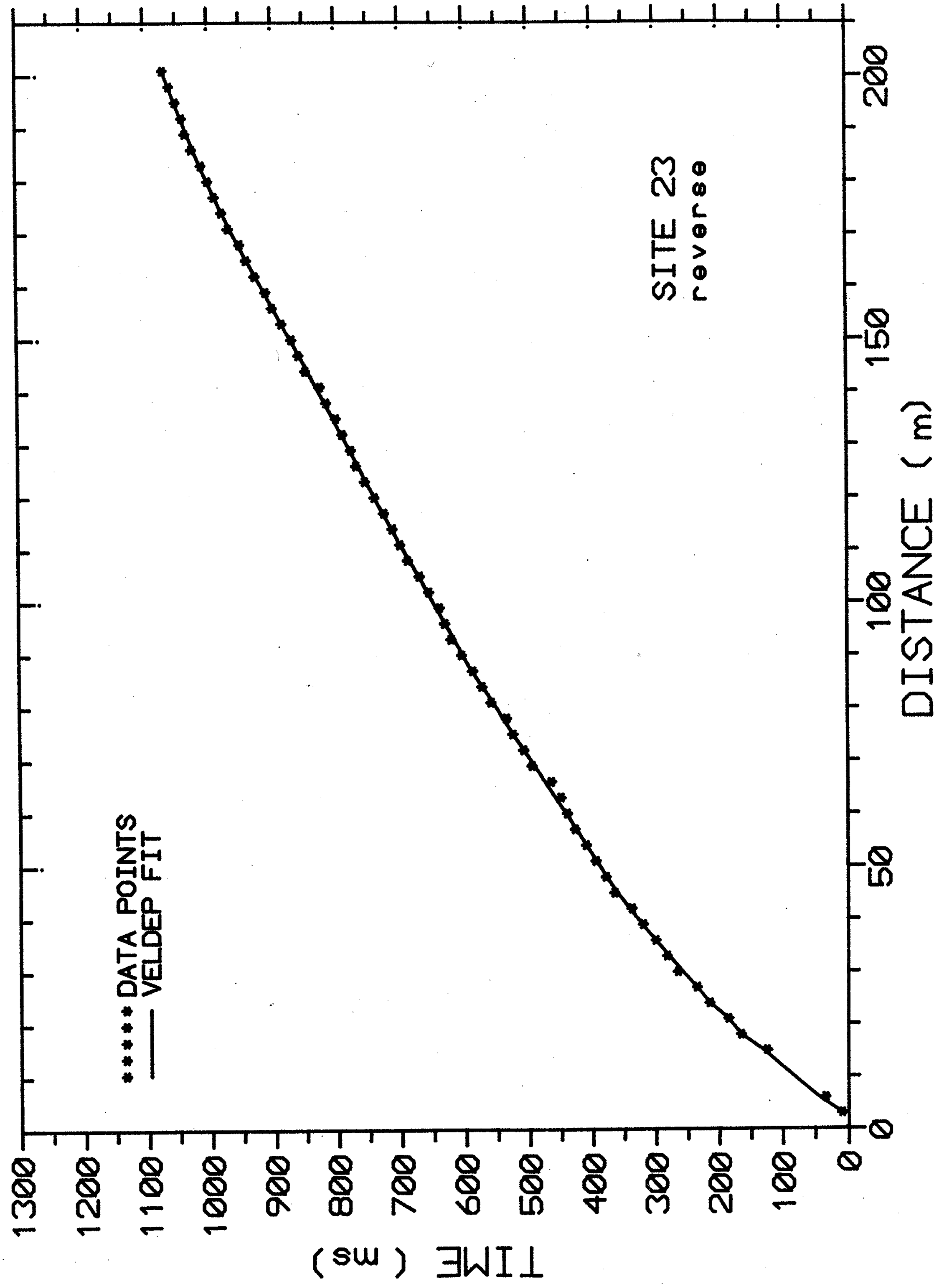
***** DATA POINTS
VELDEP FIT
SITE 22
forward
TIME (ms)
DISTANCE (m)
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
0
50
100
150
200

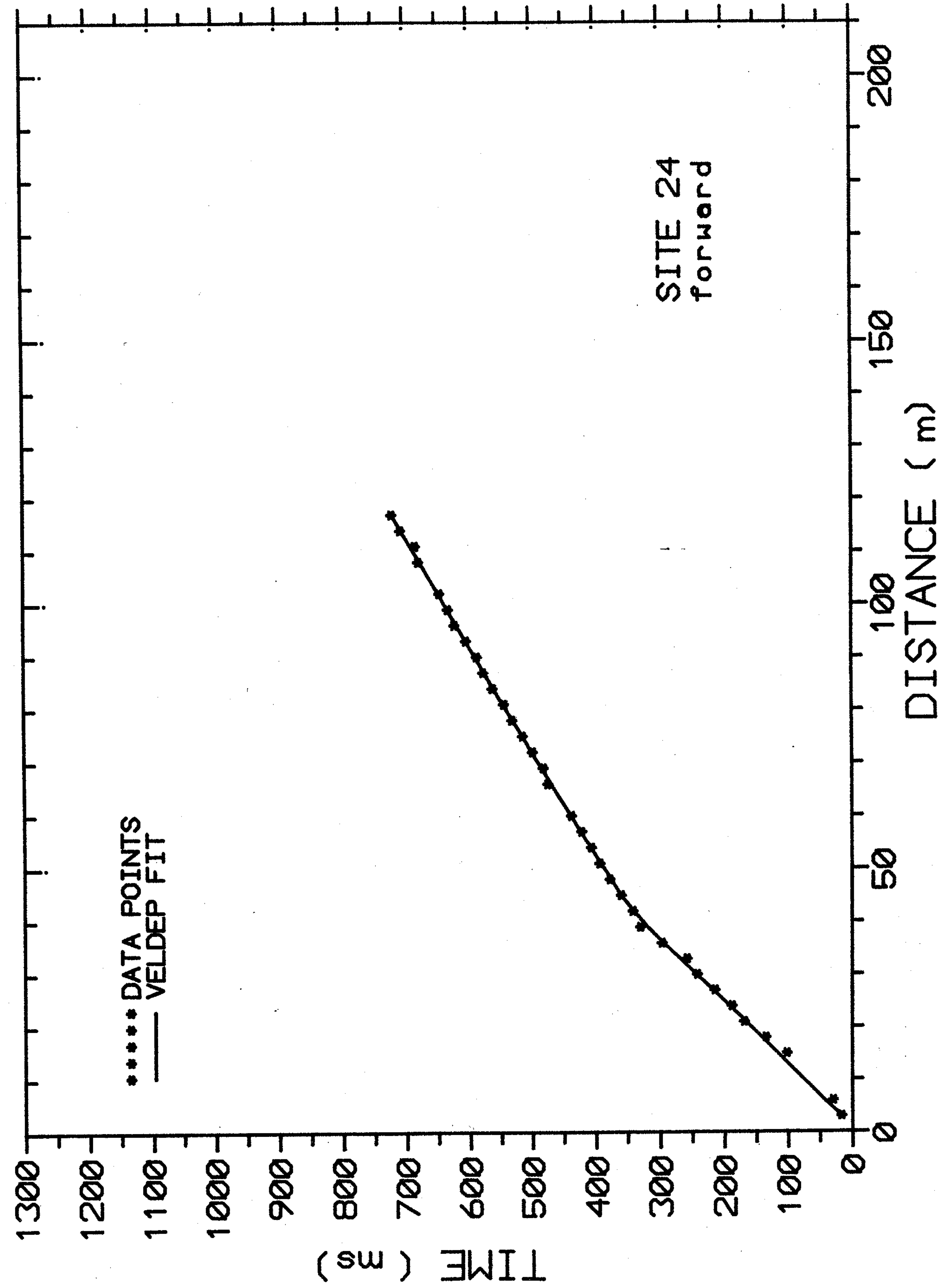


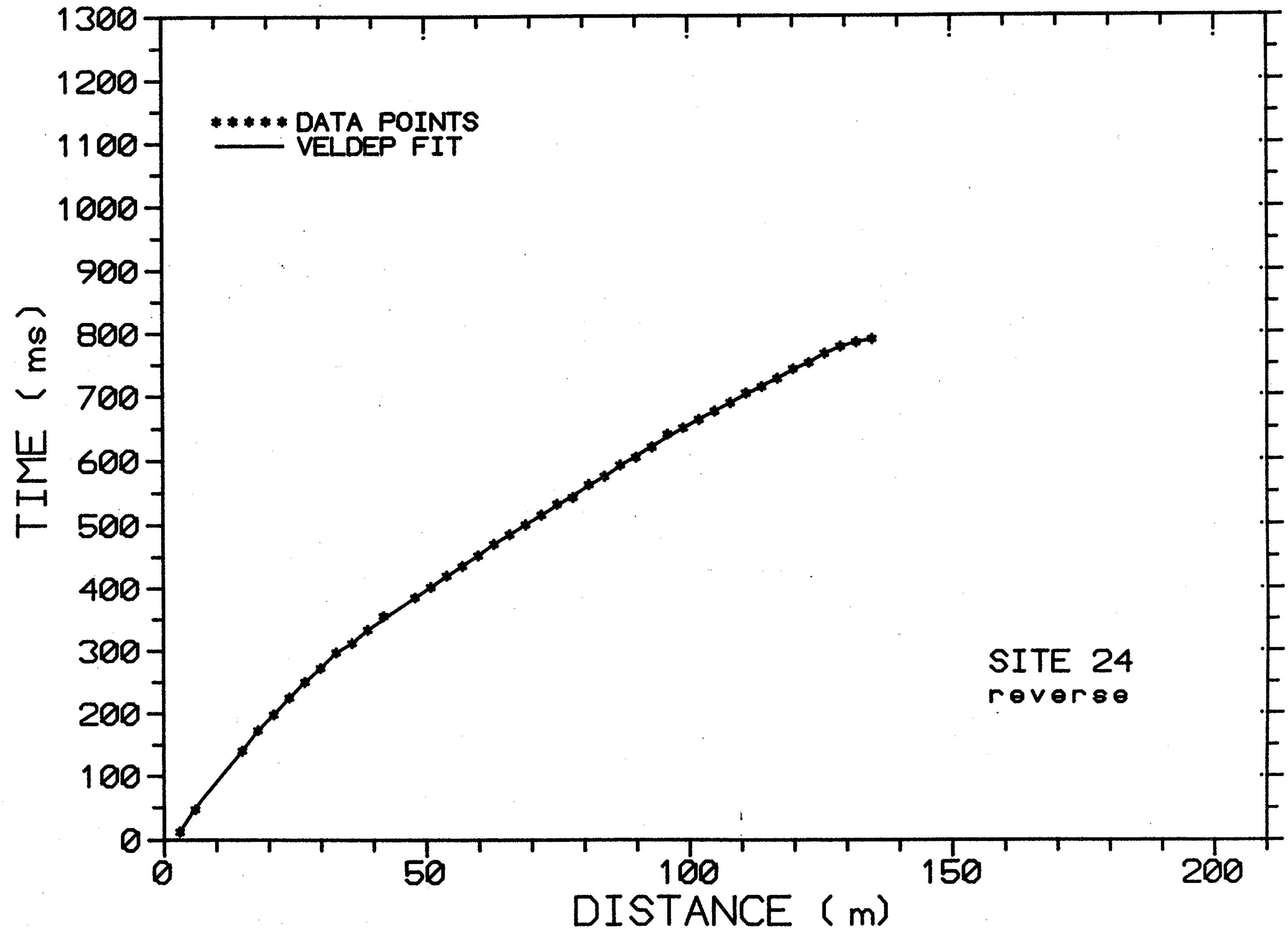
SITE 22
reverse
DATA POINTS
VELDEP FIT
DISTANCE (m)
TIME (ms)
0
50
100
150
200
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300

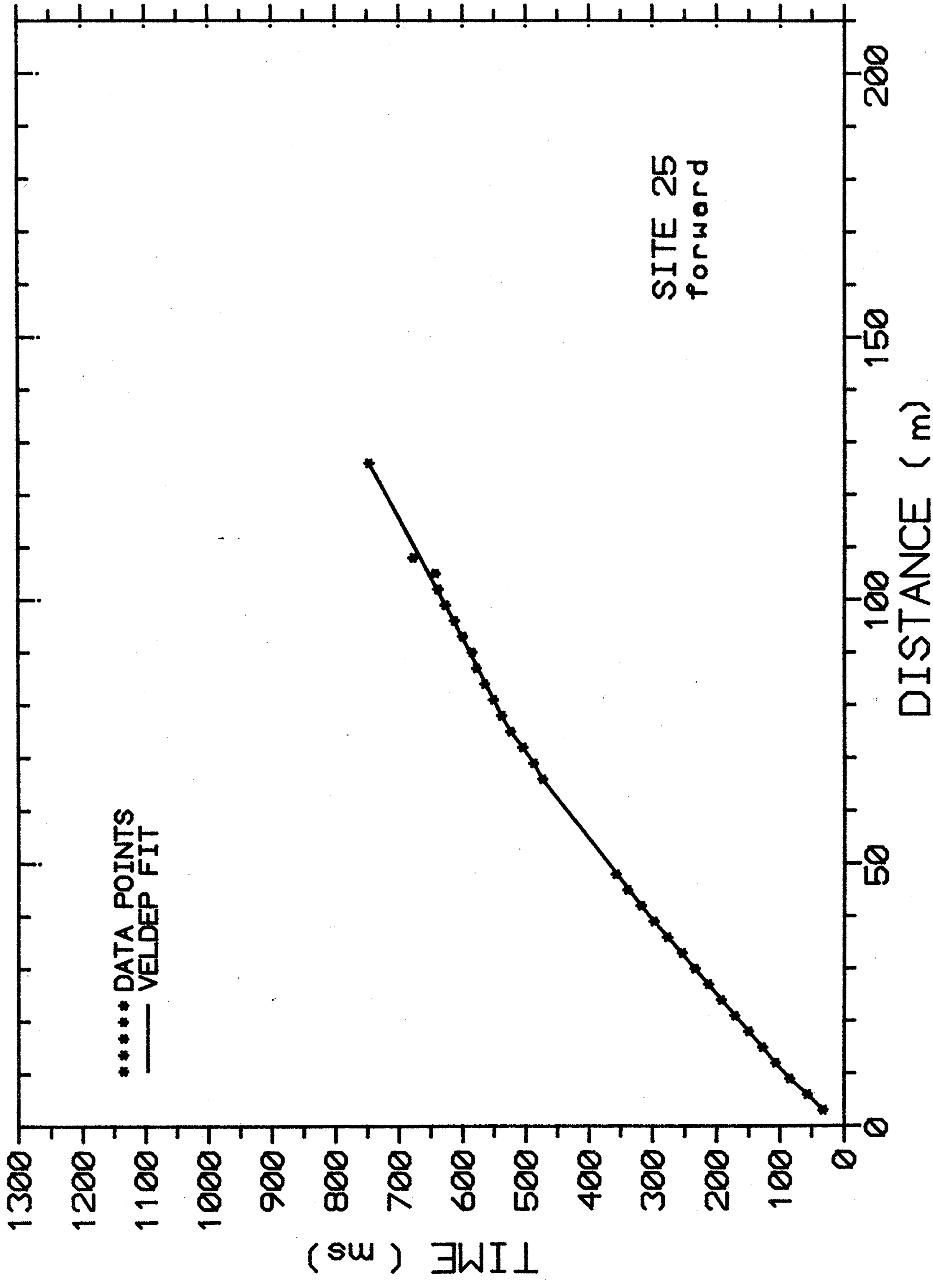


TIME (ms)
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
DISTANCE (m)
0
50
100
150
200
***** DATA POINTS
—— VELDEP FIT
SITE 23
forward

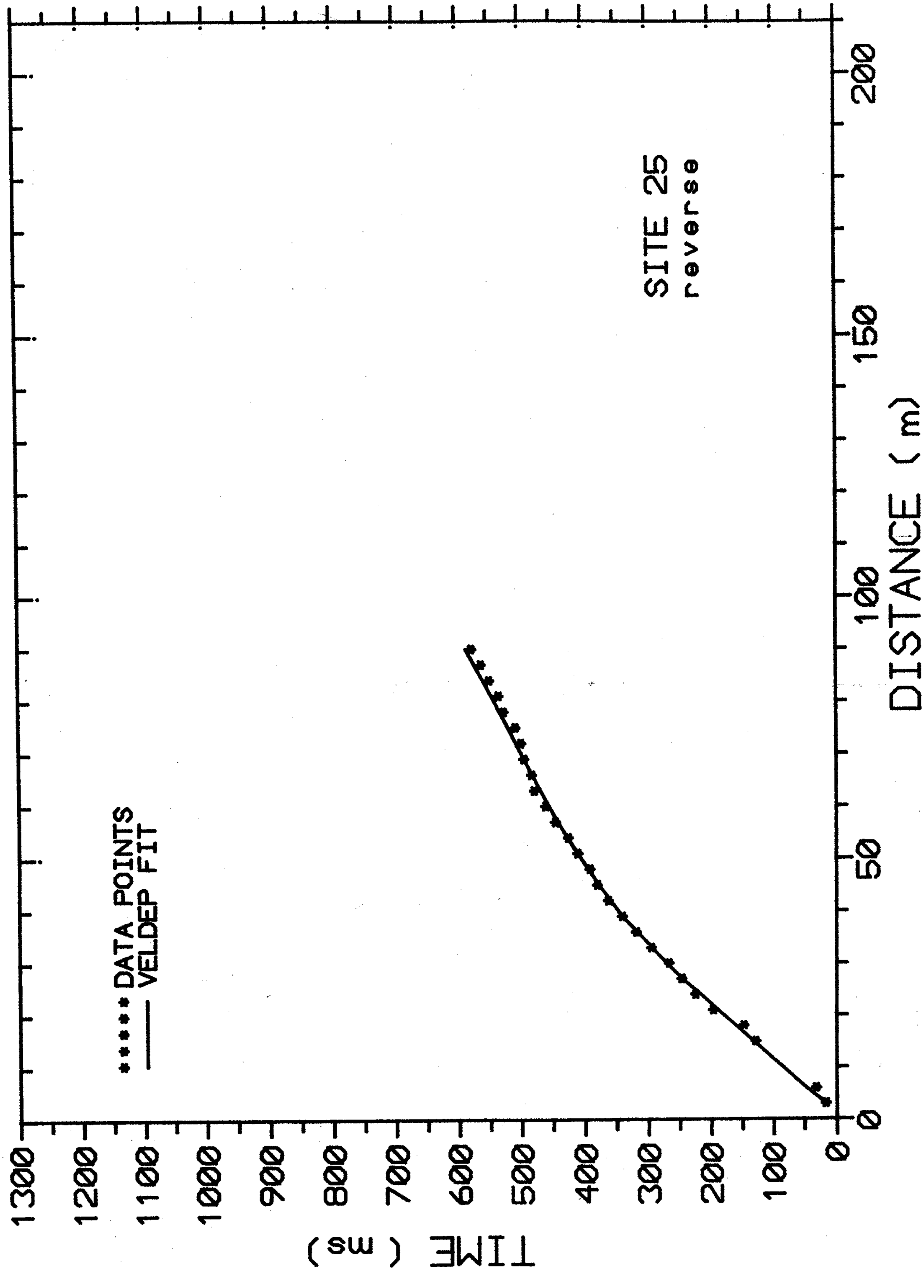

SITE 23
reverse
***** DATA POINTS
—— VELDEP FIT
DISTANCE (m)
TIME (ms)
0
50
100
150
200
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300


SITE 24
forward
***** DATA POINTS
—— VELDEP FIT
TIME (ms)
DISTANCE (m)
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
0
50
100
150
200

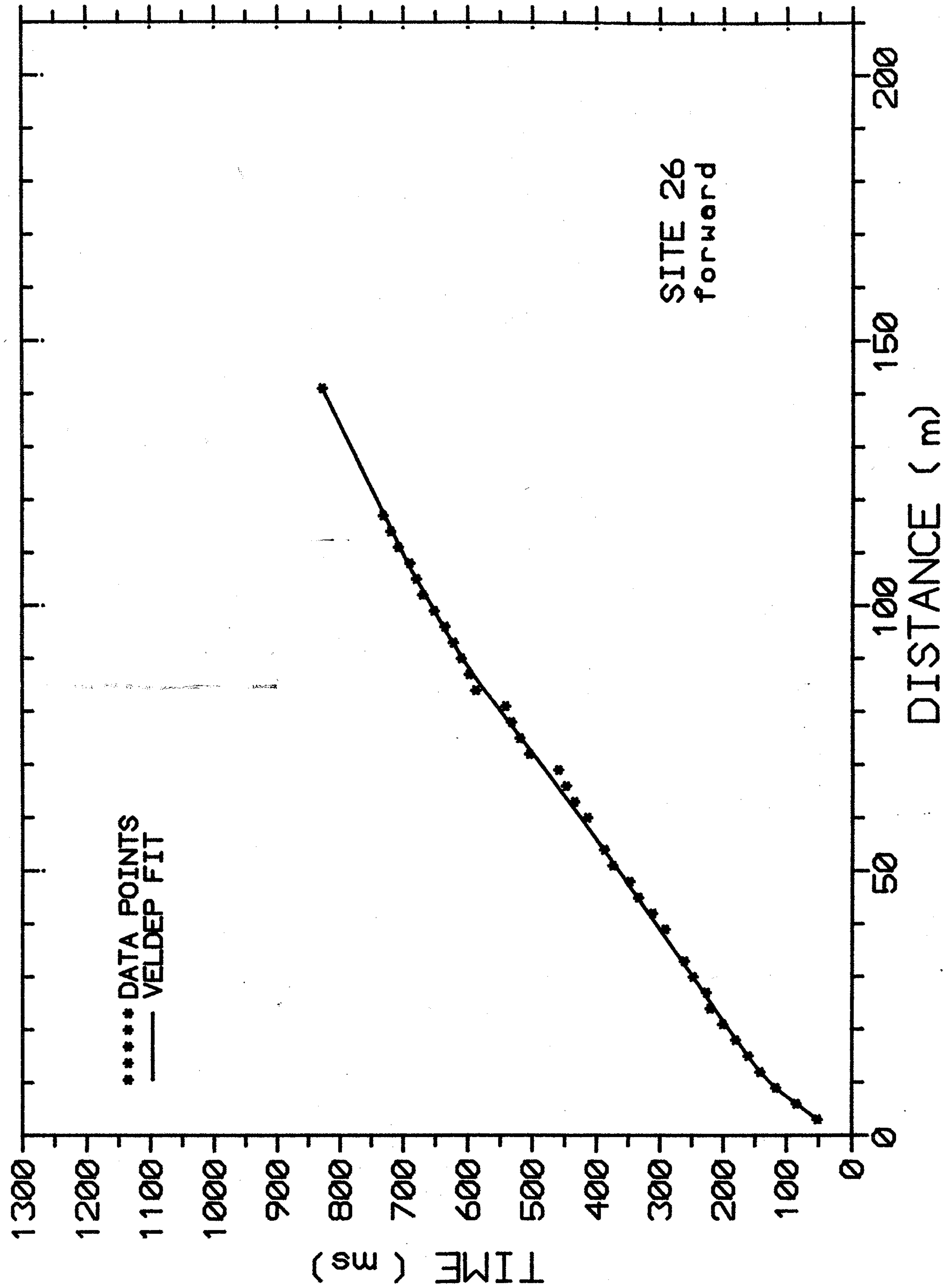

***** DATA POINTS
—— VELDEP FIT
SITE 24
reverse
TIME (ms)
DISTANCE (m)
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
0
50
100
150
200



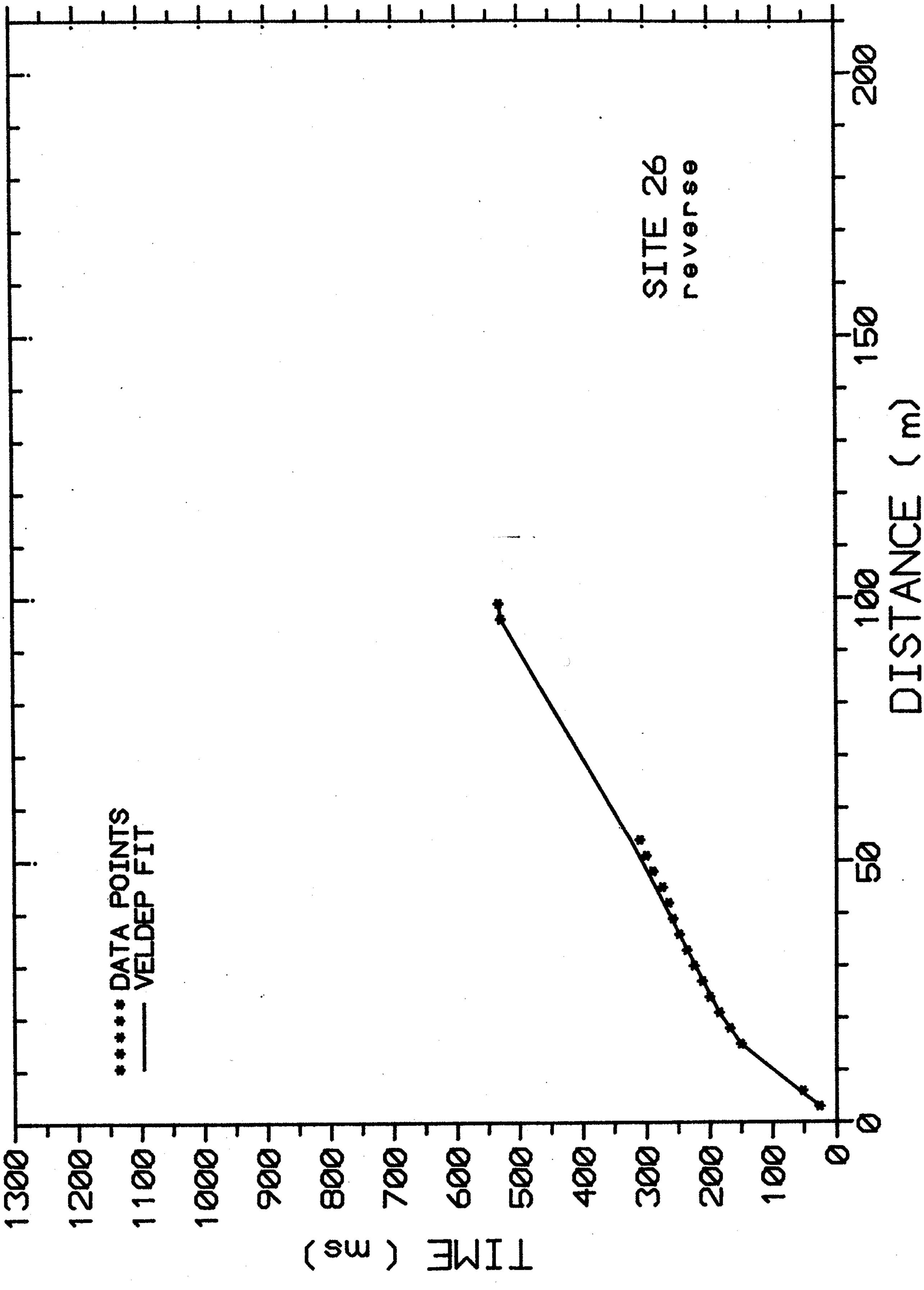
SITE 25
forward
***** DATA POINTS
—— VELDEP FIT
DISTANCE (m)
TIME (ms)
0 50 100 150 200
0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300



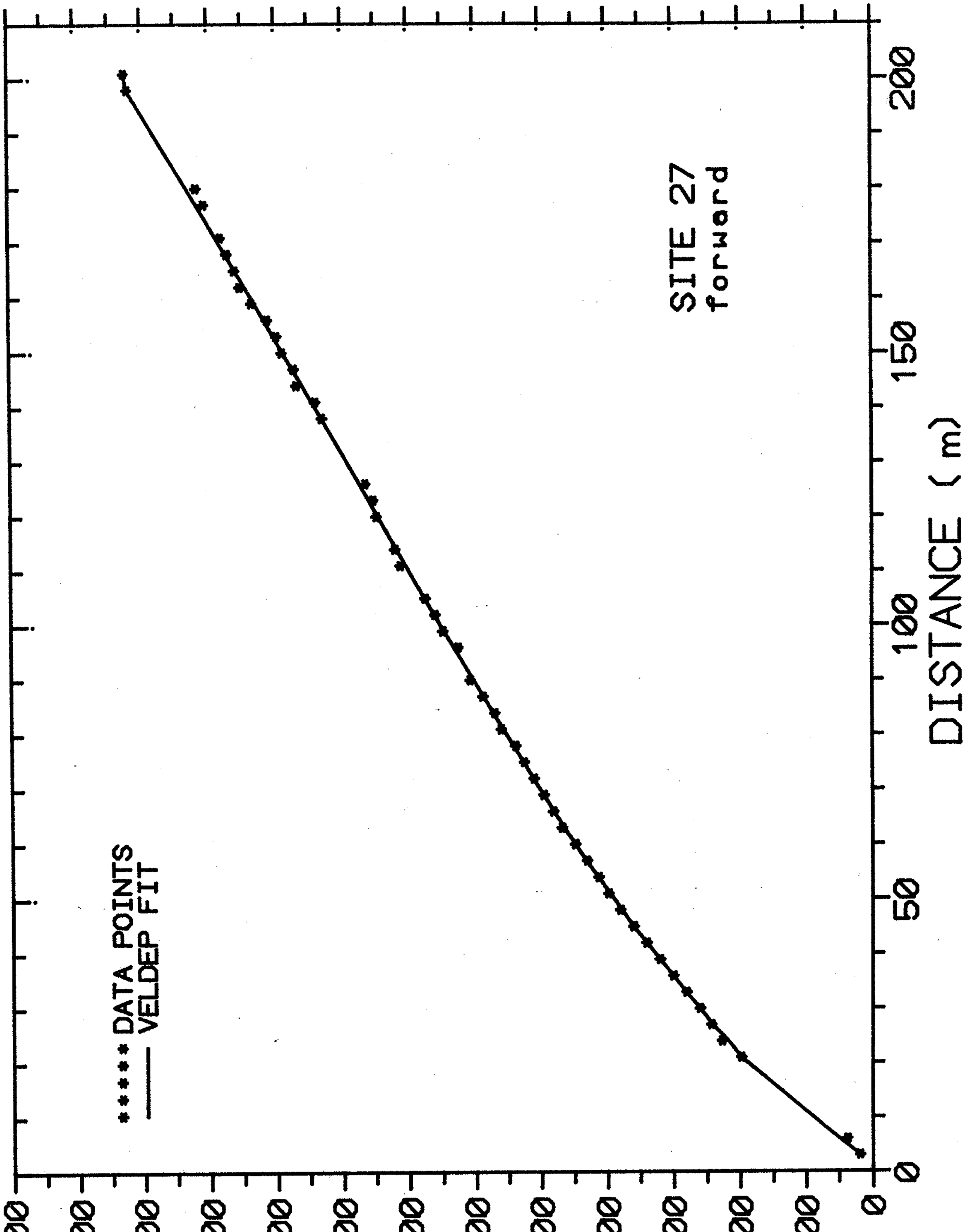
SITE 25
reverse
***** DATA POINTS
—— VELDEP FIT
DISTANCE (m)
TIME (ms)
0
50
100
150
200
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300



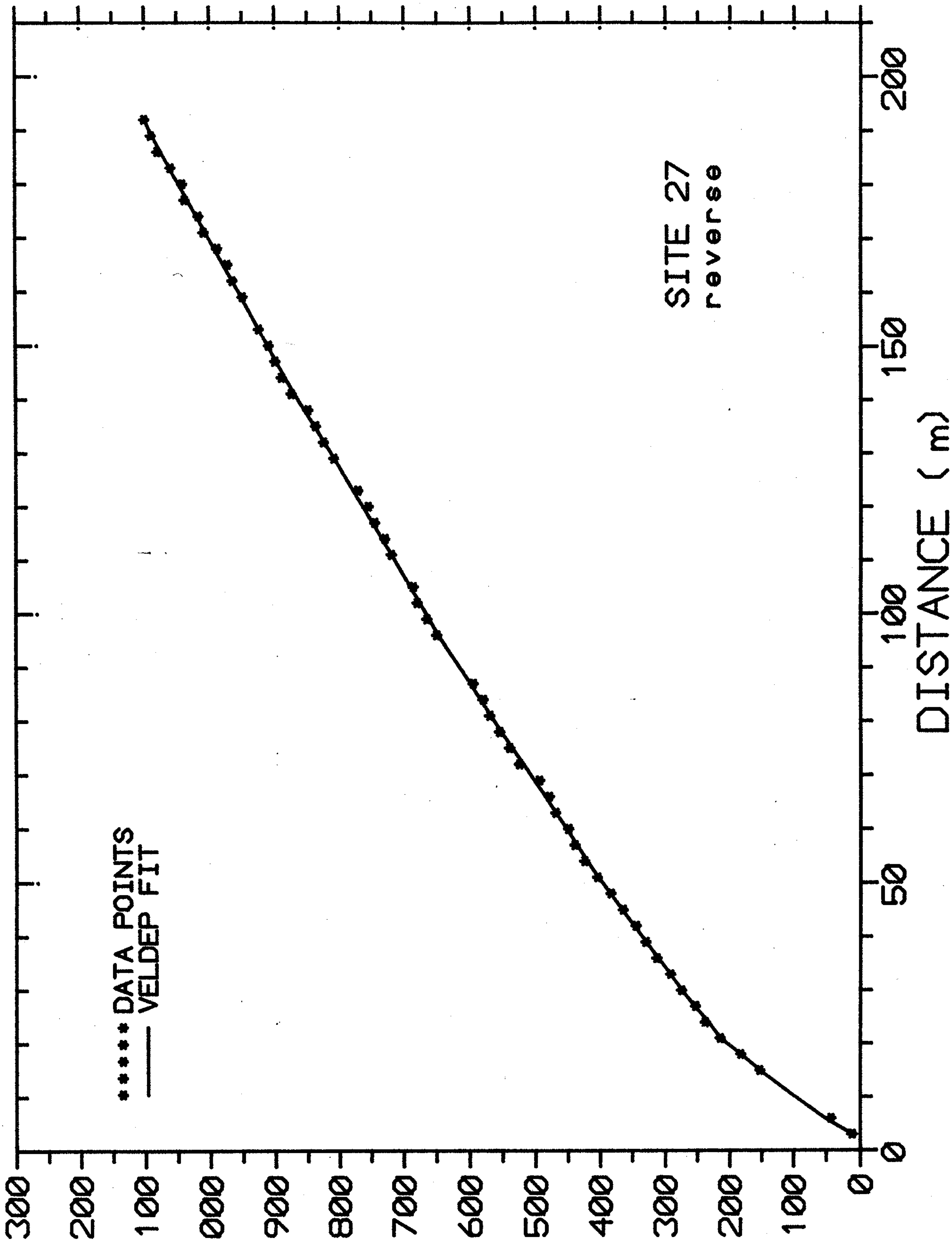
SITE 26
forward
***** DATA POINTS
— VELDEP FIT
TIME (ms)
DISTANCE (m)
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
0
50
100
150
200



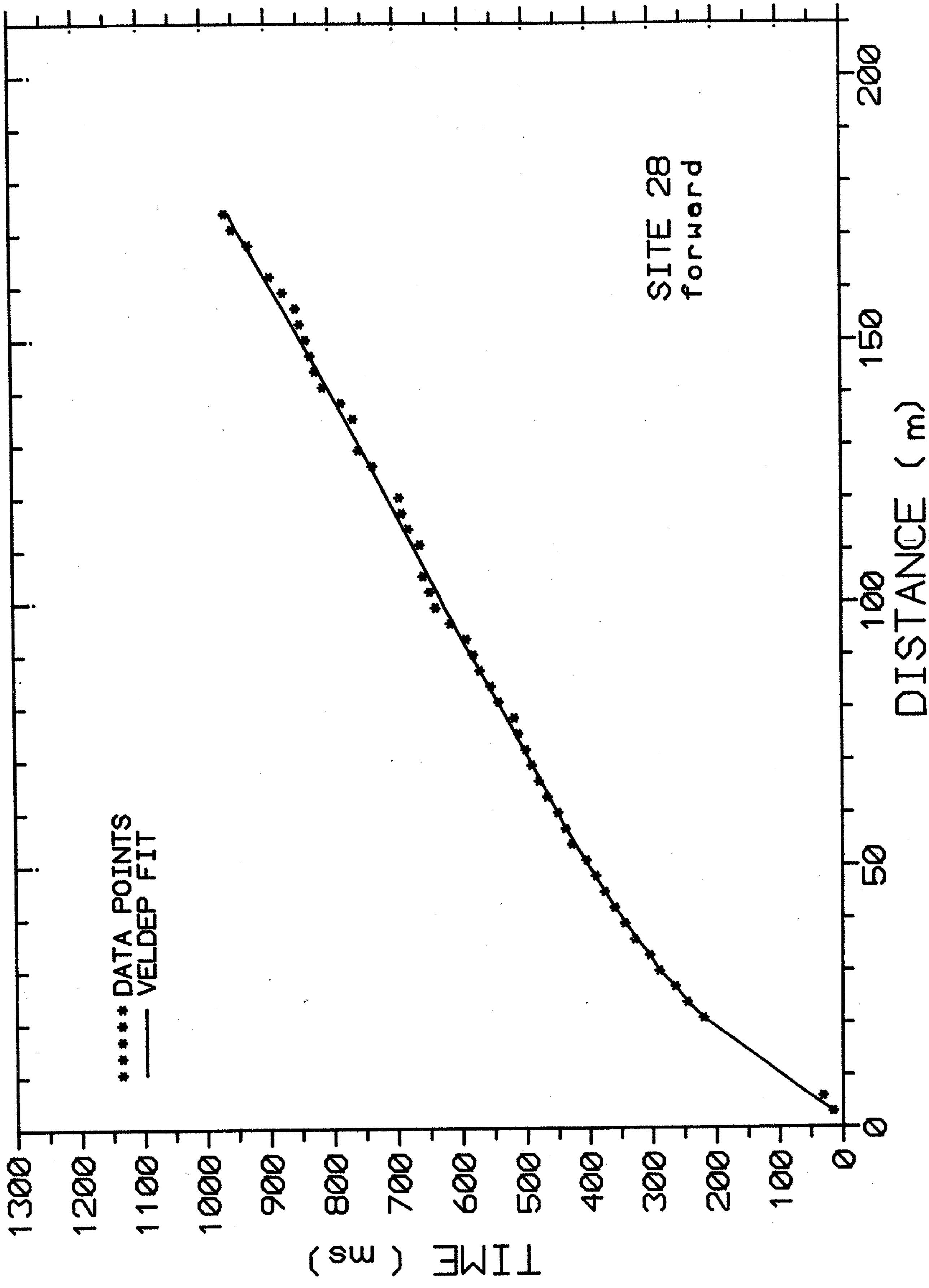
SITE 26
reverse
***** DATA POINTS
—— VELDEP FIT
DISTANCE (m)
TIME (ms)
0
50
100
150
200
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300

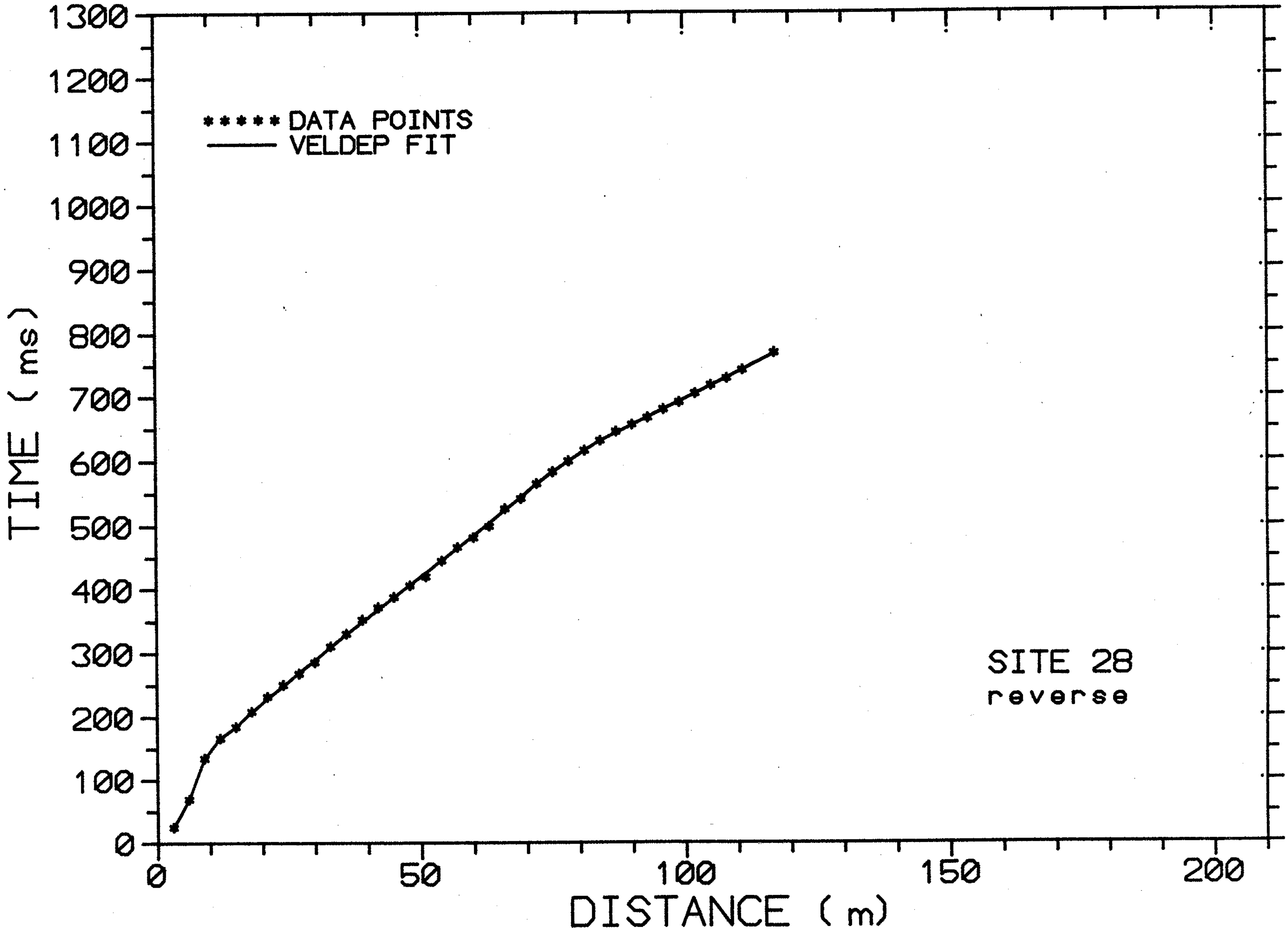


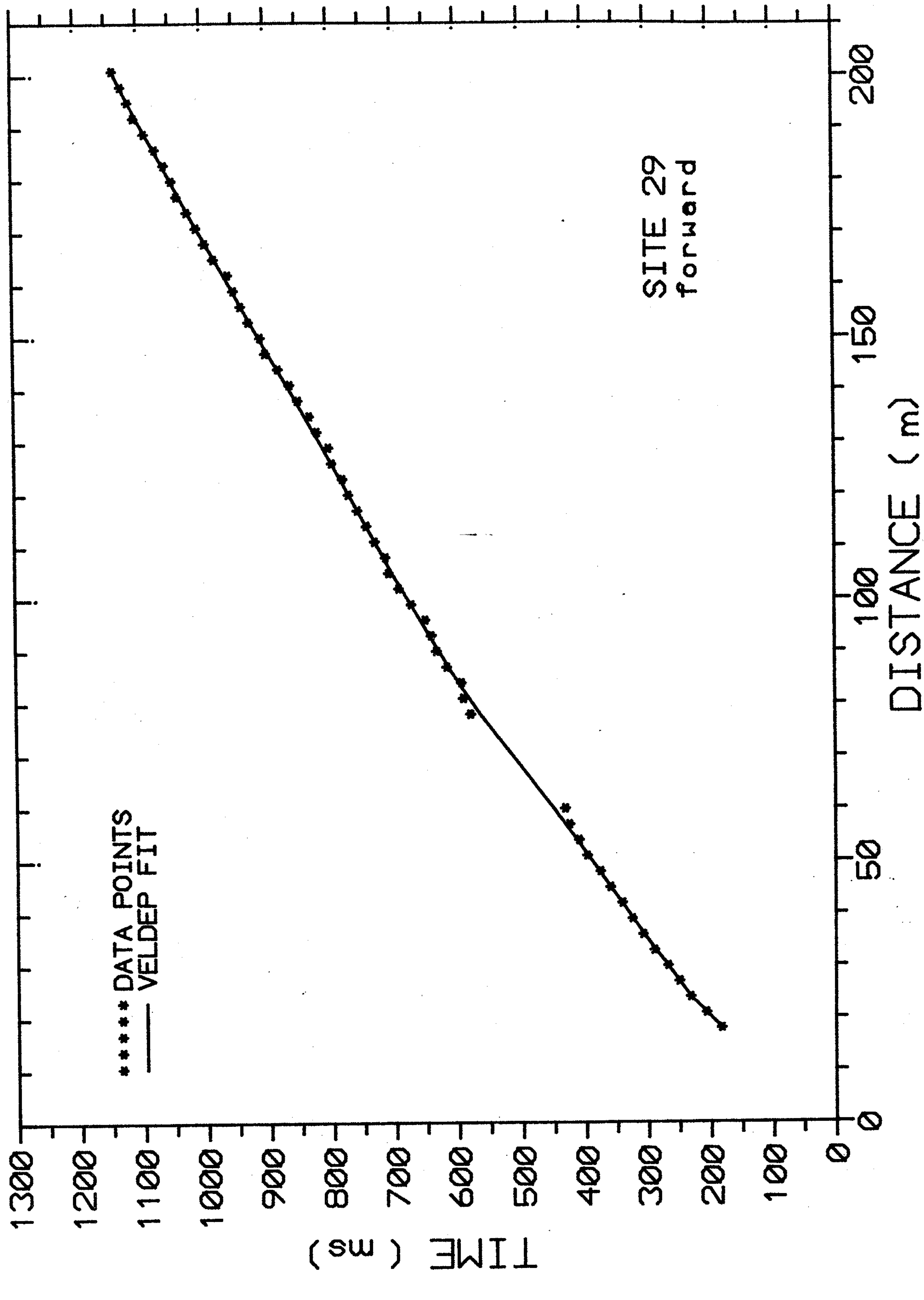
SITE 27
forward
***** DATA POINTS
—— VELDEP FIT
TIME (ms)
DISTANCE (m)
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
0
50
100
150
200



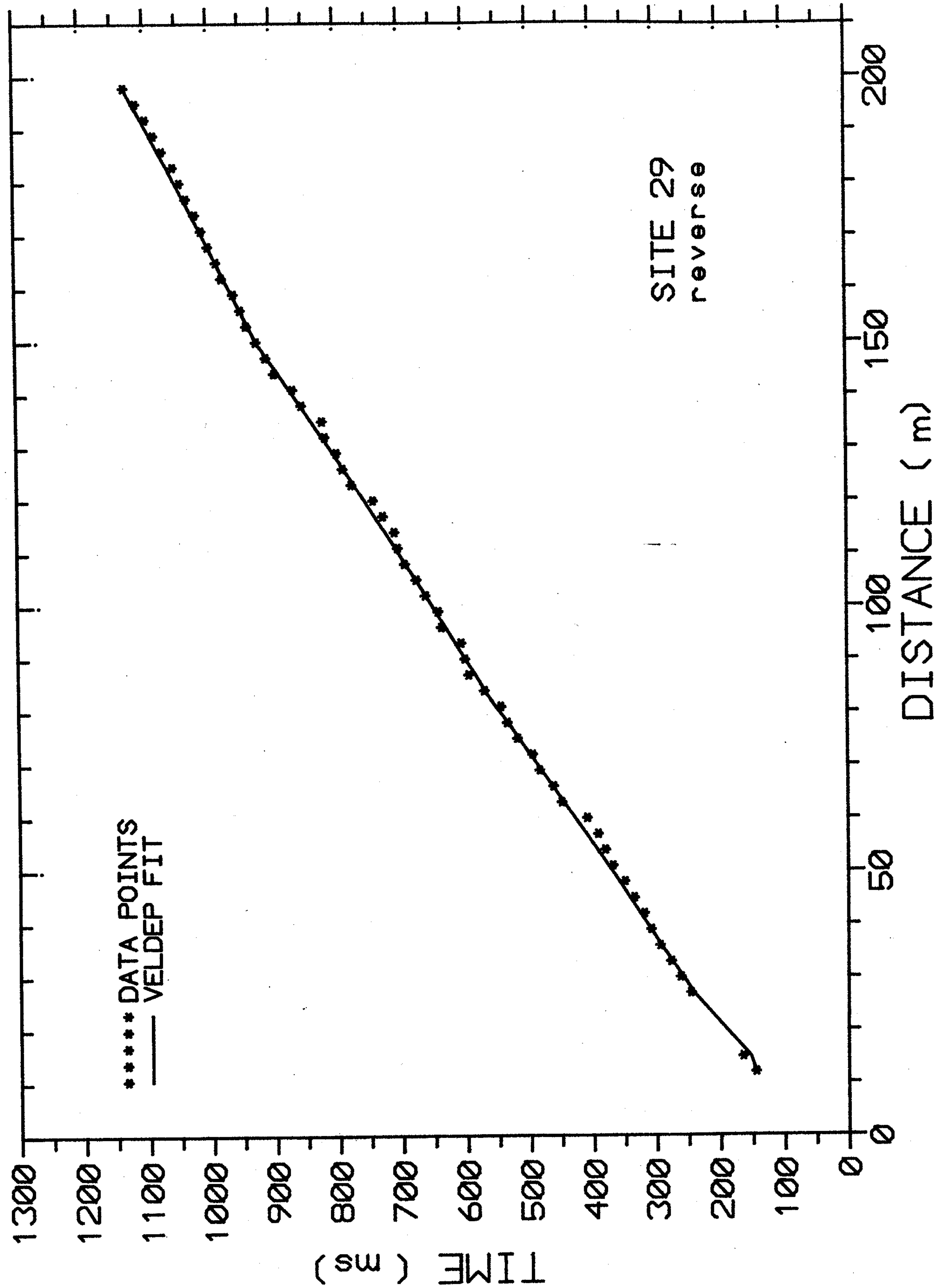
SITE 27
reverse
***** DATA POINTS
—— VELDEP FIT
DISTANCE (m)
TIME (ms)
0
50
100
150
200
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300


***** DATA POINTS
—— VELDEP FIT
SITE 28
forward
TIME (ms)
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
DISTANCE (m)
0
50
100
150
200

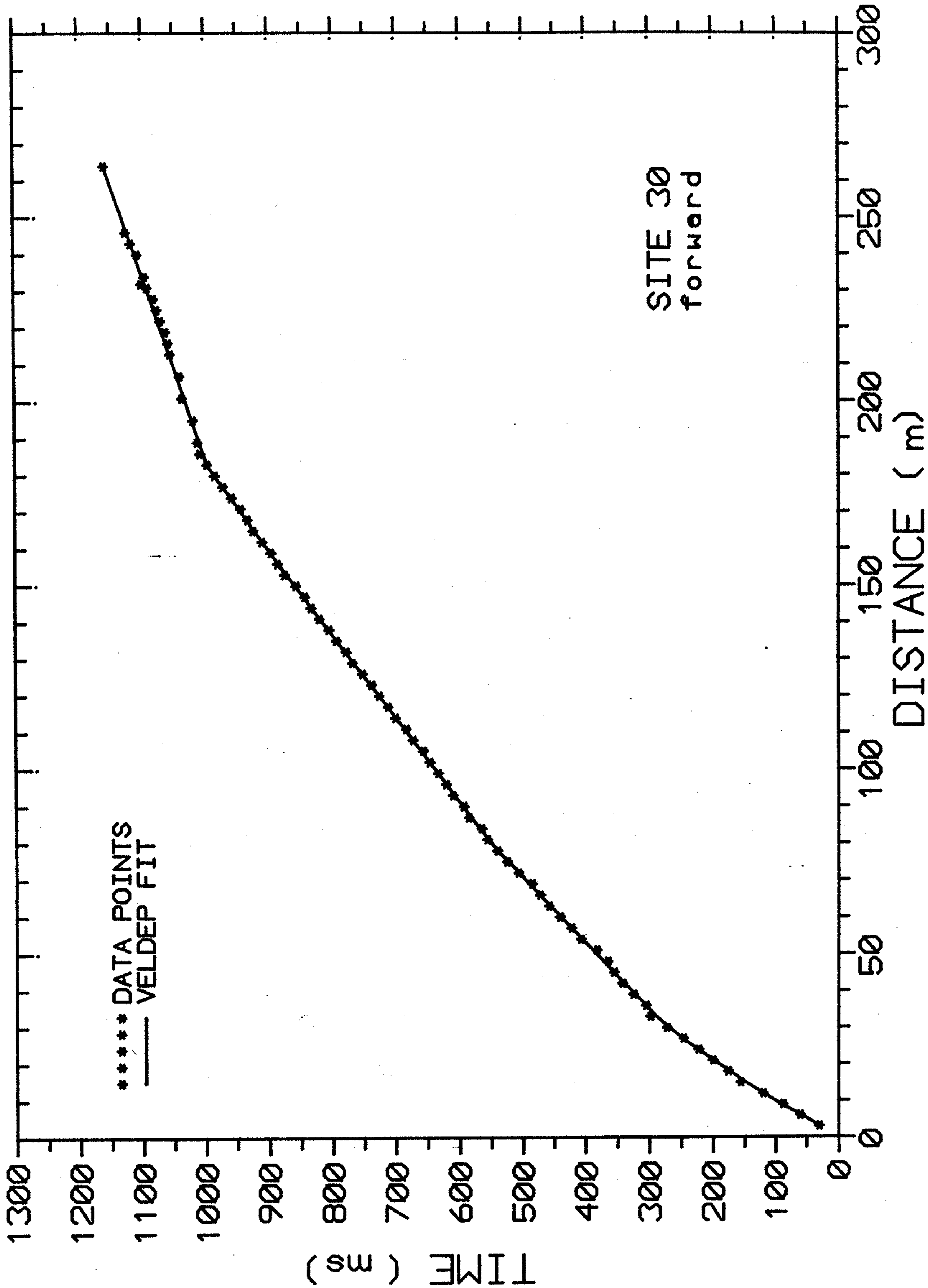

***** DATA POINTS
VELDEP FIT
SITE 28
reverse
TIME (ms)
DISTANCE (m)
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
0
50
100
150
200

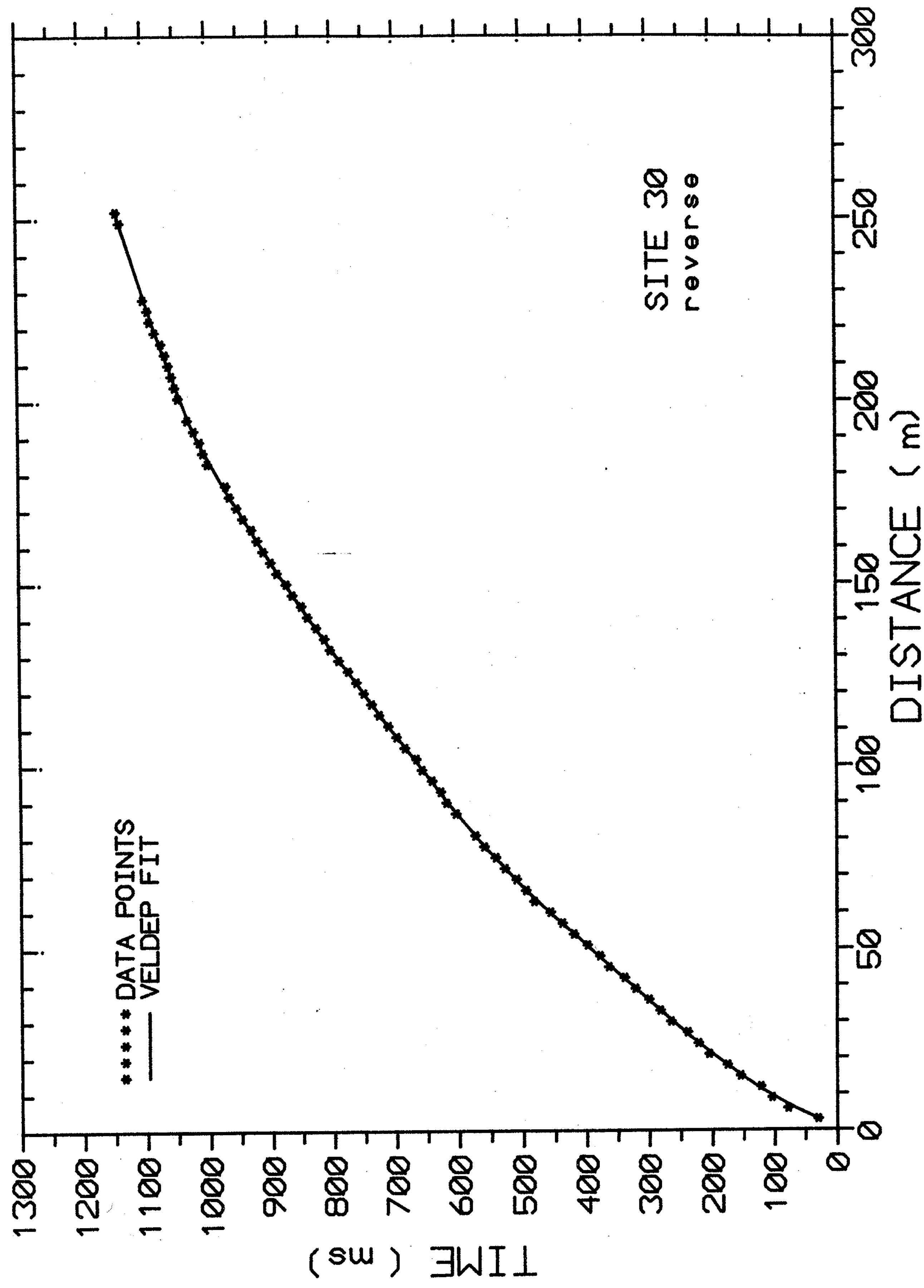


***** DATA POINTS
—— VELDEP FIT
SITE 29
forward
DISTANCE (m)
0
50
100
150
200
TIME (ms)
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300

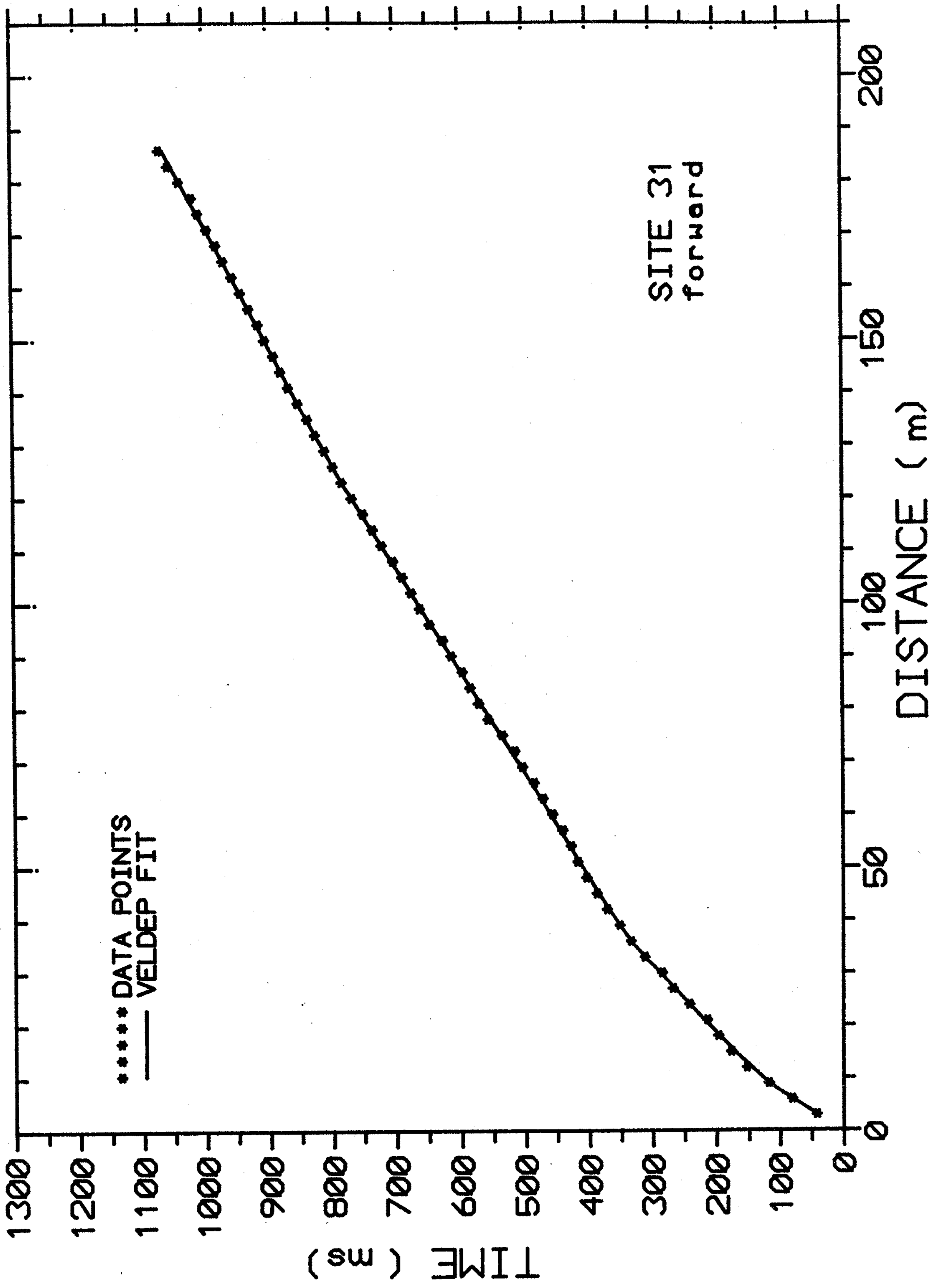


SITE 29
reverse
***** DATA POINTS
—— VELDEP FIT
TIME (ms)
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
DISTANCE (m)
0
50
100
150
200

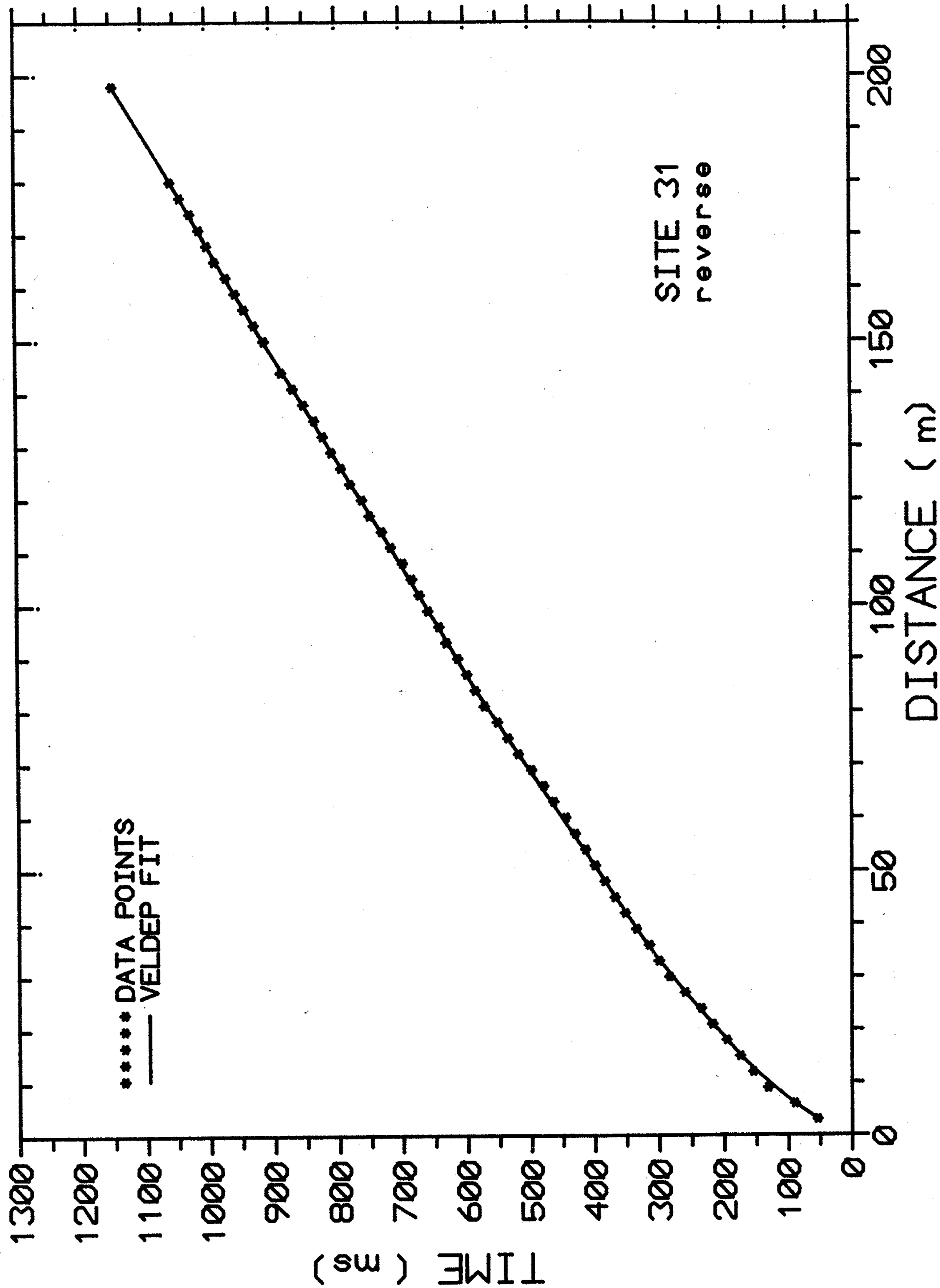

SITE 30
forward
***** DATA POINTS
—— VELDEP FIT
TIME (ms)
DISTANCE (m)
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
0
50
100
150
200
250
300



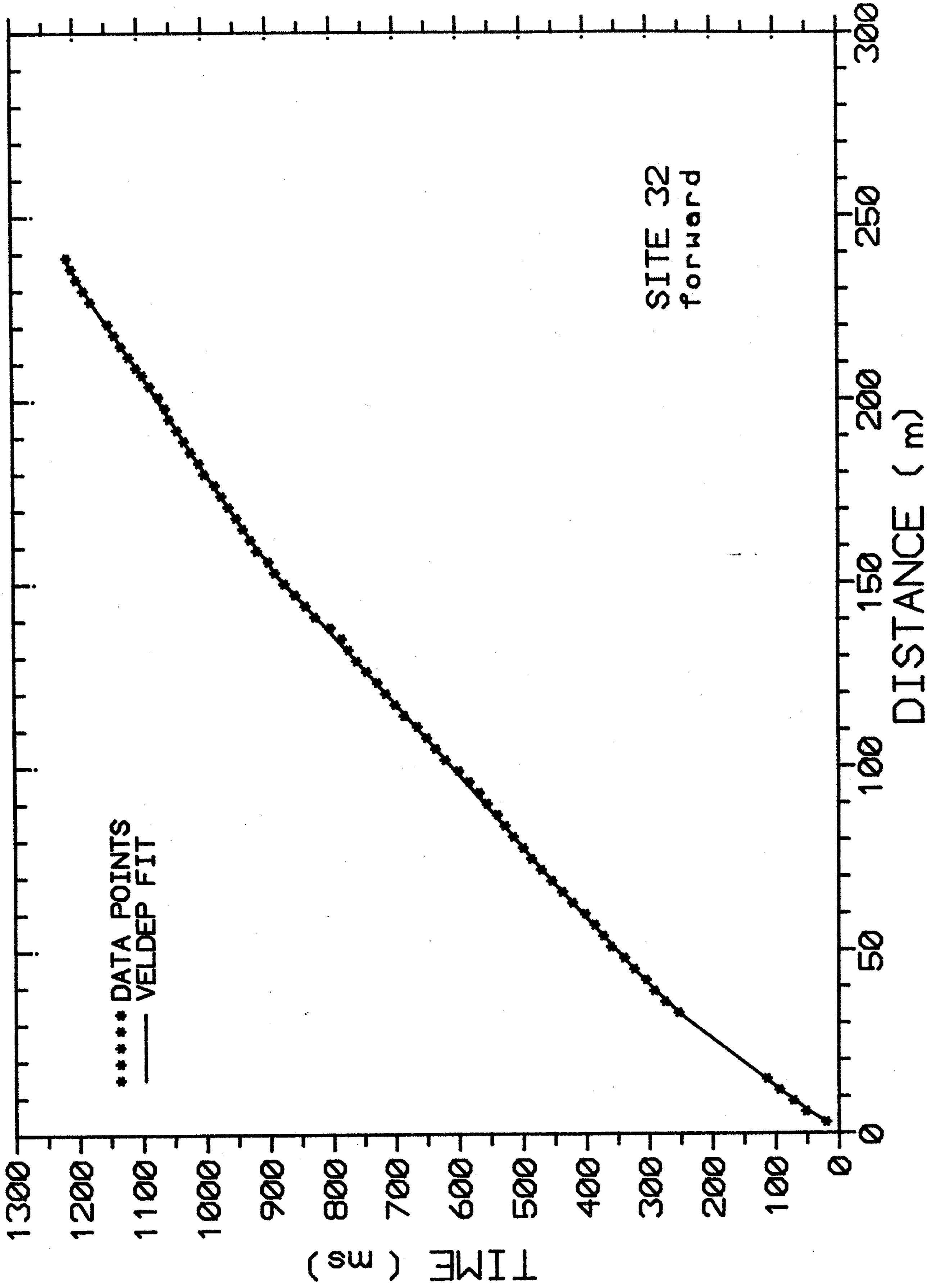
SITE 30
reverse
***** DATA POINTS
—— VELDEP FIT
TIME (ms)
DISTANCE (m)
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
0
50
100
150
200
250
300

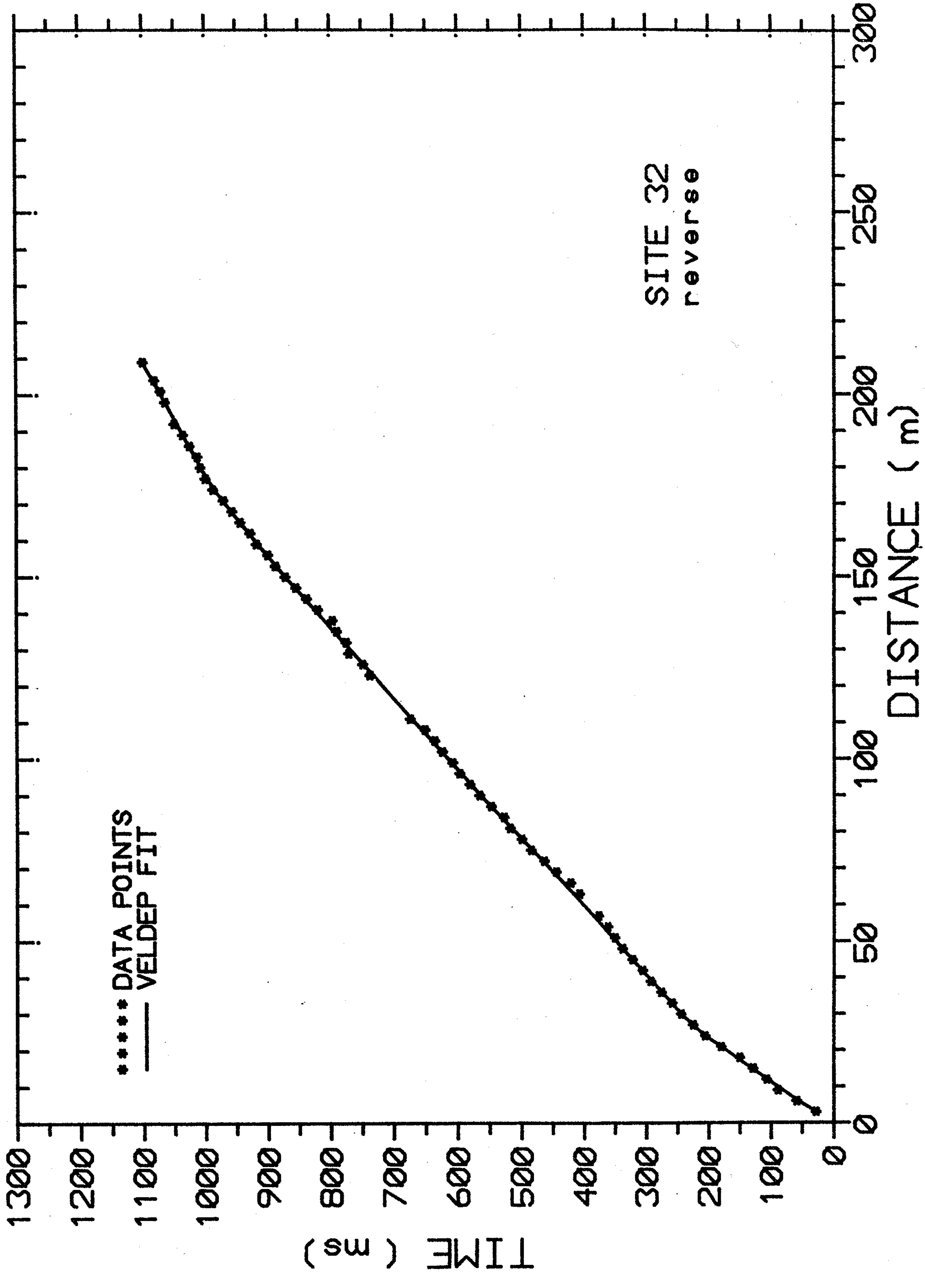


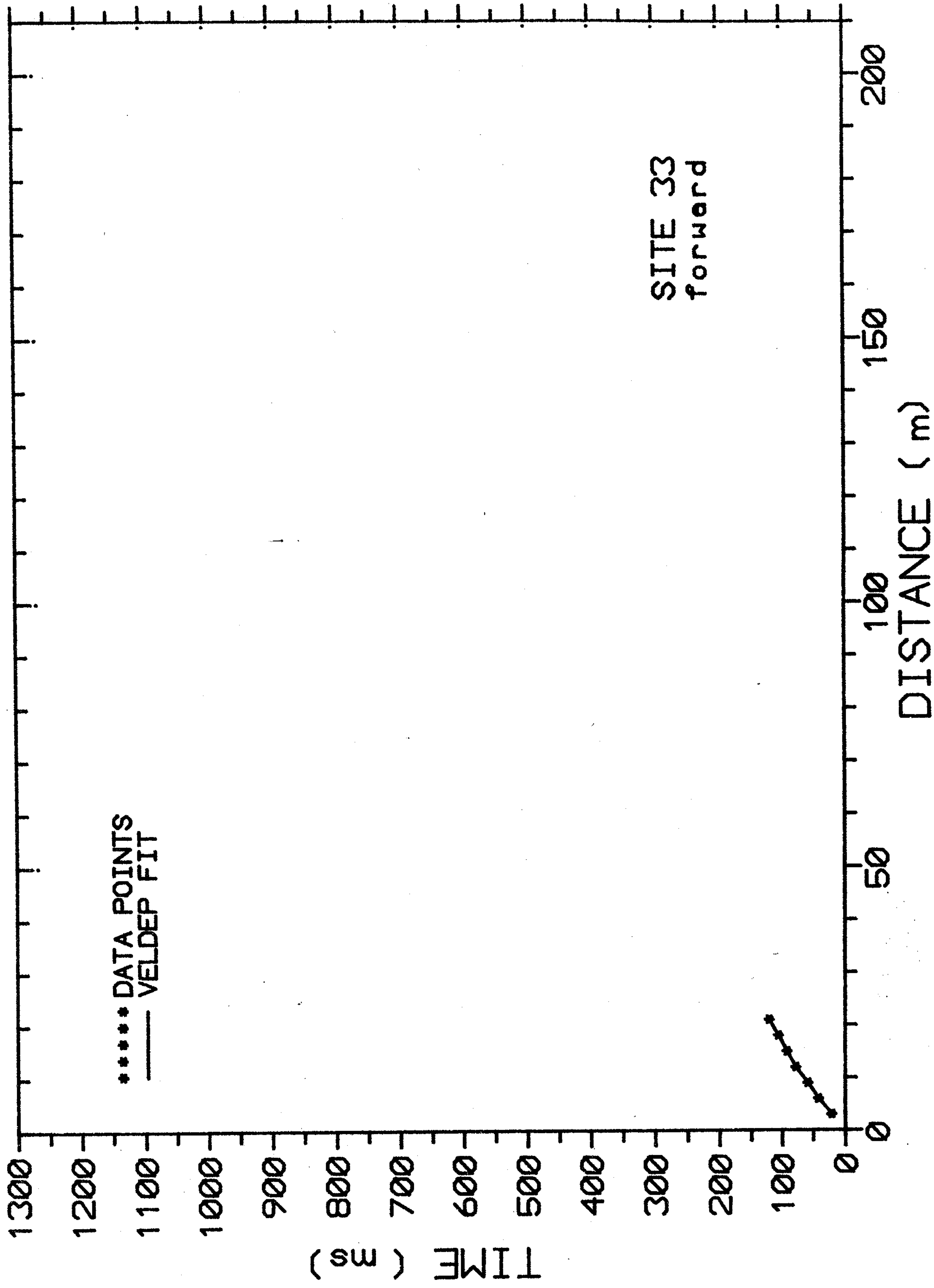
SITE 31
forward
***** DATA POINTS
—— VELDEP FIT
TIME (ms)
DISTANCE (m)
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
0
50
100
150
200

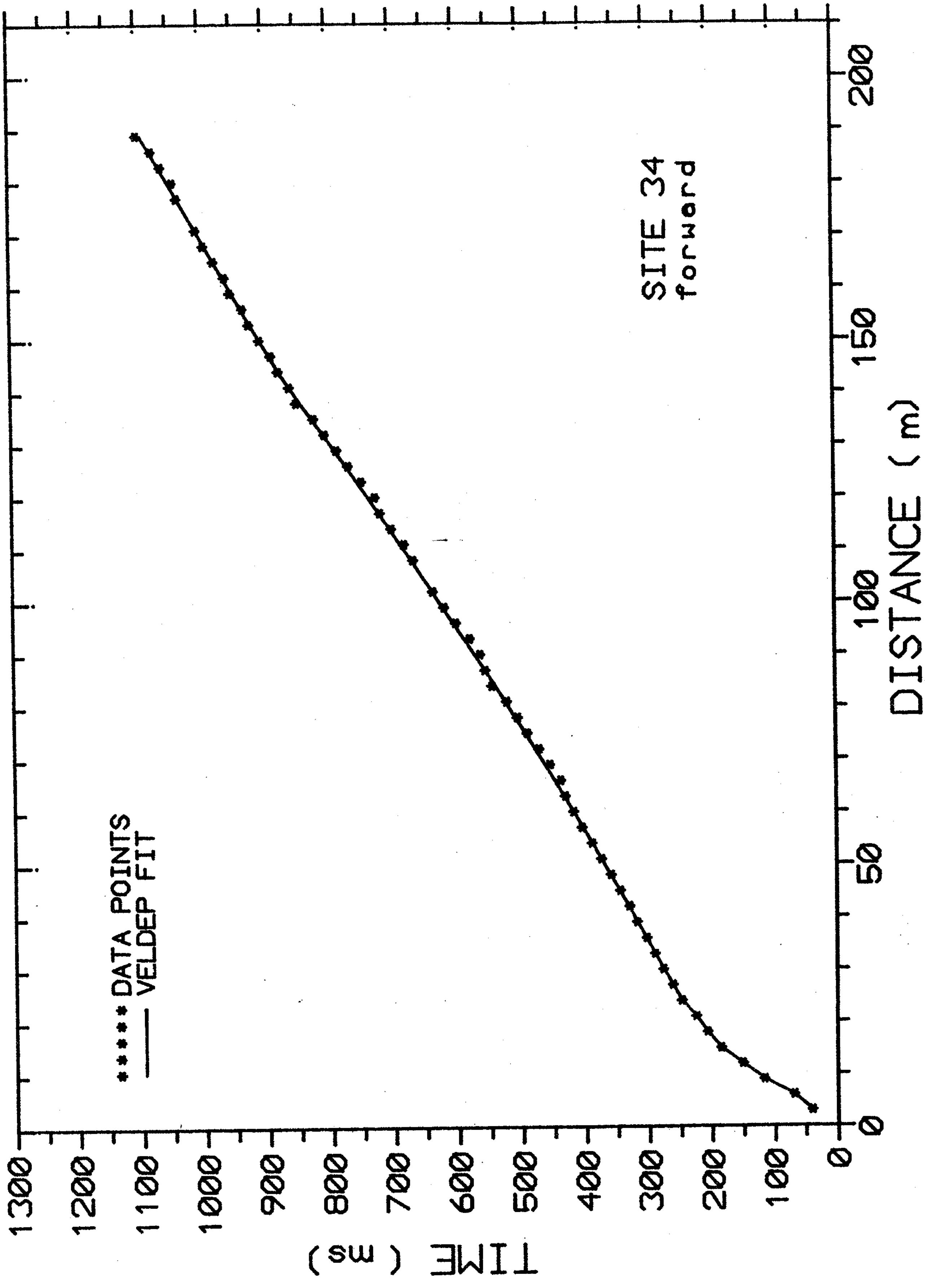


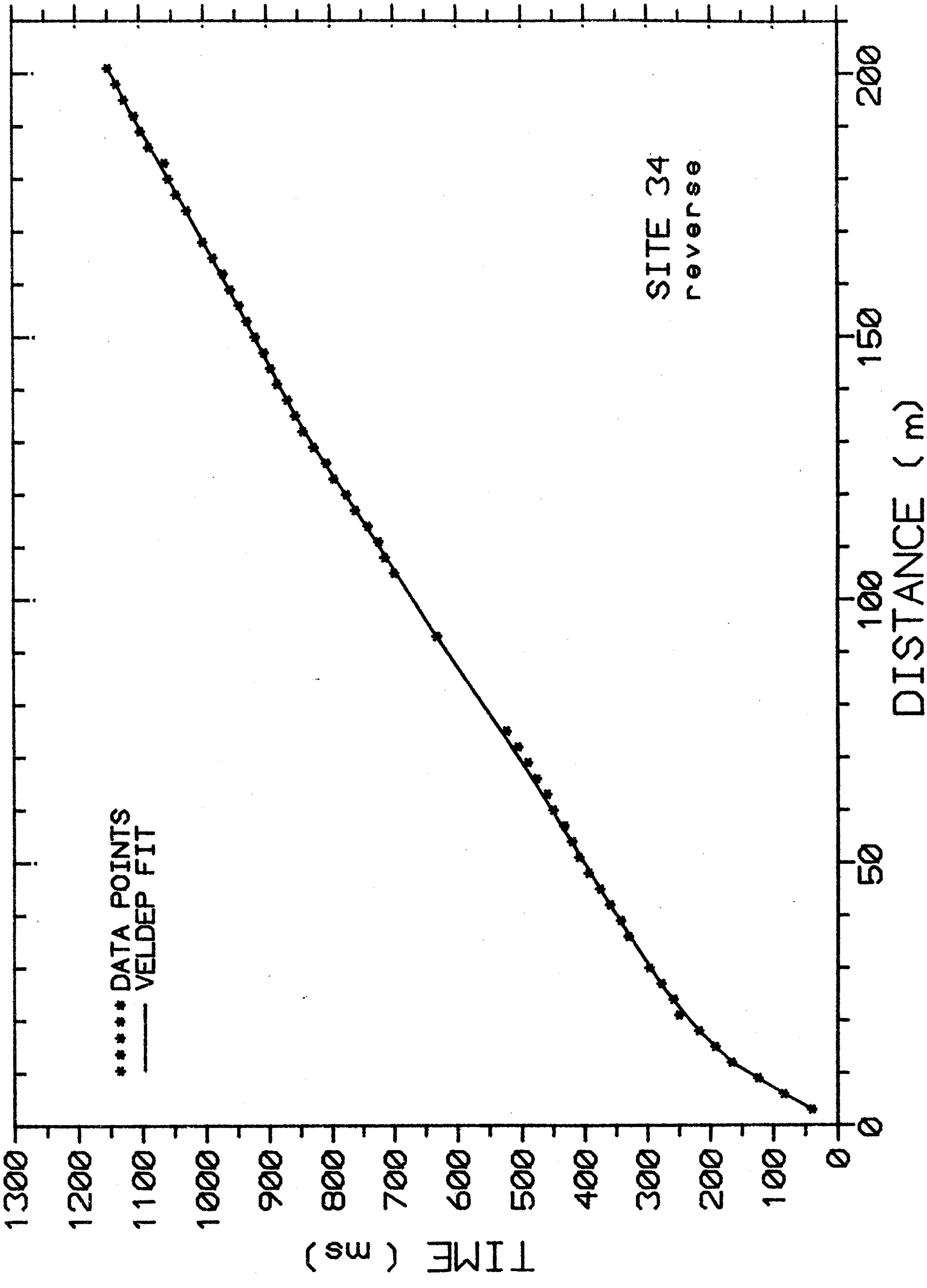
SITE 31
reverse
***** DATA POINTS
—— VELDEP FIT
DISTANCE (m)
TIME (ms)
0
50
100
150
200
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300


SITE 32
forward
***** DATA POINTS
—— VELDEP FIT
TIME (ms)
DISTANCE (m)
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
0
50
100
150
200
250
300

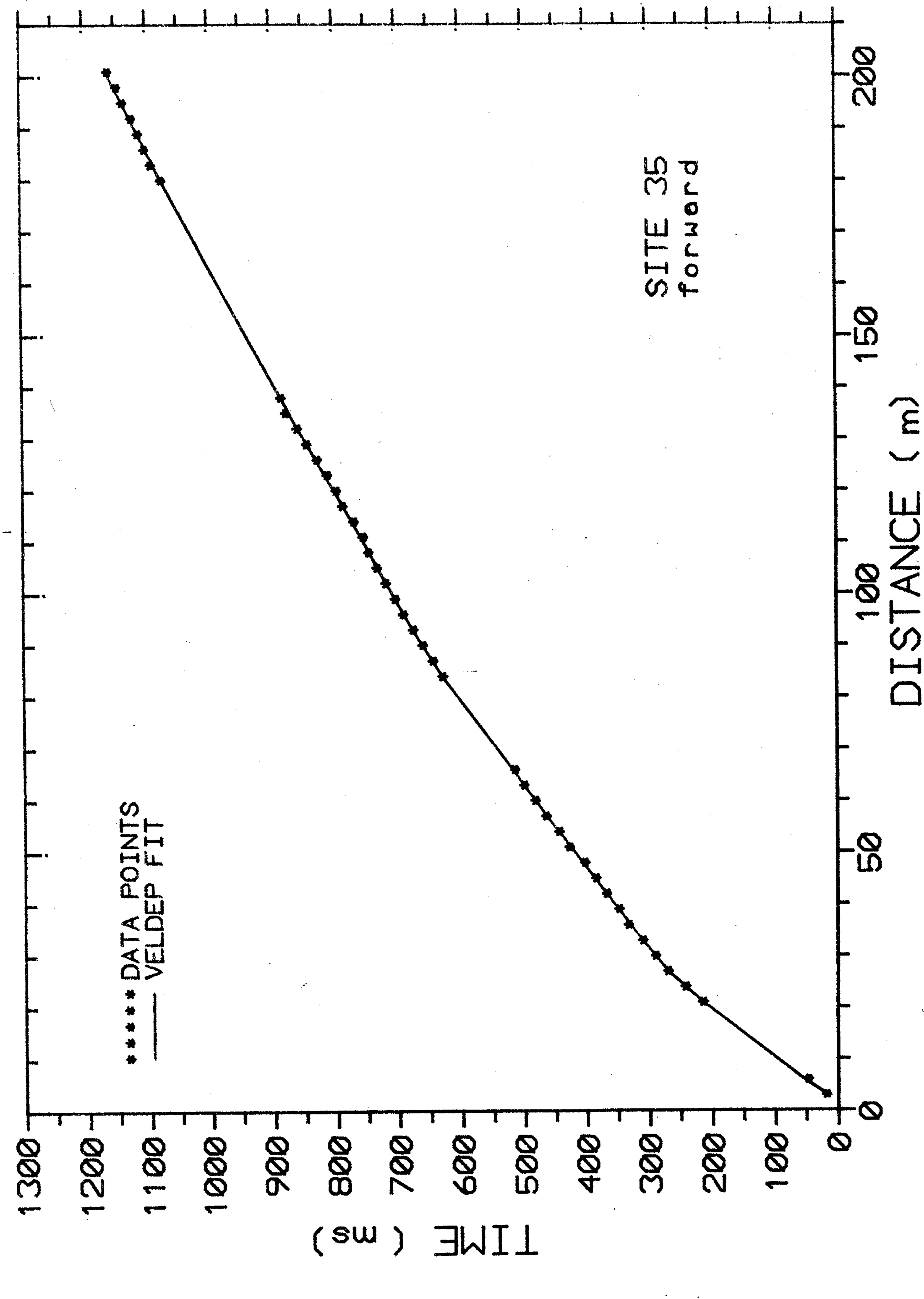

SITE 32
reverse
***** DATA POINTS
—— VELDEP FIT
TIME (ms)
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
DISTANCE (m)
0
50
100
150
200
250
300


SITE 33
forward
***** DATA POINTS
—— VELDEP FIT
DISTANCE (m)
TIME (ms)
0
50
100
150
200
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300

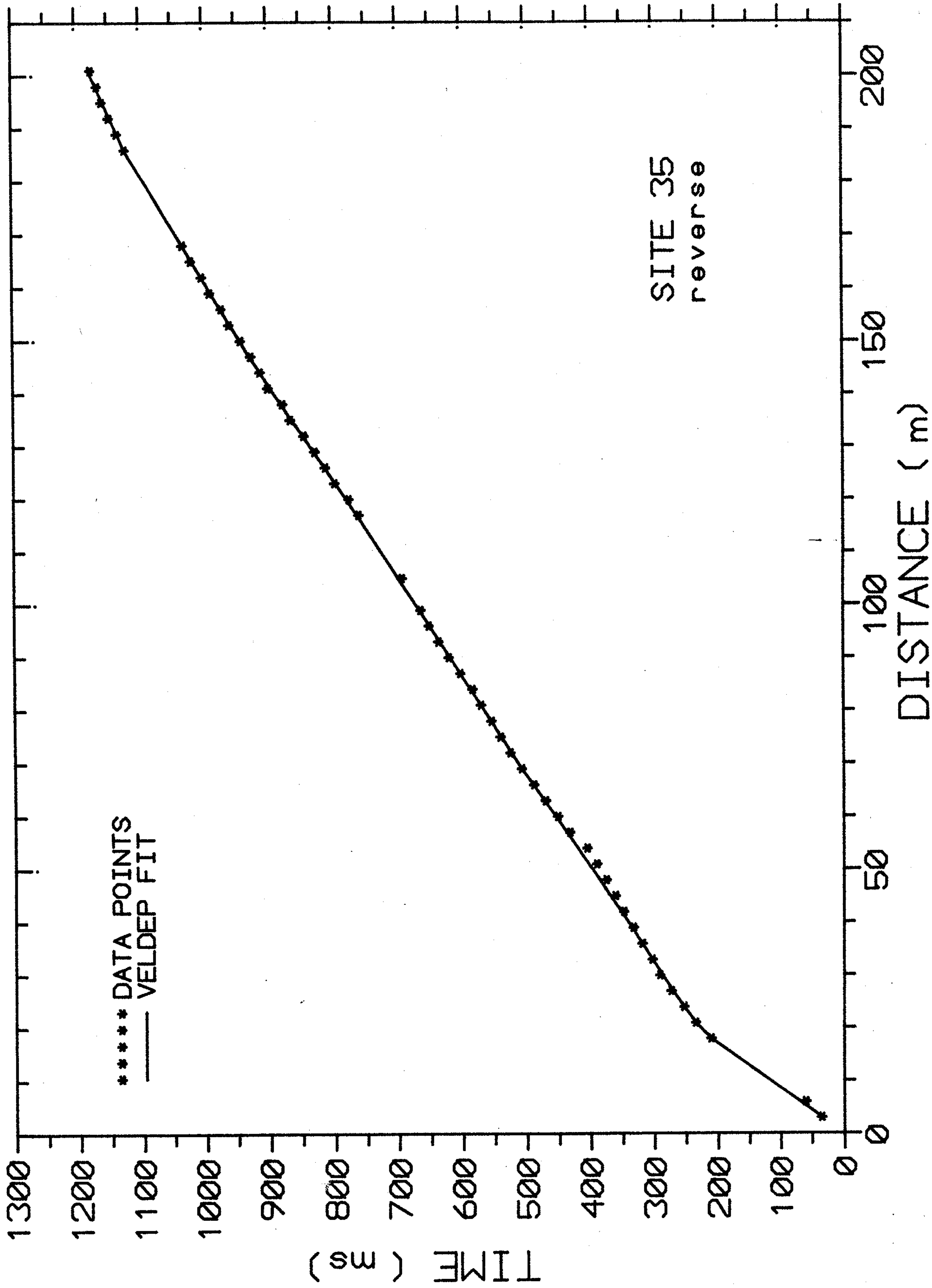

SITE 34
forward
***** DATA POINTS
— VELDEP FIT
TIME (ms)
DISTANCE (m)
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
0
50
100
150
200

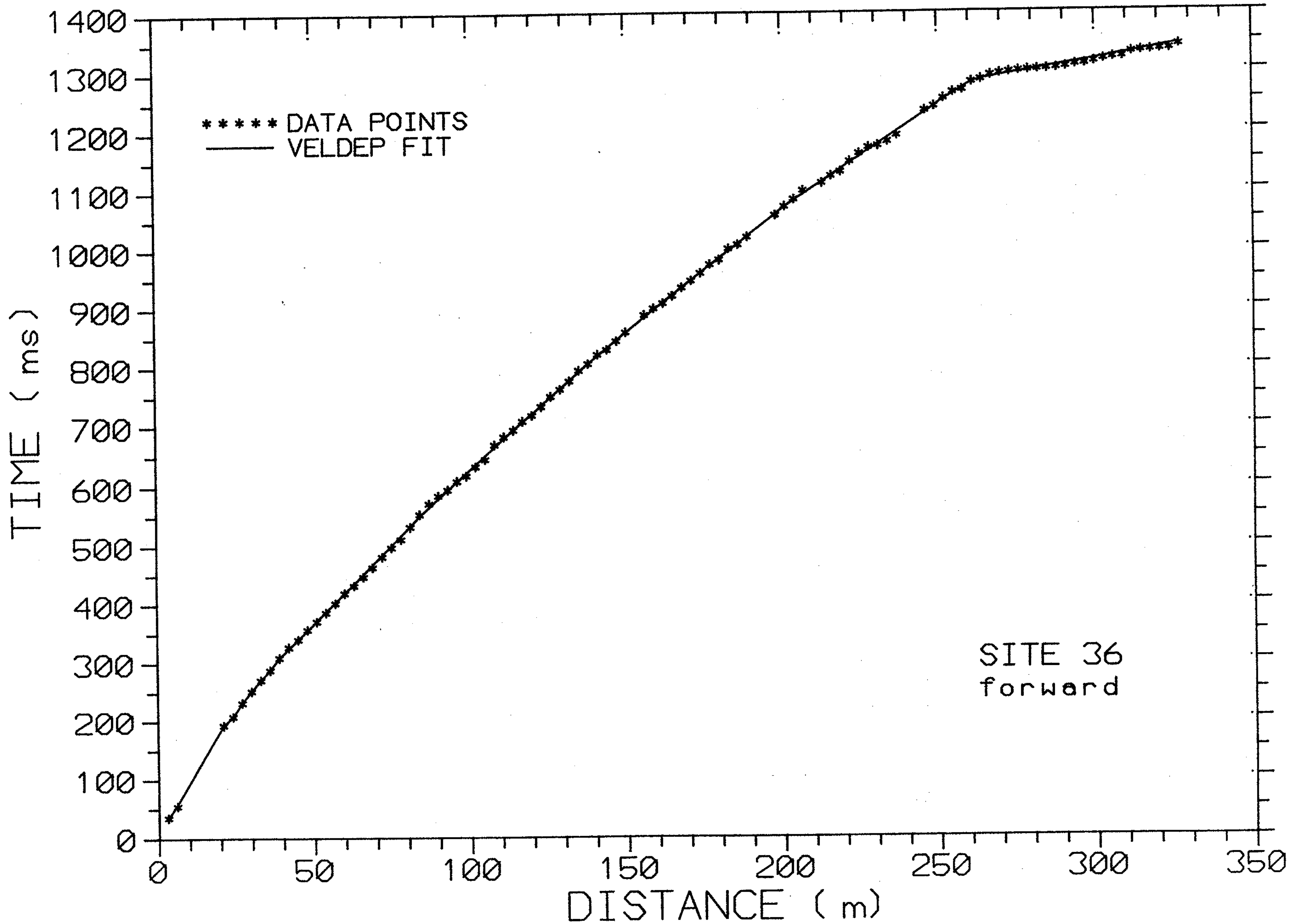


SITE 34
reverse
***** DATA POINTS
—— VELDEP FIT
TIME (ms)
DISTANCE (m)
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
0
50
100
150
200

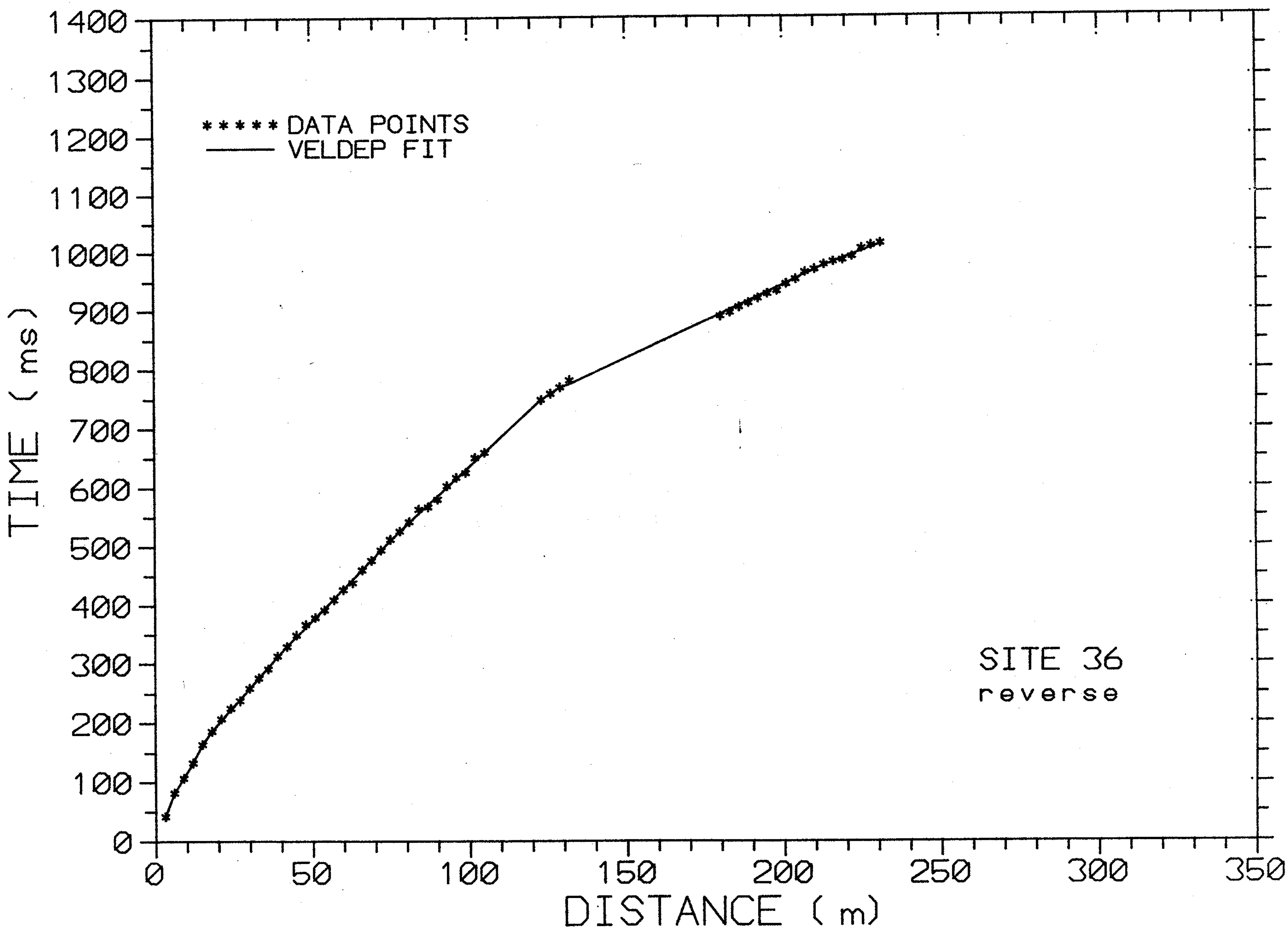


TIME (ms)
DISTANCE (m)
SITE 35
forward
***** DATA POINTS
—— VELDEP FIT
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
0
50
100
150
200

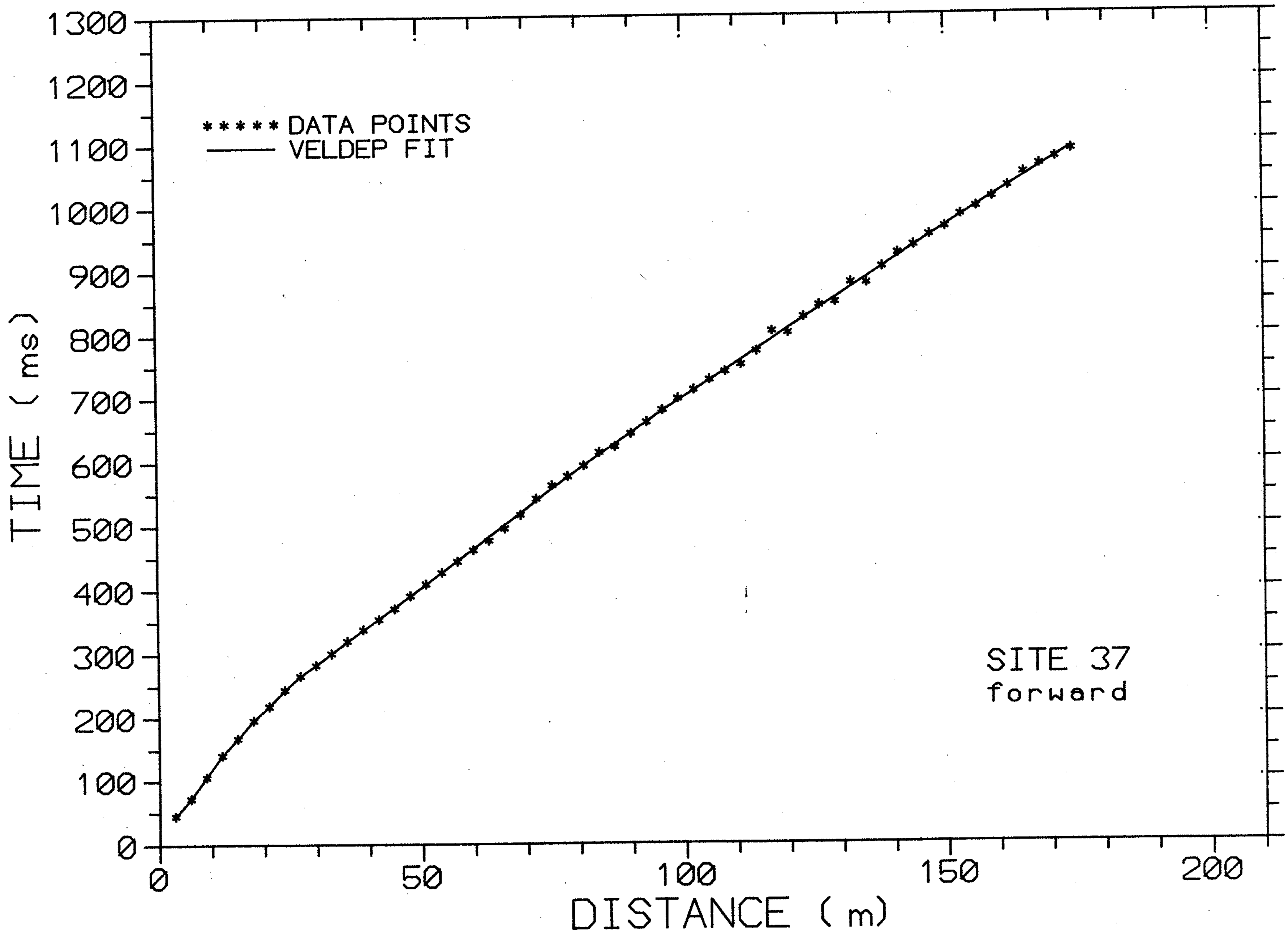

SITE 35
reverse
***** DATA POINTS
—— VELDEP FIT
TIME (ms)
DISTANCE (m)
0
50
100
150
200
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300



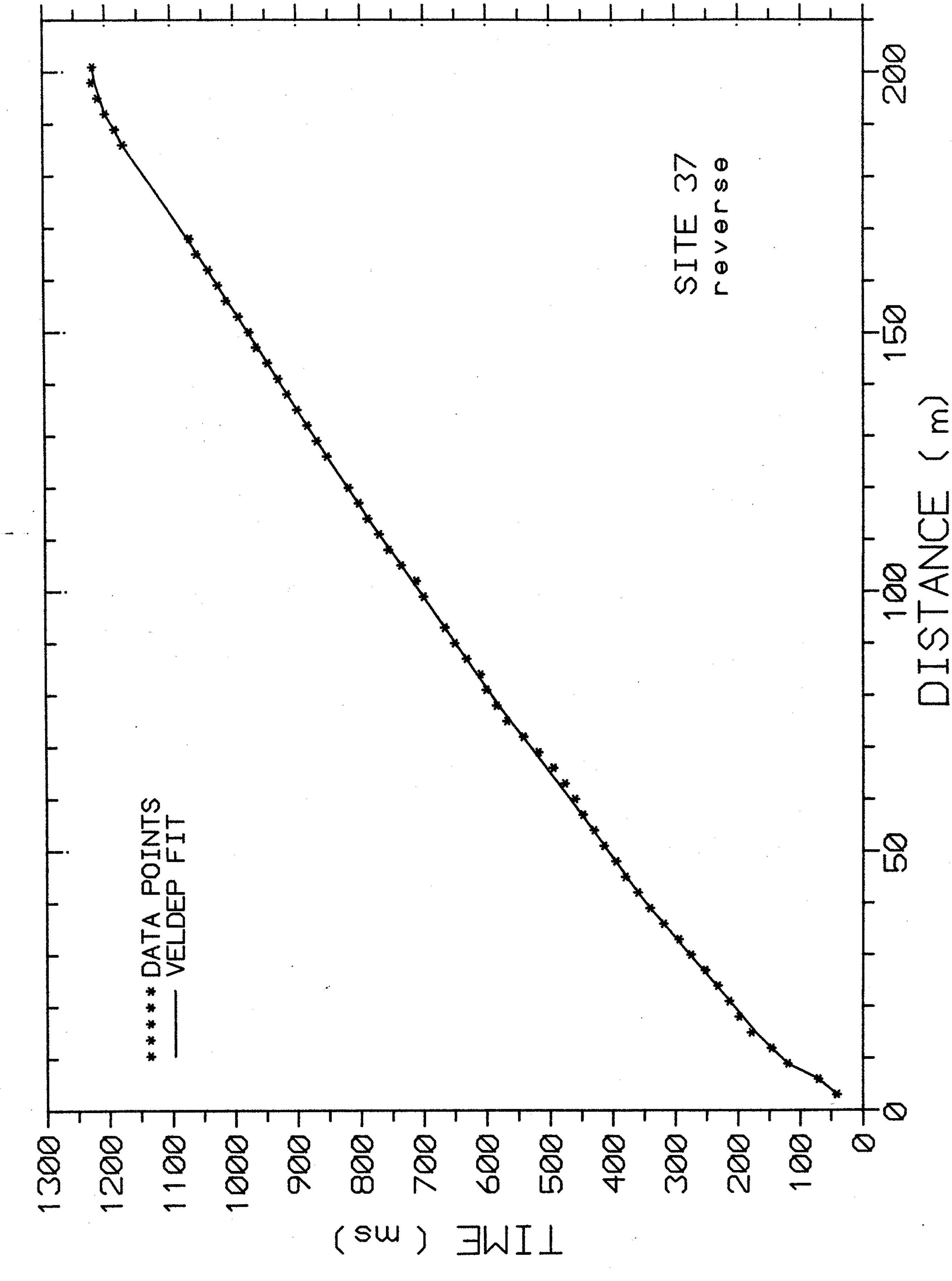
***** DATA POINTS
—— VELDEP FIT
SITE 36
forward
TIME (ms)
DISTANCE (m)
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
1400
0
50
100
150
200
250
300
350



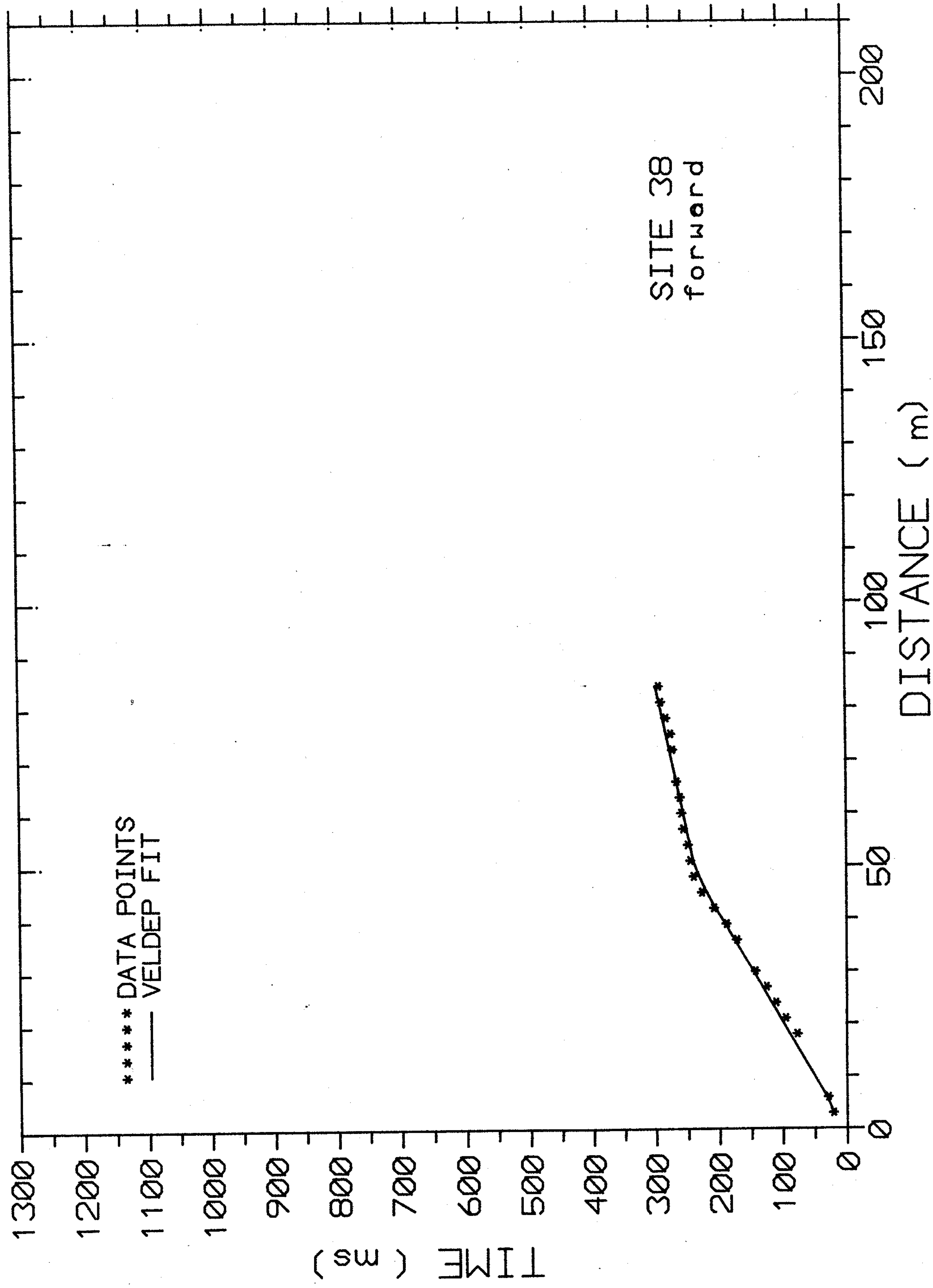
***** DATA POINTS
—— VELDEP FIT
SITE 36
reverse
TIME (ms)
1400
1300
1200
1100
1000
900
800
700
600
500
400
300
200
100
0
0
50
100
150
200
250
300
350
DISTANCE (m)

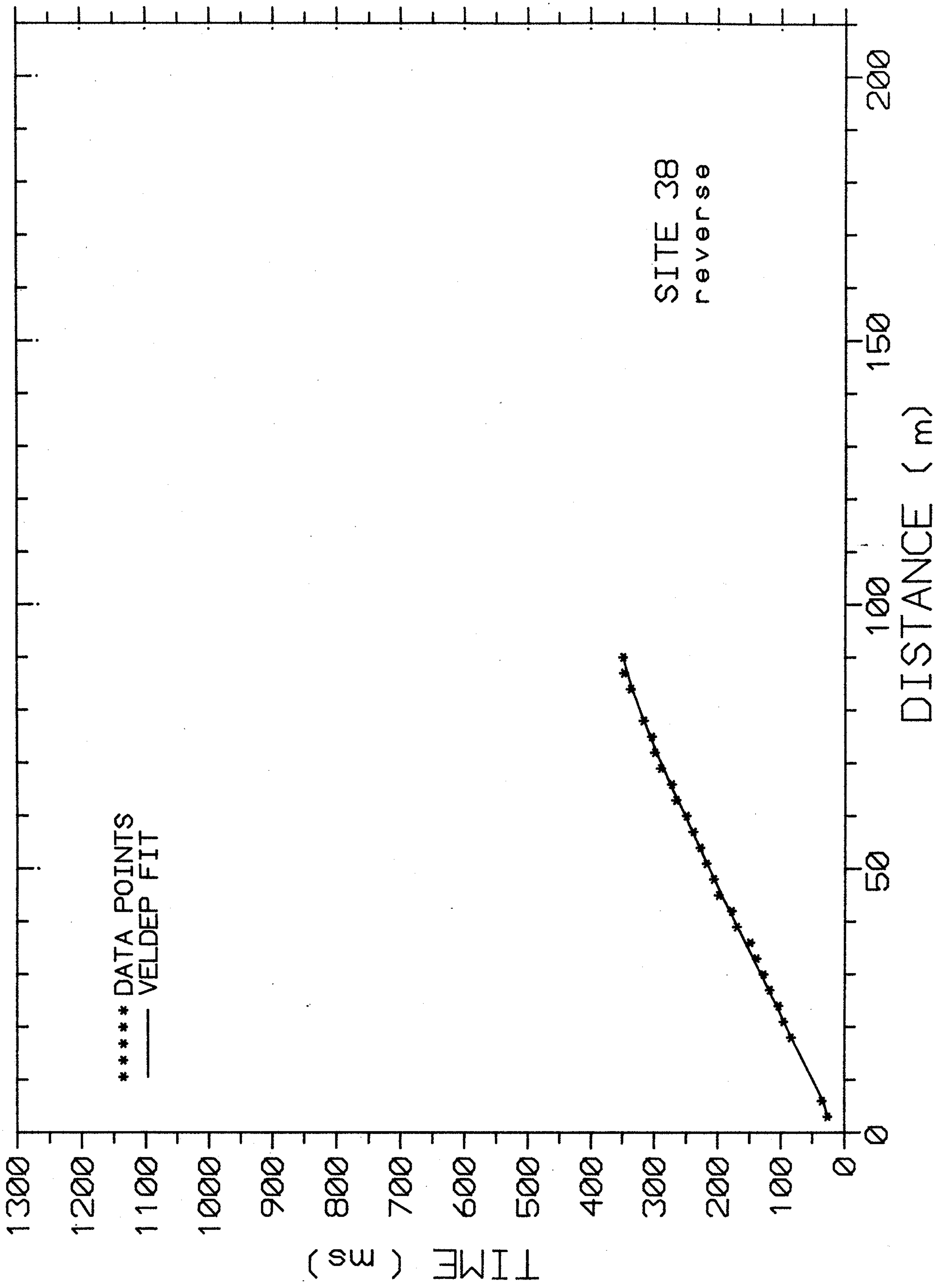


***** DATA POINTS
—— VELDEP FIT
SITE 37
forward
TIME (ms)
DISTANCE (m)
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
0
50
100
150
200

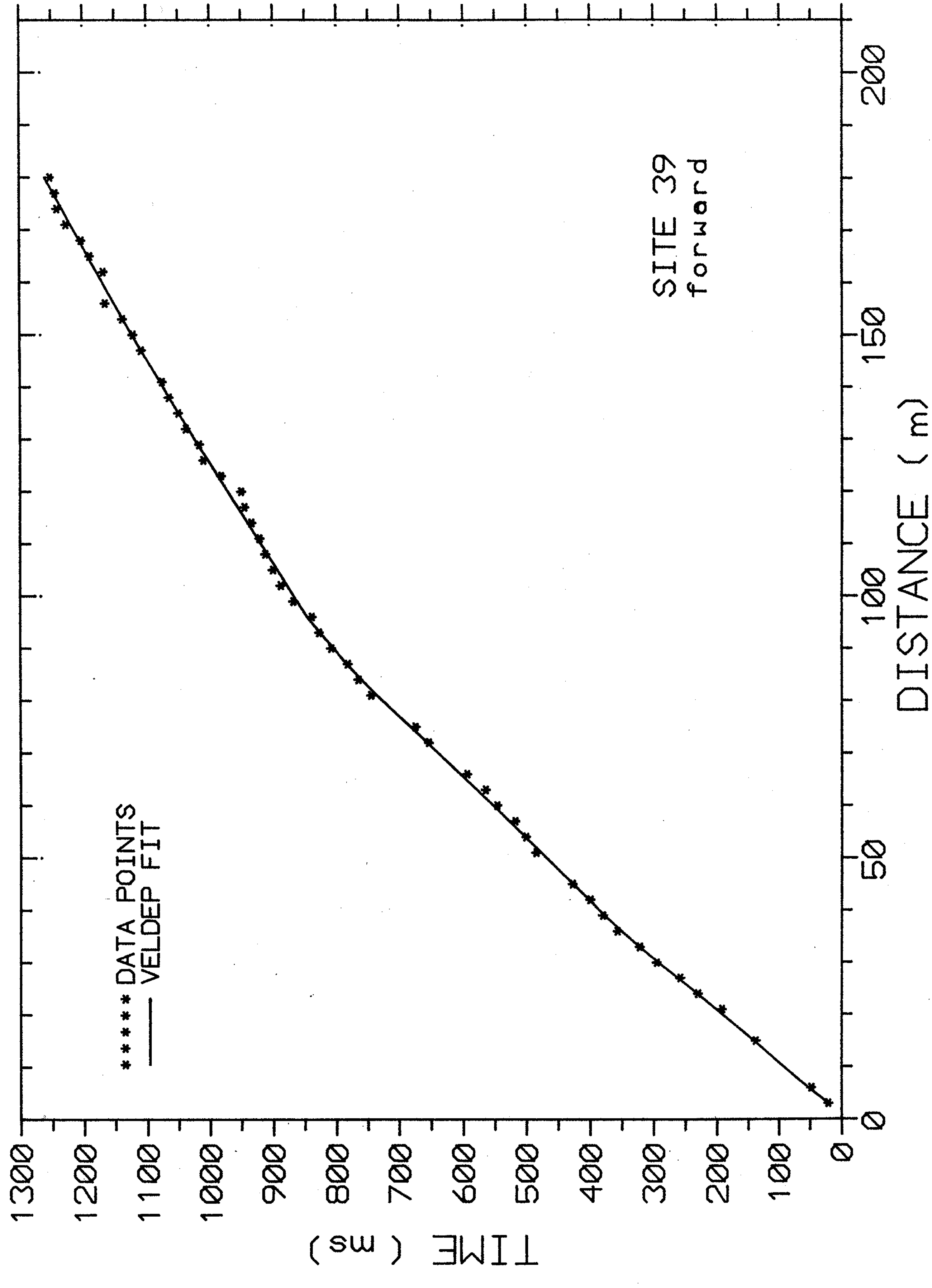


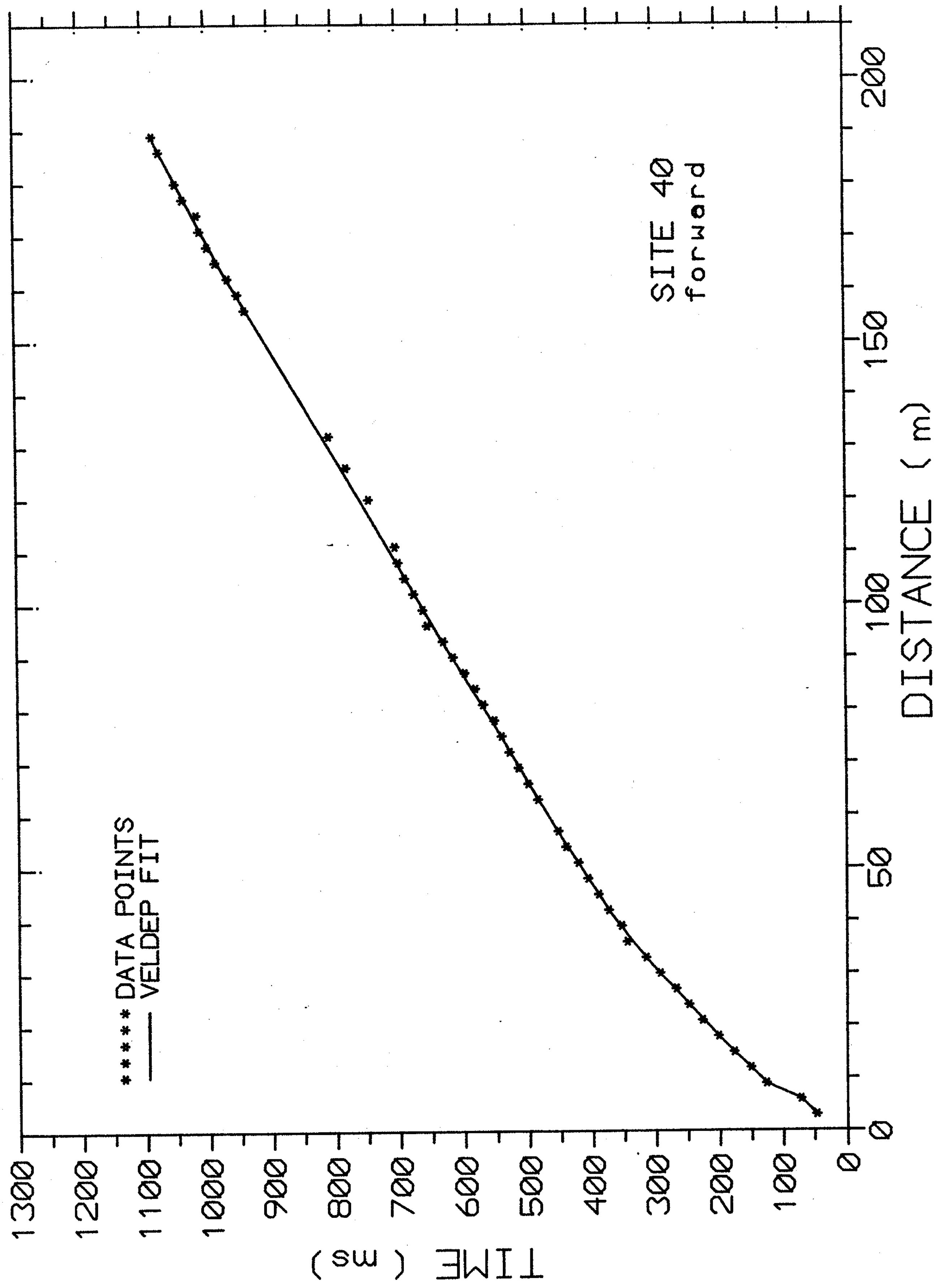
SITE 37
reverse
***** DATA POINTS
—— VELDEP FIT
TIME (ms)
DISTANCE (m)
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
0
50
100
150
200


TIME (ms)
DISTANCE (m)
SITE 38
forward
***** DATA POINTS
—— VELDEP FIT
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
0
50
100
150
200

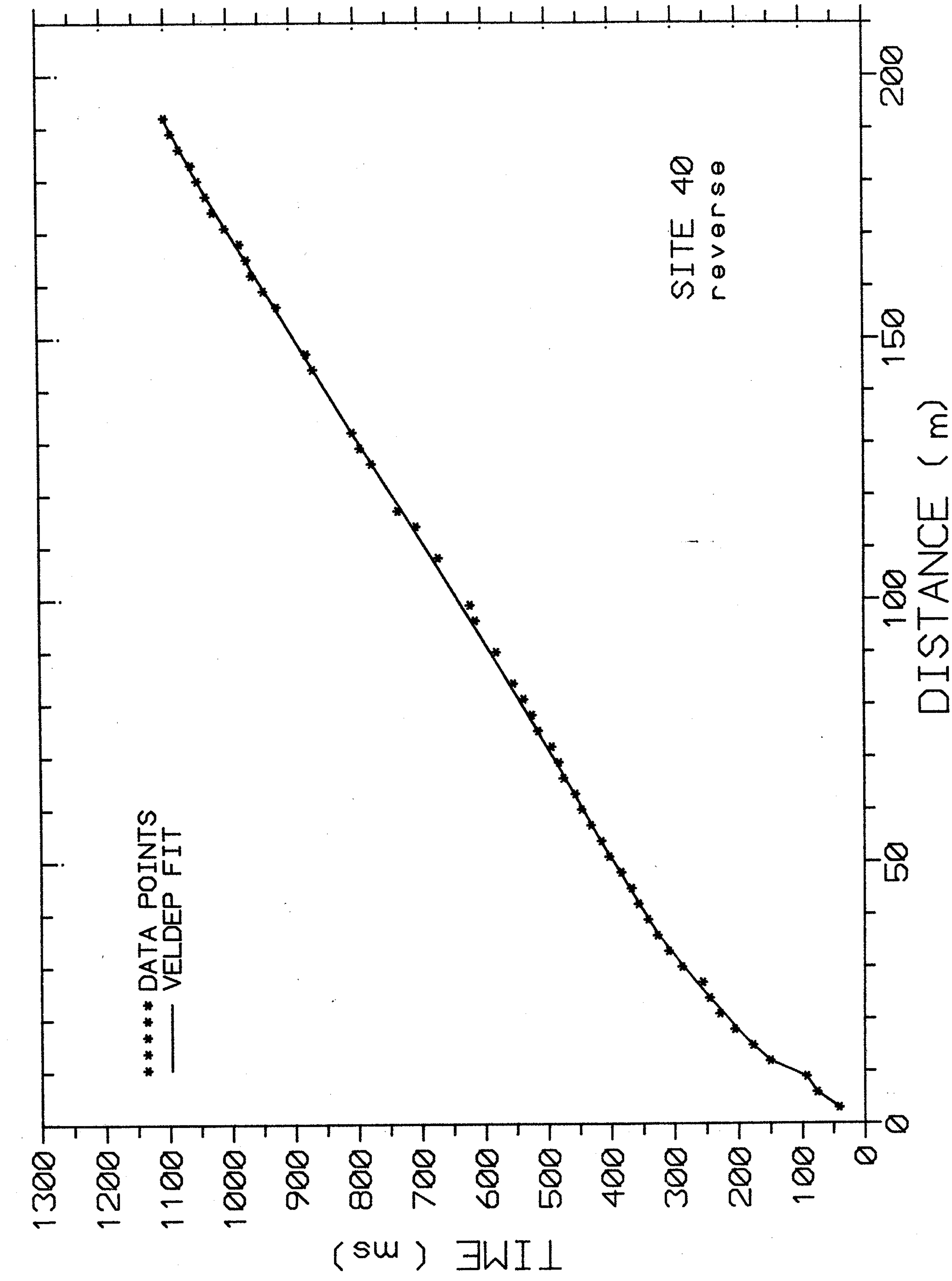


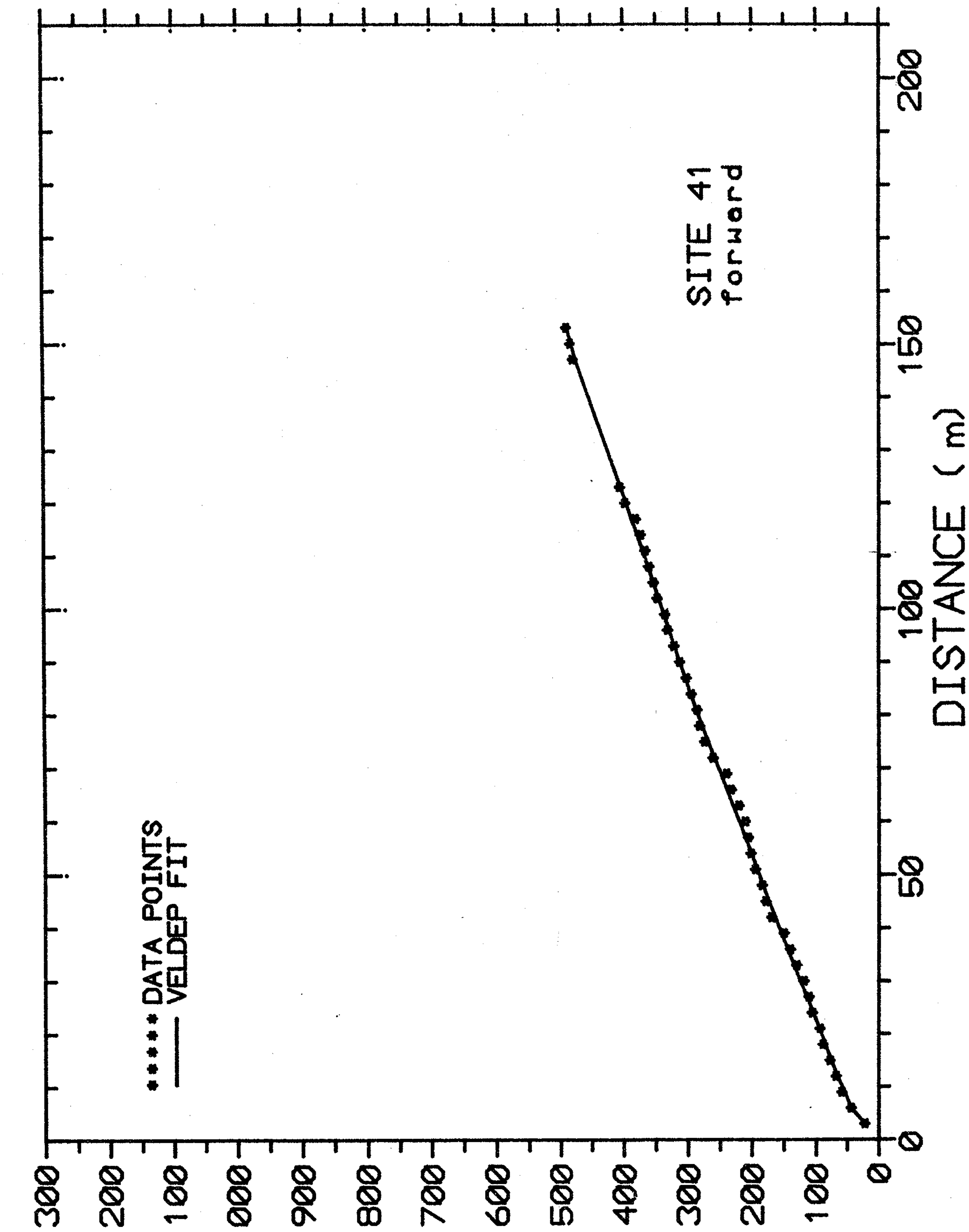
SITE 38
reverse
***** DATA POINTS
—— VELDEP FIT
DISTANCE (m)
TIME (ms)
0
50
100
150
200
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300


SITE 39
forward
***** DATA POINTS
—— VELDEP FIT
TIME (ms)
DISTANCE (m)
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
0
50
100
150
200

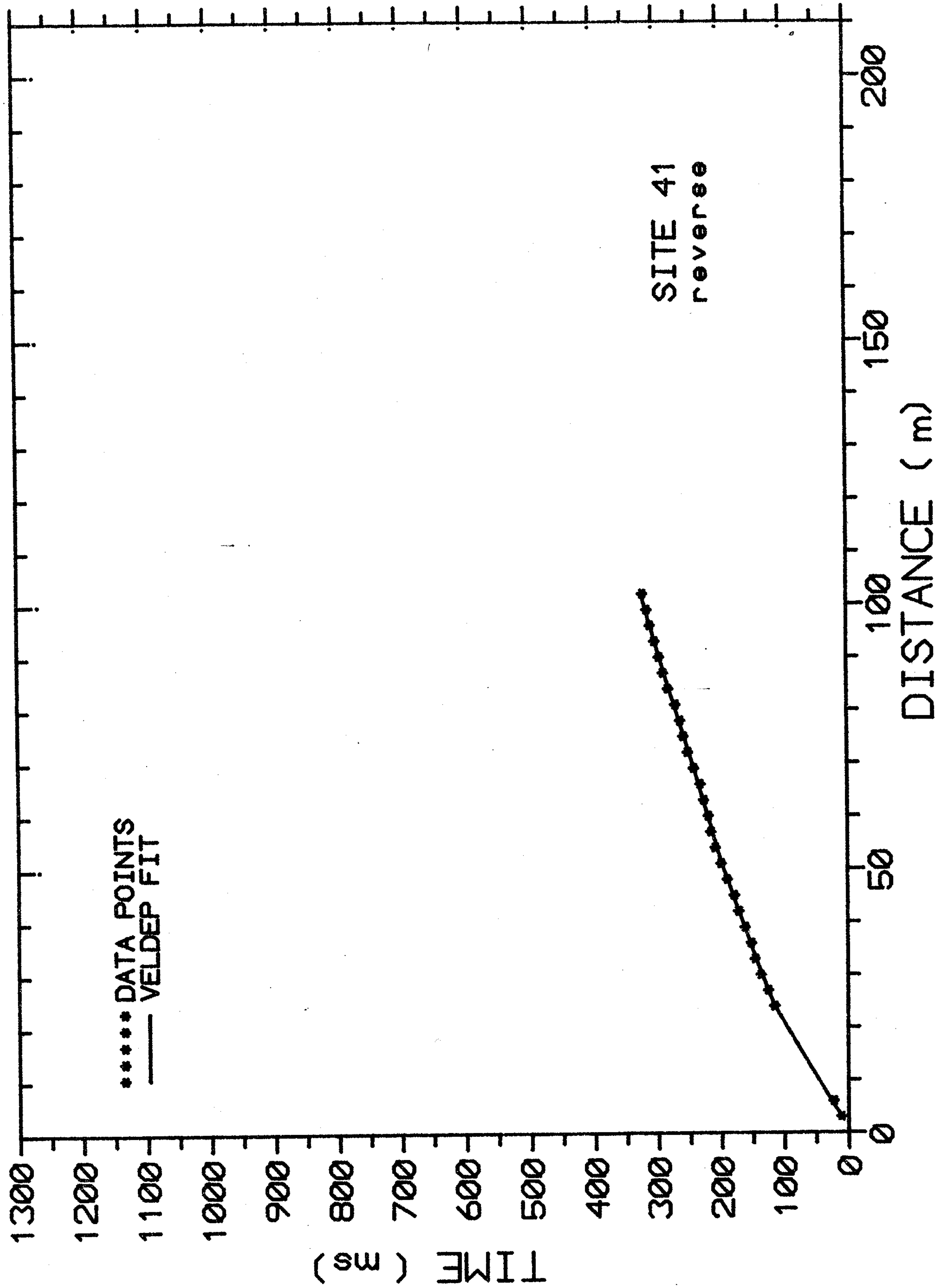


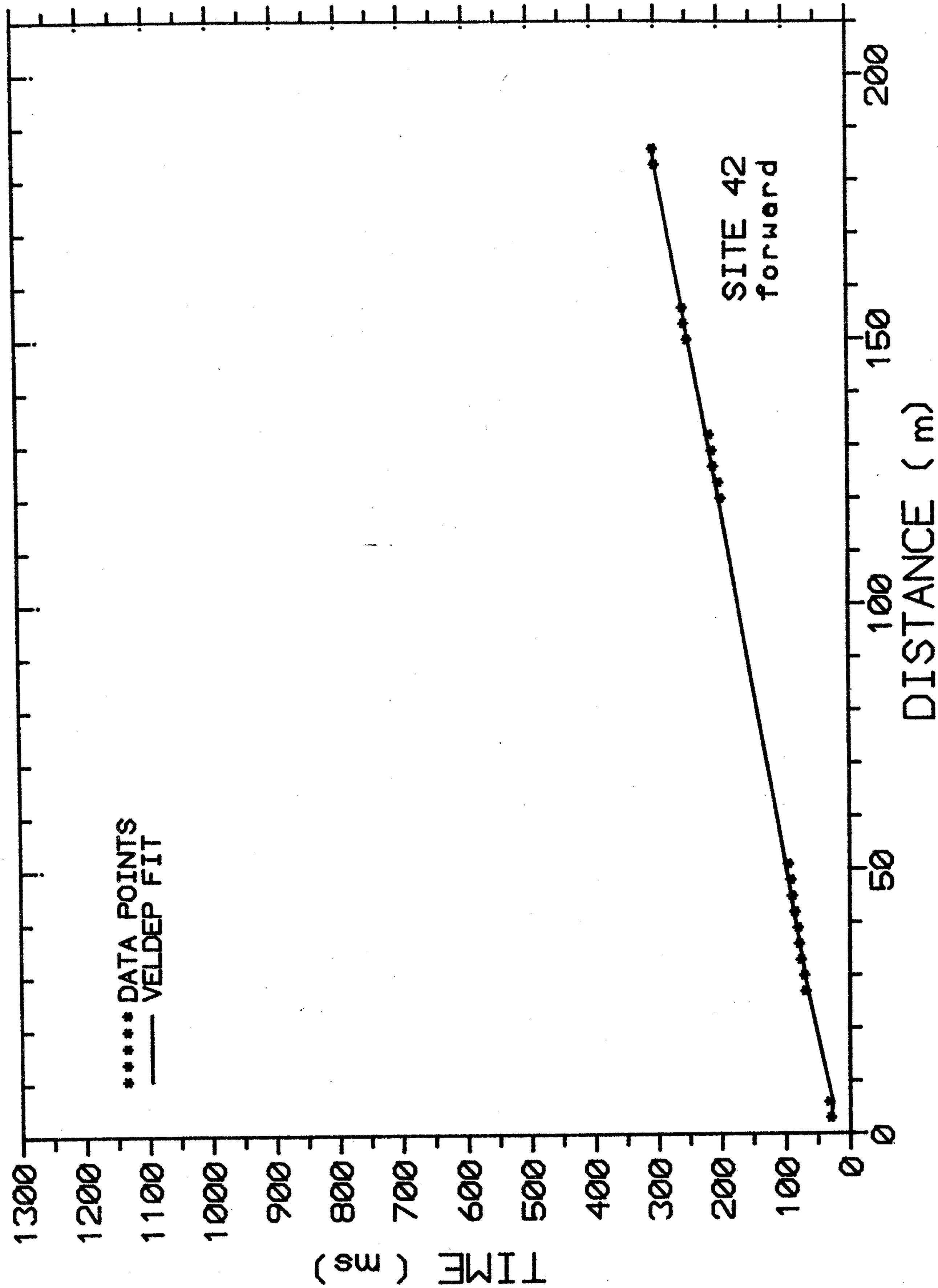
SITE 40
forward
***** DATA POINTS
—— VELDEP FIT
DISTANCE (m)
TIME (ms)
0
50
100
150
200
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300


SITE 40
reverse
***** DATA POINTS
—— VELDEP FIT
DISTANCE (m)
TIME (ms)
0
50
100
150
200
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300

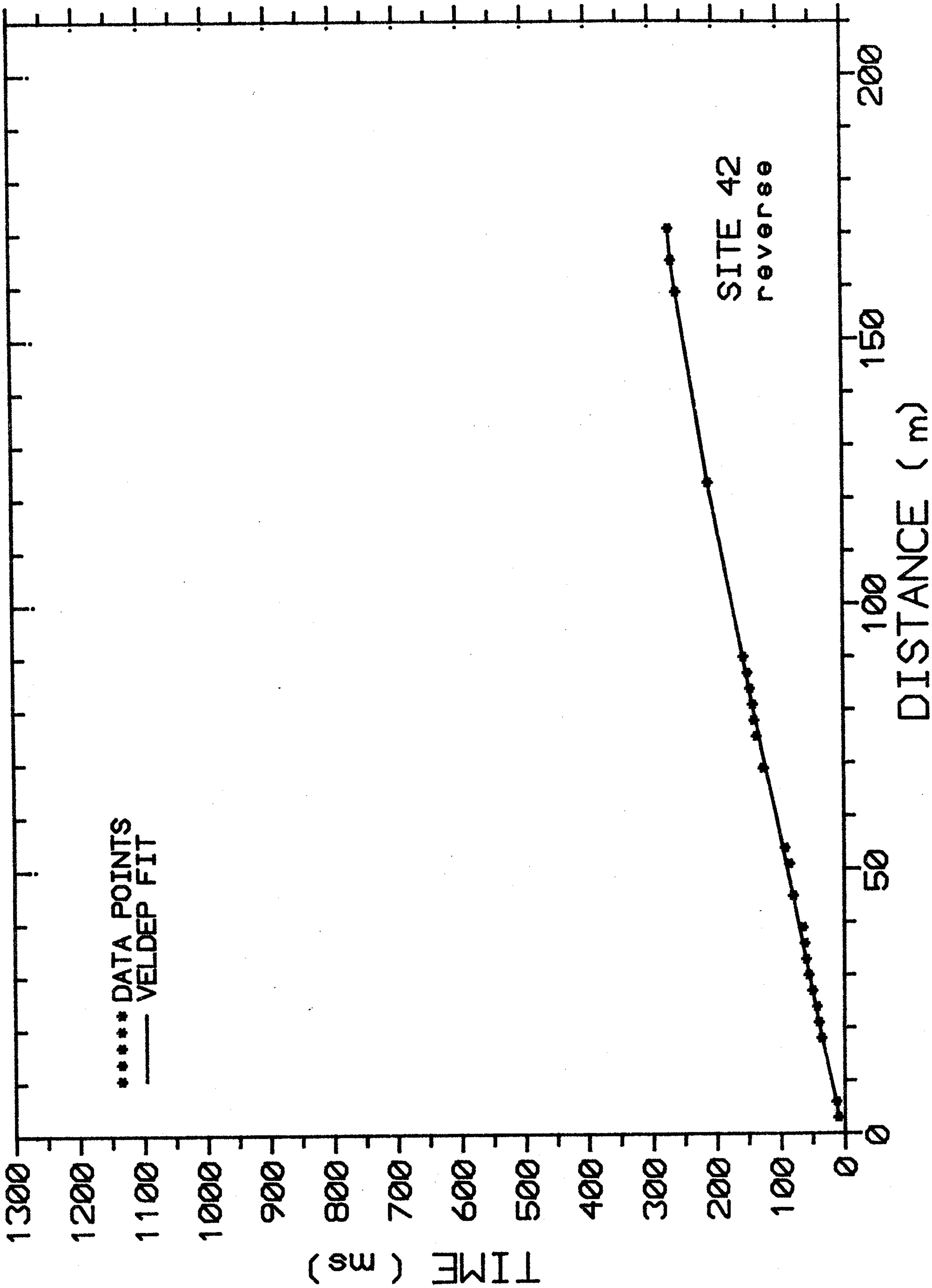


TIME (ms)
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
DISTANCE (m)
0
50
100
150
200
SITE 41
forward
***** DATA POINTS
—— VELDEP FIT

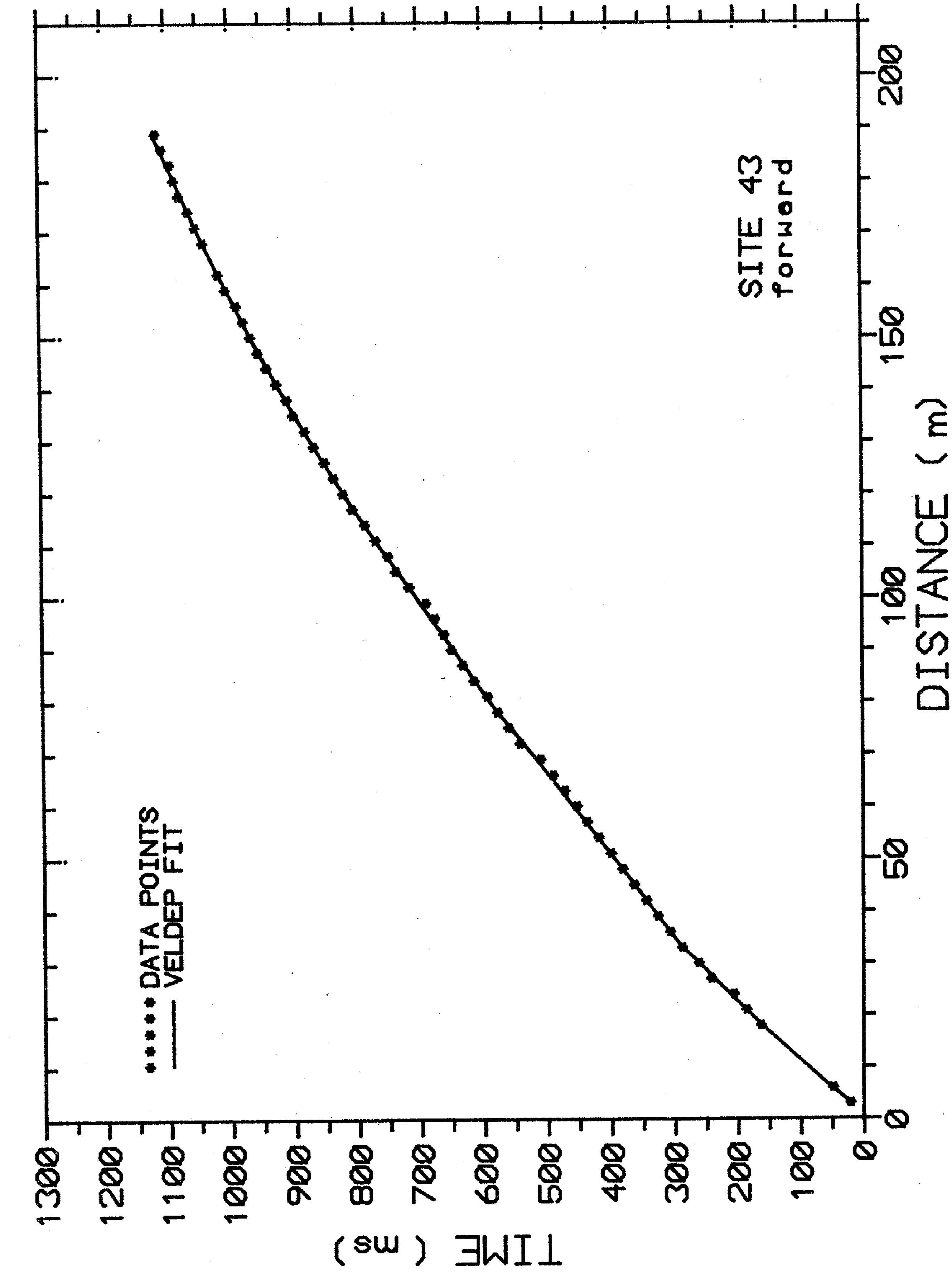

SITE 41
reverse
***** DATA POINTS
—— VELDEP FIT
DISTANCE (m)
TIME (ms)
0
50
100
150
200
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300

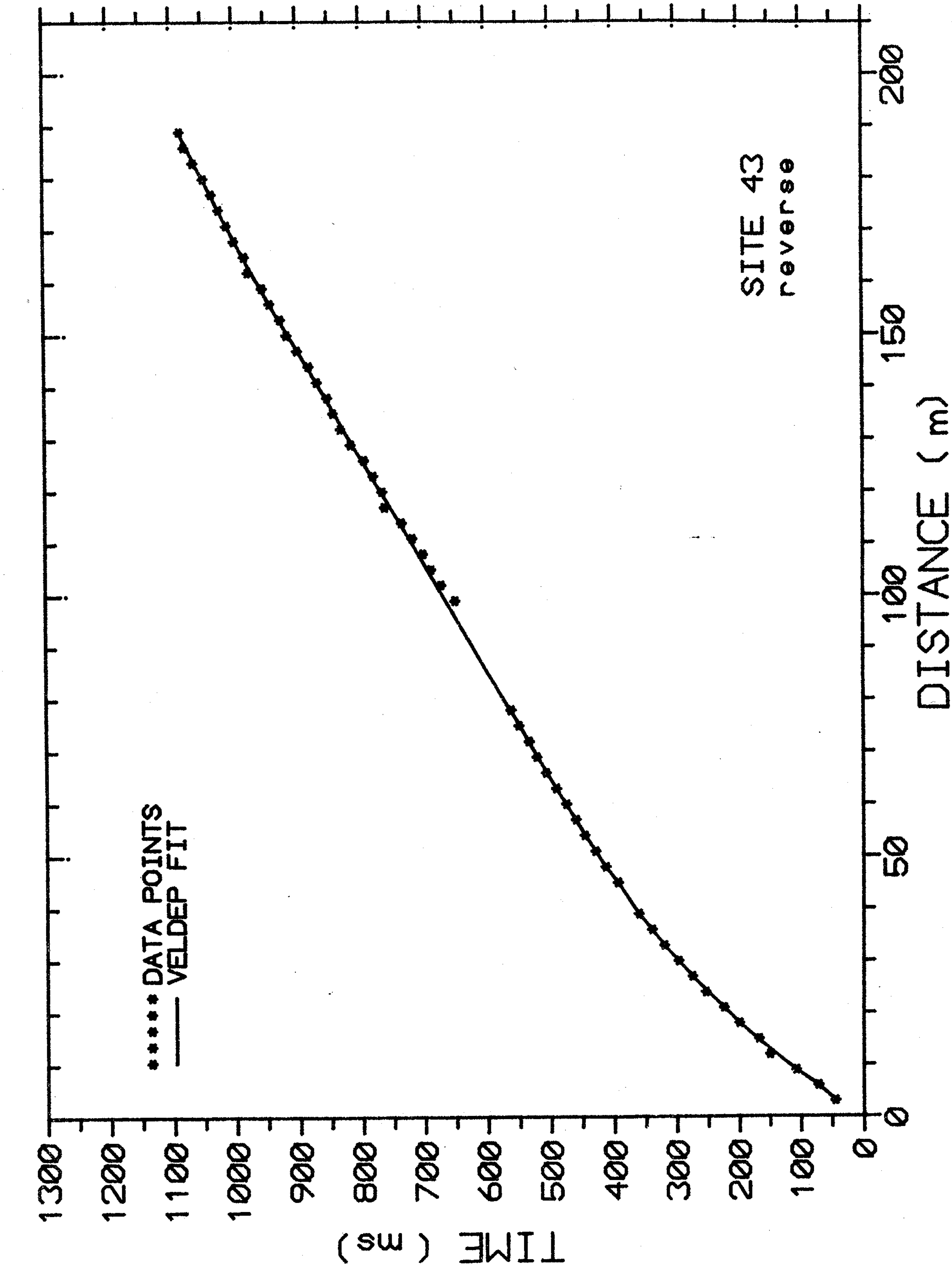


TIME (ms)
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
DISTANCE (m)
0
50
100
150
200
***** DATA POINTS
—— VELDEP FIT
SITE 42
forward

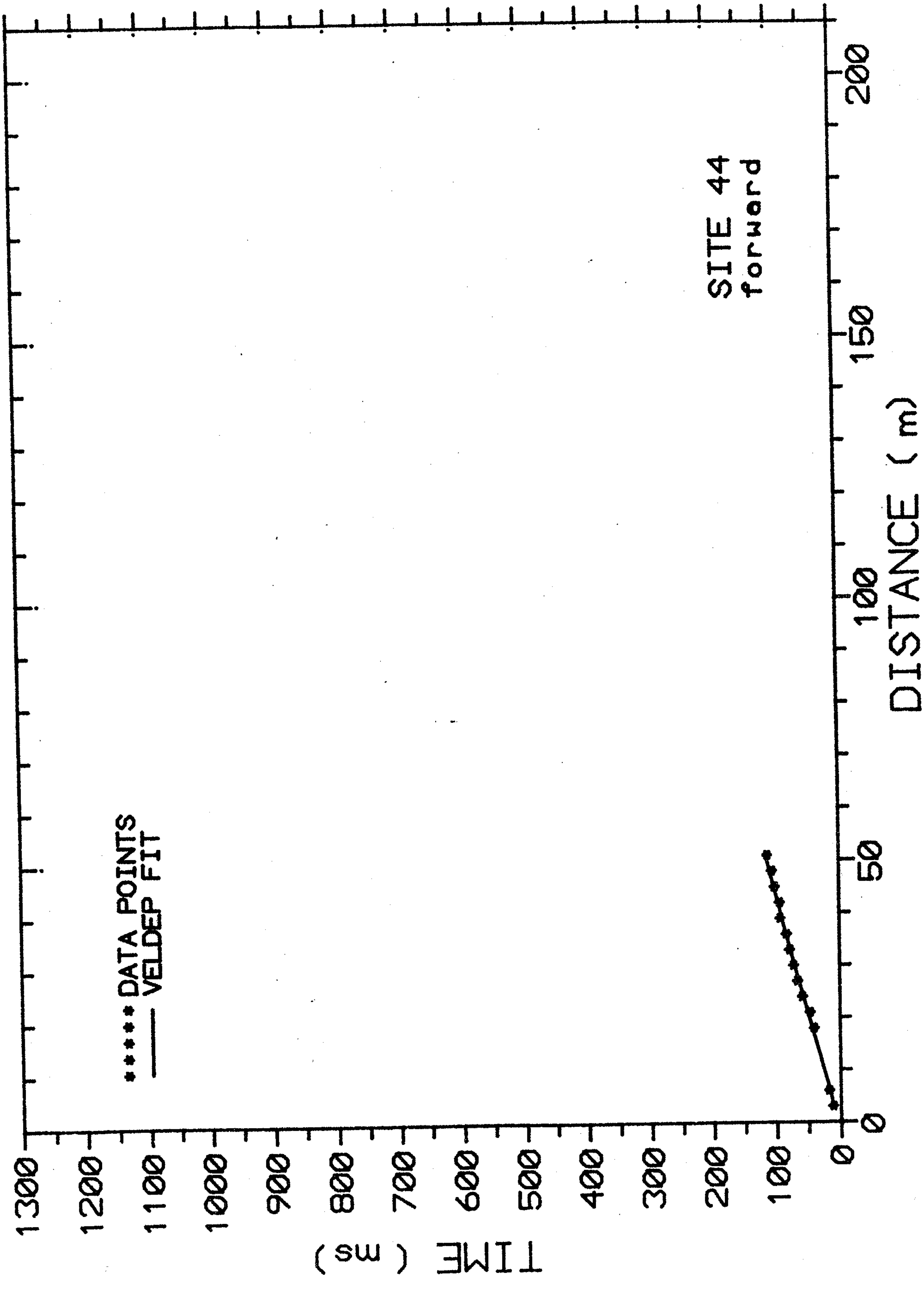


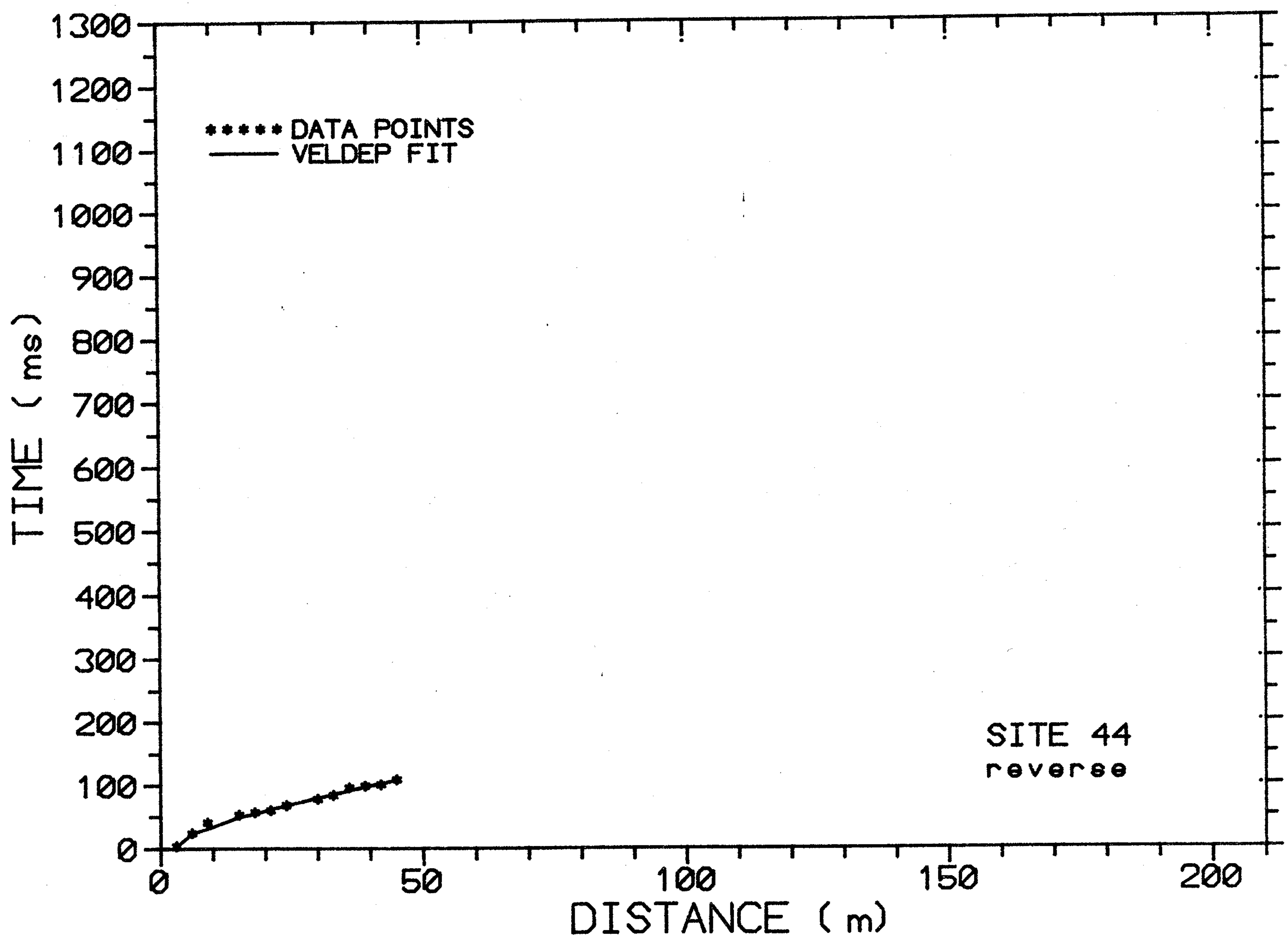
SITE 42
reverse
***** DATA POINTS
—— VELDEP FIT
TIME (ms)
DISTANCE (m)
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
0
50
100
150
200


SITE 43
forward
***** DATA POINTS
—— VELDEP FIT
DISTANCE (m)
TIME (ms)
0
50
100
150
200
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300

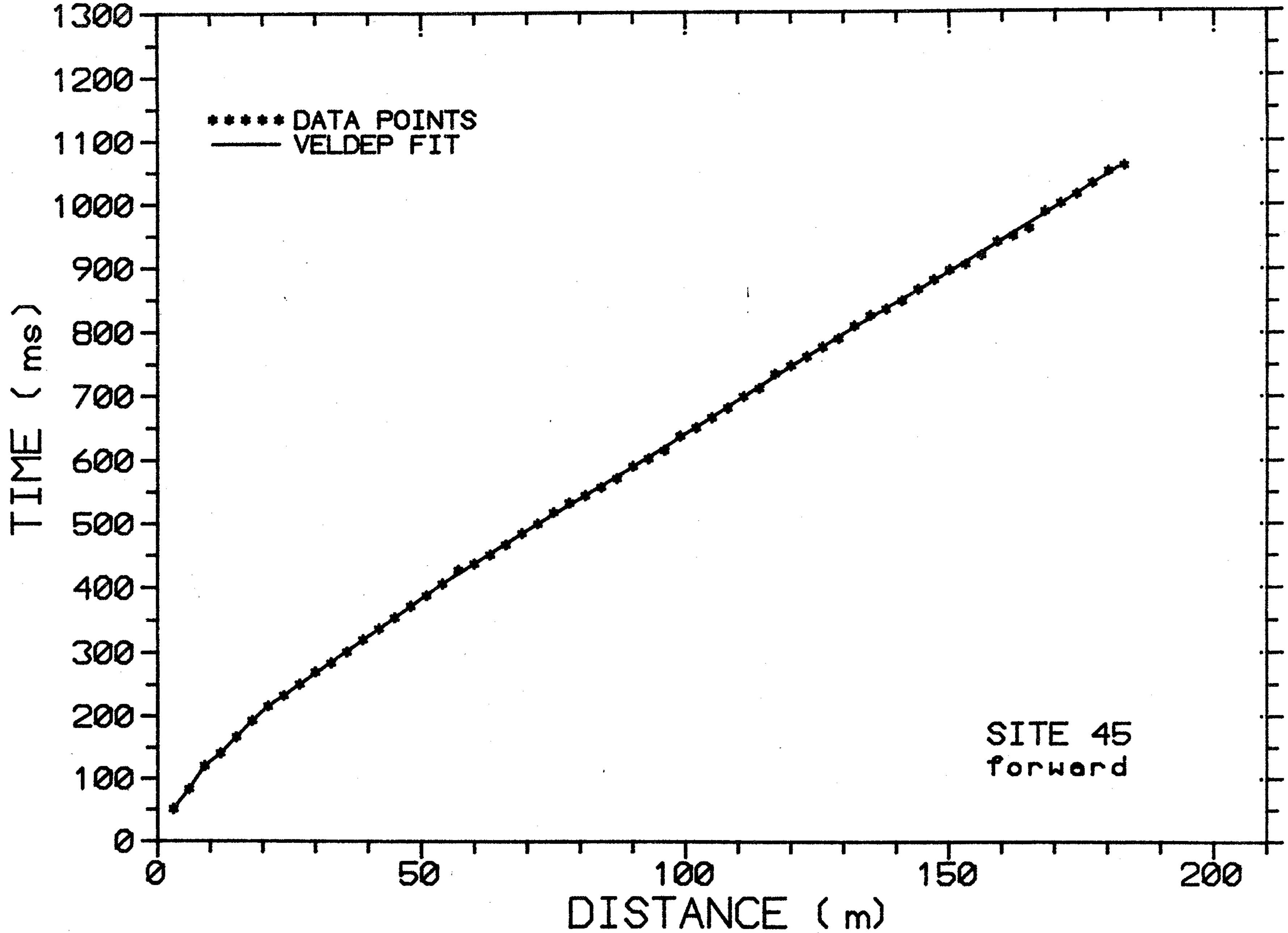


SITE 43
reverse
***** DATA POINTS
—— VELDEP FIT
DISTANCE (m)
TIME (ms)
0
50
100
150
200
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300

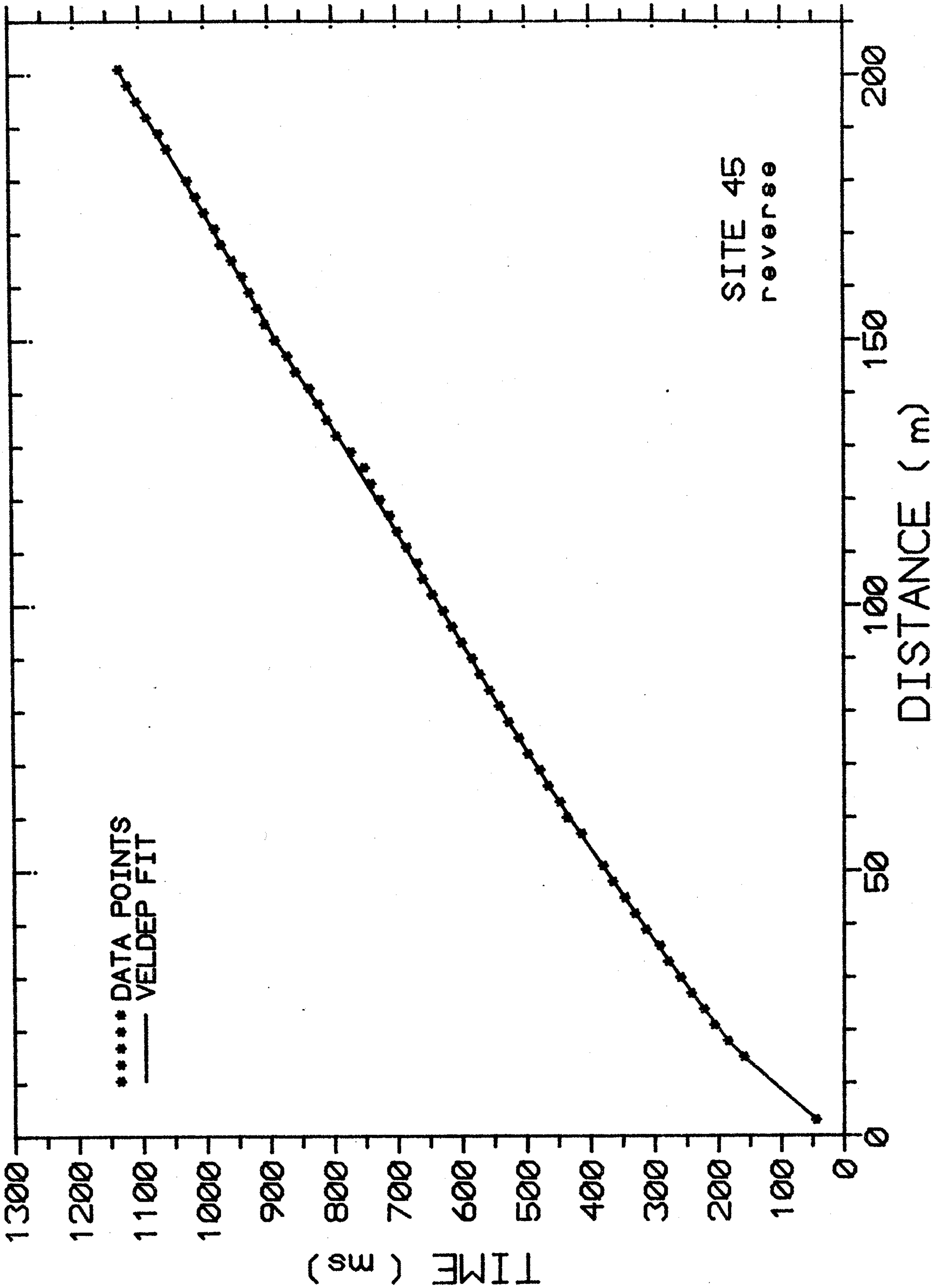

SITE 44
forward
***** DATA POINTS
—— VELDEP FIT
DISTANCE (m)
TIME (ms)
0
50
100
150
200
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300



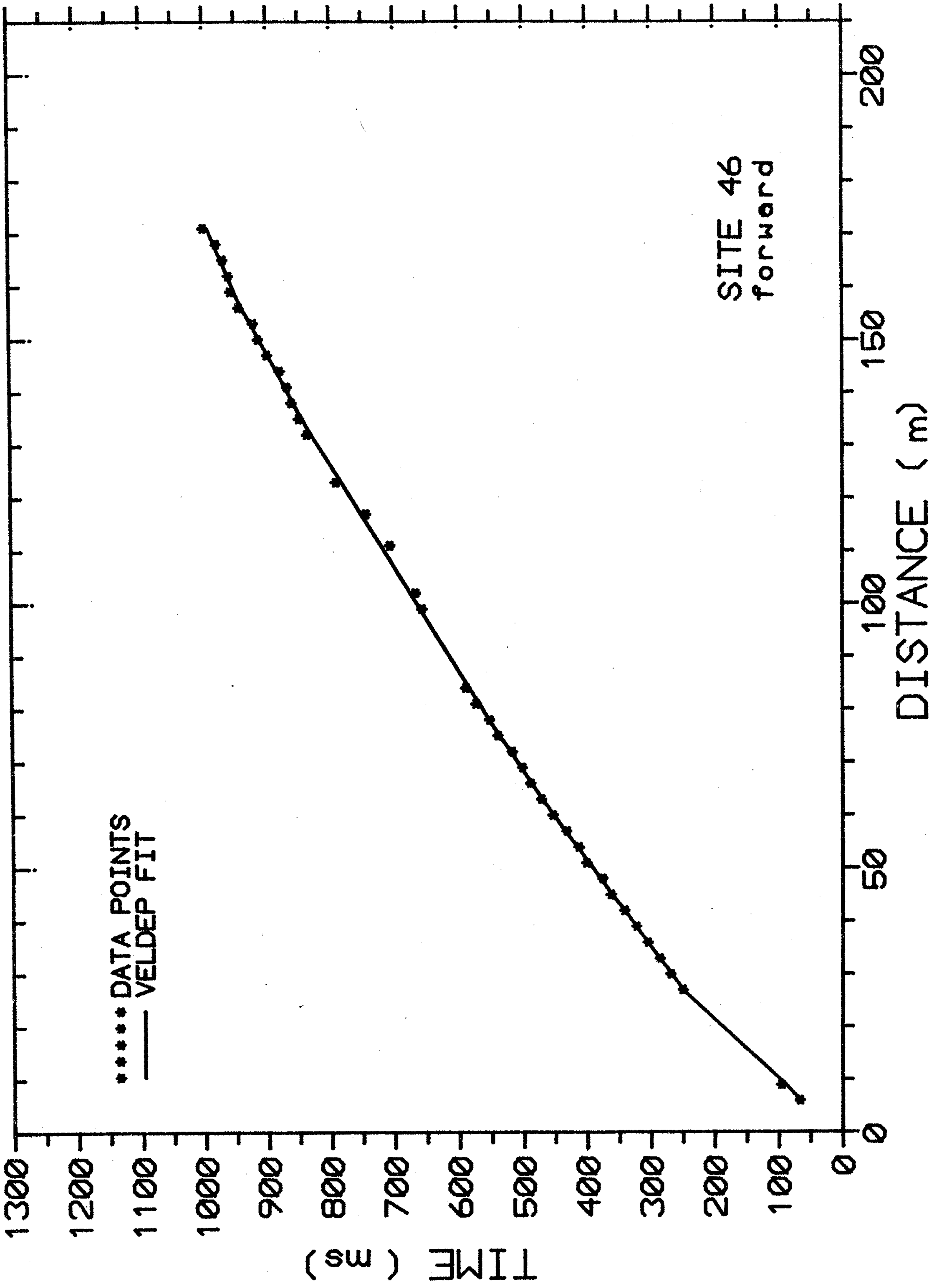
***** DATA POINTS
VELDEP FIT
SITE 44
reverse
TIME (ms)
DISTANCE (m)
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
0
50
100
150
200



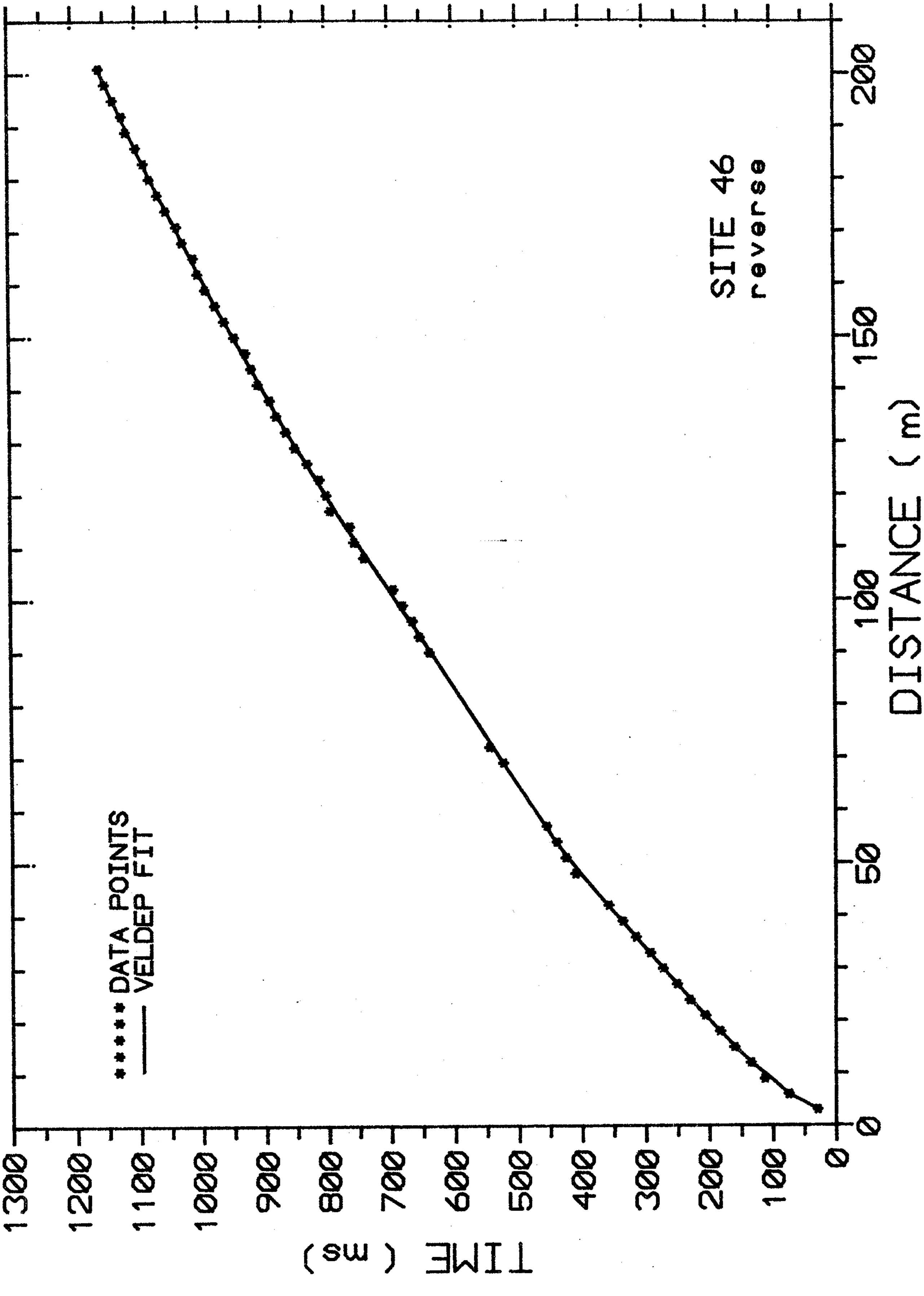
***** DATA POINTS
VELDEP FIT
SITE 45
forward
TIME (ms)
DISTANCE (m)
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
0
50
100
150
200



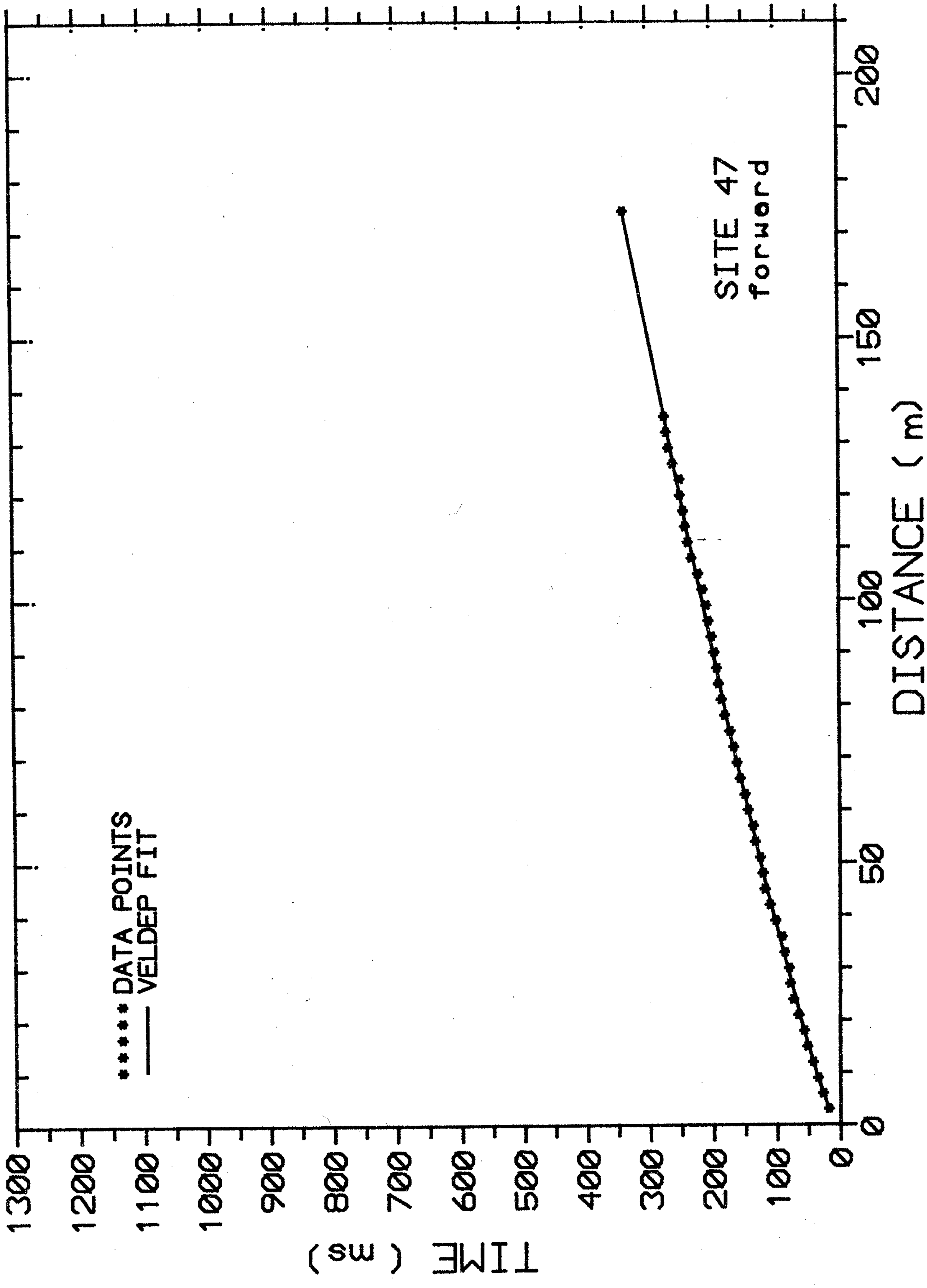
SITE 45
reverse
***** DATA POINTS
—— VELDEP FIT
DISTANCE (m)
TIME (ms)
0
50
100
150
200
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300



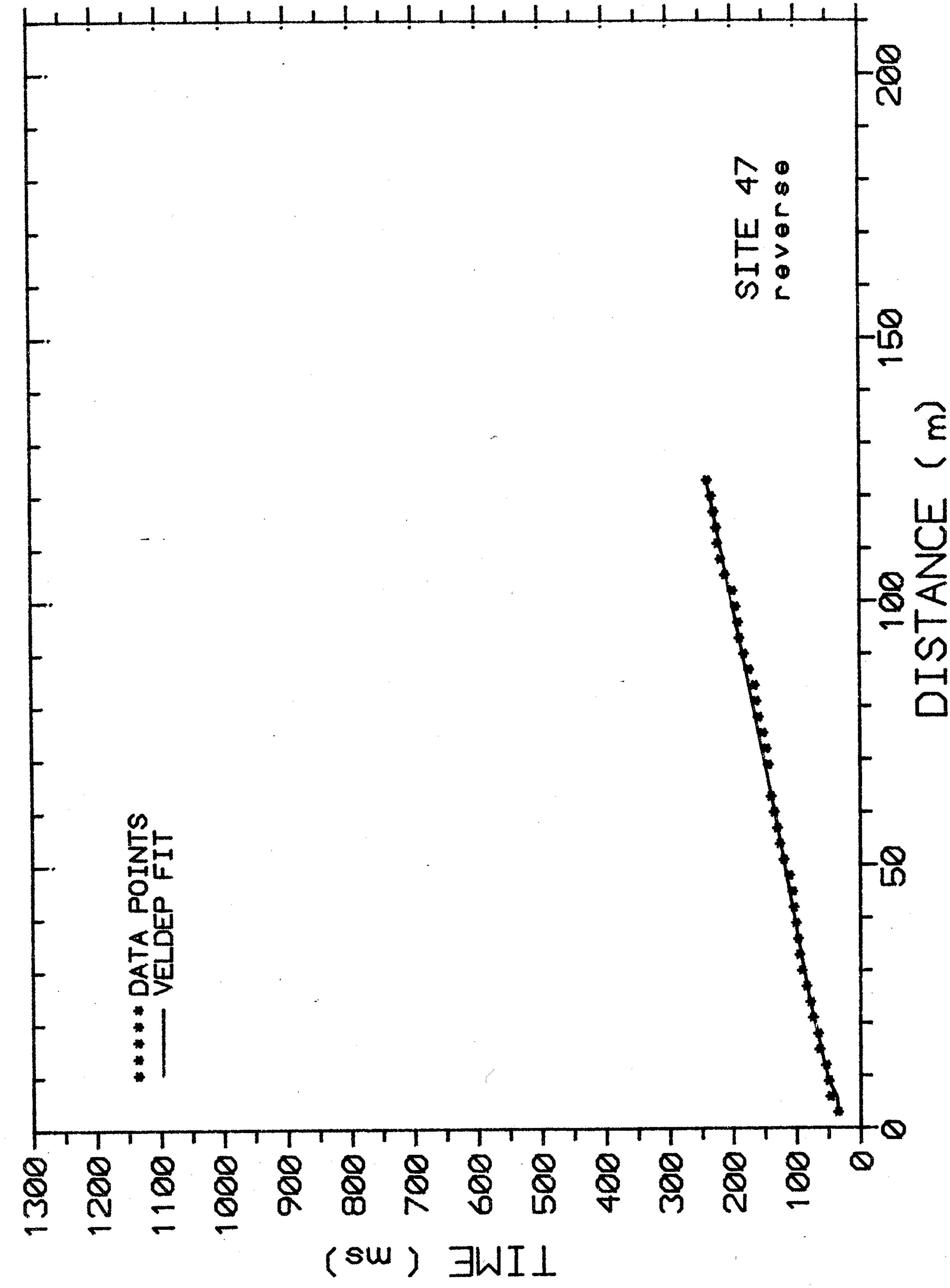
SITE 46
forward
***** DATA POINTS
VELDEP FIT
DISTANCE (m)
TIME (ms)
0
50
100
150
200
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300



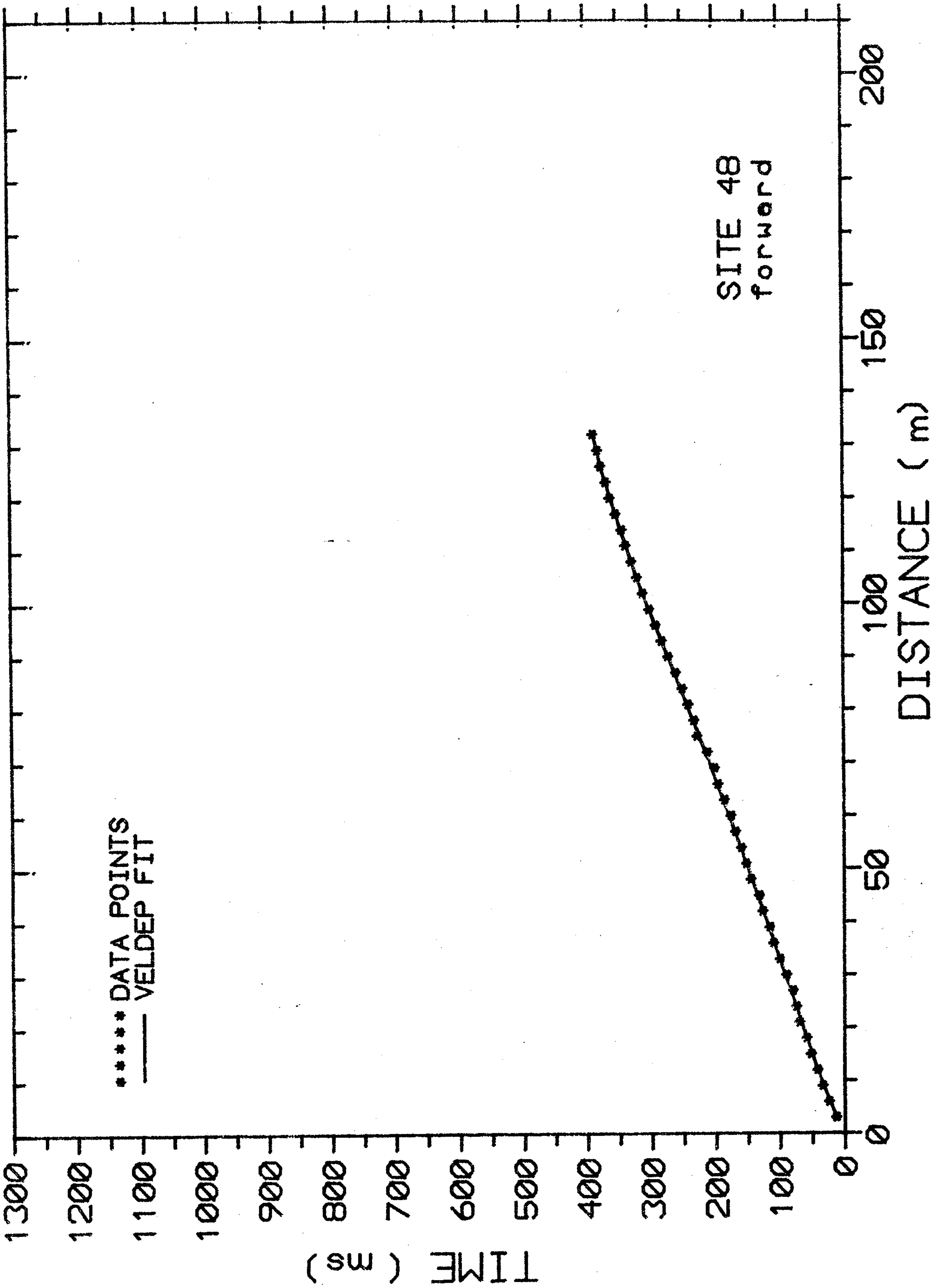
SITE 46
reverse
***** DATA POINTS
—— VELDEP FIT
DISTANCE (m)
TIME (ms)
0
50
100
150
200
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300



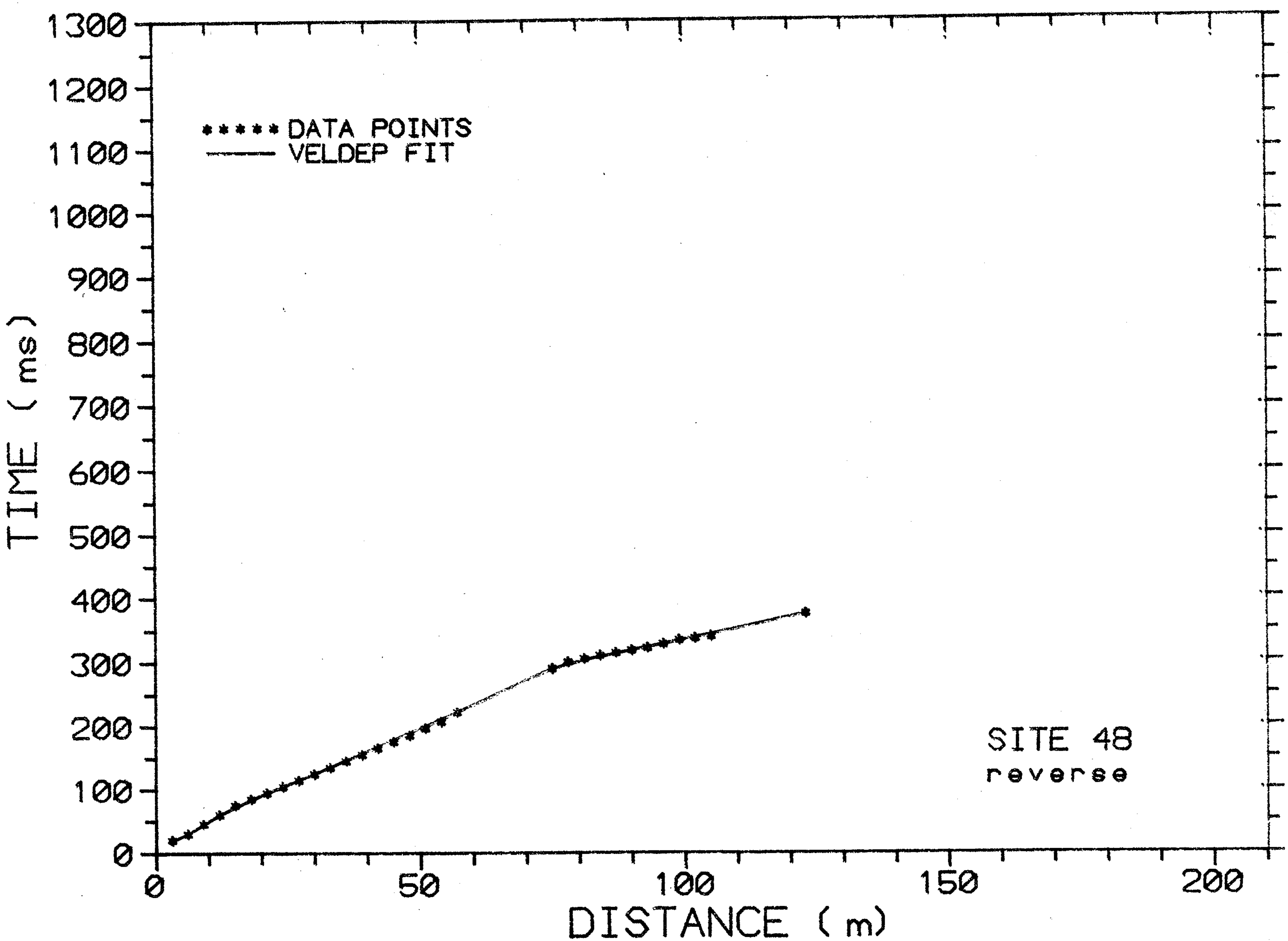
TIME (ms)
DISTANCE (m)
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
0
50
100
150
200
***** DATA POINTS
—— VELDEP FIT
SITE 47
forward

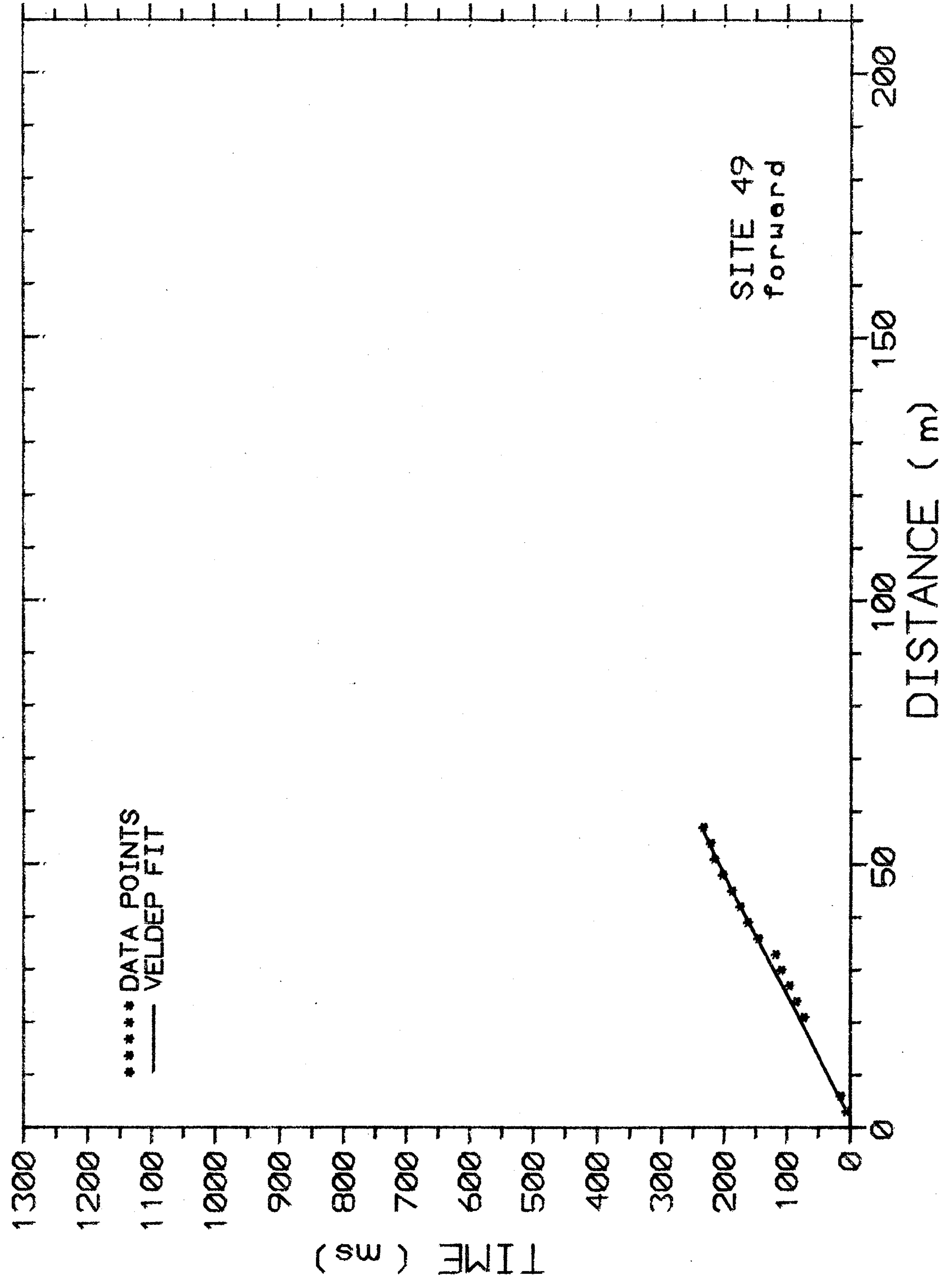


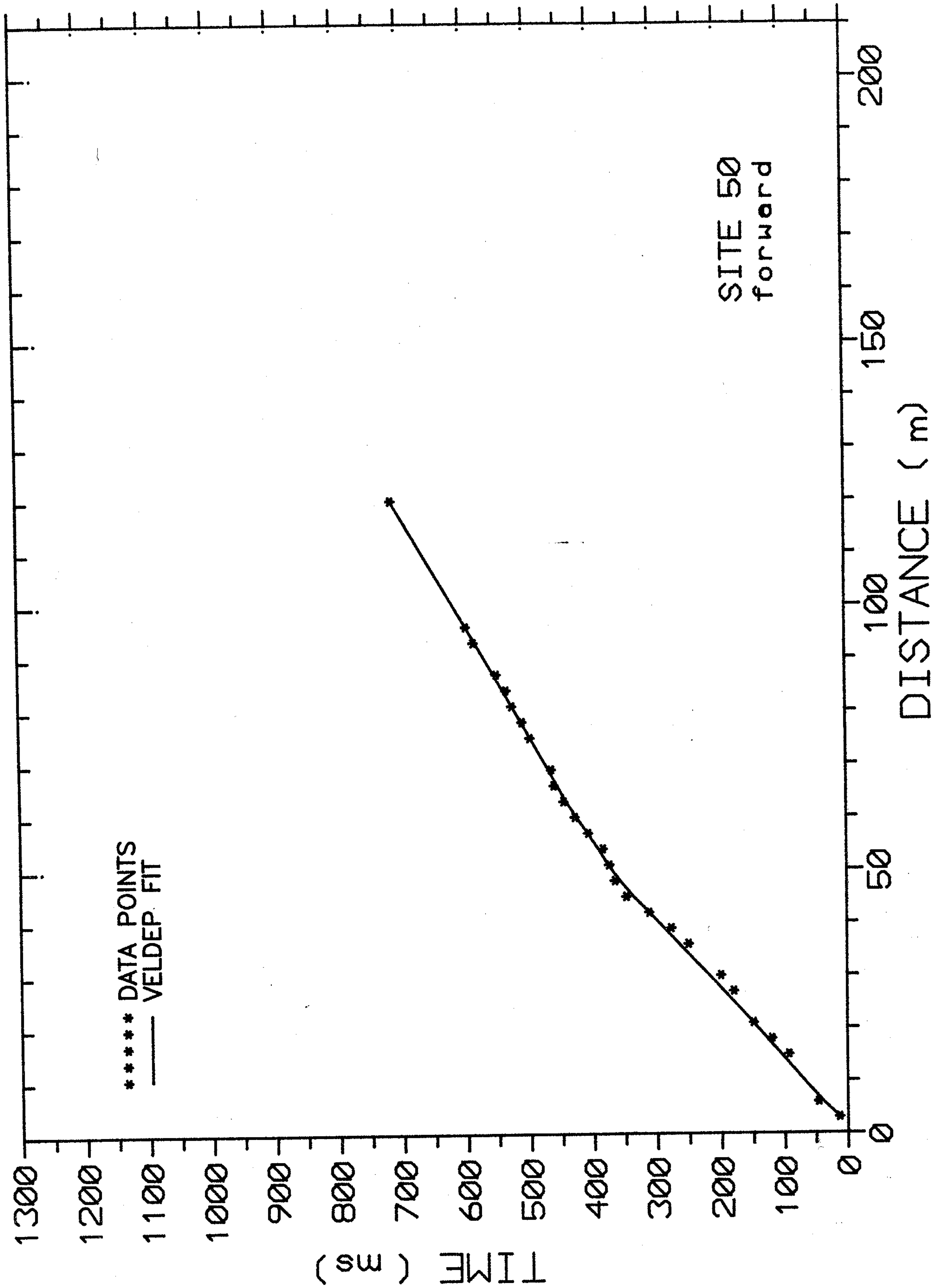
SITE 47
reverse
***** DATA POINTS
—— VELDEP FIT
DISTANCE (m)
TIME (ms)
0
50
100
150
200
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300



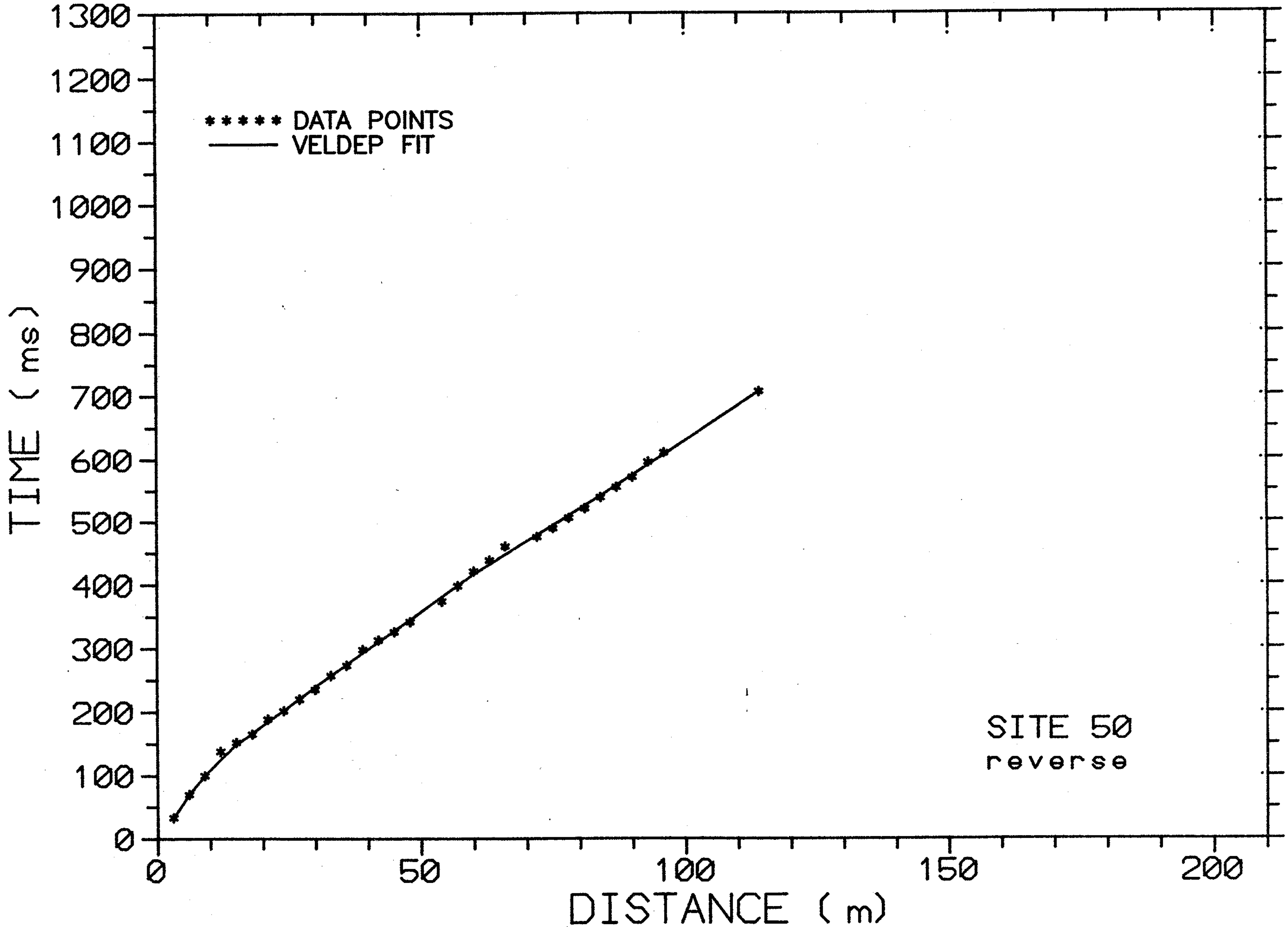
SITE 48
forward
***** DATA POINTS
—— VELDEP FIT
DISTANCE (m)
TIME (ms)
0
50
100
150
200
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300

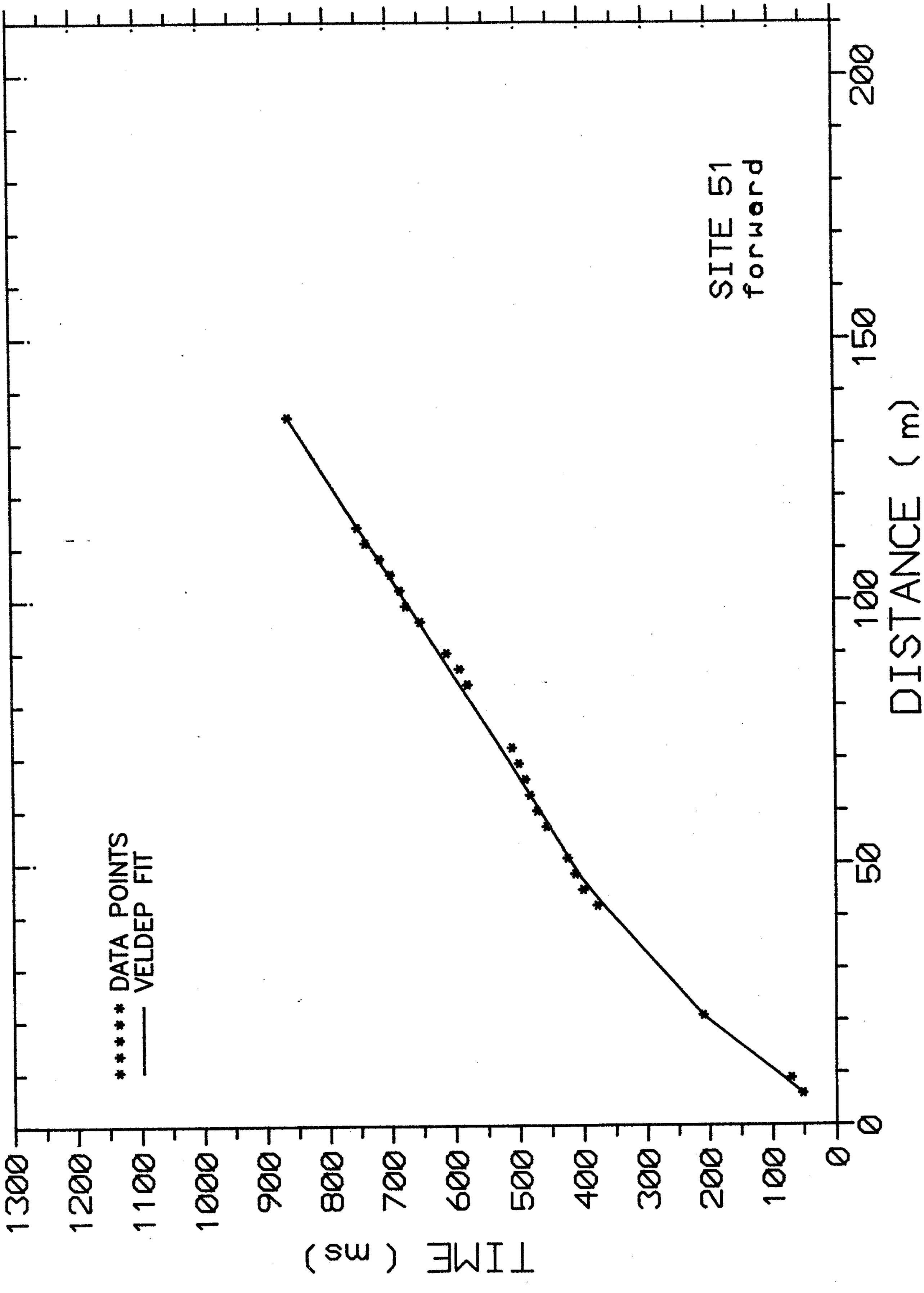

***** DATA POINTS
—— VELDEP FIT
SITE 48
reverse
TIME (ms)
1300
1200
1100
1000
900
800
700
600
500
400
300
200
100
0
0
50
100
150
200
DISTANCE (m)

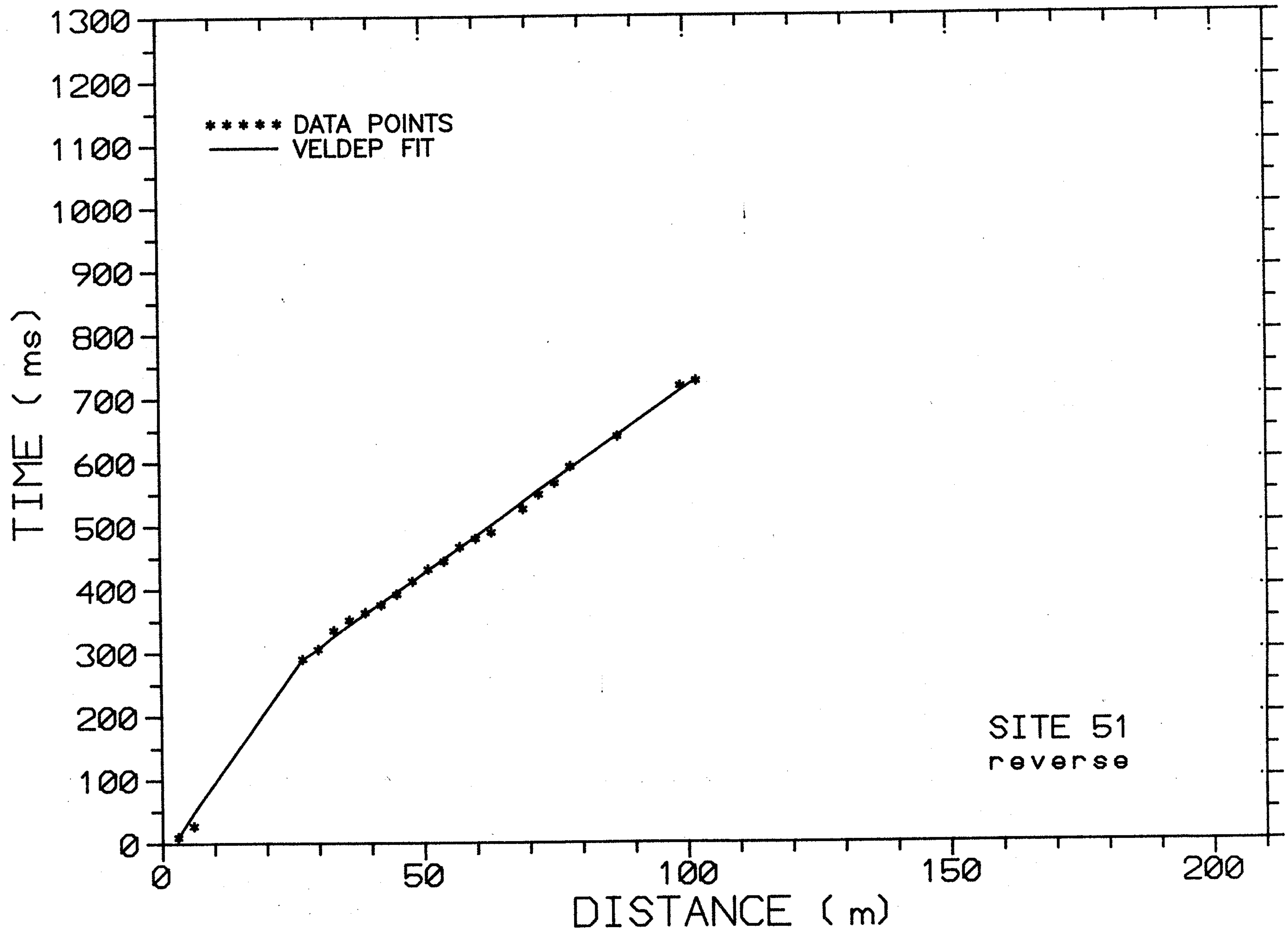

SITE 49
forward
***** DATA POINTS
—— VELDEP FIT
DISTANCE (m)
TIME (ms)
0
50
100
150
200
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300



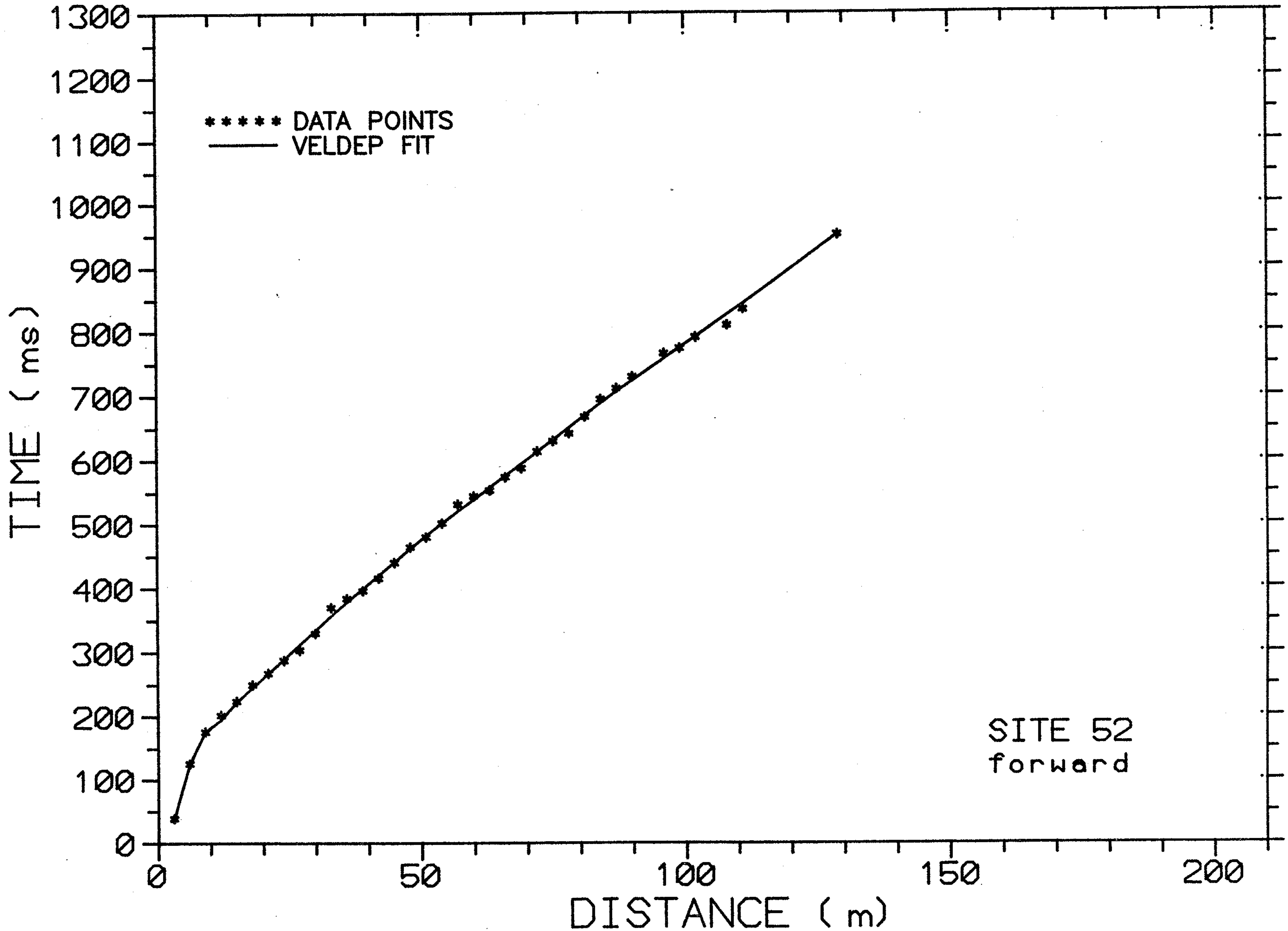
SITE 50
forward
***** DATA POINTS
—— VELDEP FIT
DISTANCE (m)
TIME (ms)
0
50
100
150
200
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300

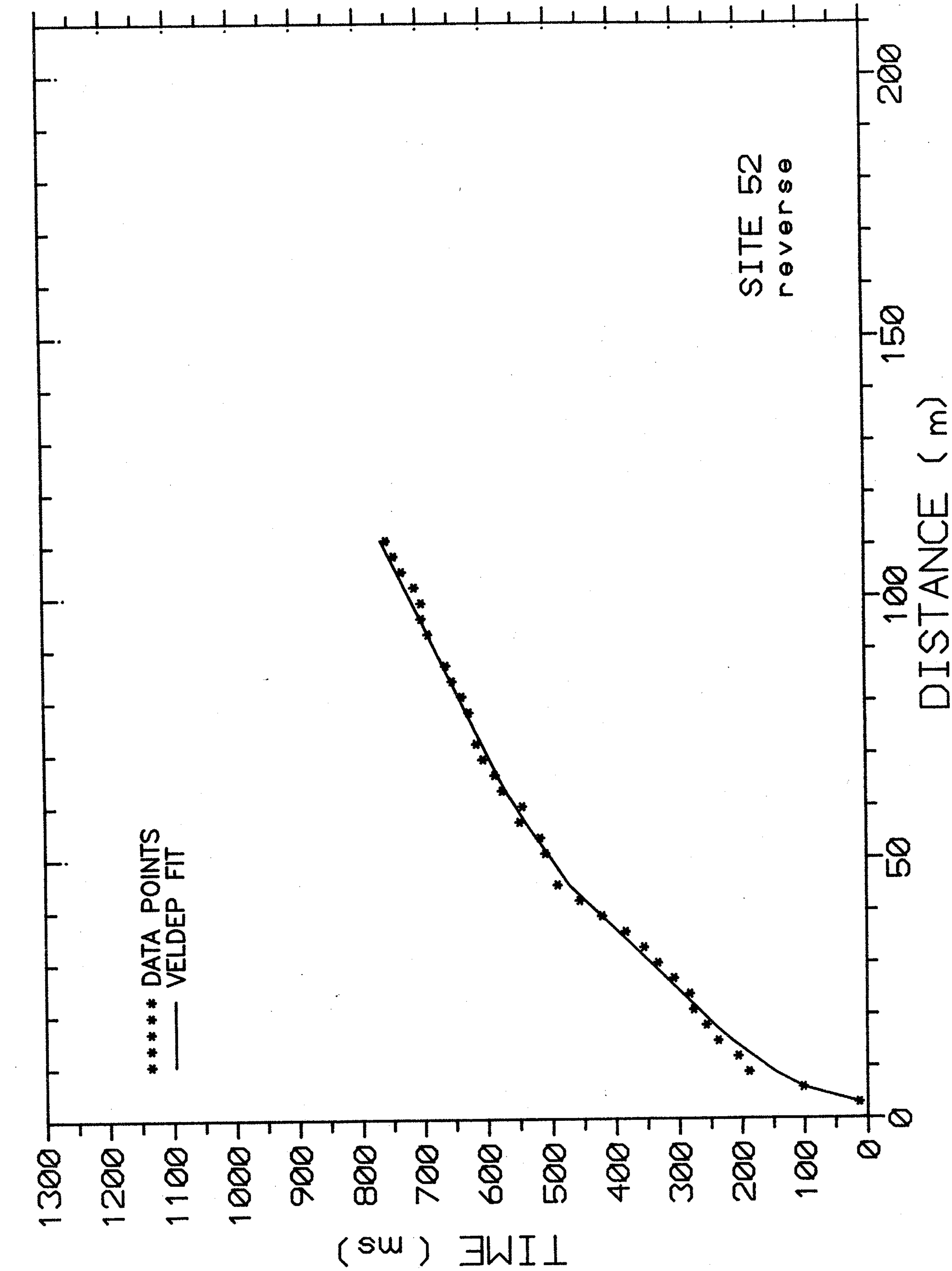

***** DATA POINTS
VELDEP FIT
TIME (ms)
DISTANCE (m)
SITE 50
reverse
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
0
50
100
150
200

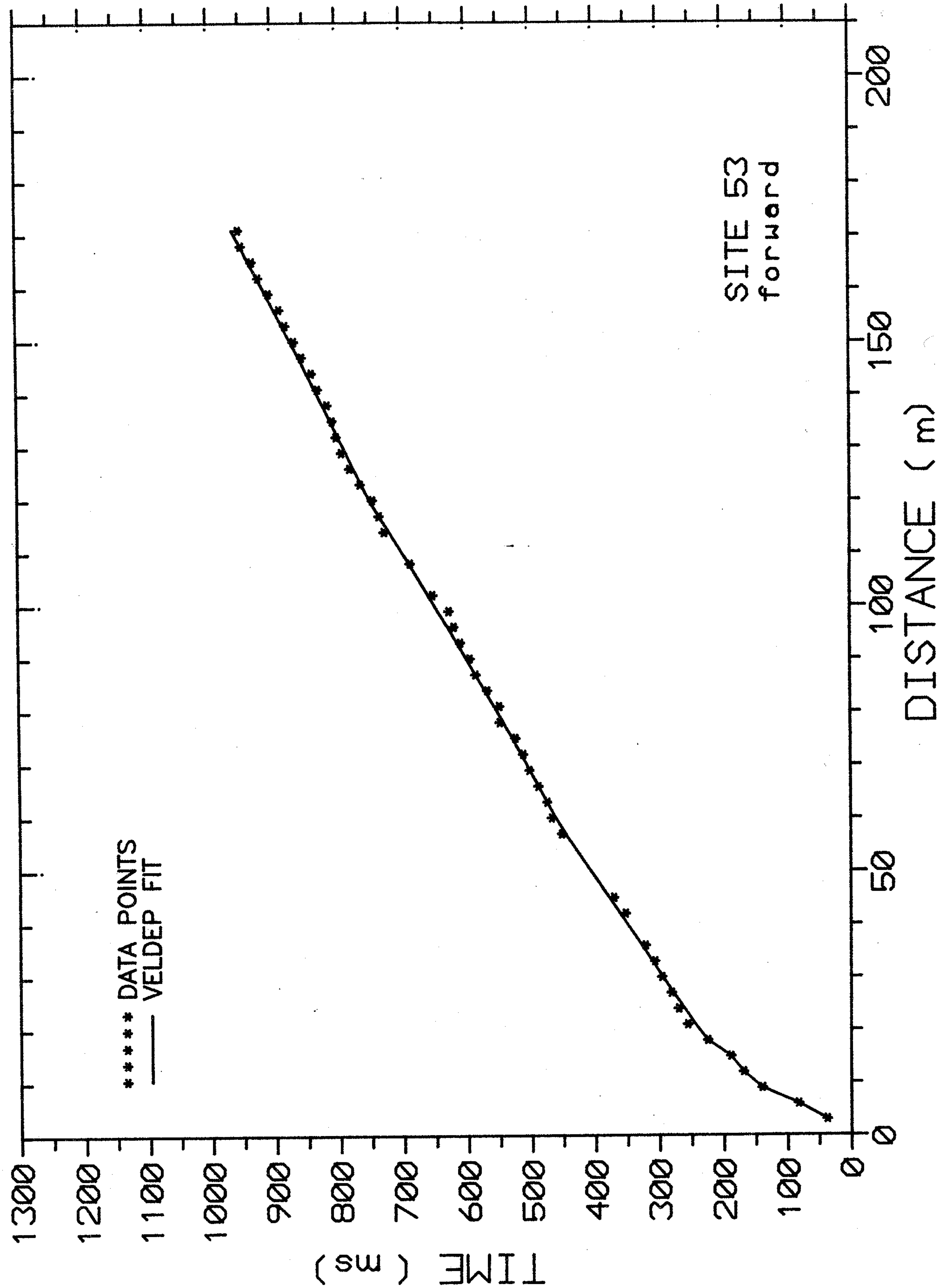

SITE 51
forward
***** DATA POINTS
—— VELDEP FIT
TIME (ms)
DISTANCE (m)
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
0
50
100
150
200

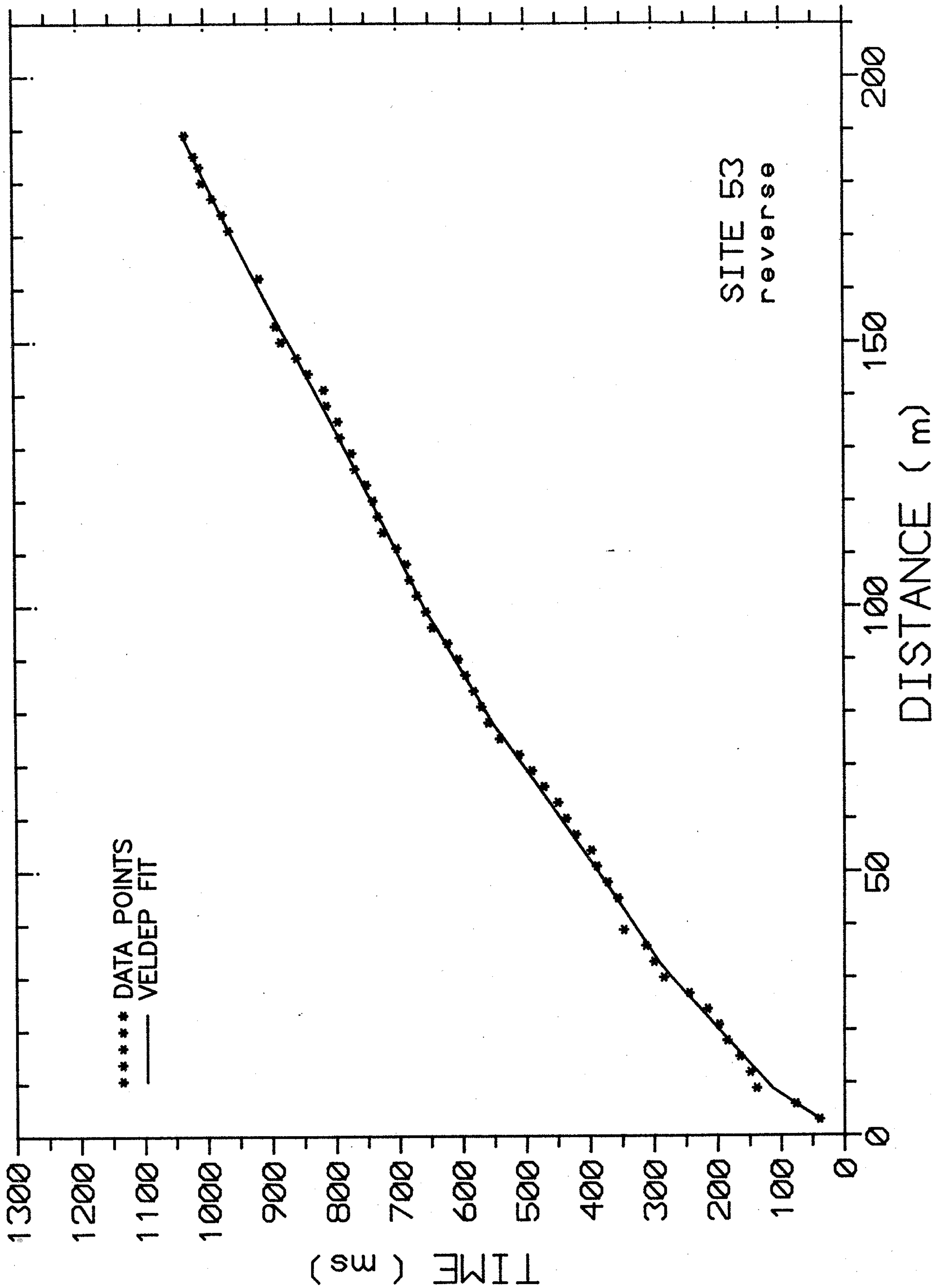


***** DATA POINTS
VELDEP FIT
SITE 51
reverse
TIME (ms)
DISTANCE (m)
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
0
50
100
150
200

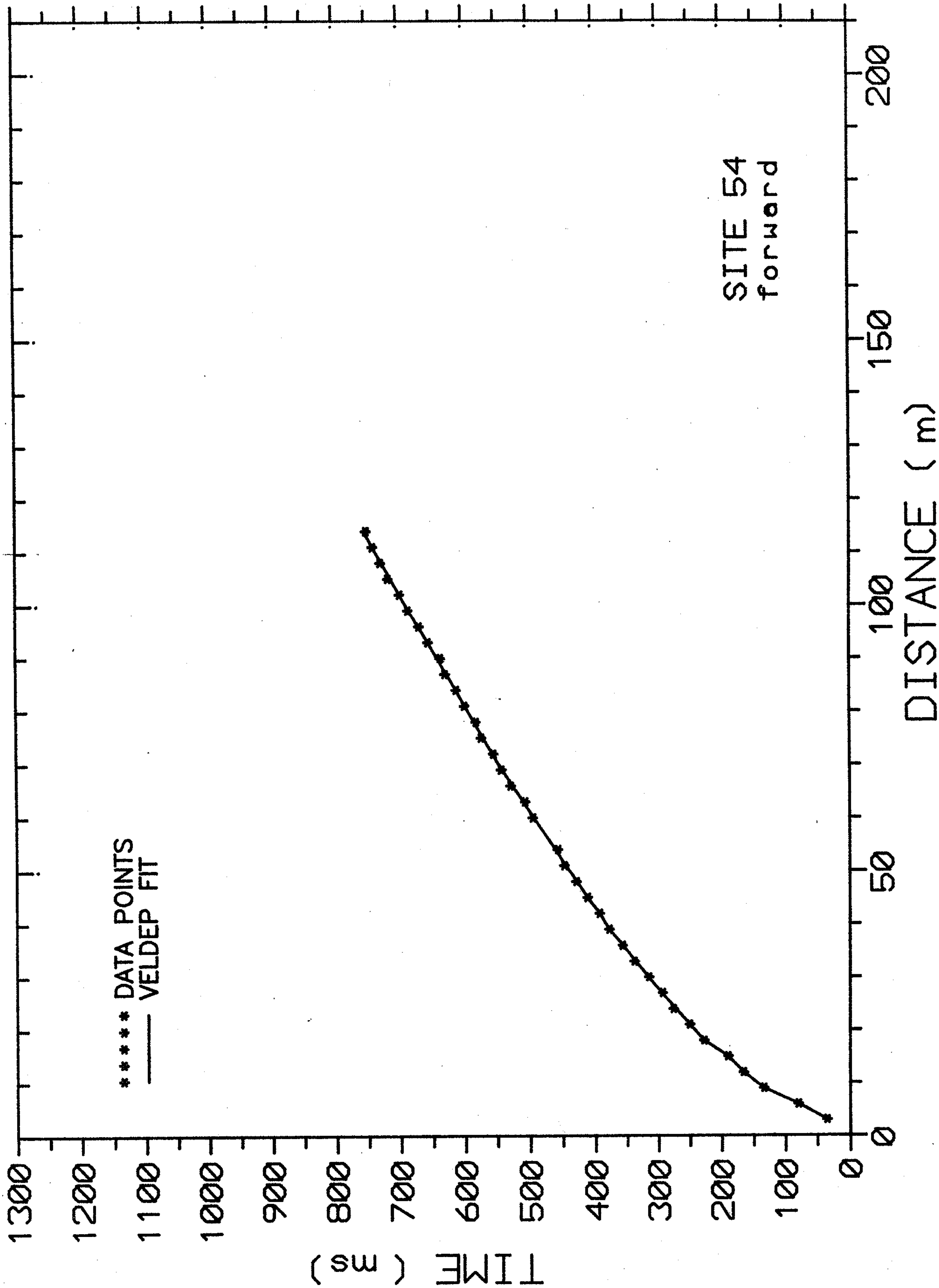

***** DATA POINTS
VELDEP FIT
SITE 52
forward
TIME (ms)
DISTANCE (m)
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
0
50
100
150
200

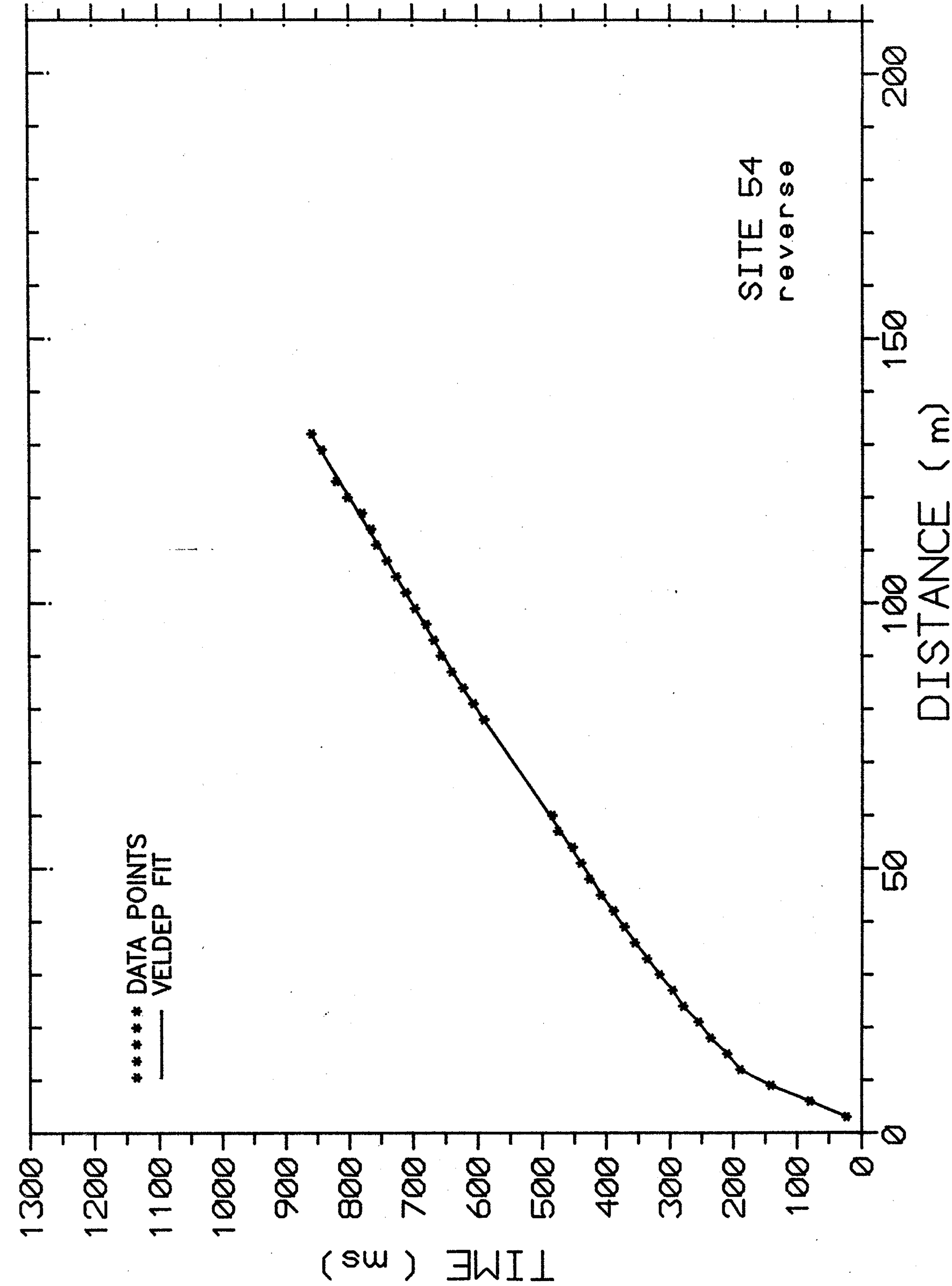

SITE 52
reverse
***** DATA POINTS
—— VELDEP FIT
DISTANCE (m)
TIME (ms)
0
50
100
150
200
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300

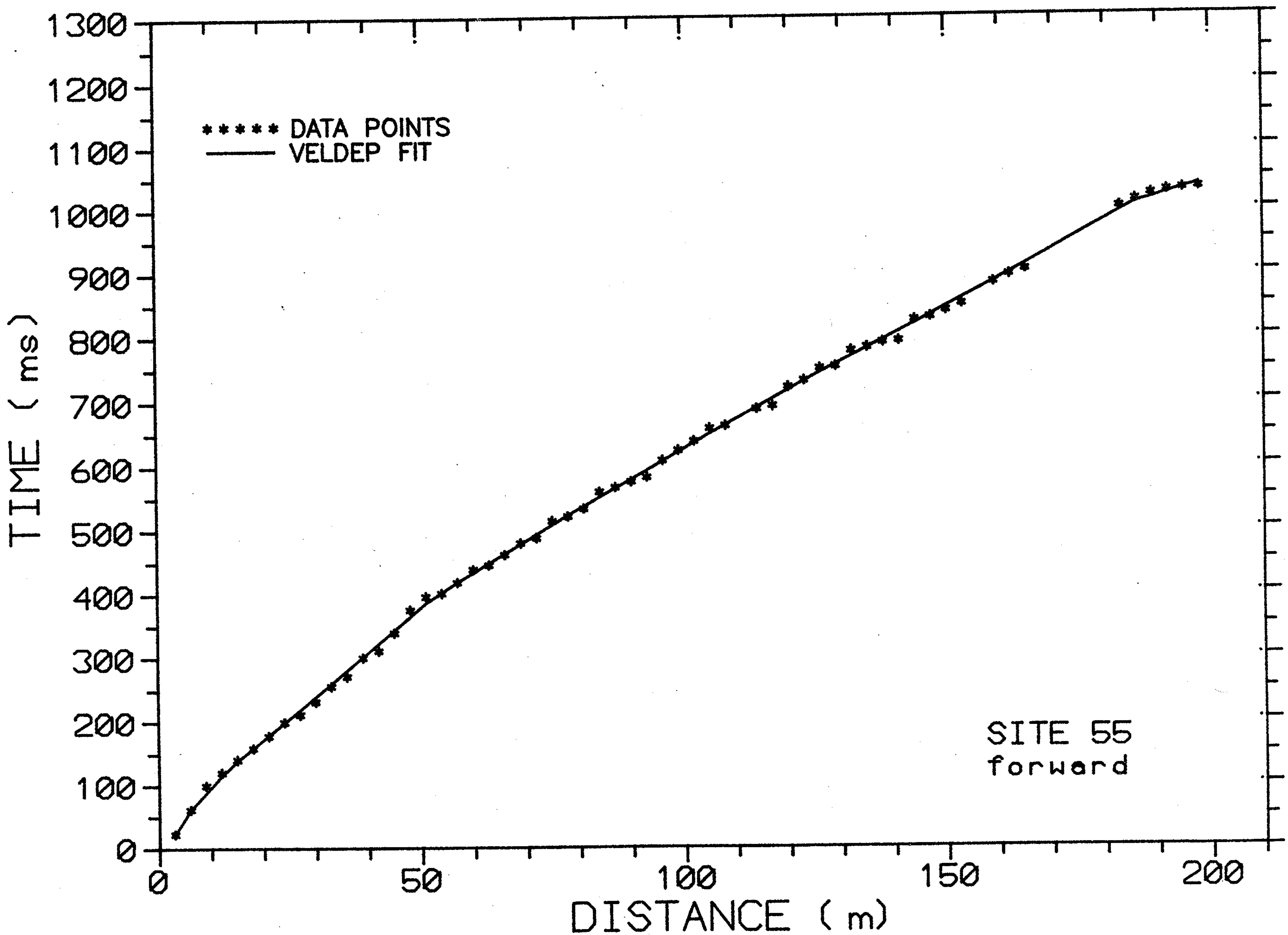

SITE 53
forward
***** DATA POINTS
—— VELDEP FIT
DISTANCE (m)
TIME (ms)
0
50
100
150
200
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300



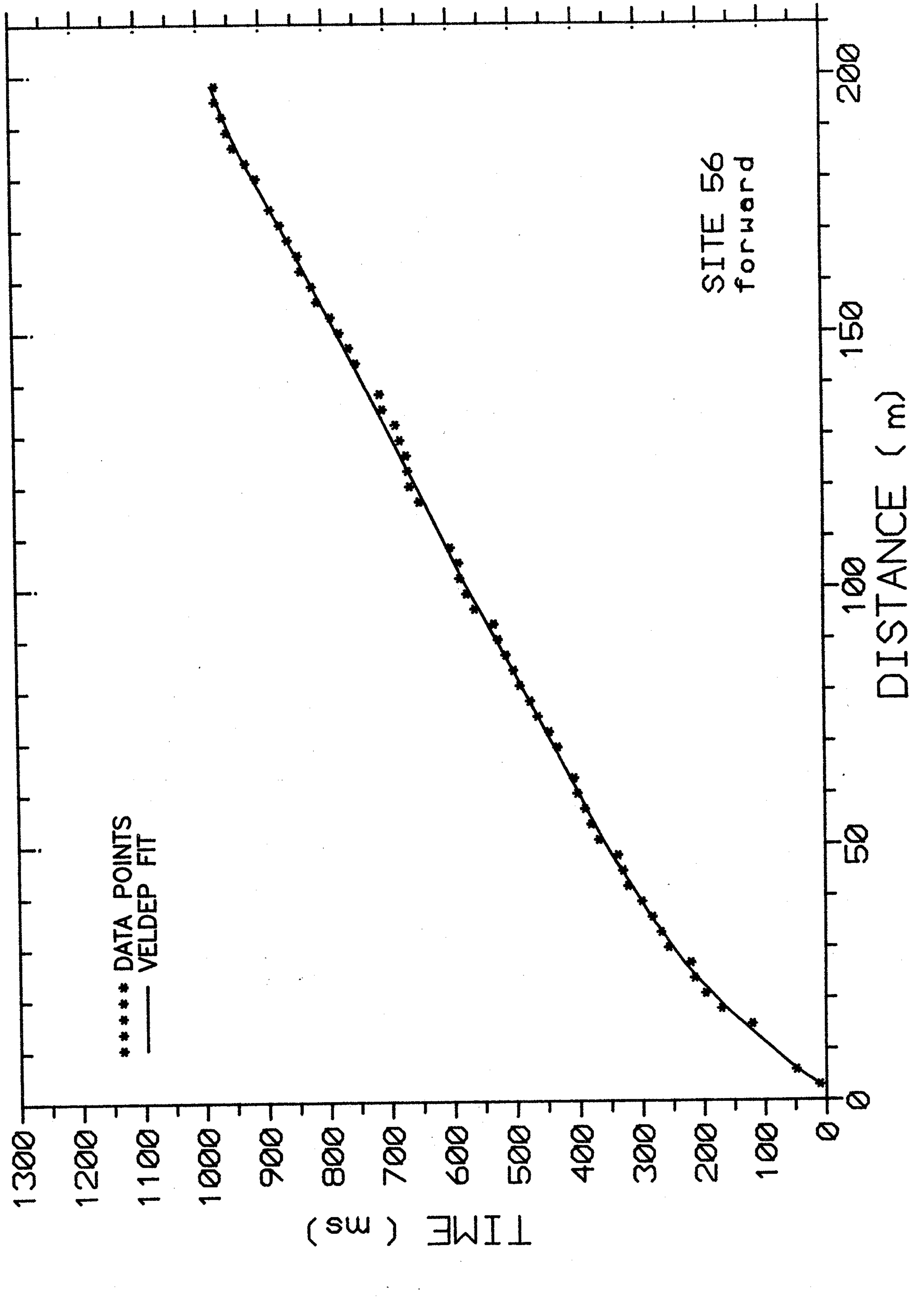
SITE 53
reverse
***** DATA POINTS
—— VELDEP FIT
DISTANCE (m)
TIME (ms)
0
50
100
150
200
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300


SITE 54
forward
***** DATA POINTS
—— VELDEP FIT
TIME (ms)
1300
1200
1100
1000
900
800
700
600
500
400
300
200
100
0
DISTANCE (m)
0
50
100
150
200

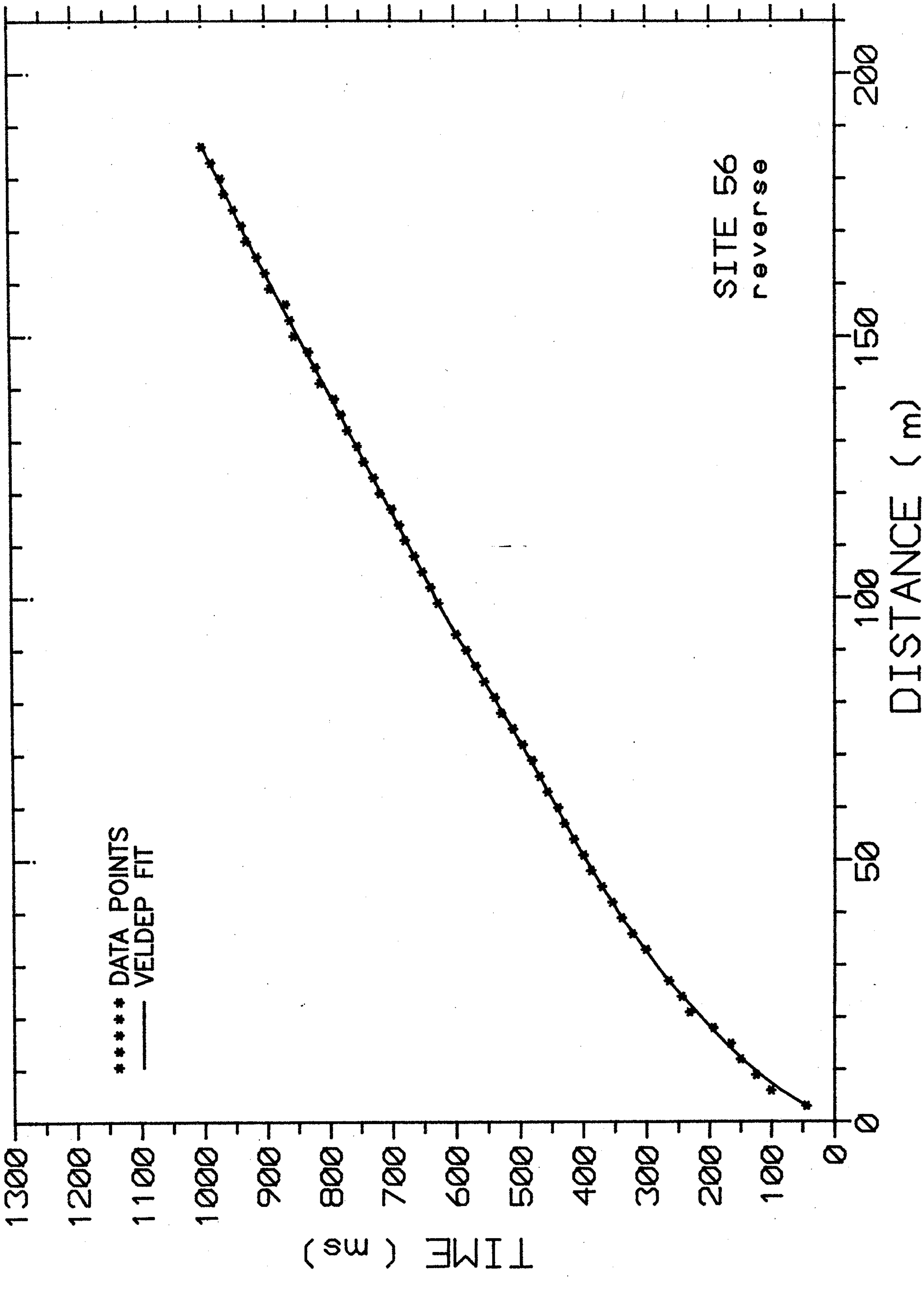

SITE 54
reverse
***** DATA POINTS
—— VELDEP FIT
TIME (ms)
DISTANCE (m)
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
0
50
100
150
200

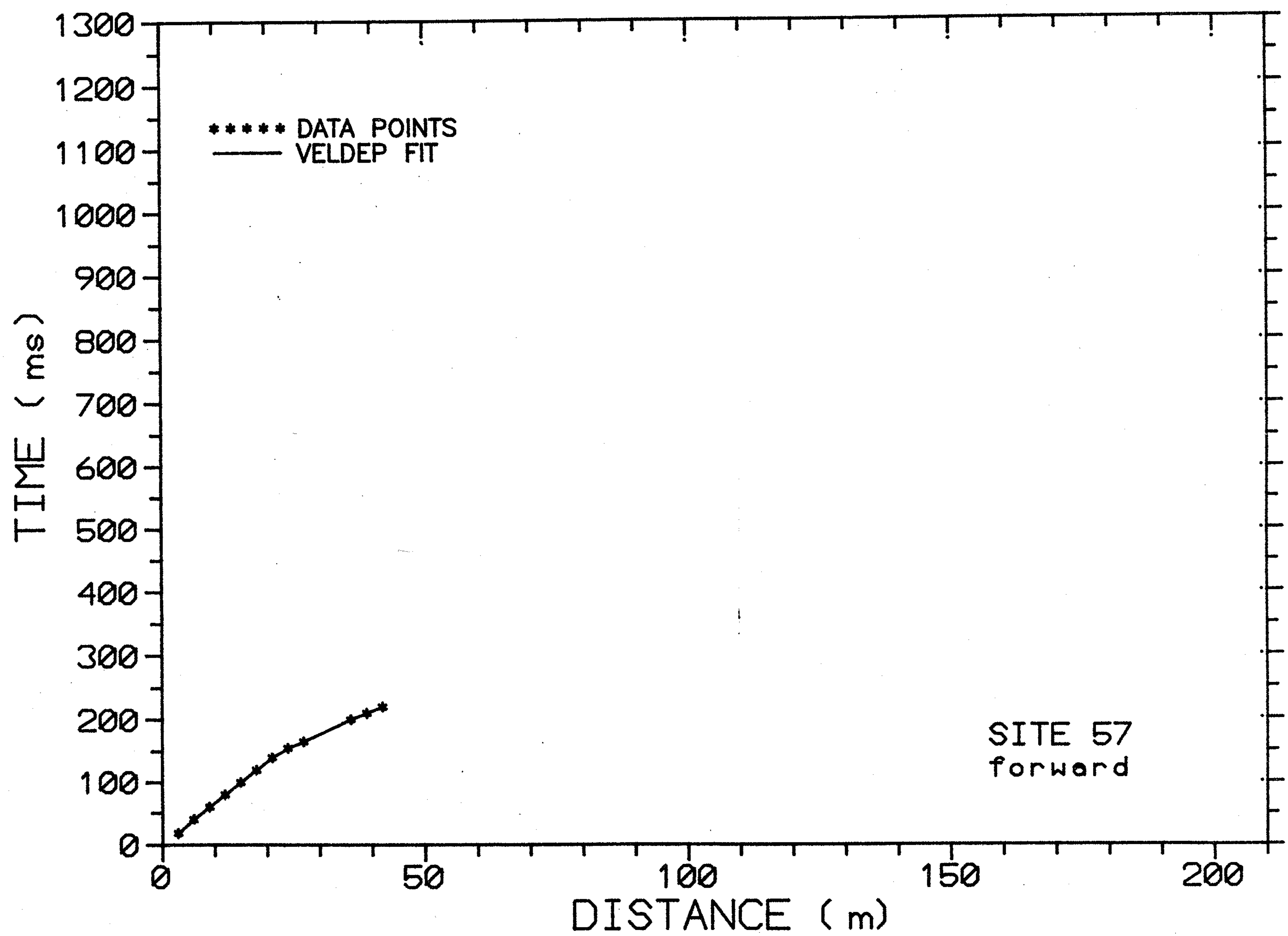


***** DATA POINTS
VELDEP FIT
SITE 55
forward
TIME (ms)
DISTANCE (m)
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
0
50
100
150
200

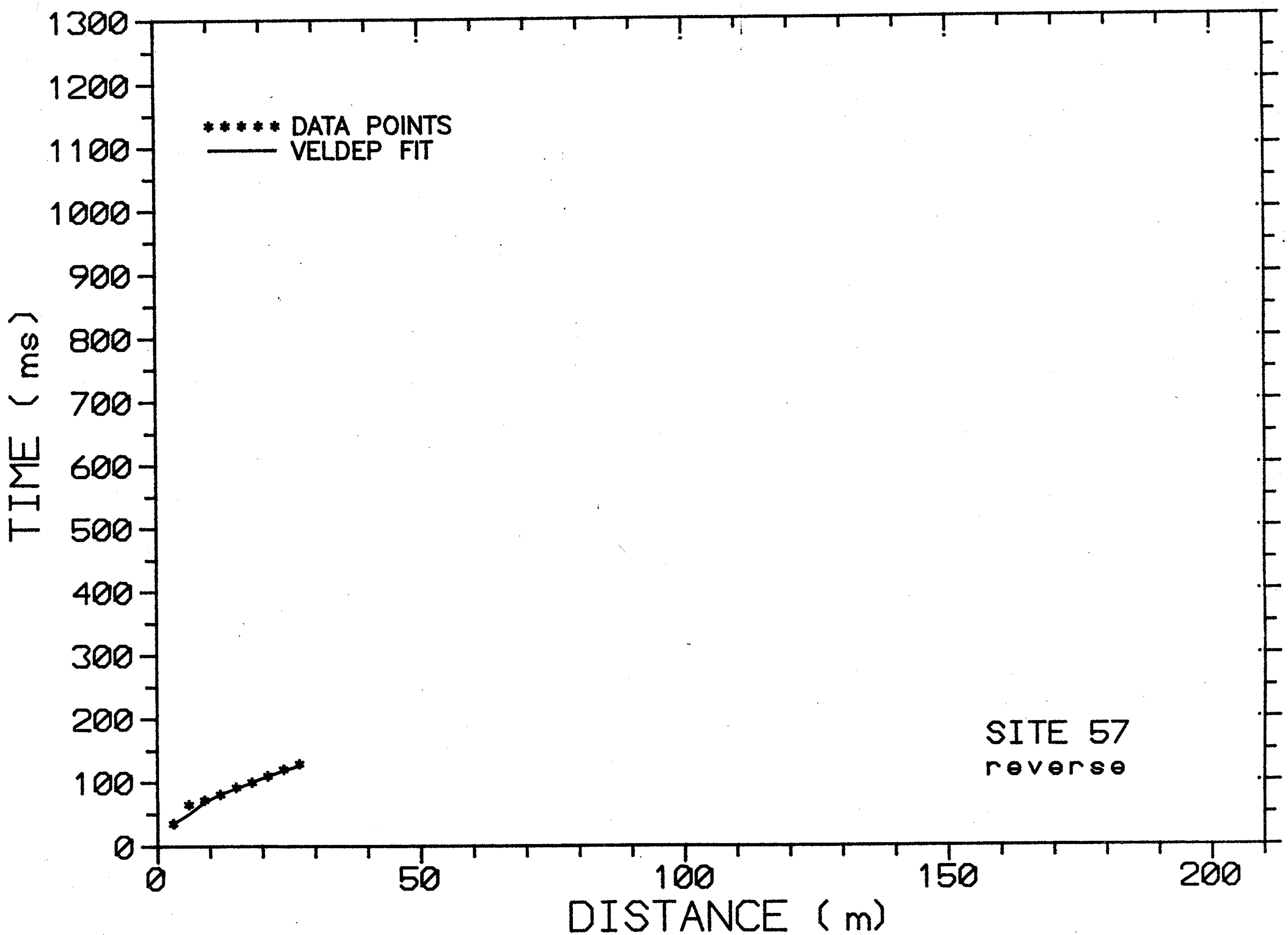


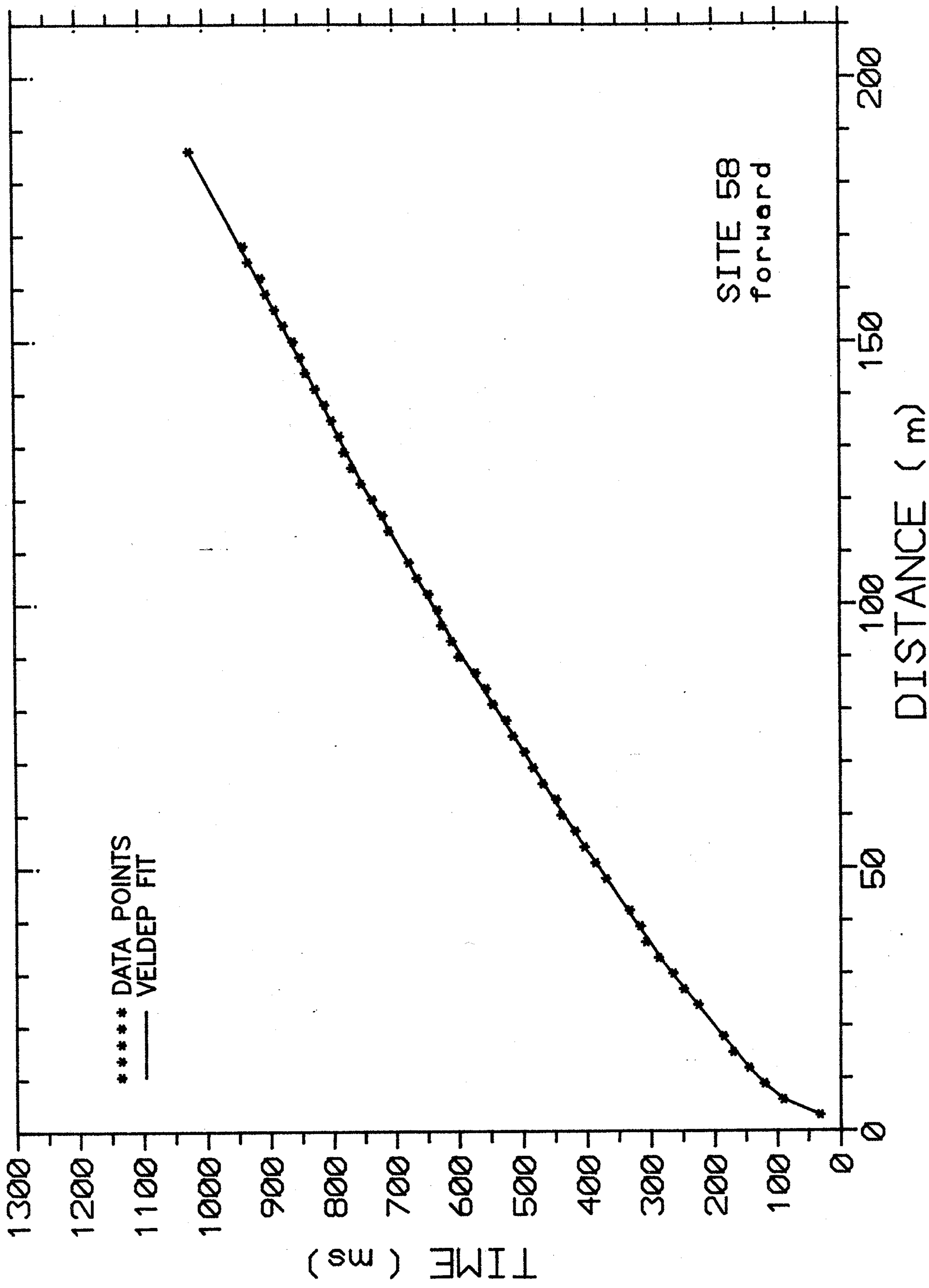
SITE 56
forward
***** DATA POINTS
—— VELDEP FIT
TIME (ms)
DISTANCE (m)
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
0
50
100
150
200


SITE 56
reverse
***** DATA POINTS
—— VELDEP FIT
TIME (ms)
DISTANCE (m)
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
0
50
100
150
200

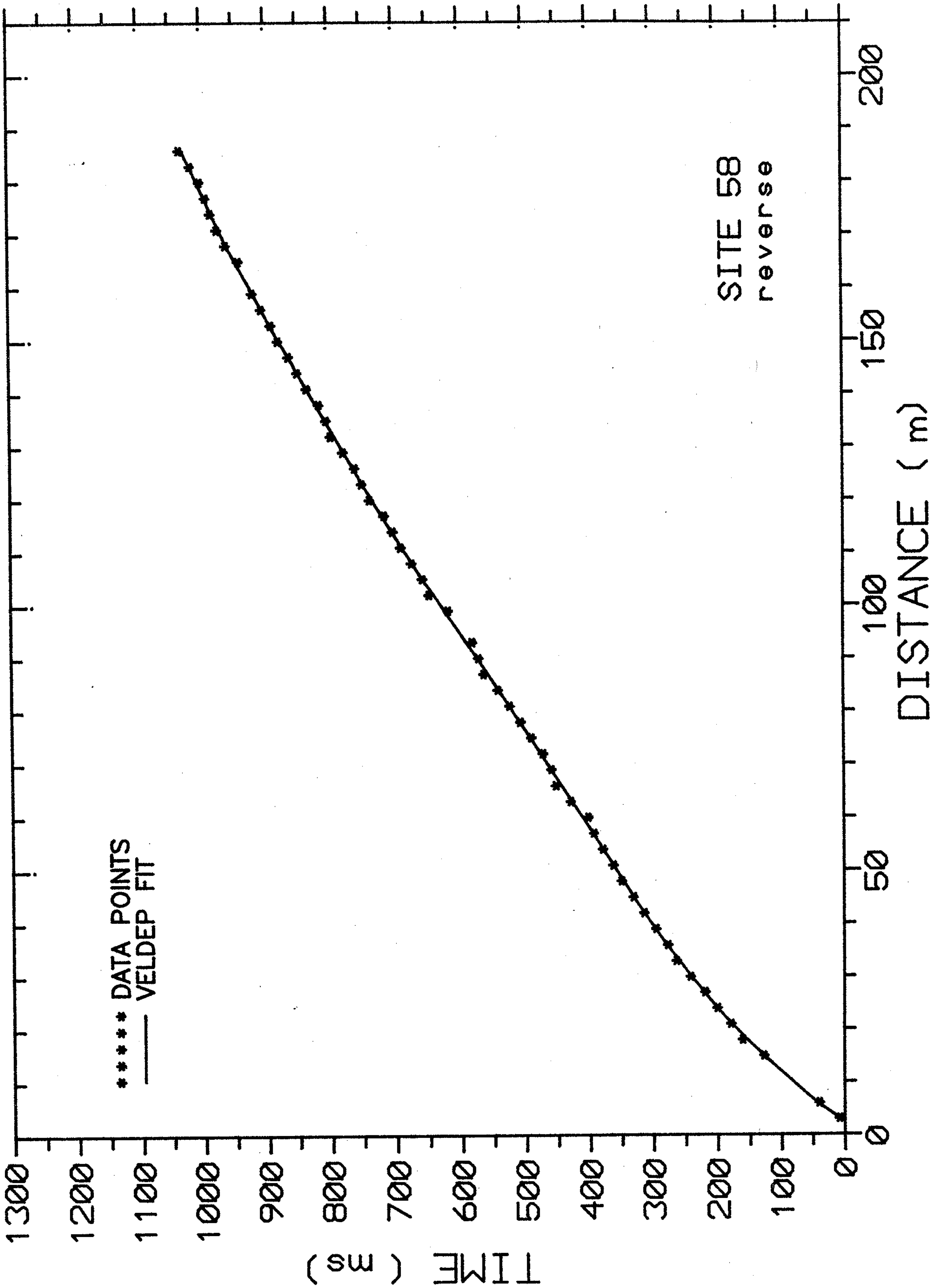


1300
1200
1100
1000
900
800
700
600
500
400
300
200
100
0
TIME (ms)
***** DATA POINTS
—— VELDEP FIT
SITE 57
forward
0
50
100
150
200
DISTANCE (m)

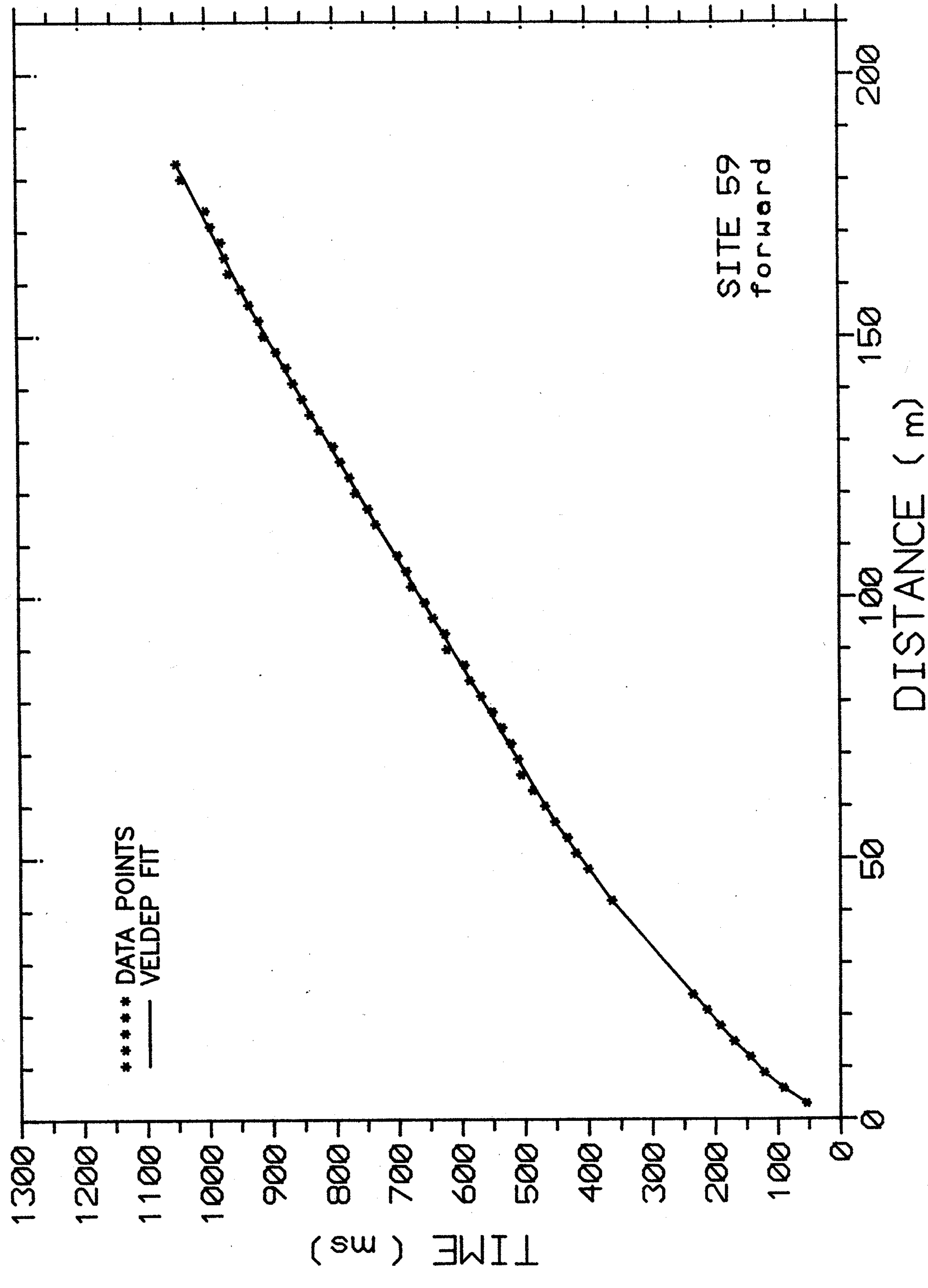

***** DATA POINTS
VELDEP FIT
SITE 57
reverse
TIME (ms)
DISTANCE (m)
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
0
50
100
150
200



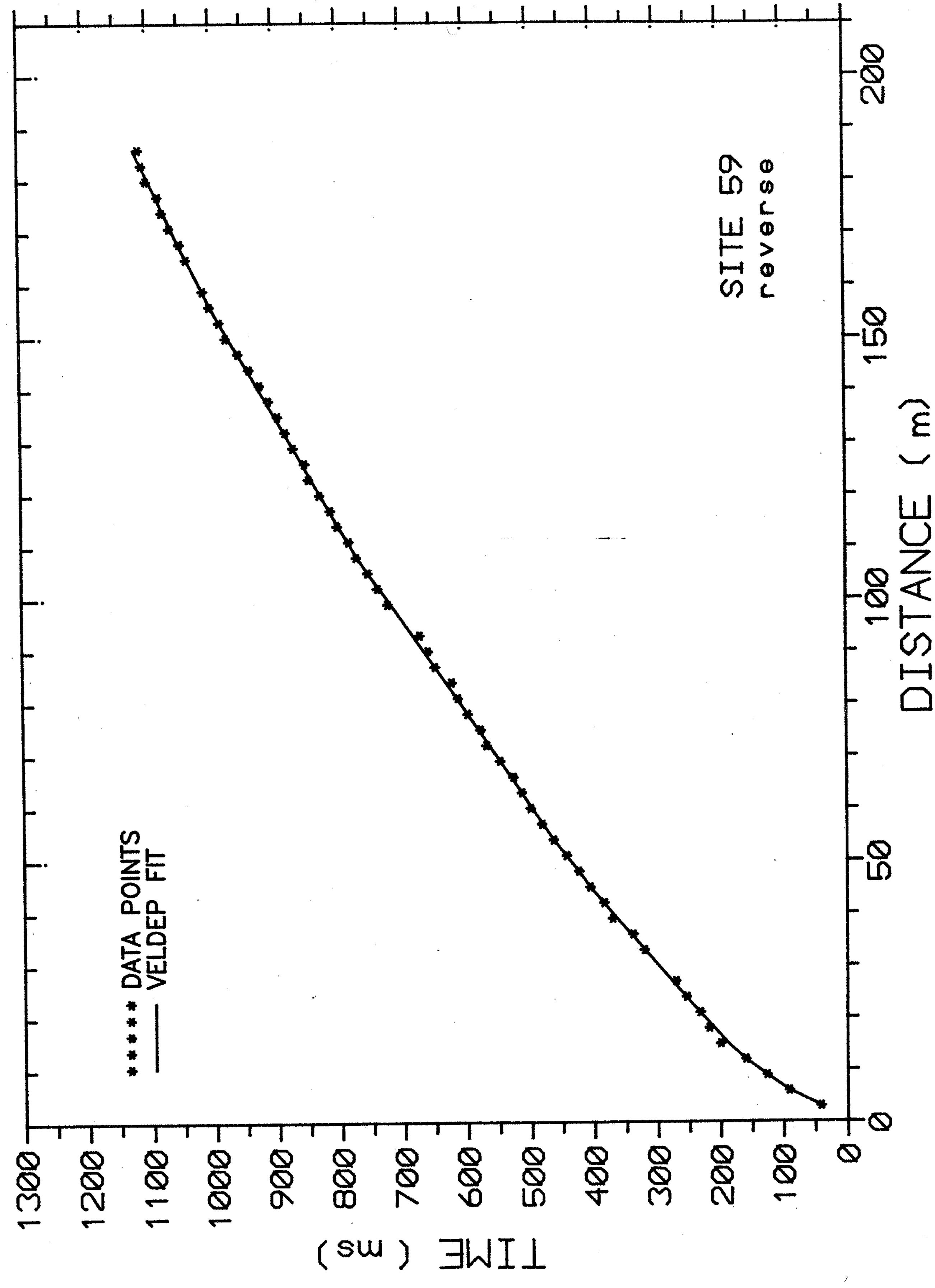
***** DATA POINTS
—— VELDEP FIT
SITE 58
forward
TIME (ms)
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
DISTANCE (m)
0
50
100
150
200

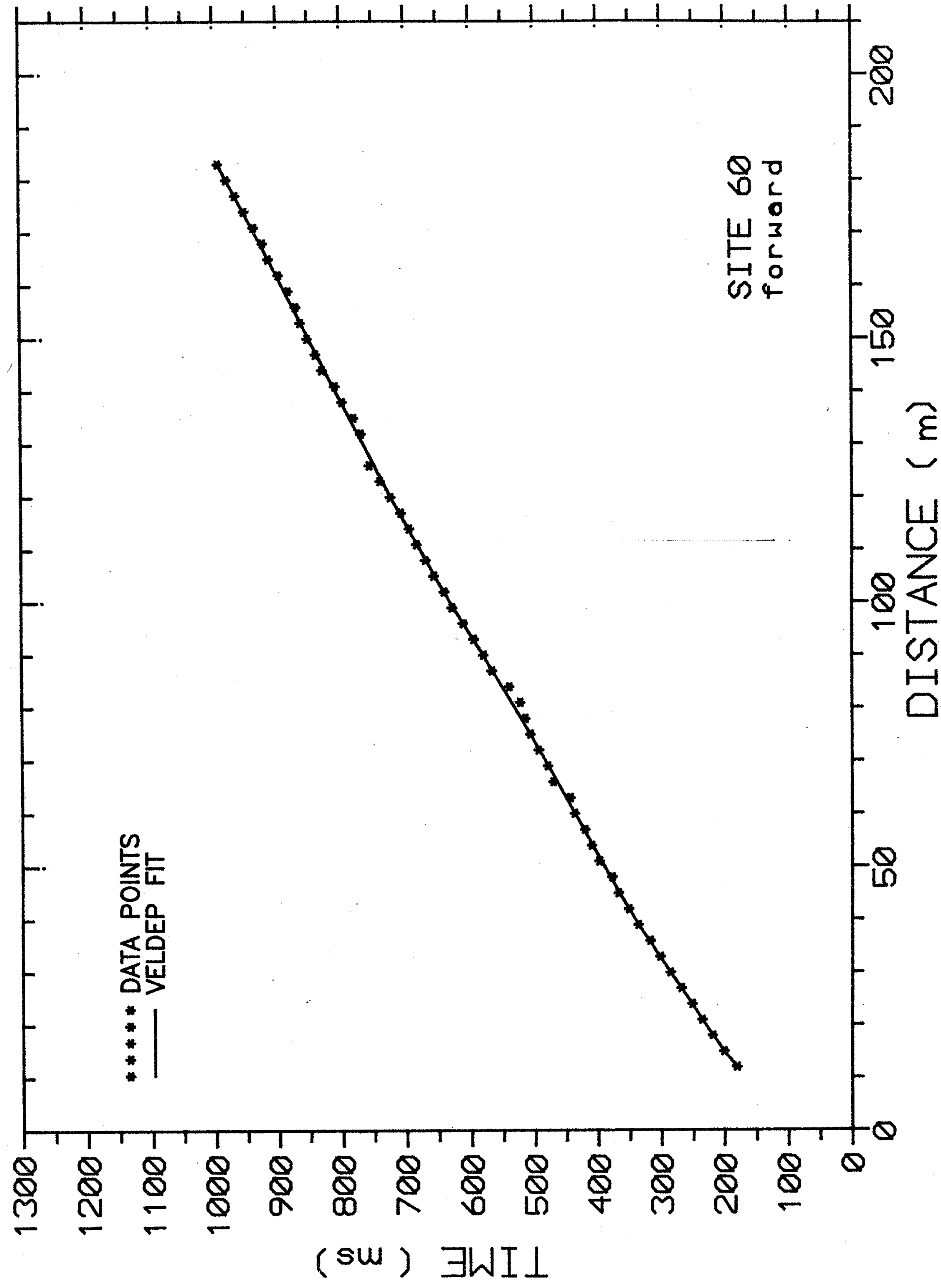


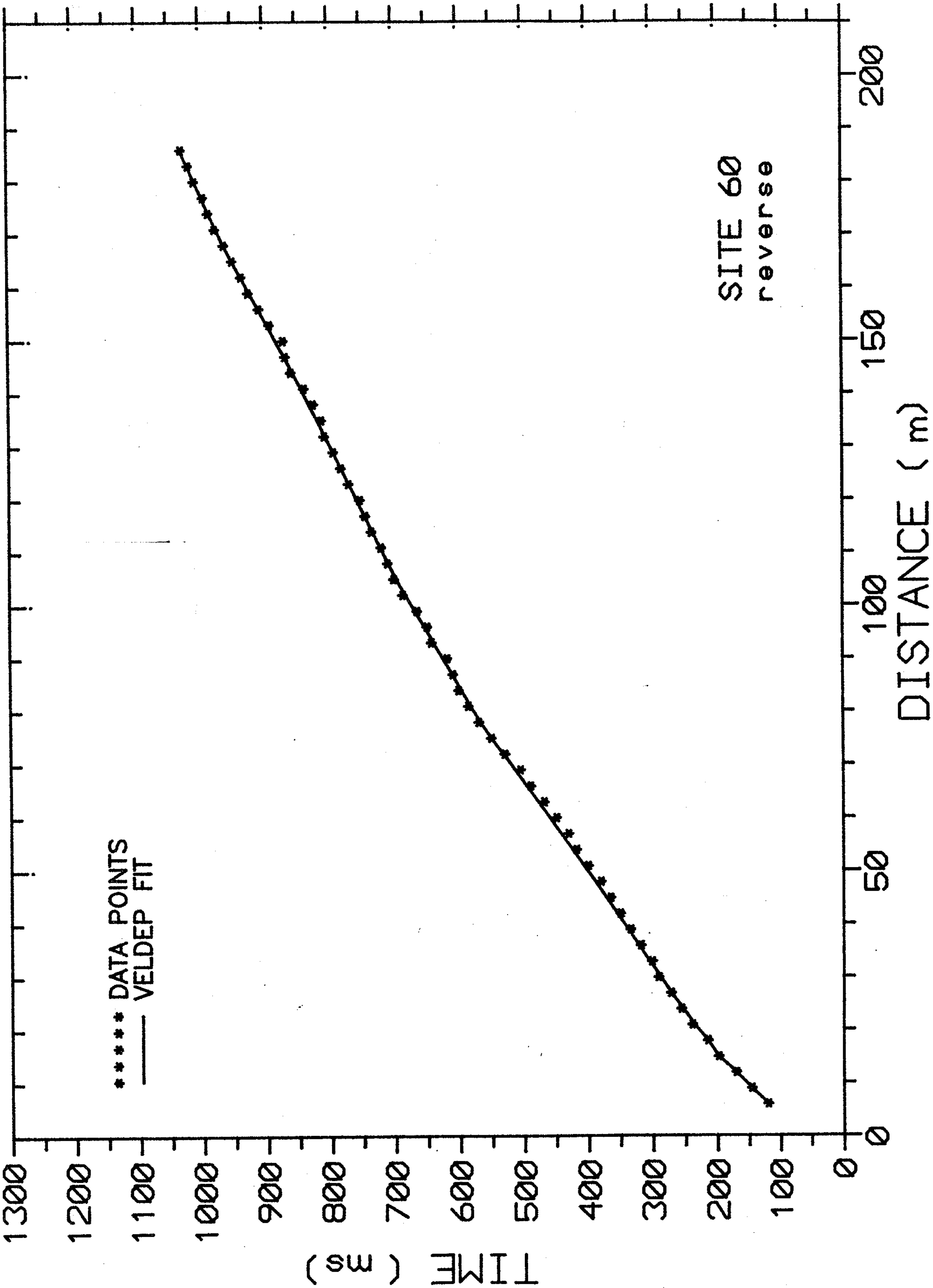
SITE 58
reverse
***** DATA POINTS
—— VELDEP FIT
DISTANCE (m)
TIME (ms)
0
50
100
150
200
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300



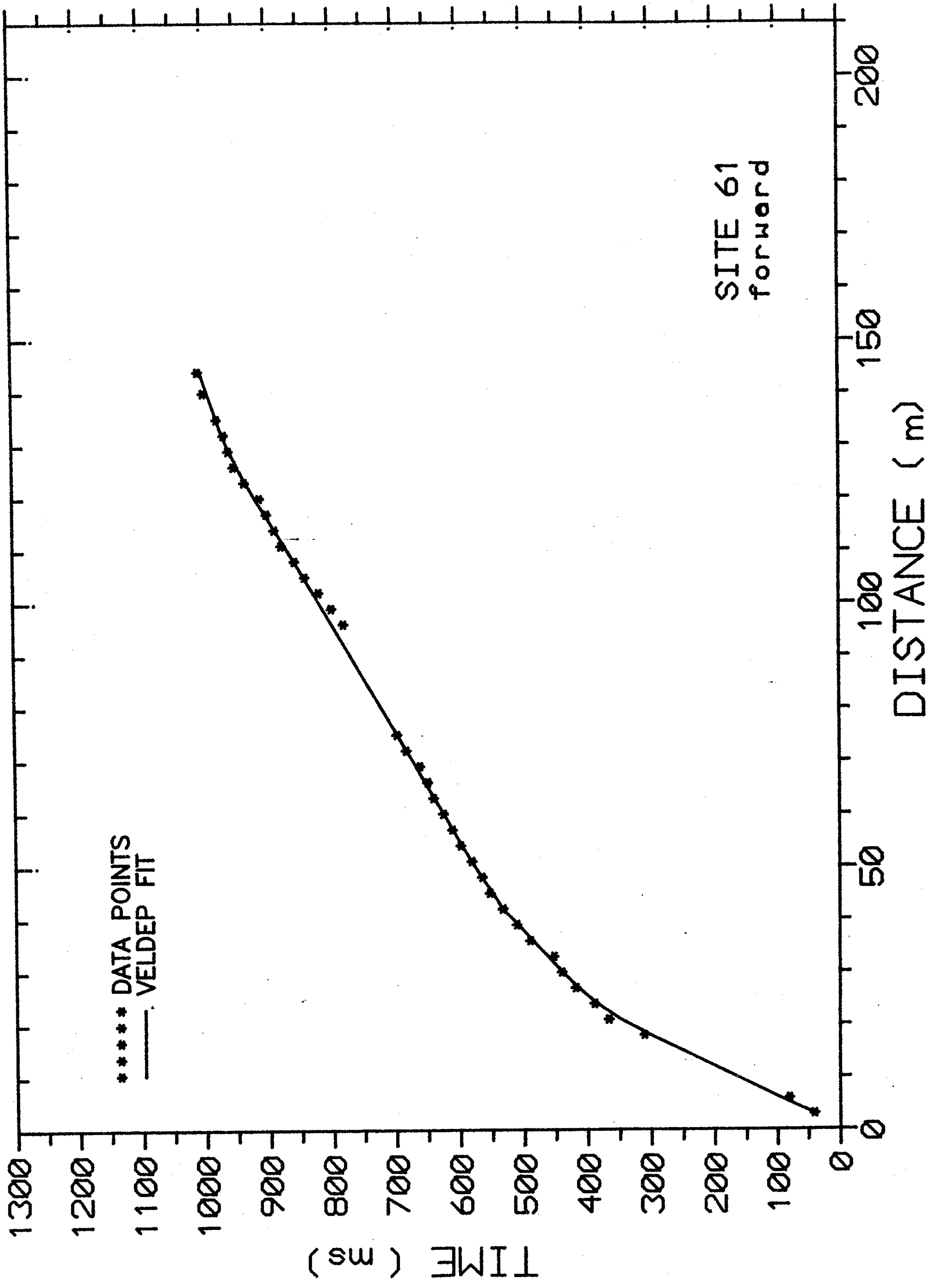
SITE 59
forward
***** DATA POINTS
—— VELDEP FIT
TIME (ms)
DISTANCE (m)
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
0
50
100
150
200

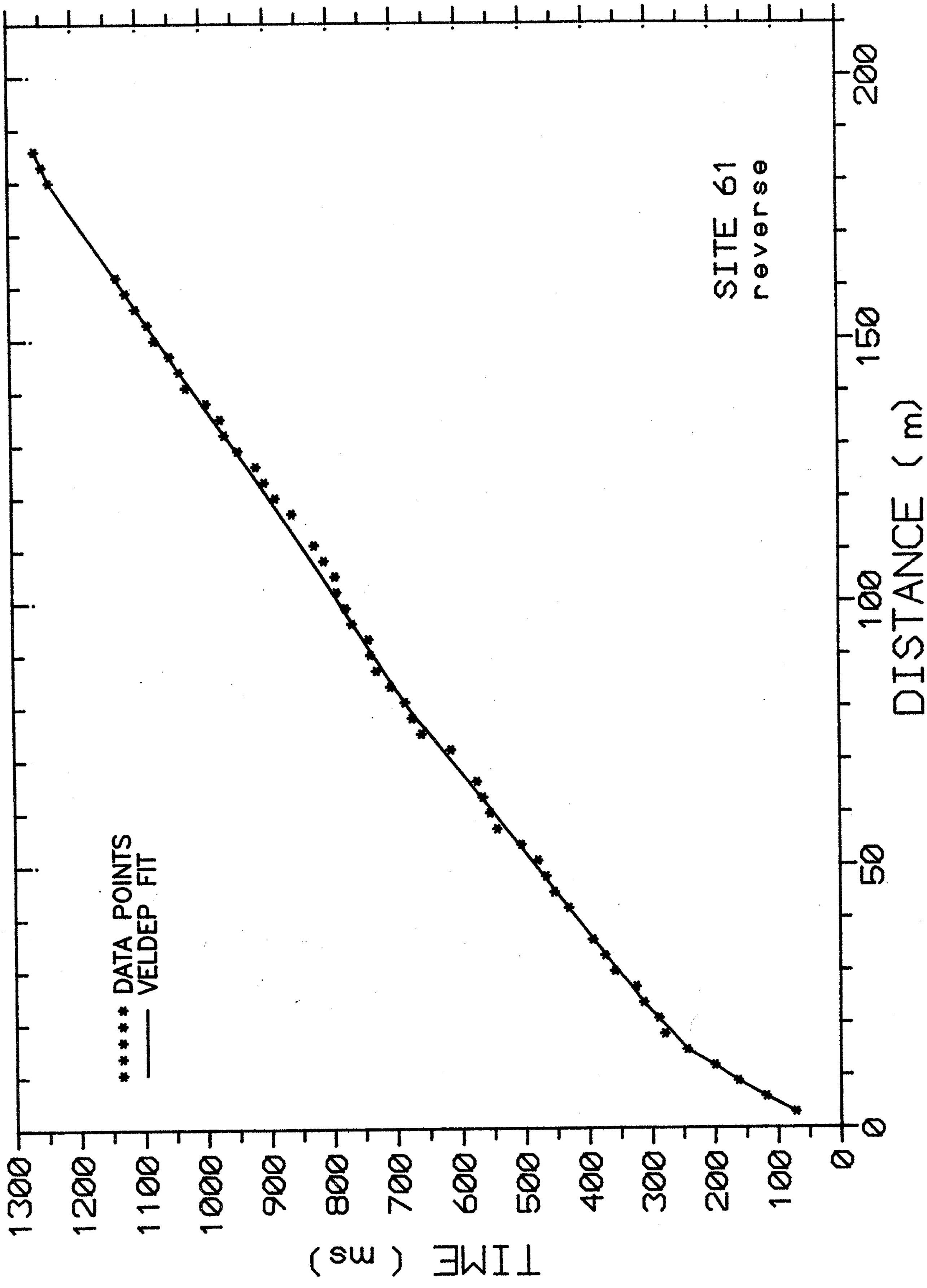

SITE 59
reverse
***** DATA POINTS
—— VELDEP FIT
TIME (ms)
DISTANCE (m)
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
0
50
100
150
200


SITE 60
forward
***** DATA POINTS
—— VELDEP FIT
DISTANCE (m)
TIME (ms)
0
50
100
150
200
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300

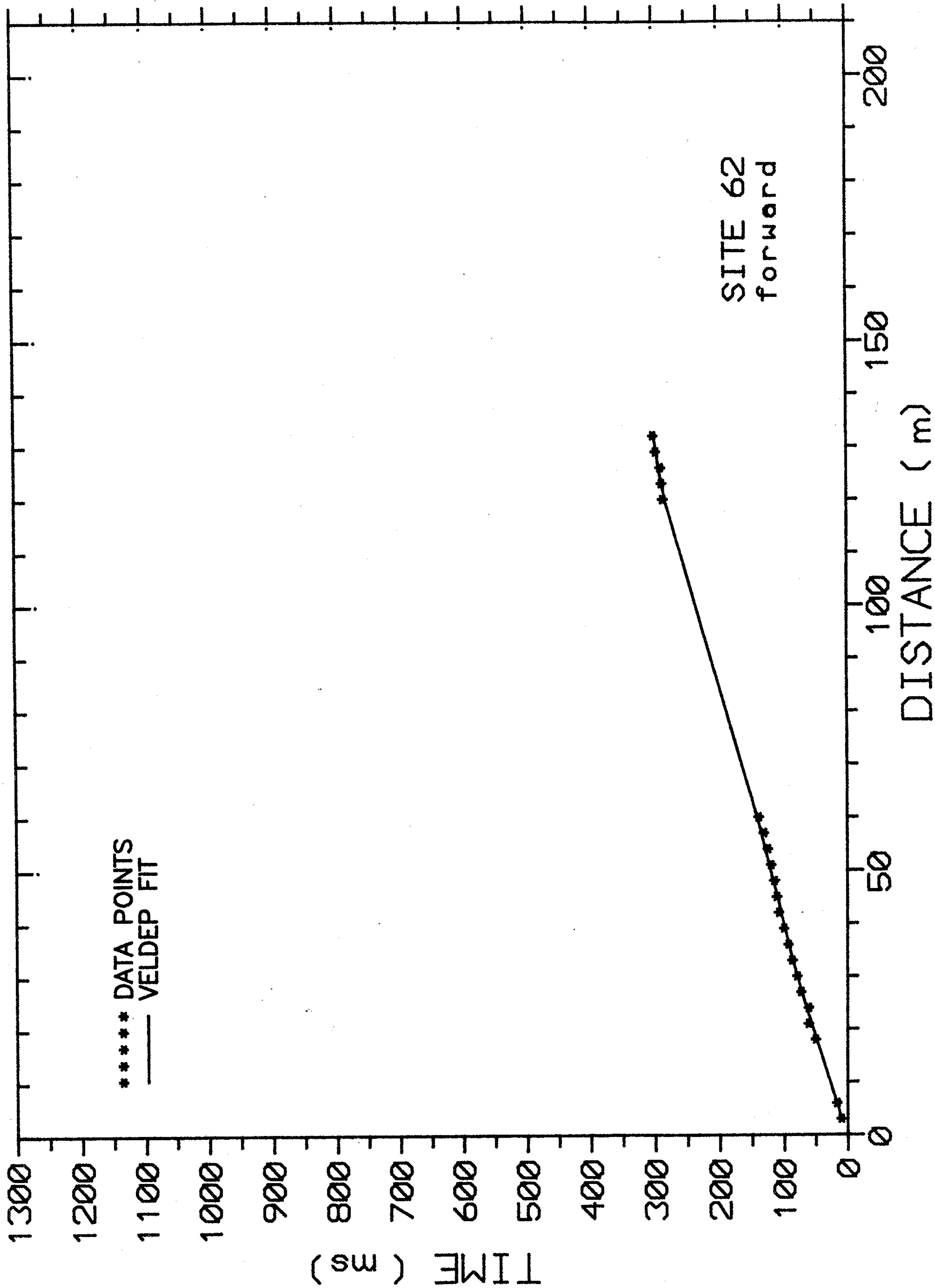


SITE 60
reverse
***** DATA POINTS
—— VELDEP FIT
DISTANCE (m)
TIME (ms)
0
50
100
150
200
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300

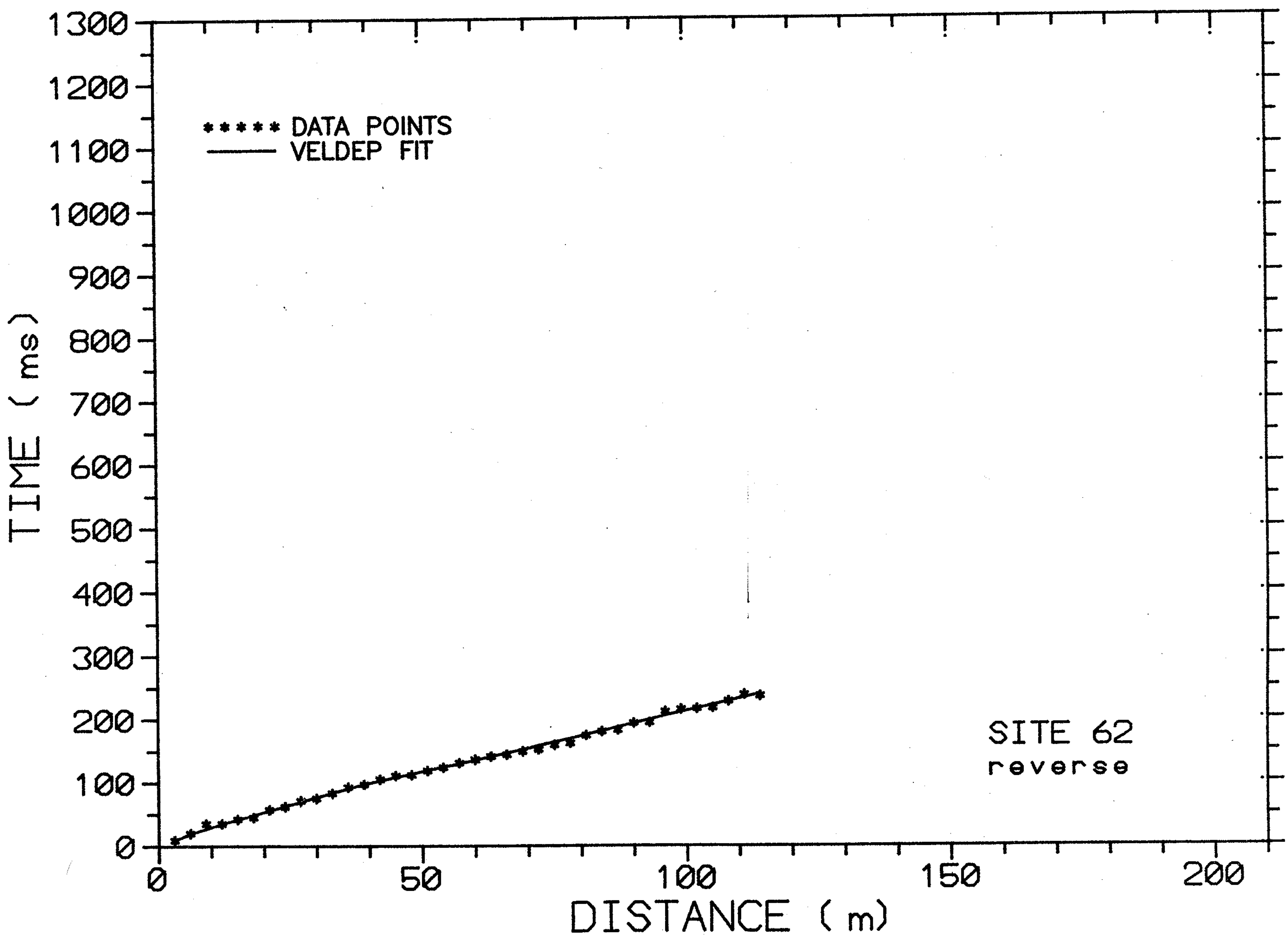

SITE 61
forward
***** DATA POINTS
—— VELDEP FIT
TIME (ms)
DISTANCE (m)
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
0
50
100
150
200



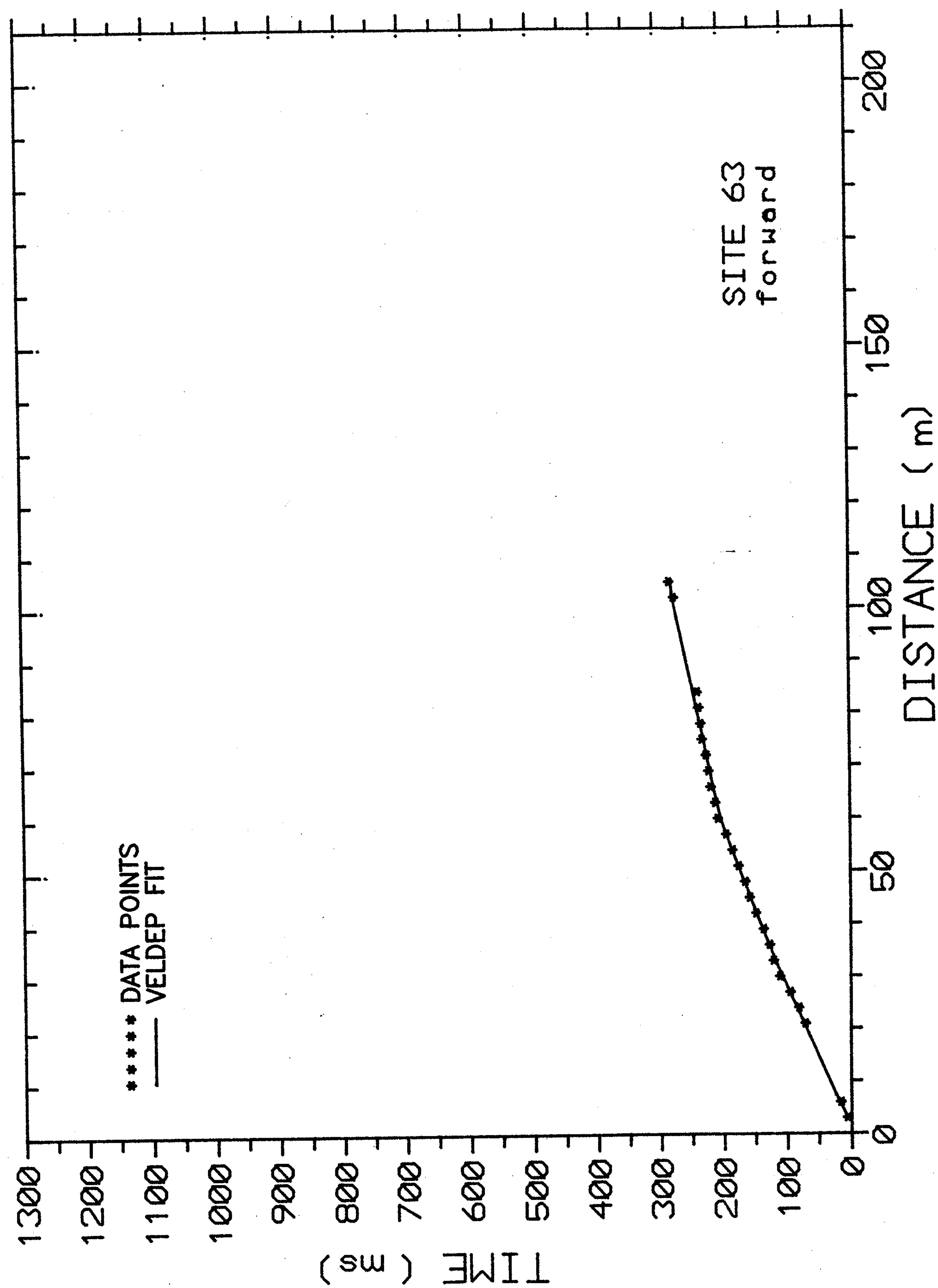
SITE 61
reverse
***** DATA POINTS
—— VELDEP FIT
TIME (ms)
DISTANCE (m)
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
50
150

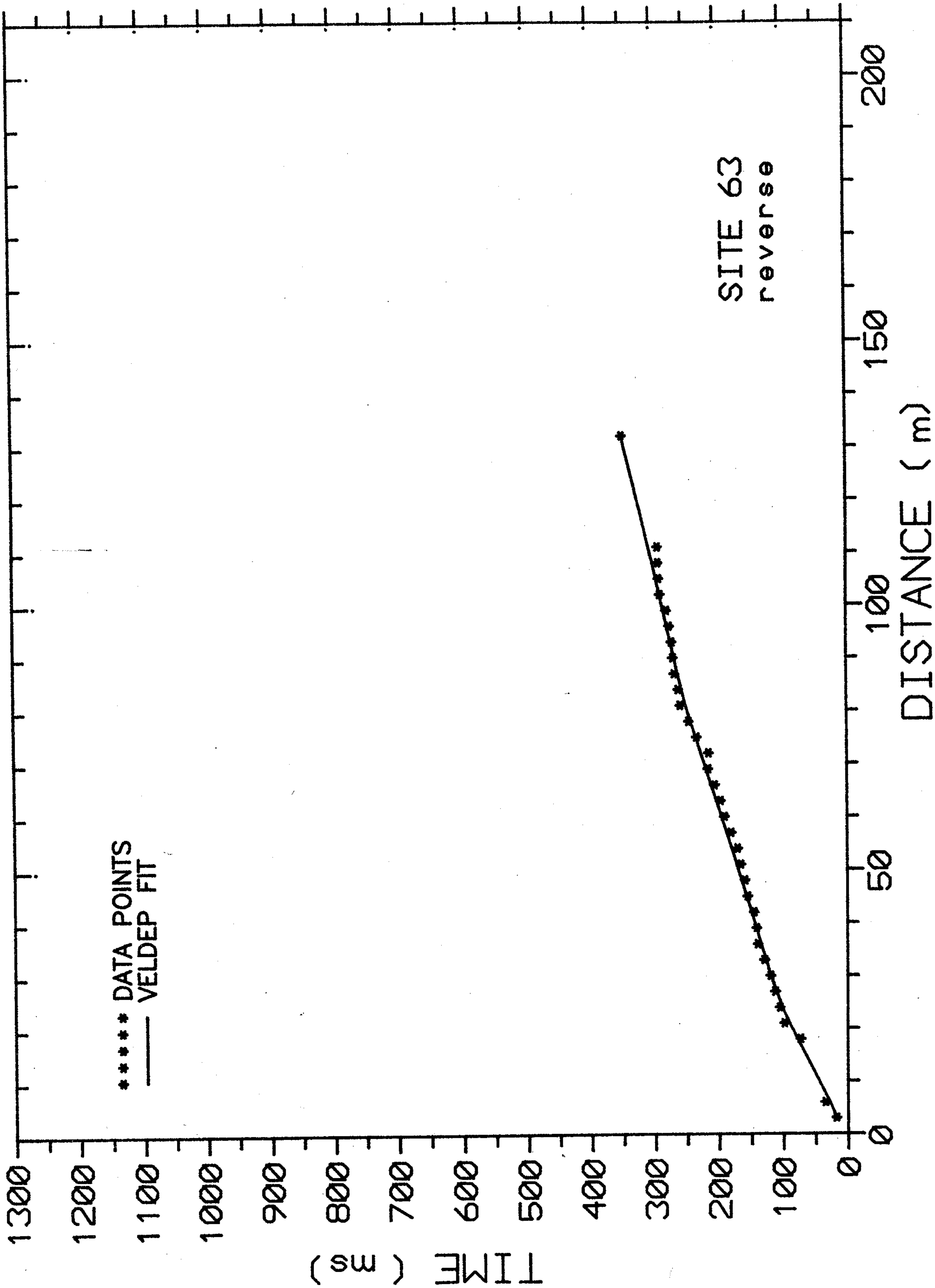


SITE 62
forward
***** DATA POINTS
—— VELDEP FIT
TIME (ms)
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
DISTANCE (m)
0
50
100
150
200

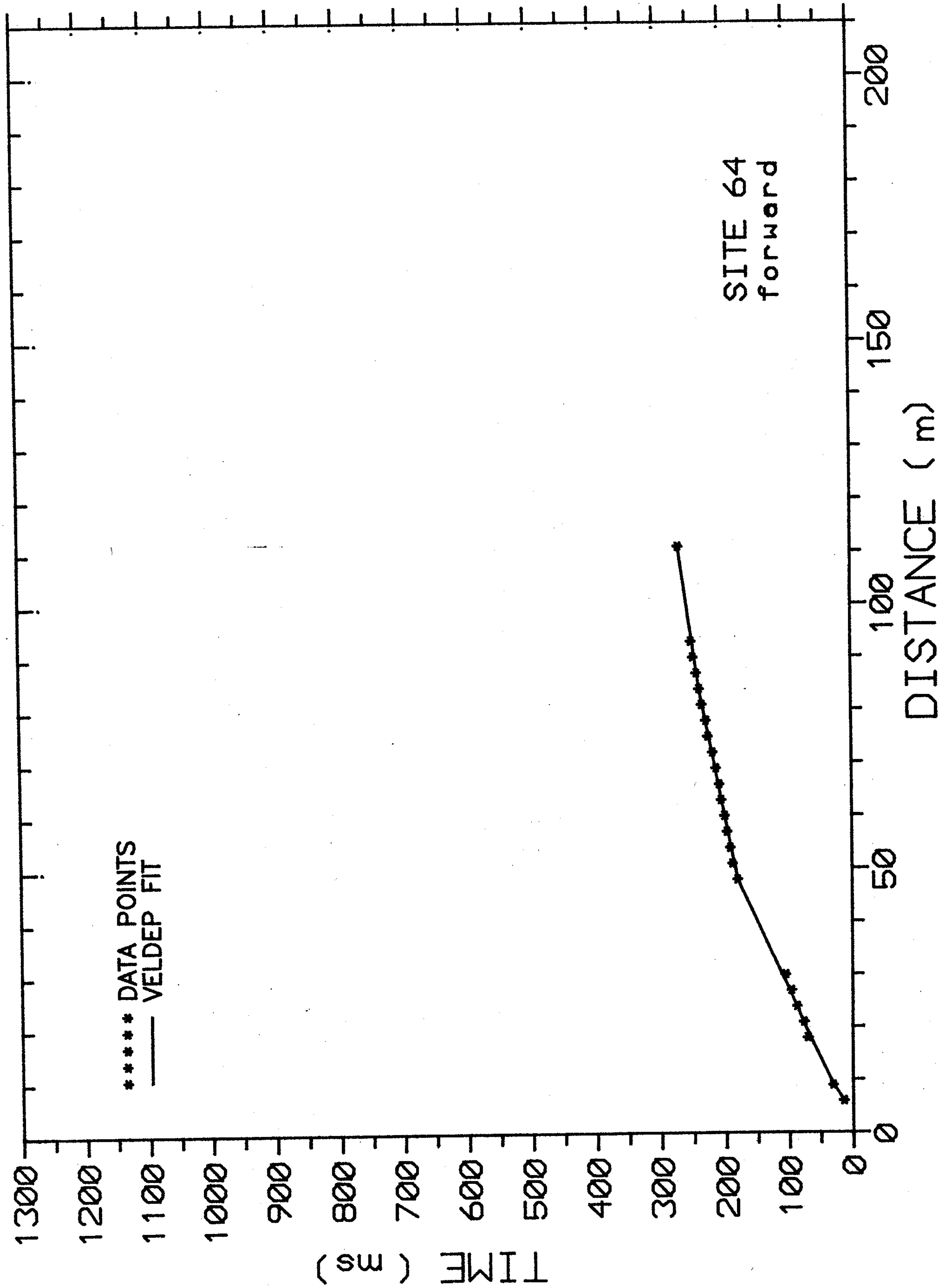


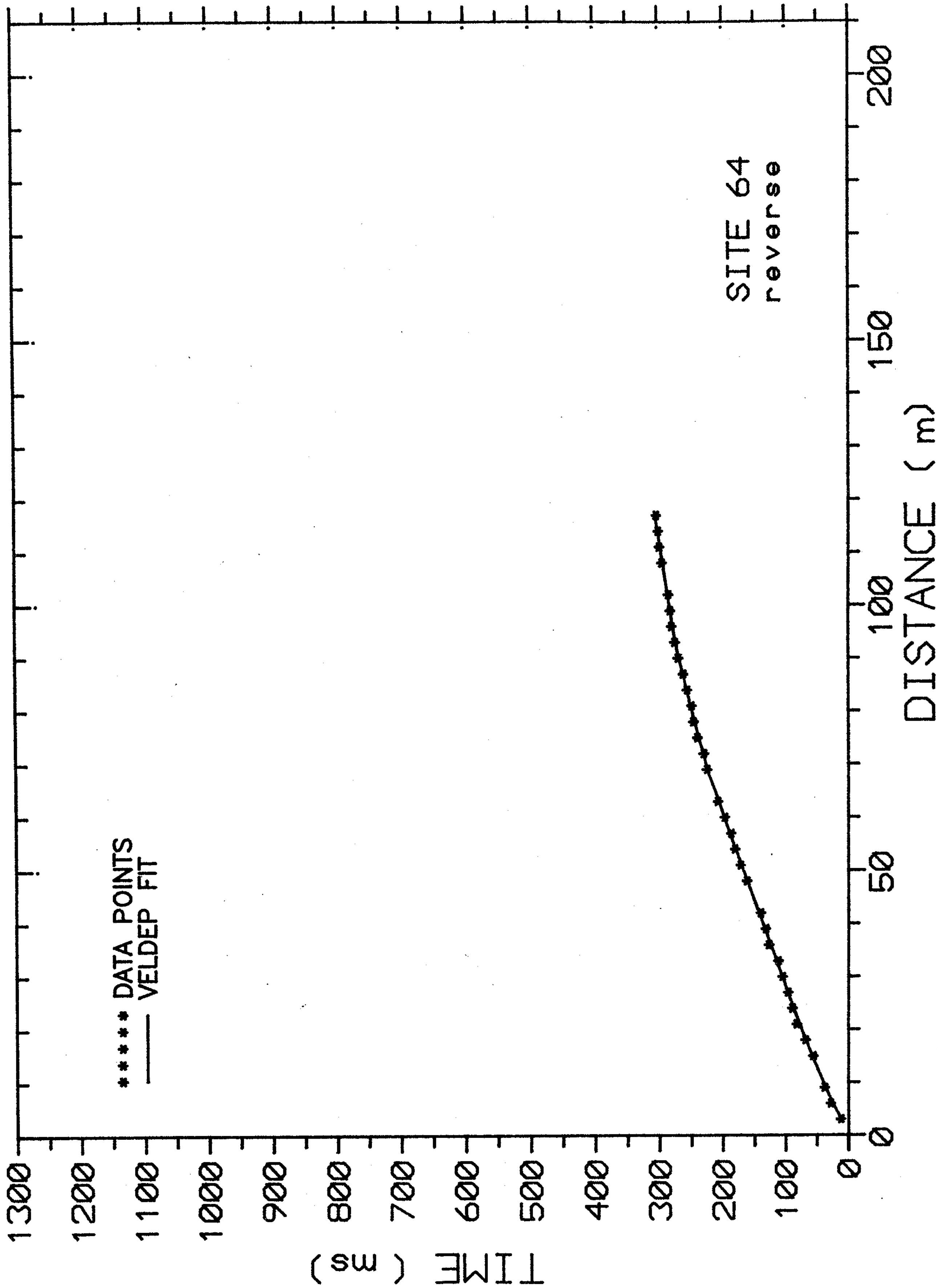
***** DATA POINTS
—— VELDEP FIT
SITE 62
reverse
TIME (ms)
DISTANCE (m)
1300
1200
1100
1000
900
800
700
600
500
400
300
200
100
0
0
50
100
150
200

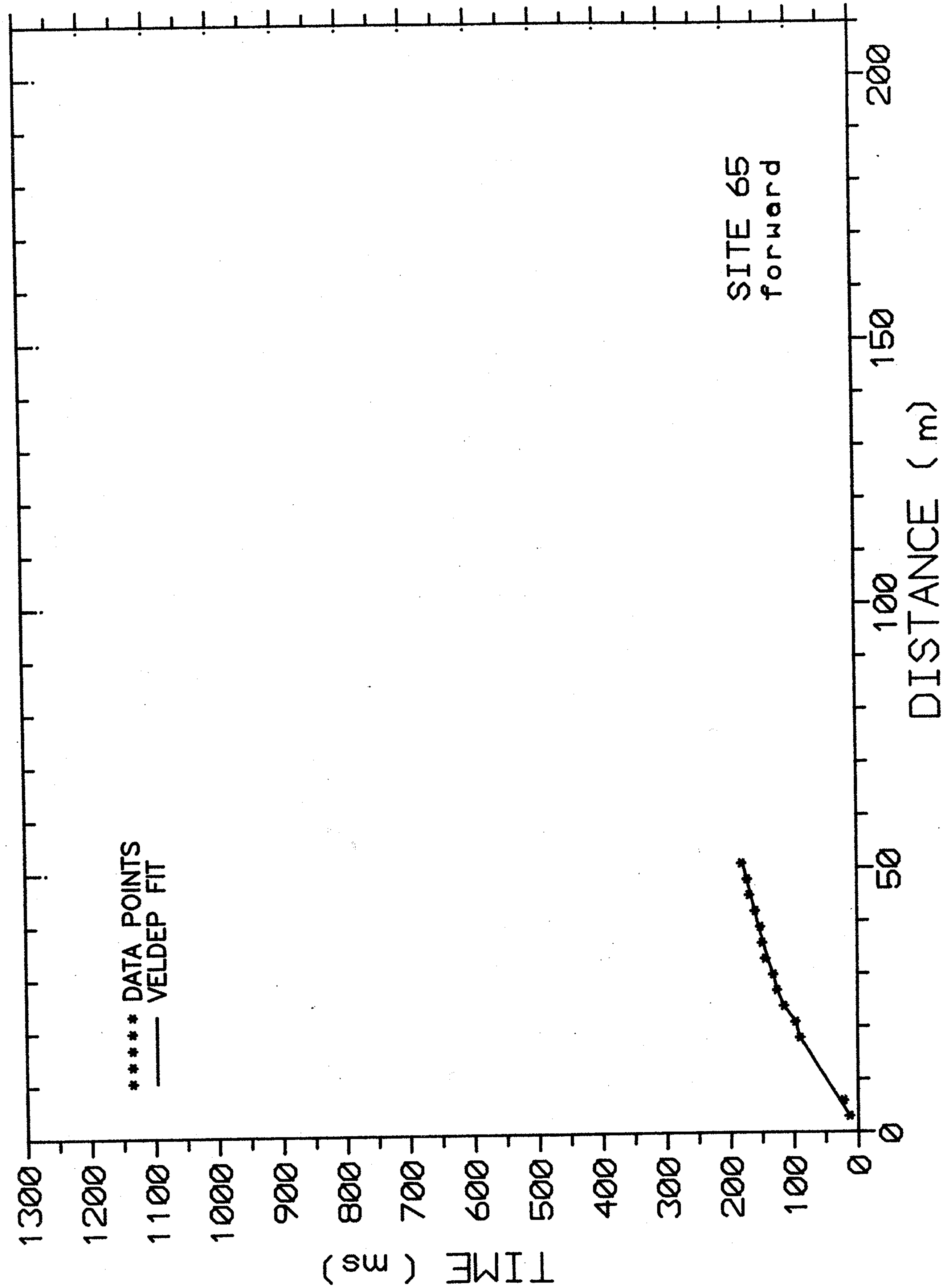

SITE 63
forward
***** DATA POINTS
—— VELDEP FIT
TIME (ms)
DISTANCE (m)
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
50
150

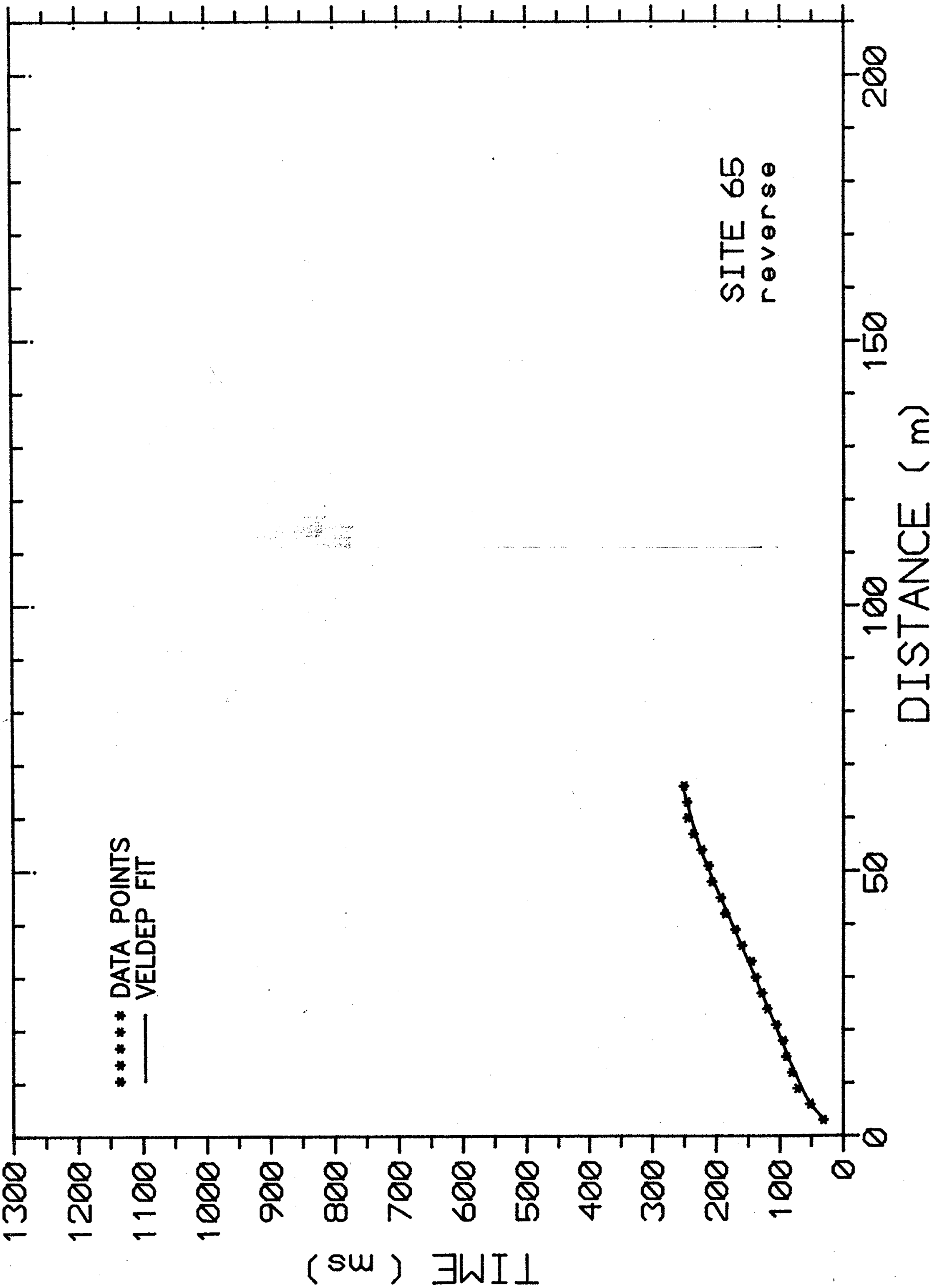


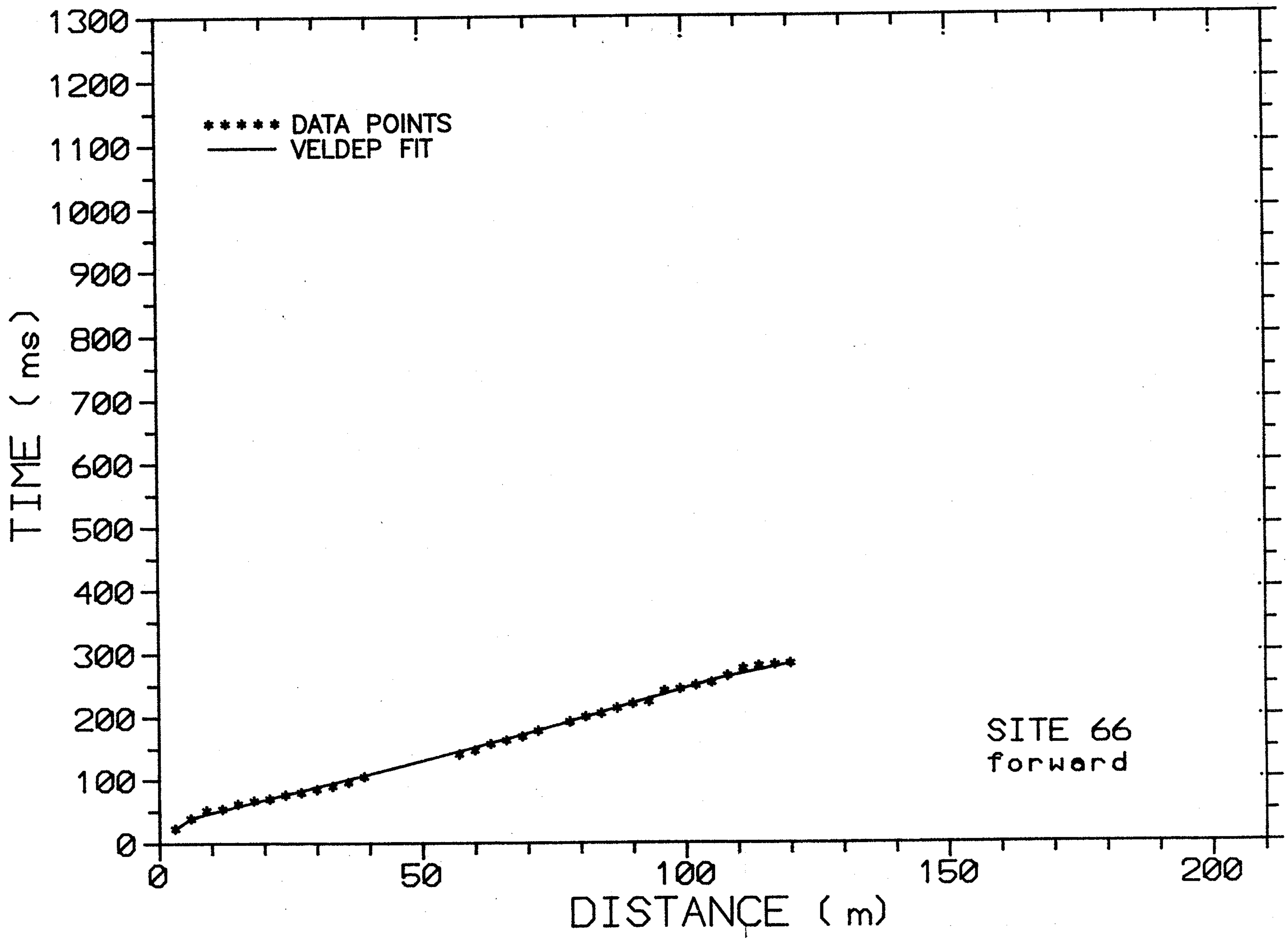
SITE 63
reverse
***** DATA POINTS
—— VELDEP FIT
TIME (ms)
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
DISTANCE (m)
0
50
100
150
200


SITE 64
forward
***** DATA POINTS
—— VELDEP FIT
TIME (ms)
DISTANCE (m)
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
0
50
100
150
200

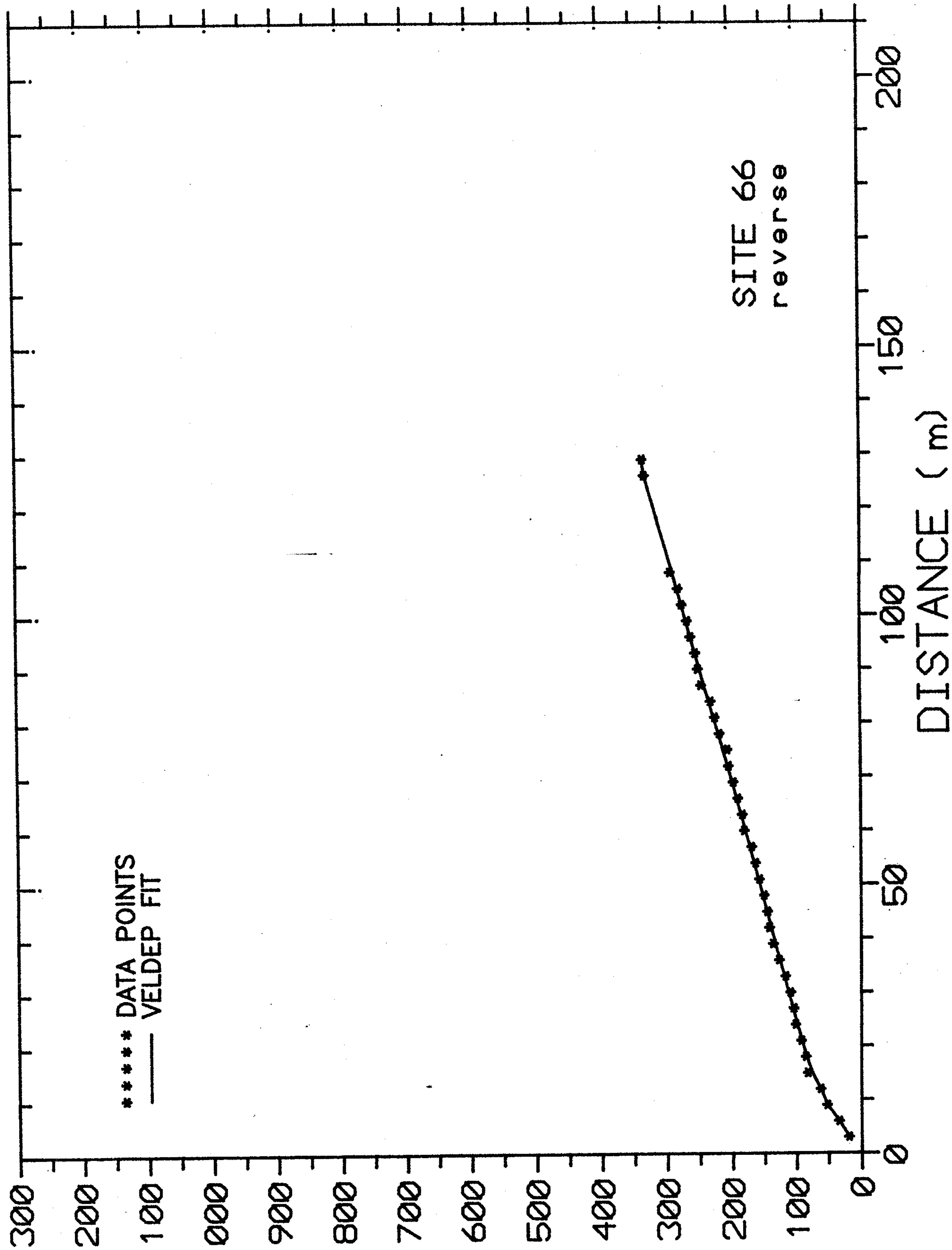

SITE 64
reverse
***** DATA POINTS
—— VELDEP FIT
DISTANCE (m)
TIME (ms)
0
50
100
150
200
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300


SITE 65
forward
***** DATA POINTS
—— VELDEP FIT
DISTANCE (m)
TIME (ms)
0
50
100
150
200
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300

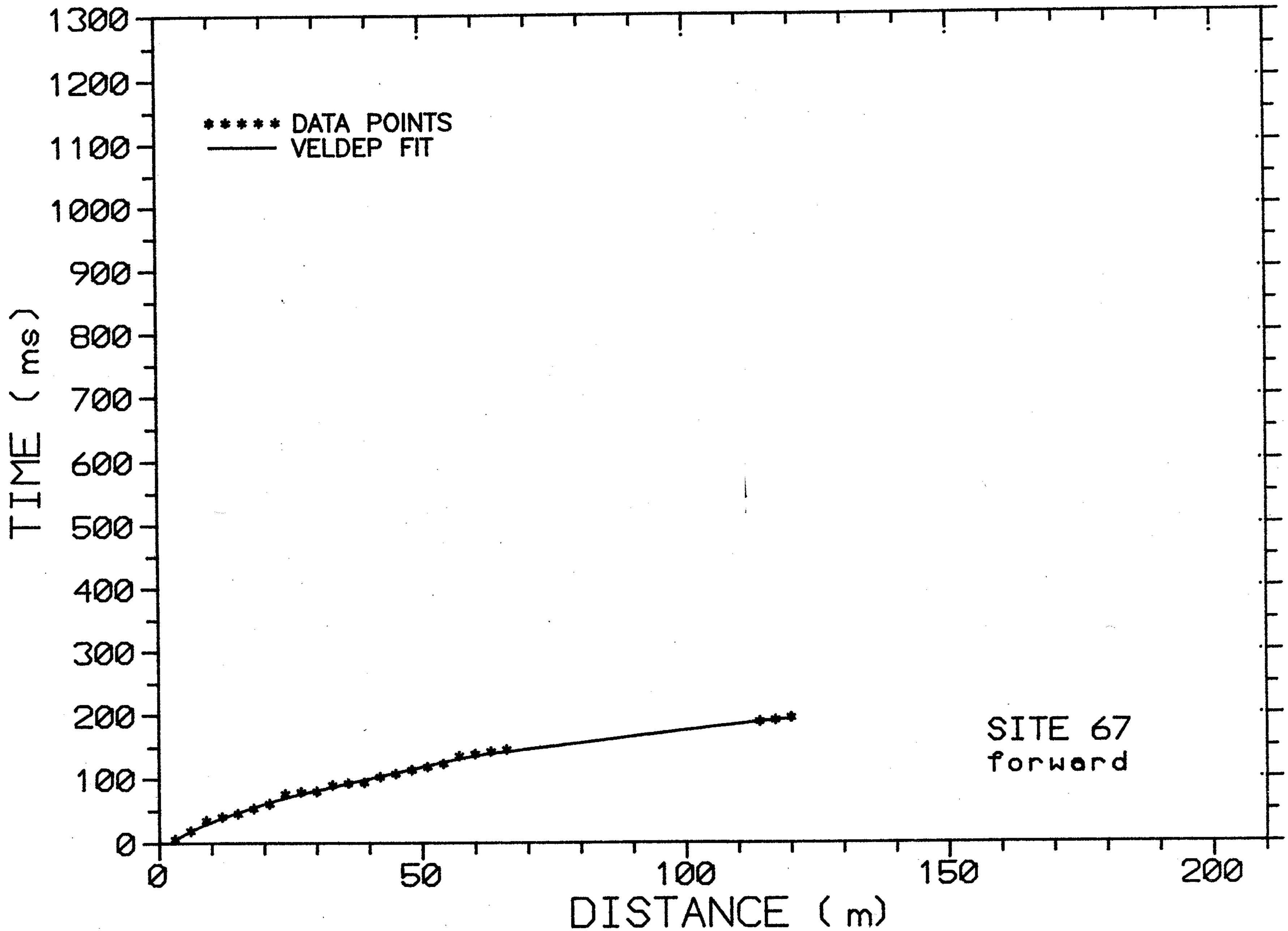

SITE 65
reverse
***** DATA POINTS
—— VELDEP FIT
TIME (ms)
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
DISTANCE (m)
0
50
100
150
200



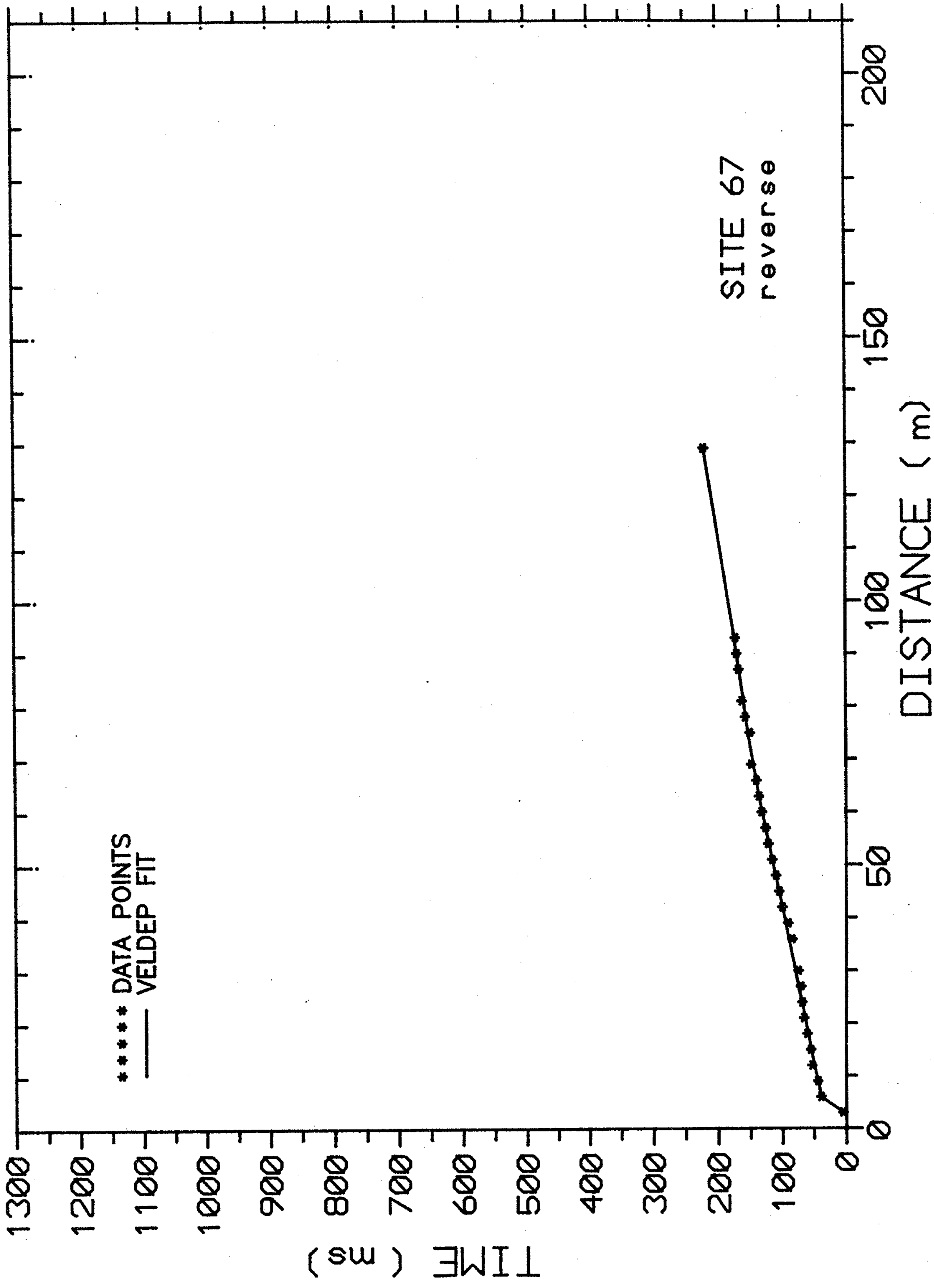
1300
1200
1100
1000
900
800
700
600
500
400
300
200
100
0
TIME (ms)
***** DATA POINTS
—— VELDEP FIT
SITE 66
forward
0
50
100
150
200
DISTANCE (m)

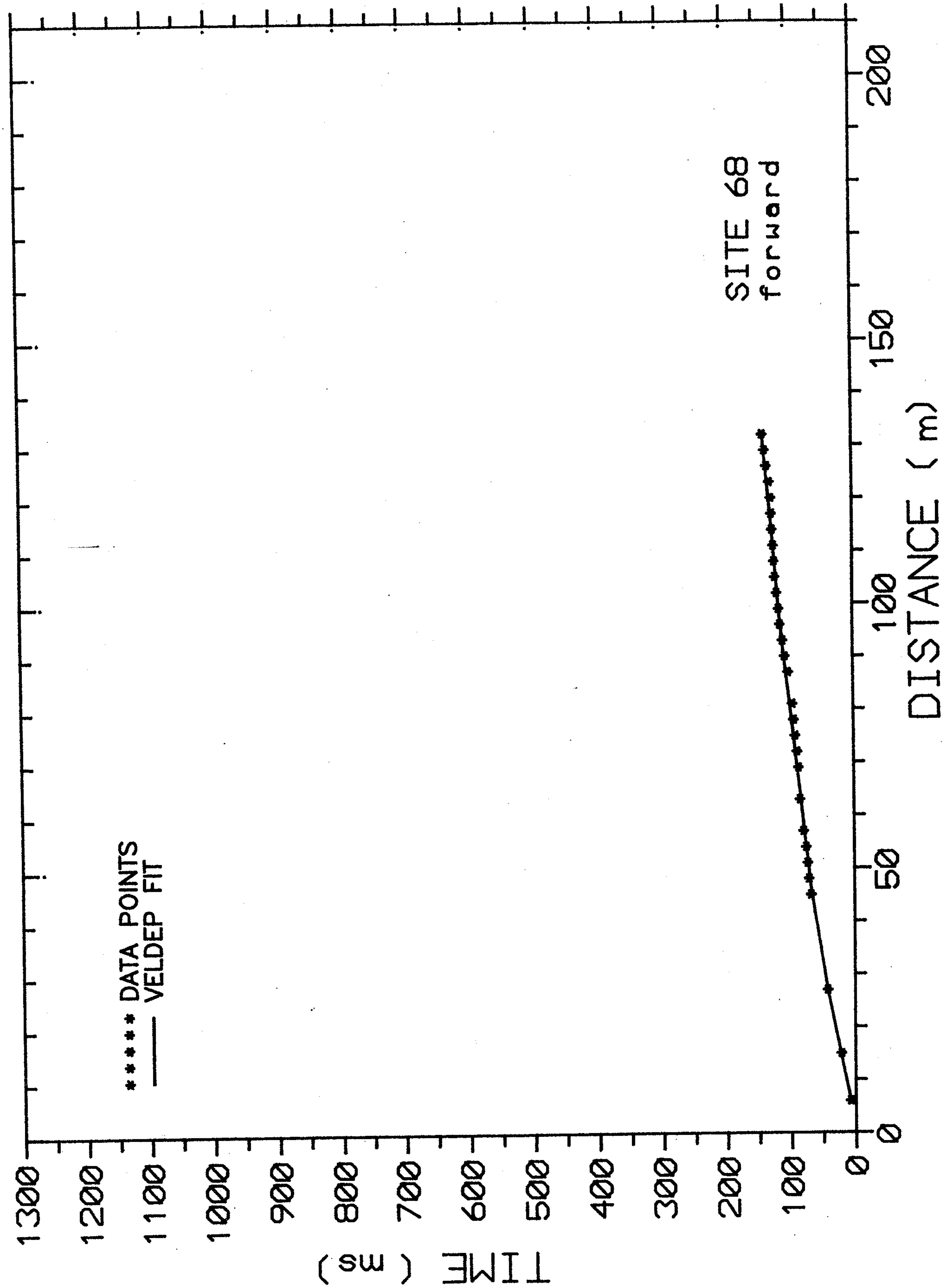


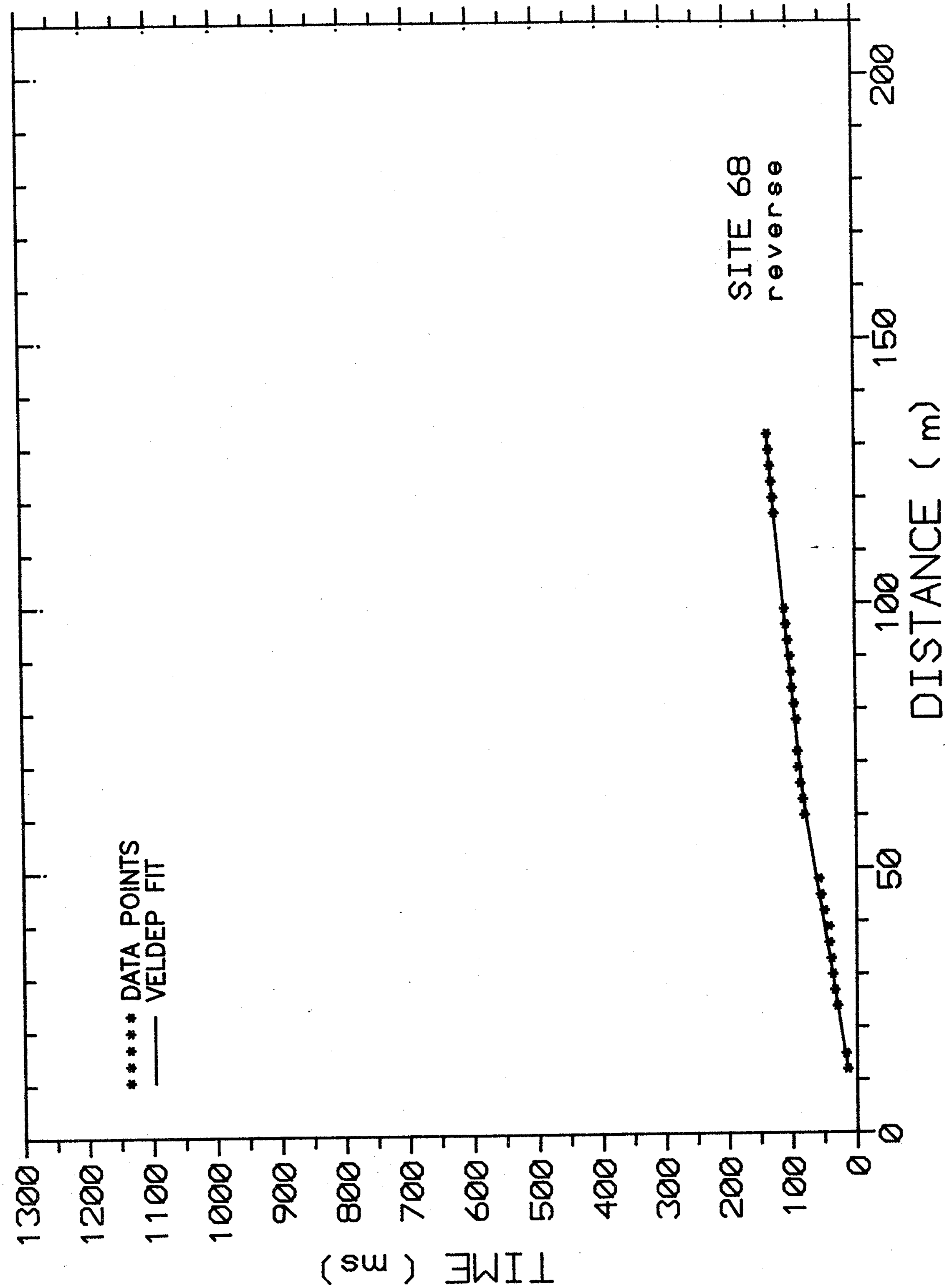
SITE 66
reverse
***** DATA POINTS
—— VELDEP FIT
DISTANCE (m)
TIME (ms)
0
50
100
150
200
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300



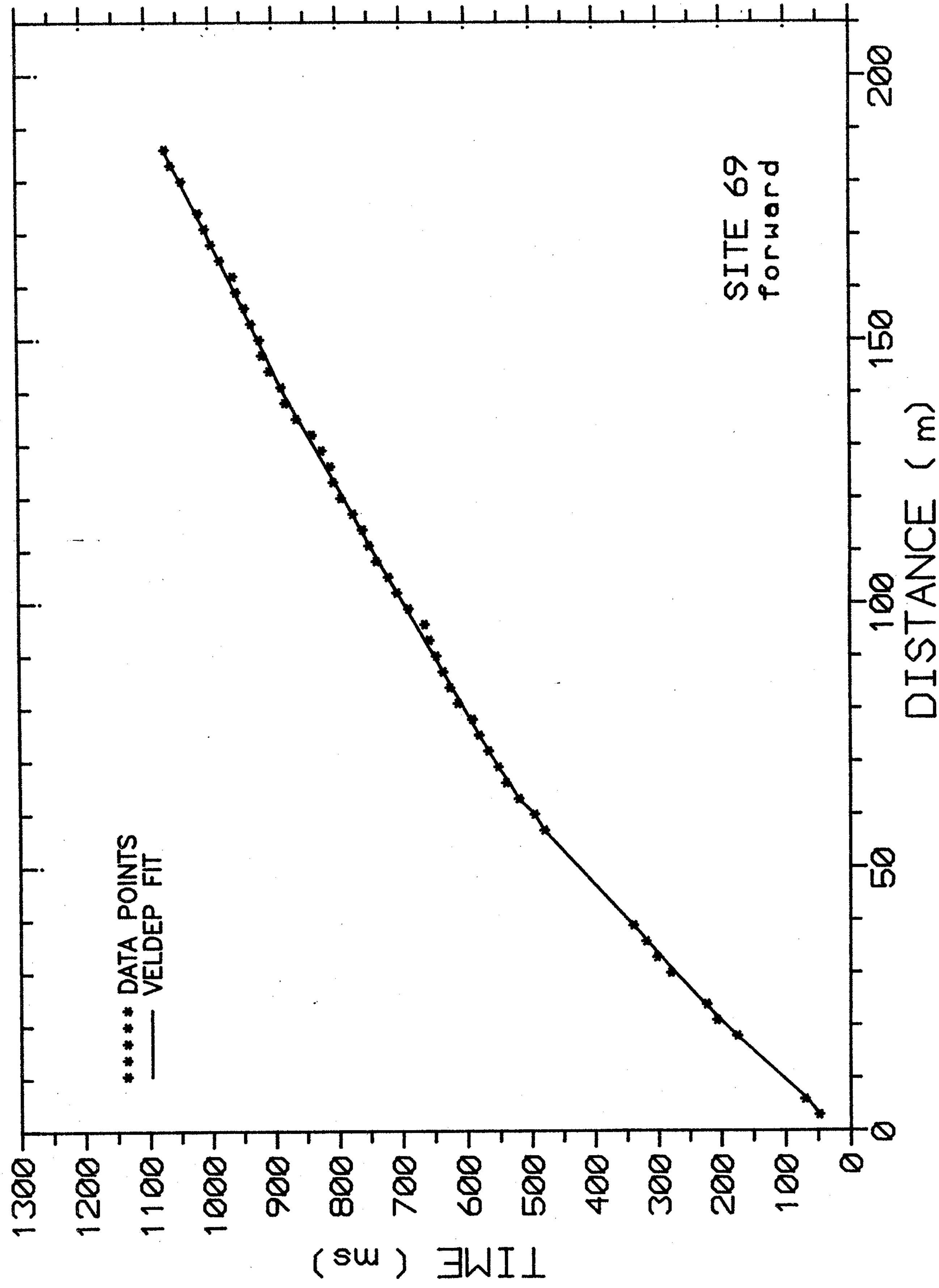
1300
1200
1100
1000
900
800
700
600
500
400
300
200
100
0
TIME (ms)
***** DATA POINTS
—— VELDEP FIT
SITE 67
forward
0
50
100
150
200
DISTANCE (m)

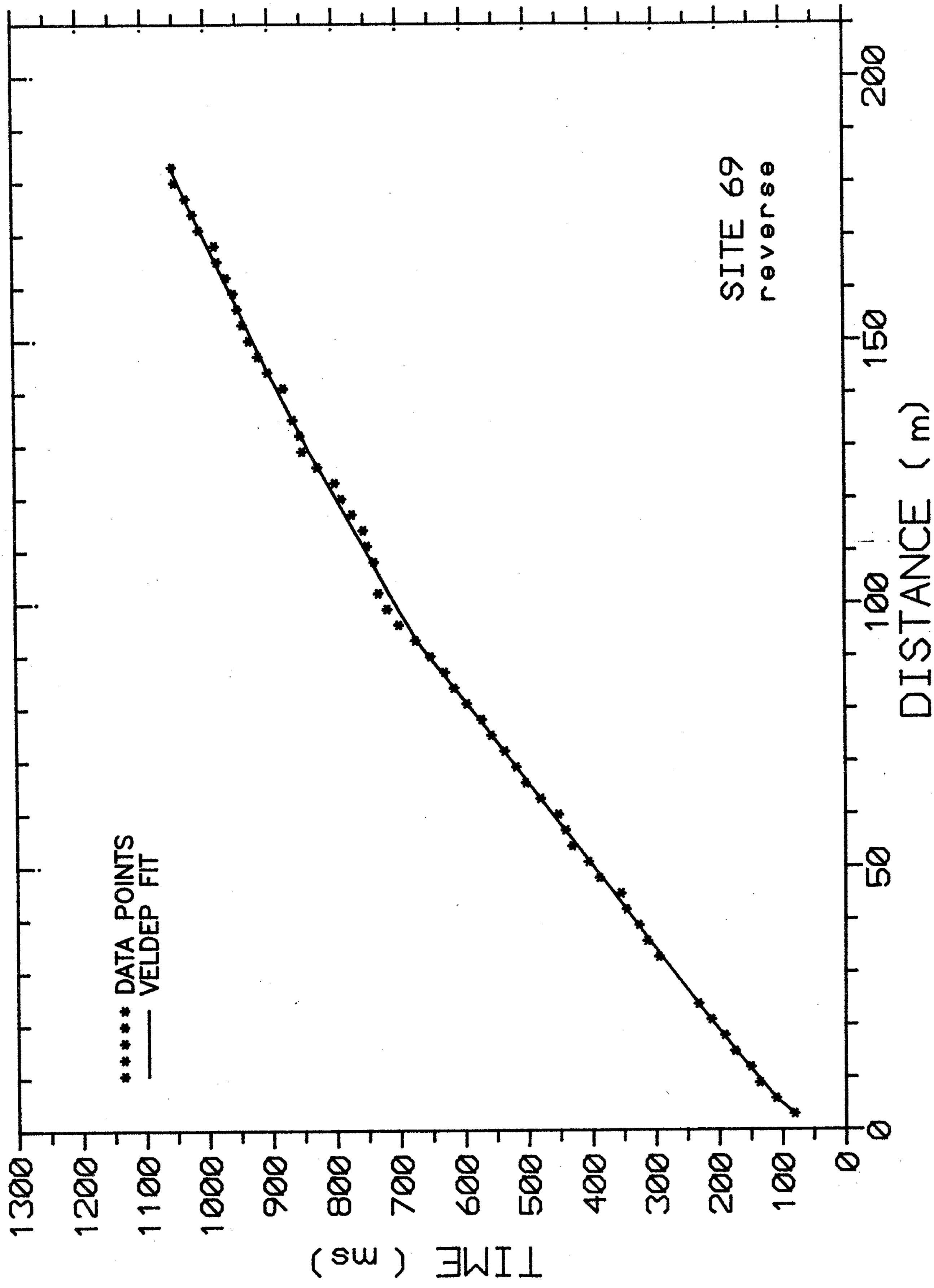

SITE 67
reverse
***** DATA POINTS
—— VELDEP FIT
DISTANCE (m)
TIME (ms)
0
50
100
150
200
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300


SITE 68
forward
DISTANCE (m)
TIME (ms)
***** DATA POINTS
—— VELDEP FIT
0
50
100
150
200
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300

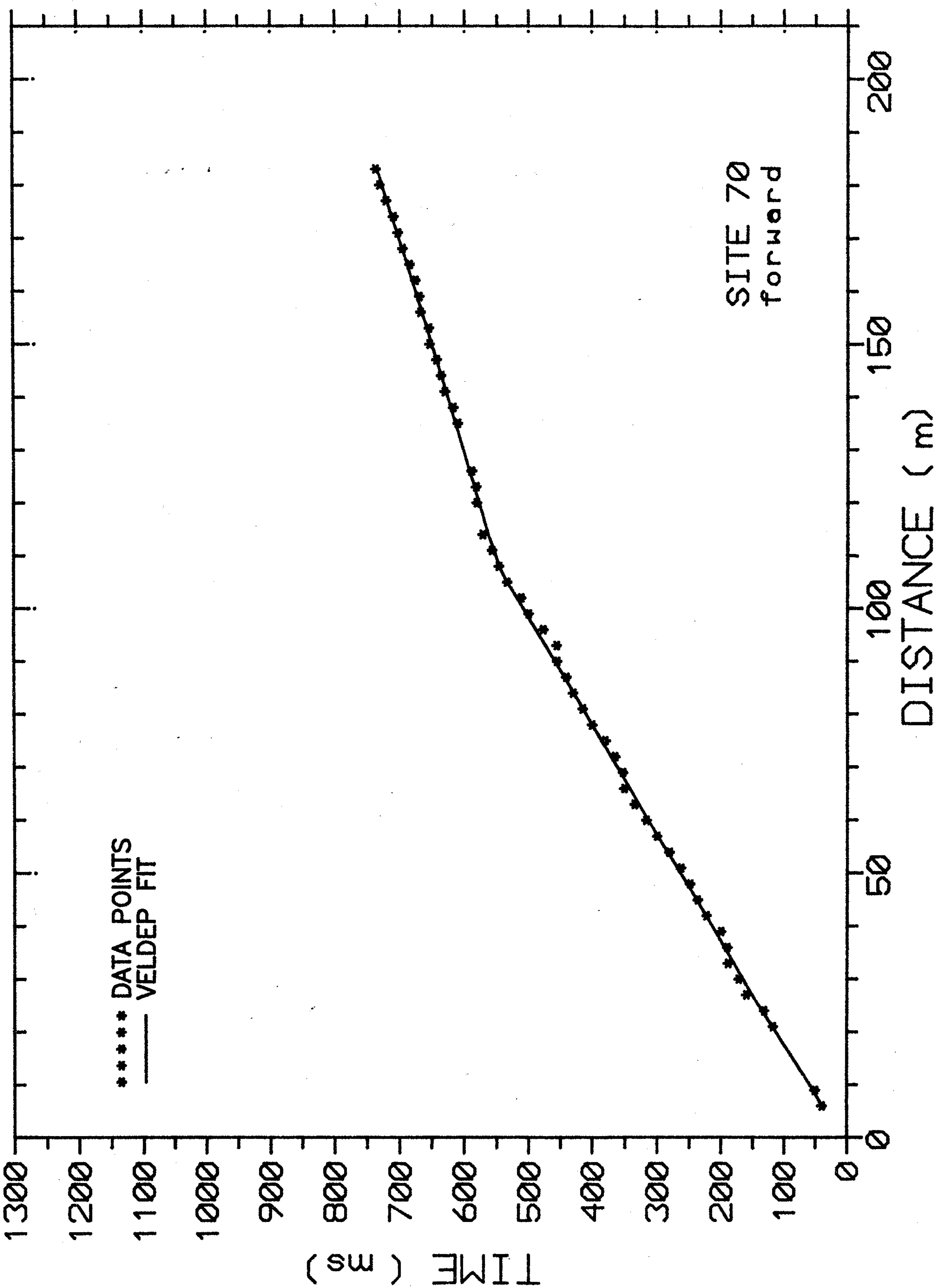


SITE 68
reverse
***** DATA POINTS
—— VELDEP FIT
DISTANCE (m)
0
50
100
150
200
TIME (ms)
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300

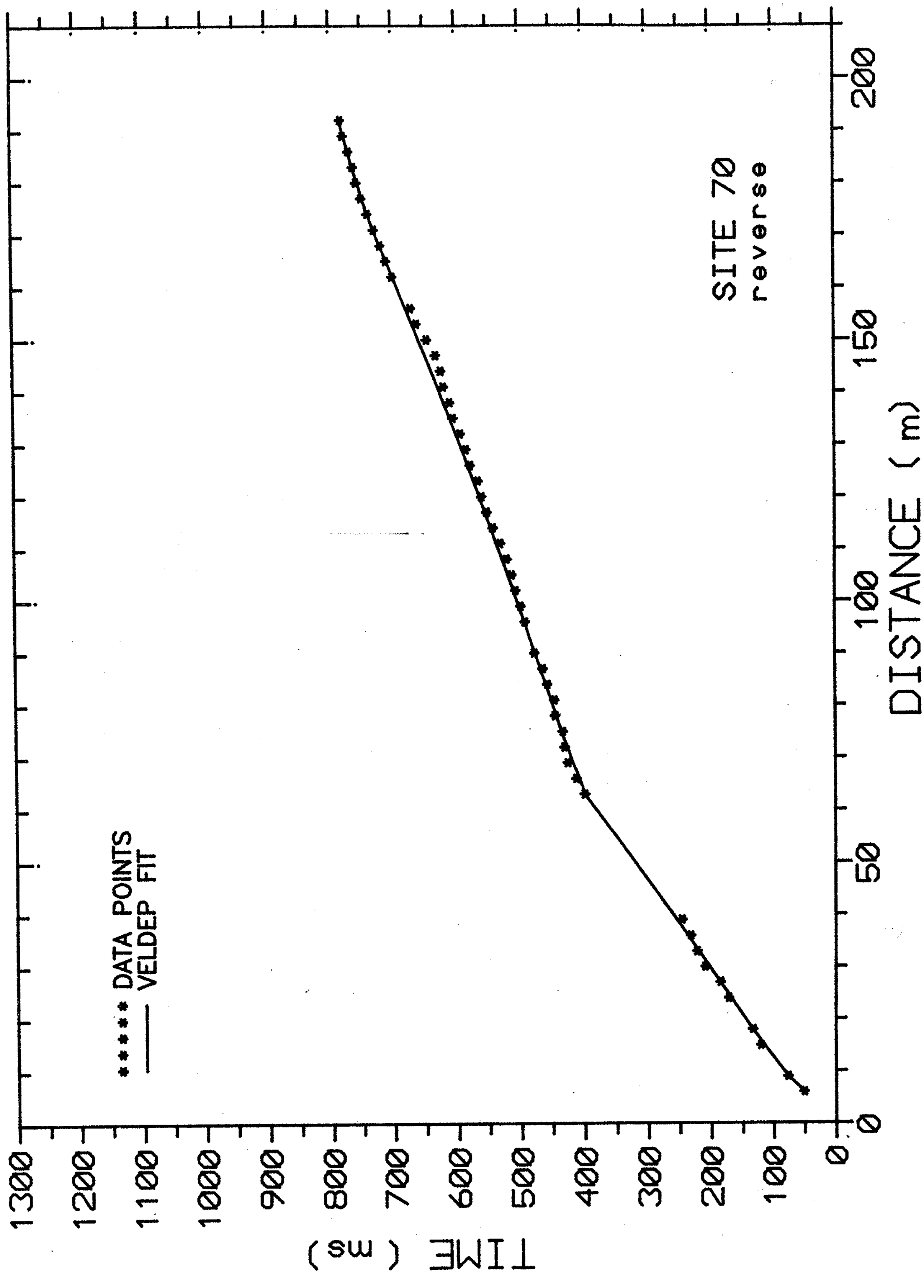

SITE 69
forward
***** DATA POINTS
—— VELDEP FIT
TIME (ms)
DISTANCE (m)
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
0
50
100
150
200



***** DATA POINTS
—— VELDEP FIT
SITE 69
reverse
TIME (ms)
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
DISTANCE (m)
0
50
100
150
200



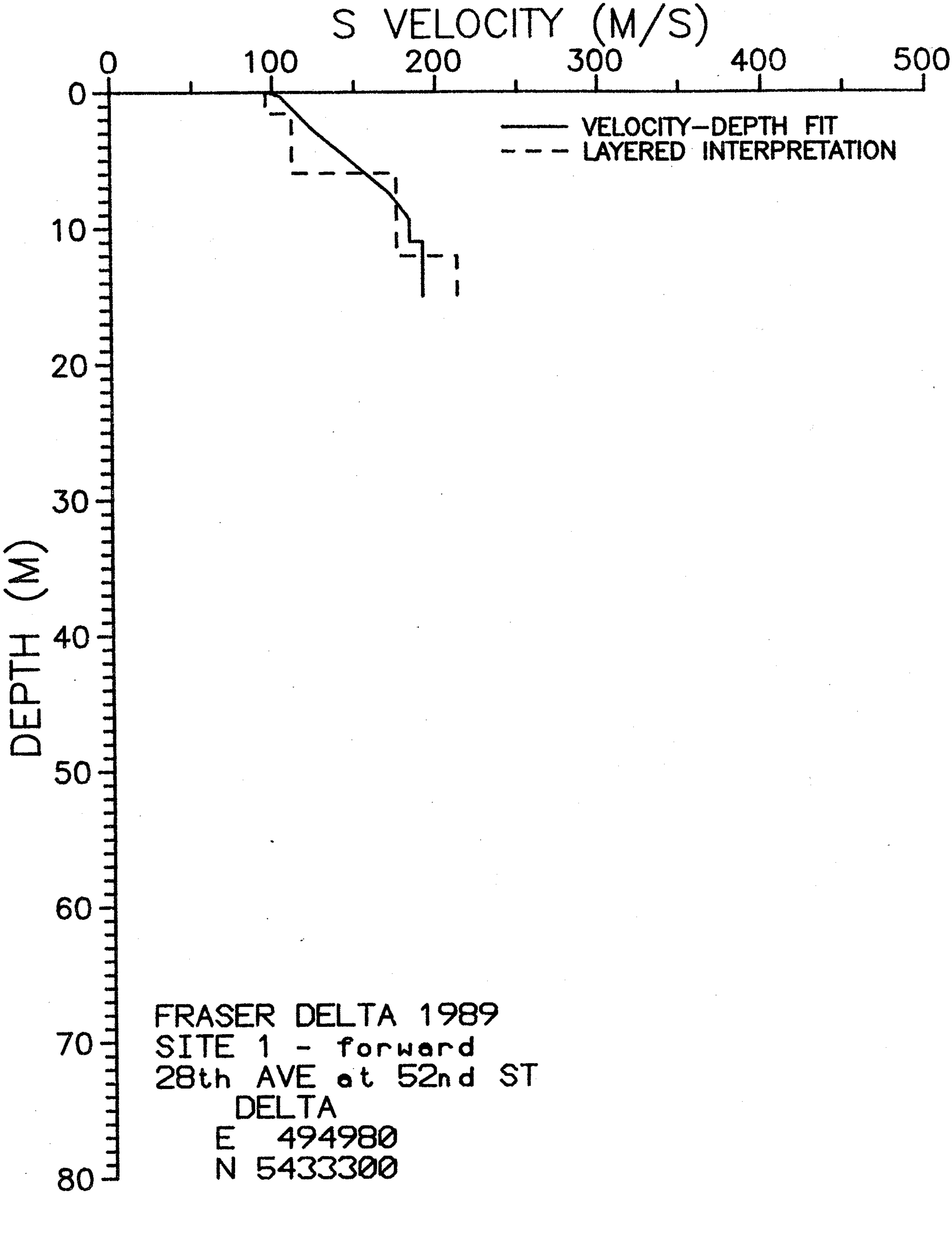
SITE 70
forward
***** DATA POINTS
—— VELDEP FIT
DISTANCE (m)
TIME (ms)
0
50
100
150
200
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300

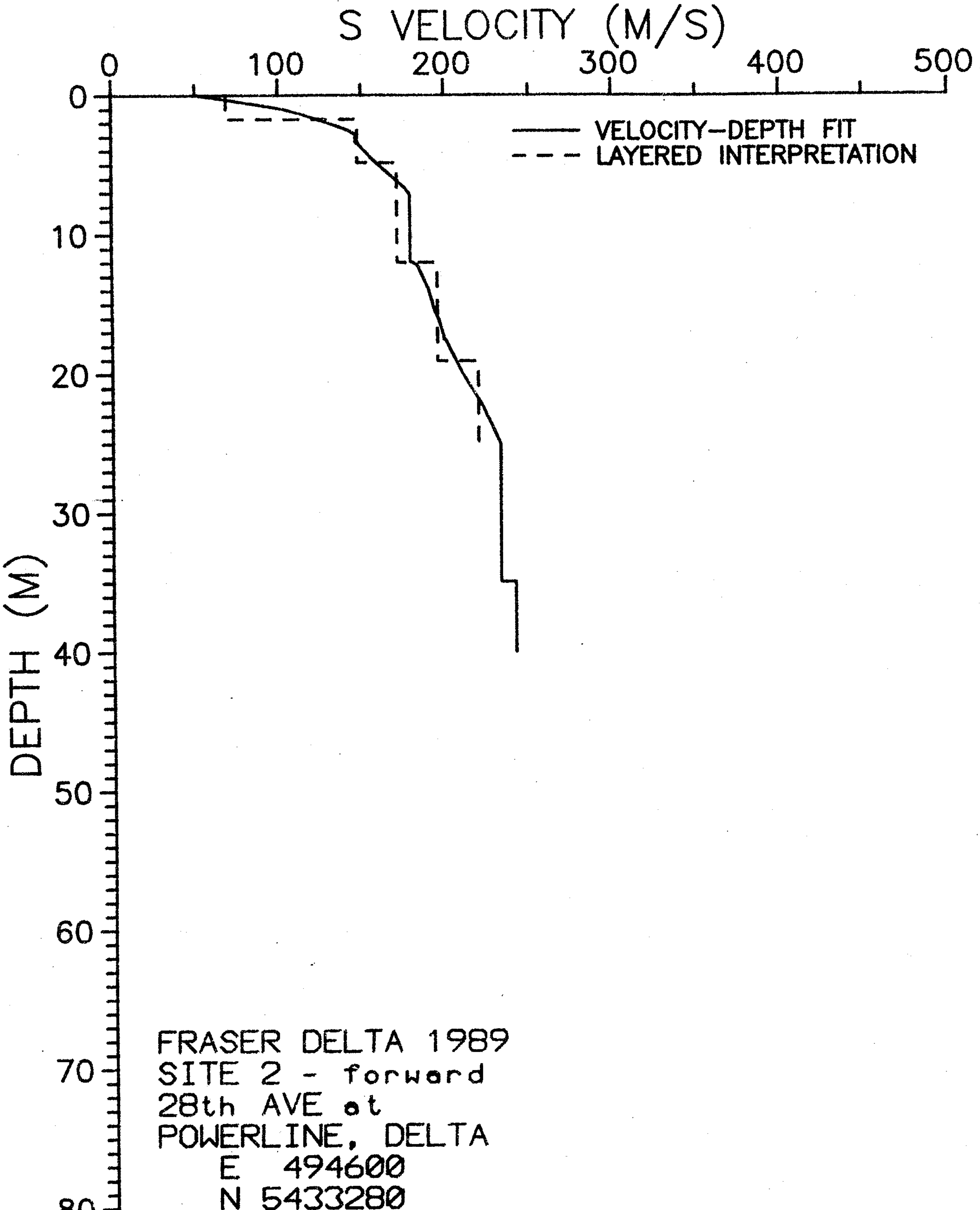

SITE 70
reverse
***** DATA POINTS
—— VELDEP FIT
DISTANCE (m)
0
50
100
150
200
TIME (ms)
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300

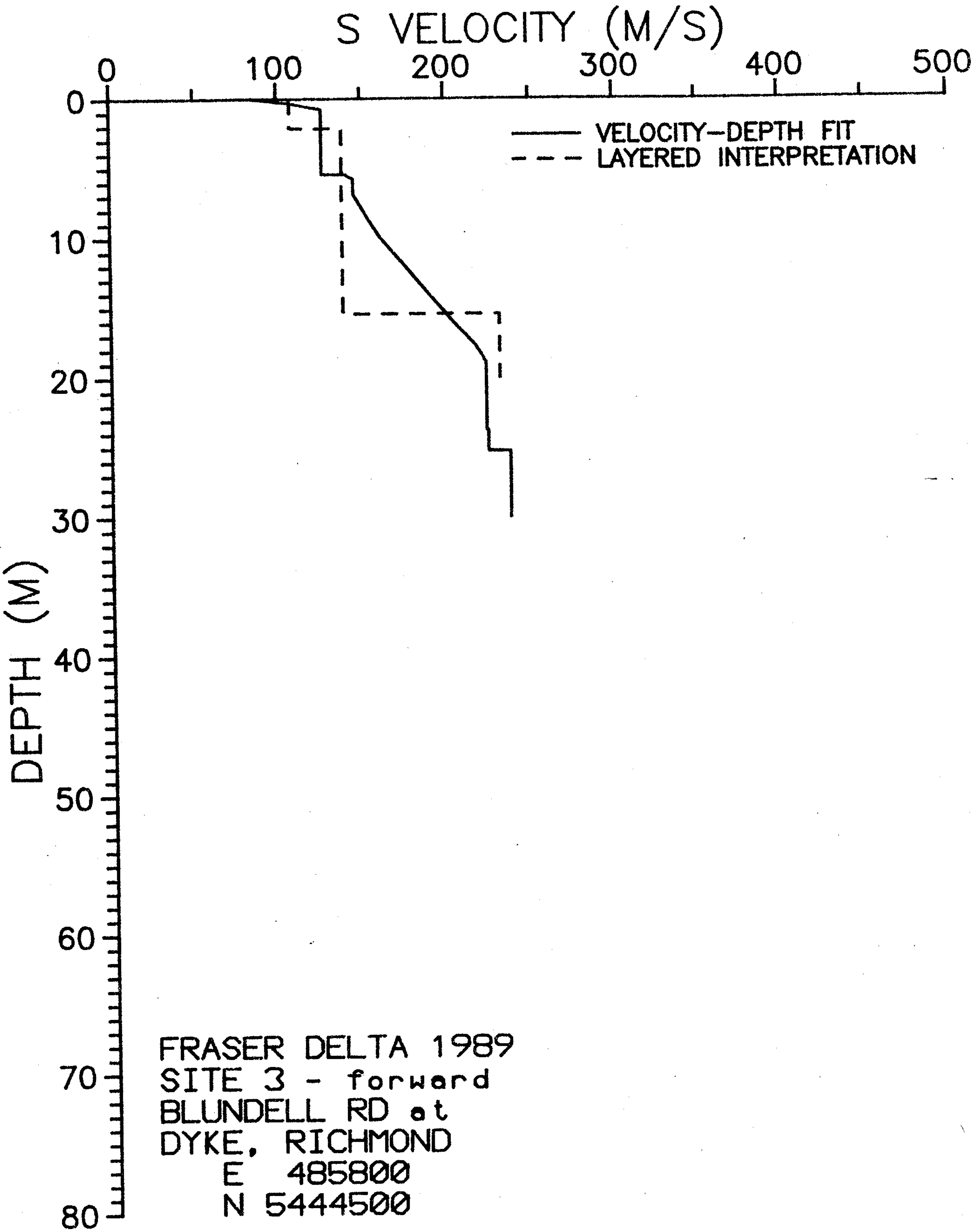
SECTION II

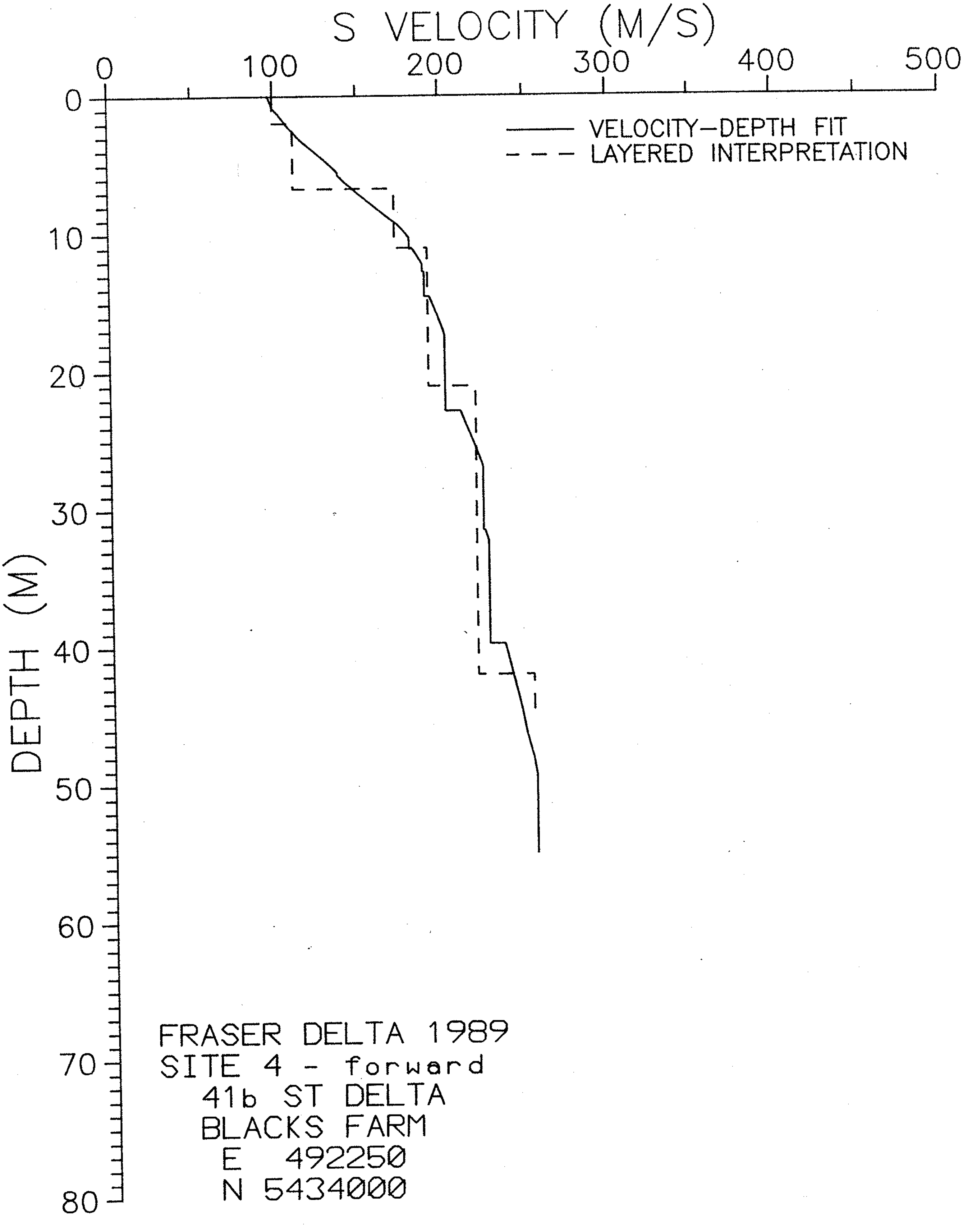
VELOCITY - DEPTH INTERPRETATIONS

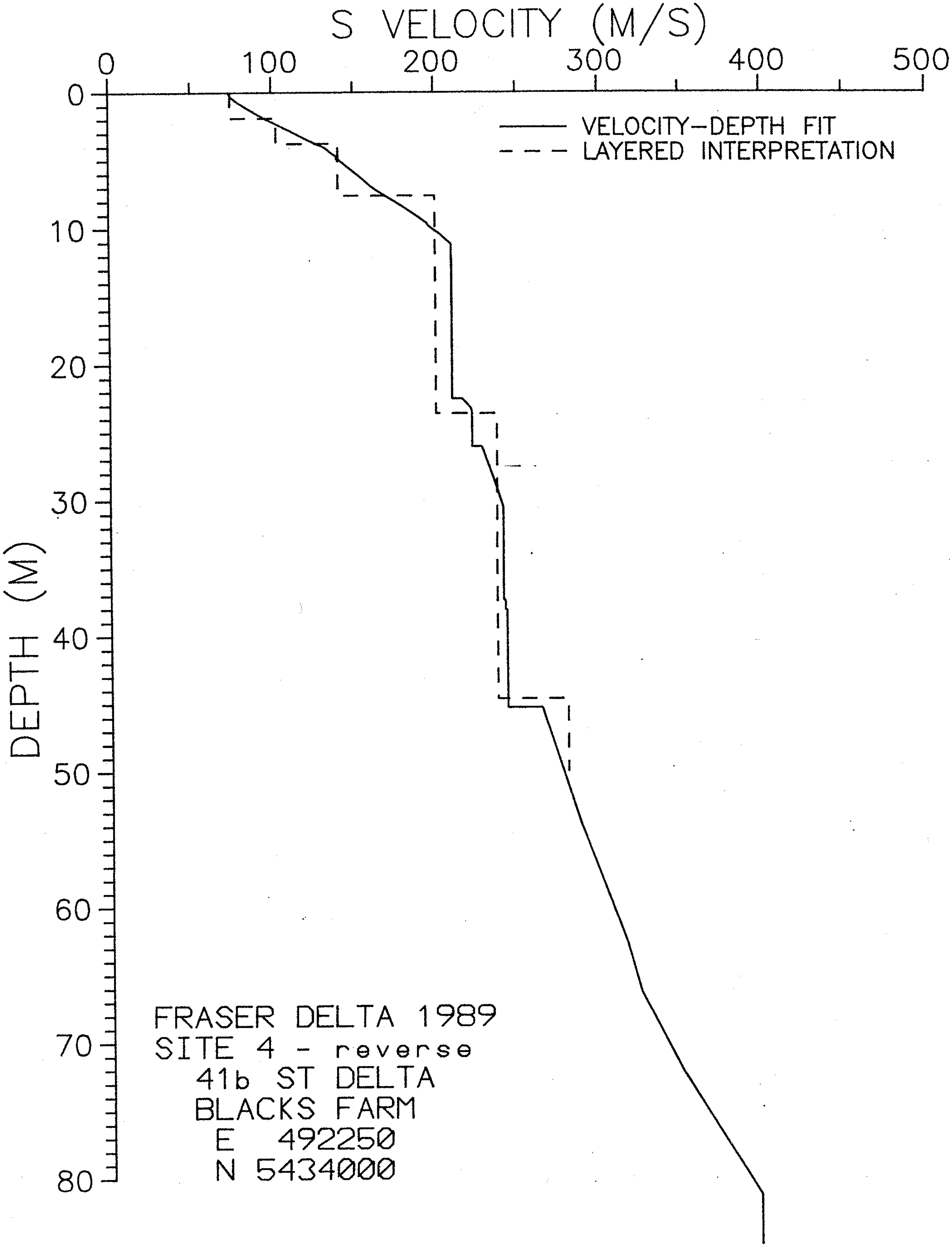
SITES 1 TO 70

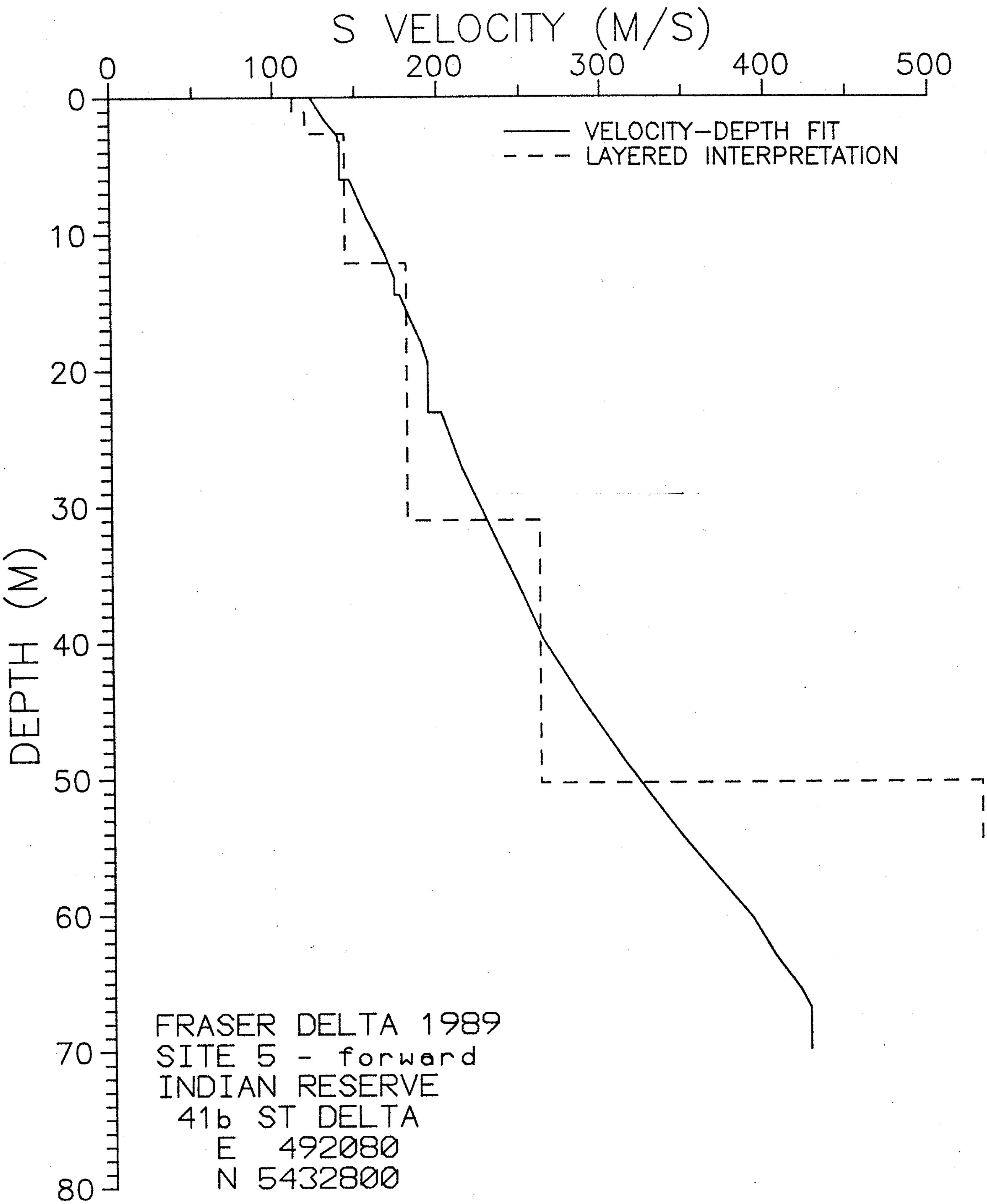

S VELOCITY (M/S)
0
100
200
300
400
500
0
10
20
30
40
50
60
70
80
DEPTH (M)
VELOCITY—DEPTH FIT
LAYERED INTERPRETATION
FRASER DELTA 1989
SITE 1 - forward
28th AVE at 52nd ST
DELTA
E 494980
N 5433300

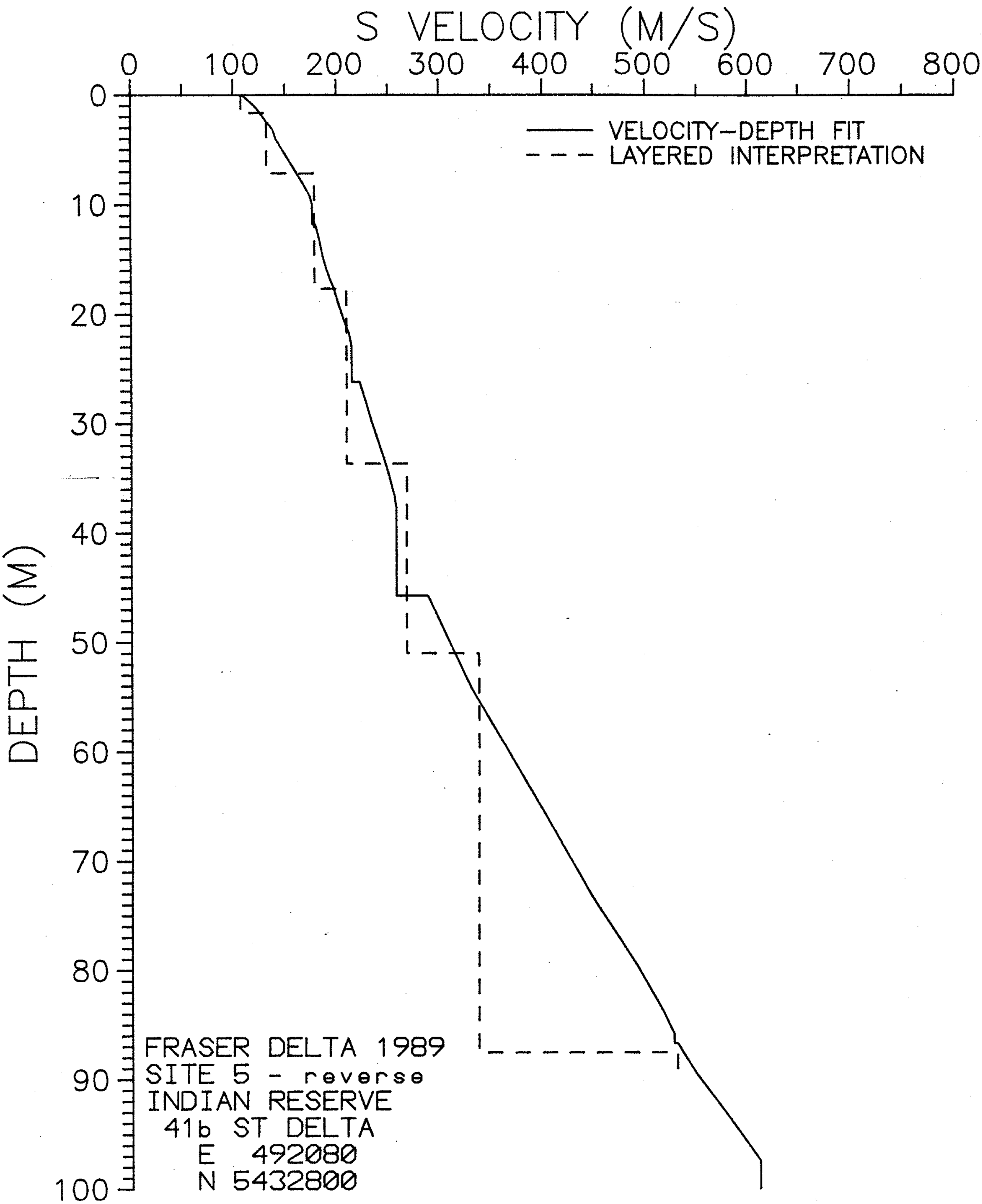

S VELOCITY (M/S)
0
100
200
300
400
500
VELOCITY-DEPTH FIT
LAYERED INTERPRETATION
DEPTH (M)
0
10
20
30
40
50
60
70
80
FRASER DELTA 1989
SITE 2 - forward
28th AVE at
POWERLINE, DELTA
E 494600
N 5433280

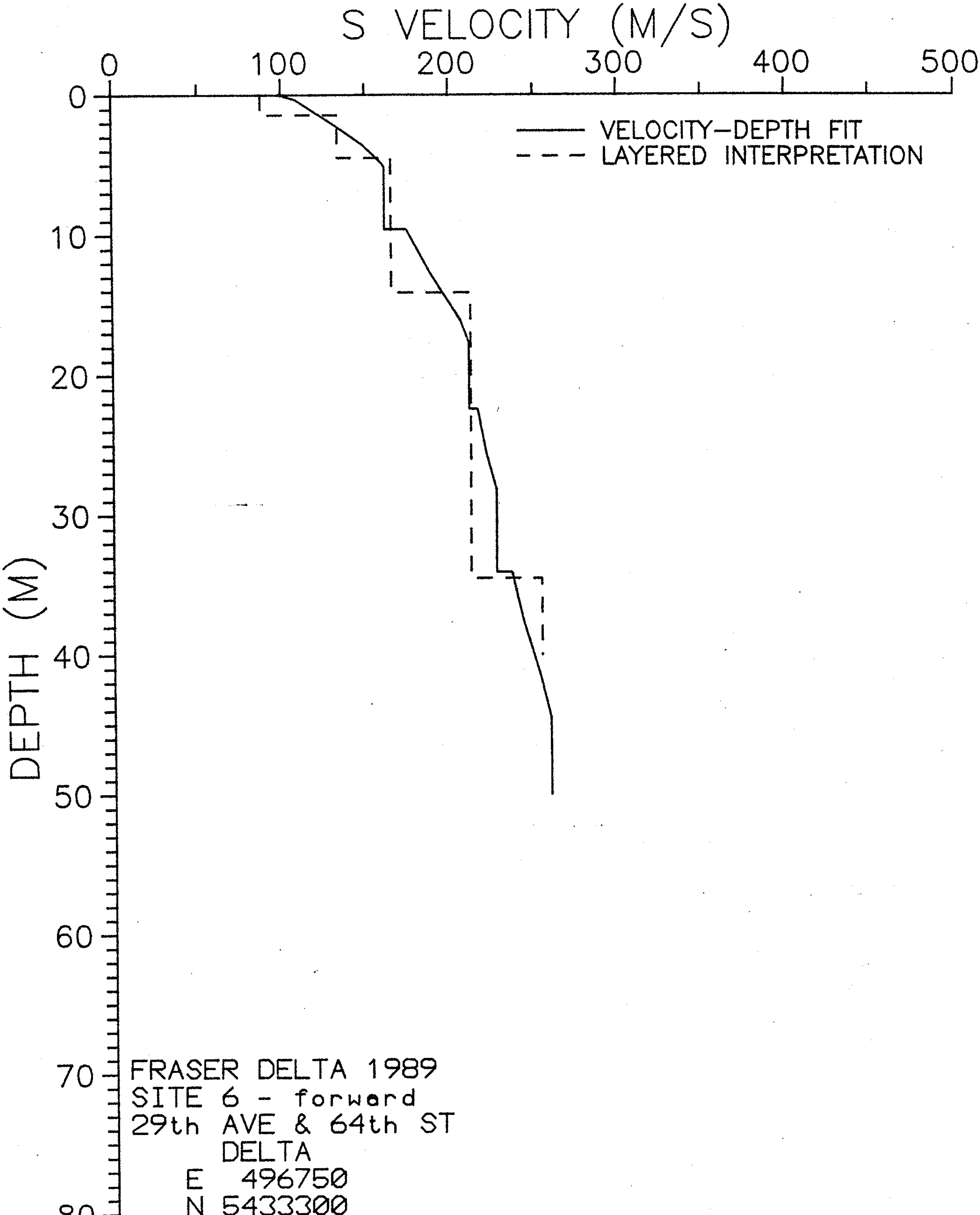

S VELOCITY (M/S)
0
100
200
300
400
500
0
10
20
30
40
50
60
70
80
DEPTH (M)
VELOCITY—DEPTH FIT
LAYERED INTERPRETATION
FRASER DELTA 1989
SITE 3 - forward
BLUNDELL RD at
DYKE, RICHMOND
E 485800
N 5444500

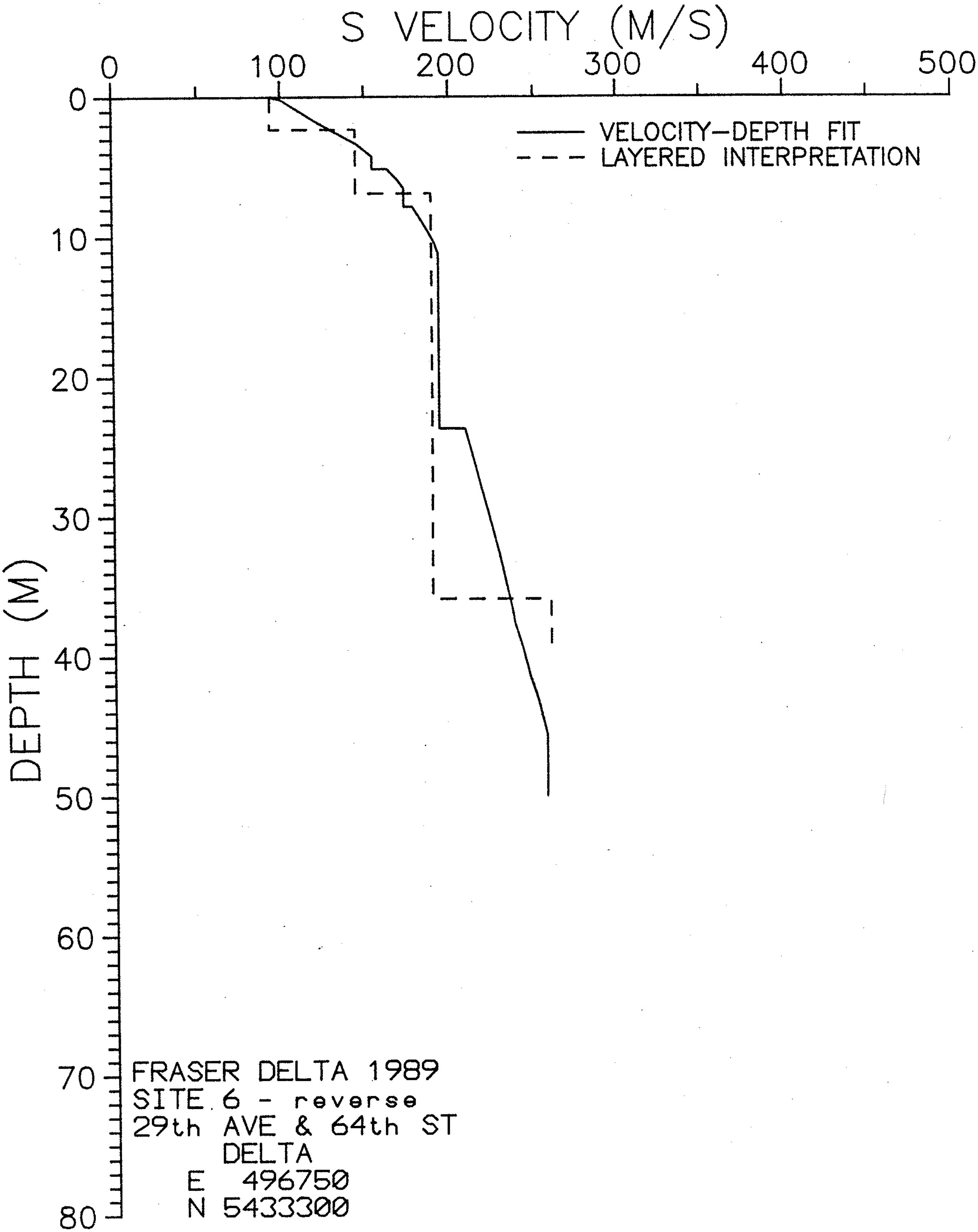

S VELOCITY (M/S)
0
100
200
300
400
500
0
10
20
30
40
50
60
70
80
DEPTH (M)
VELOCITY–DEPTH FIT
LAYERED INTERPRETATION
FRASER DELTA 1989
SITE 4 - forward
41b ST DELTA
BLACKS FARM
E 492250
N 5434000

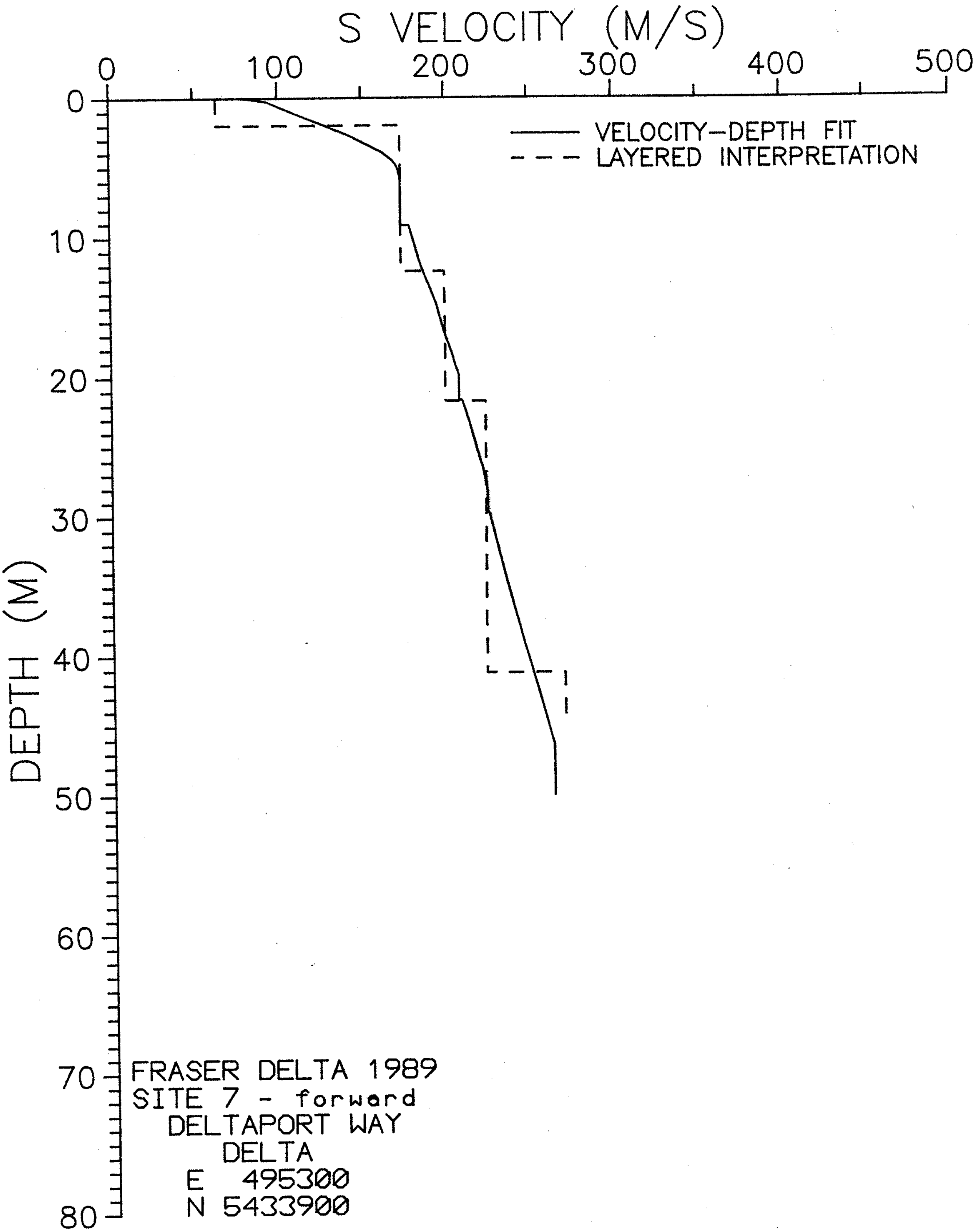

S VELOCITY (M/S)
0
100
200
300
400
500
DEPTH (M)
0
10
20
30
40
50
60
70
80
VELOCITY-DEPTH FIT
LAYERED INTERPRETATION
FRASER DELTA 1989
SITE 4 - reverse
41b ST DELTA
BLACKS FARM
E 492250
N 5434000

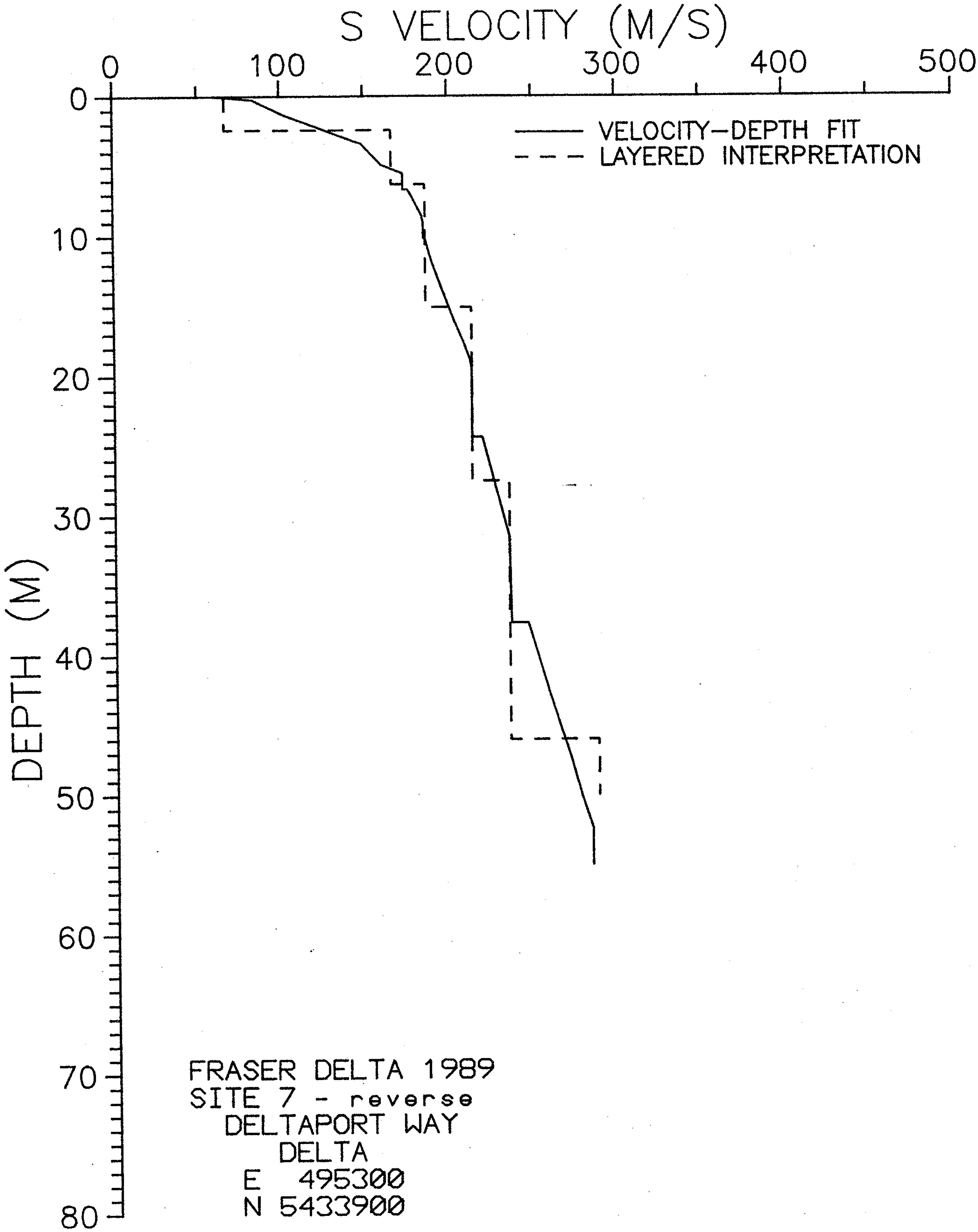

S VELOCITY (M/S)
0
100
200
300
400
500
0
10
20
30
40
50
60
70
80
DEPTH (M)
VELOCITY-DEPTH FIT
LAYERED INTERPRETATION
FRASER DELTA 1989
SITE 5 - forward
INDIAN RESERVE
41b ST DELTA
E 492080
N 5432800

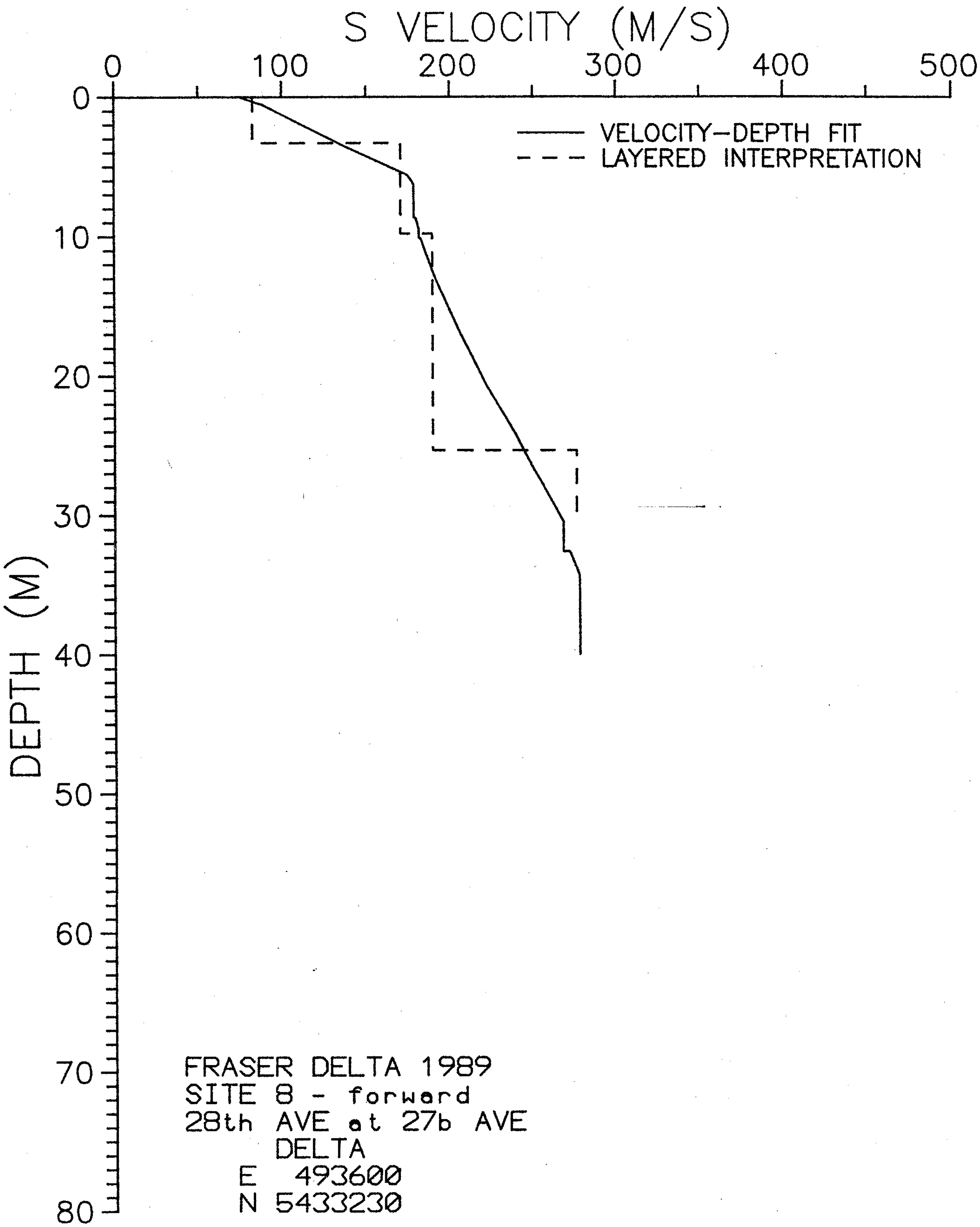

S VELOCITY (M/S)
0 100 200 300 400 500 600 700 800
DEPTH (M)
0 10 20 30 40 50 60 70 80 90 100
VELOCITY-DEPTH FIT
LAYERED INTERPRETATION
FRASER DELTA 1989
SITE 5 - reverse
INDIAN RESERVE
41b ST DELTA
E 492080
N 5432800

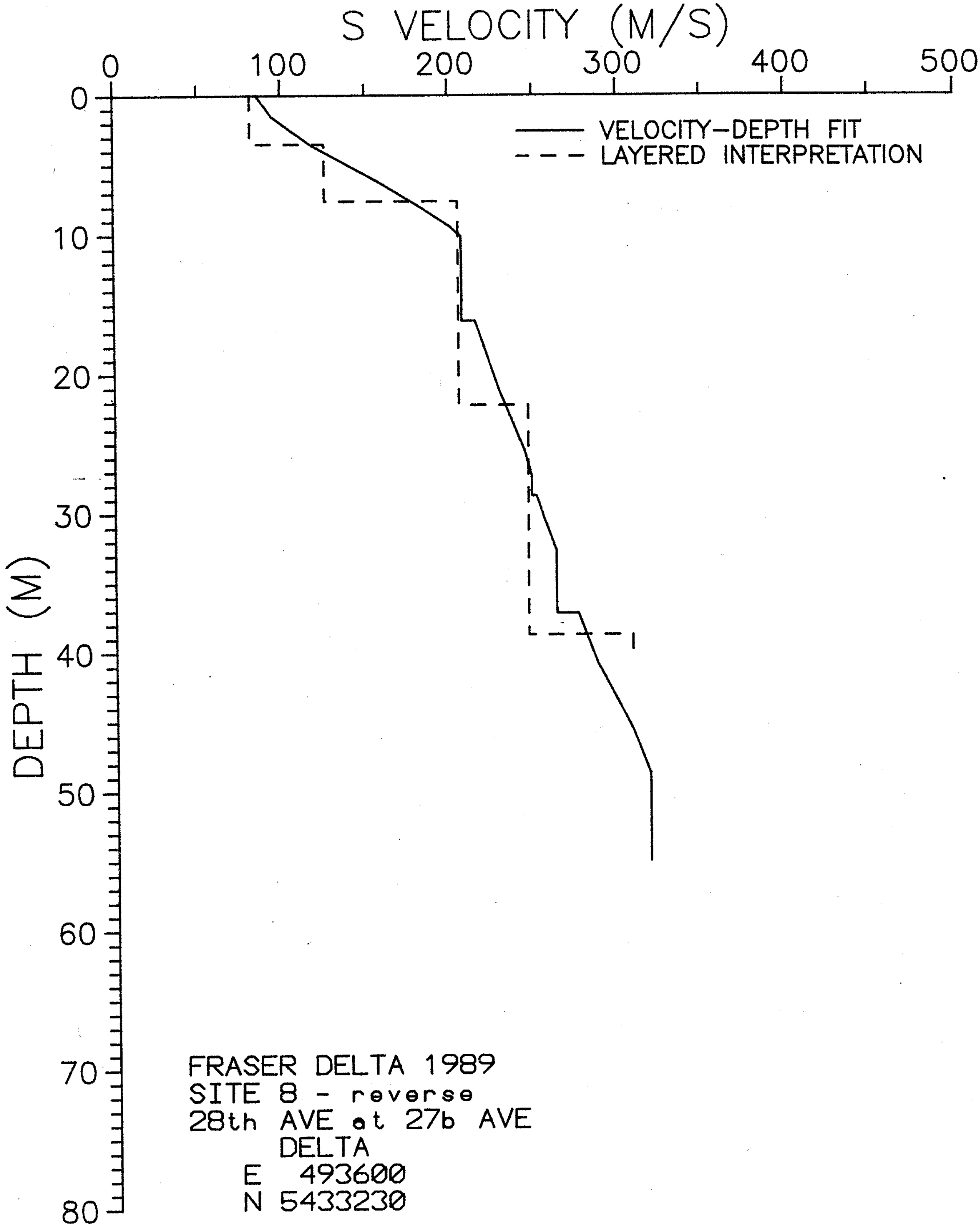

S VELOCITY (M/S)
0
100
200
300
400
500
VELOCITY-DEPTH FIT
LAYERED INTERPRETATION
DEPTH (M)
0
10
20
30
40
50
60
70
80
FRASER DELTA 1989
SITE 6 - forward
29th AVE & 64th ST
DELTA
E 496750
N 5433300


S VELOCITY (M/S)
0
100
200
300
400
500
DEPTH (M)
0
10
20
30
40
50
60
70
80
VELOCITY—DEPTH FIT
LAYERED INTERPRETATION
FRASER DELTA 1989
SITE 6 - reverse
29th AVE & 64th ST
DELTA
E 496750
N 5433300

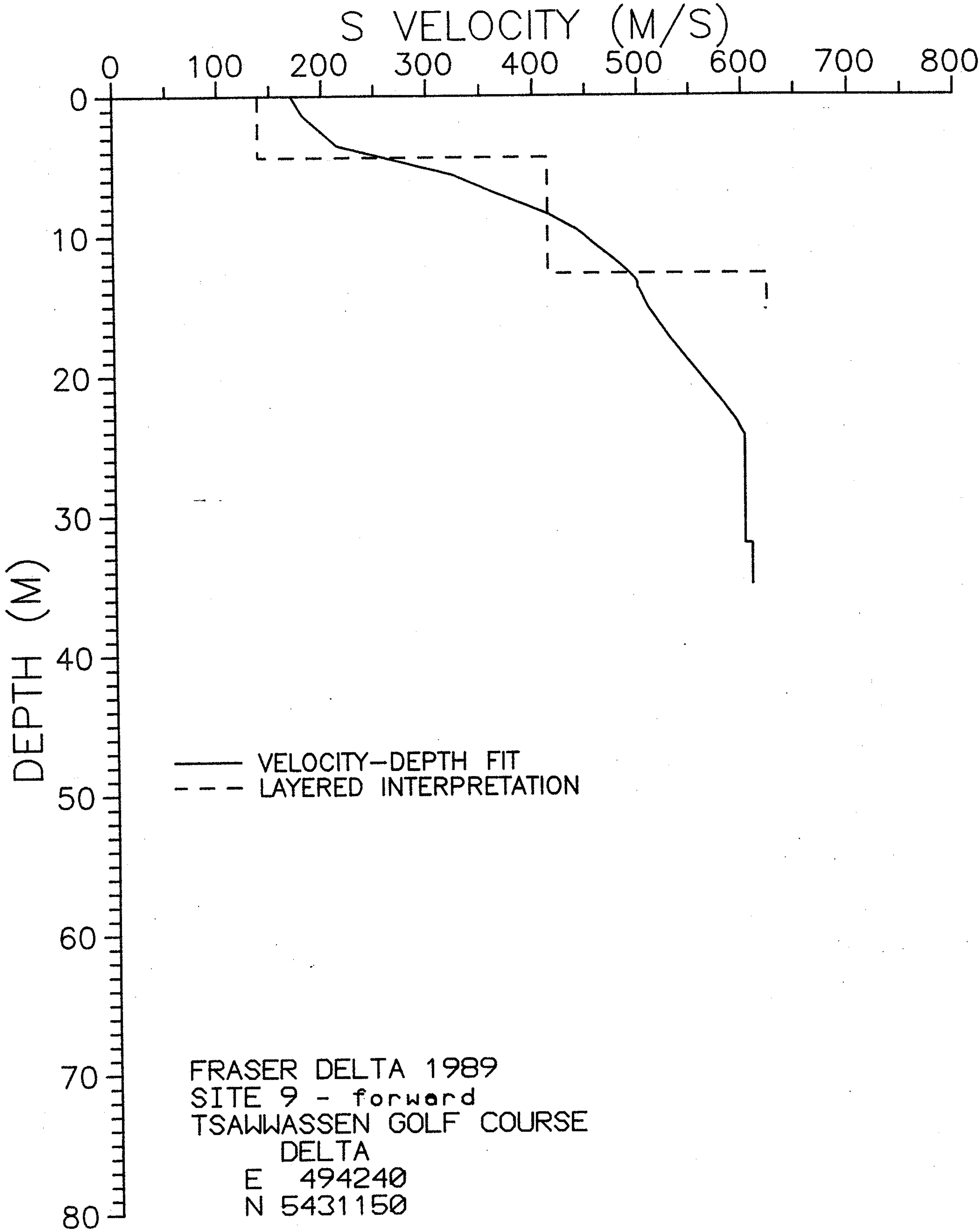

S VELOCITY (M/S)
0
100
200
300
400
500
0
10
20
30
40
50
60
70
80
DEPTH (M)
VELOCITY—DEPTH FIT
LAYERED INTERPRETATION
FRASER DELTA 1989
SITE 7 - forward
DELTAPORT WAY
DELTA
E 495300
N 5433900

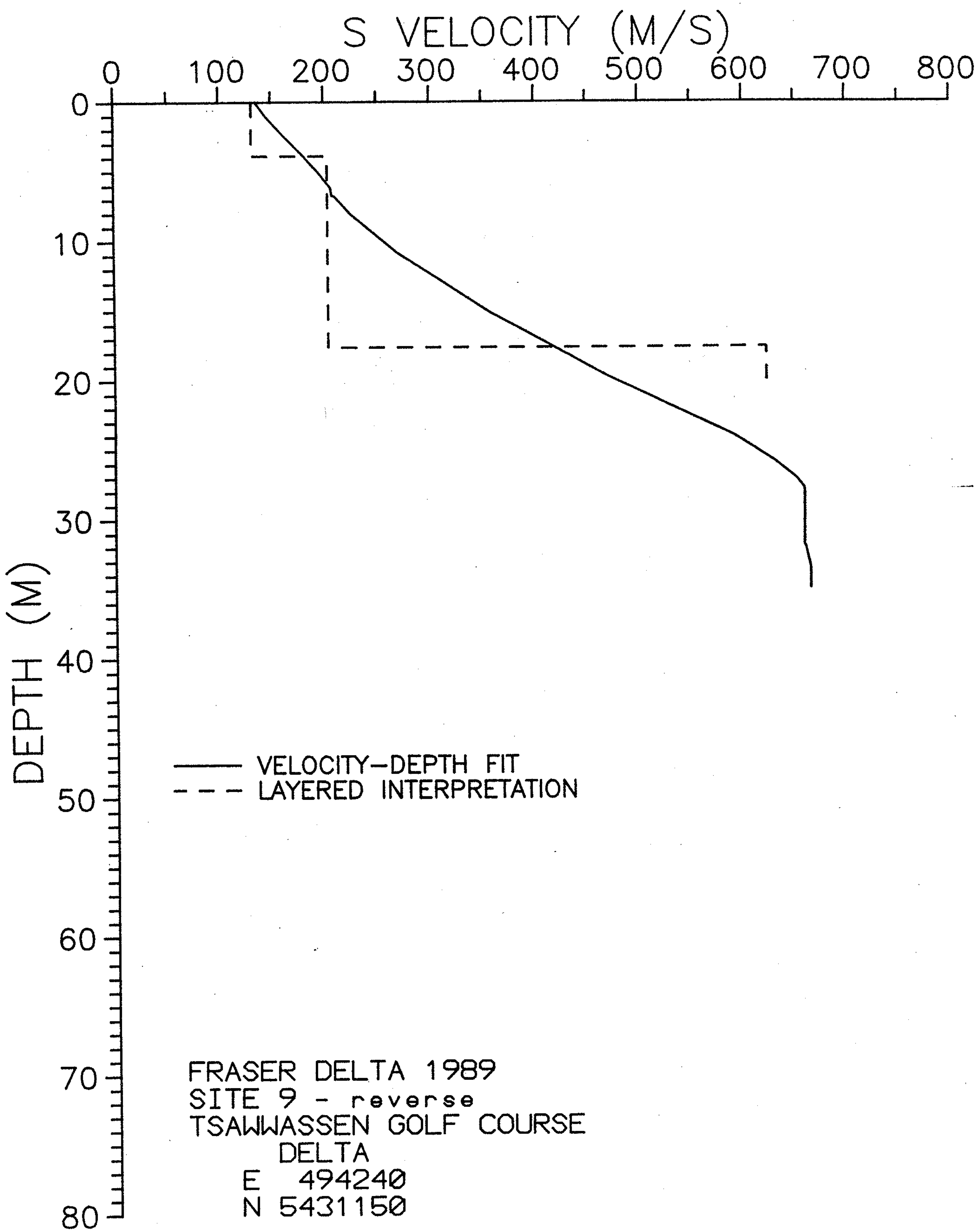

S VELOCITY (M/S)
0 100 200 300 400 500
DEPTH (M)
0 10 20 30 40 50 60 70 80
VELOCITY-DEPTH FIT
LAYERED INTERPRETATION
FRASER DELTA 1989
SITE 7 - reverse
DELTAPORT WAY
DELTA
E 495300
N 5433900

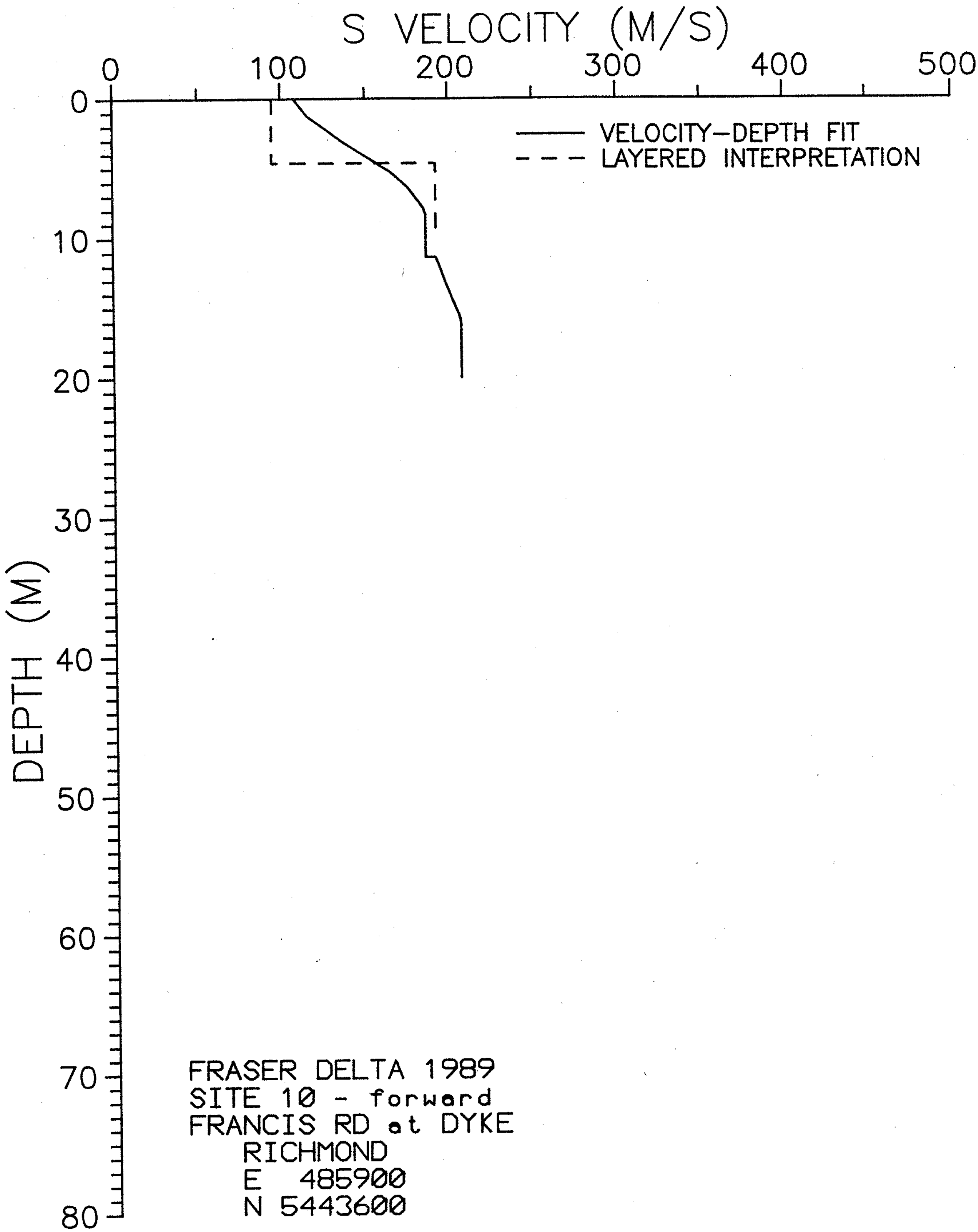

S VELOCITY (M/S)
0
100
200
300
400
500
DEPTH (M)
0
10
20
30
40
50
60
70
80
VELOCITY—DEPTH FIT
LAYERED INTERPRETATION
FRASER DELTA 1989
SITE 8 - forward
28th AVE at 27b AVE
DELTA
E 493600
N 5433230

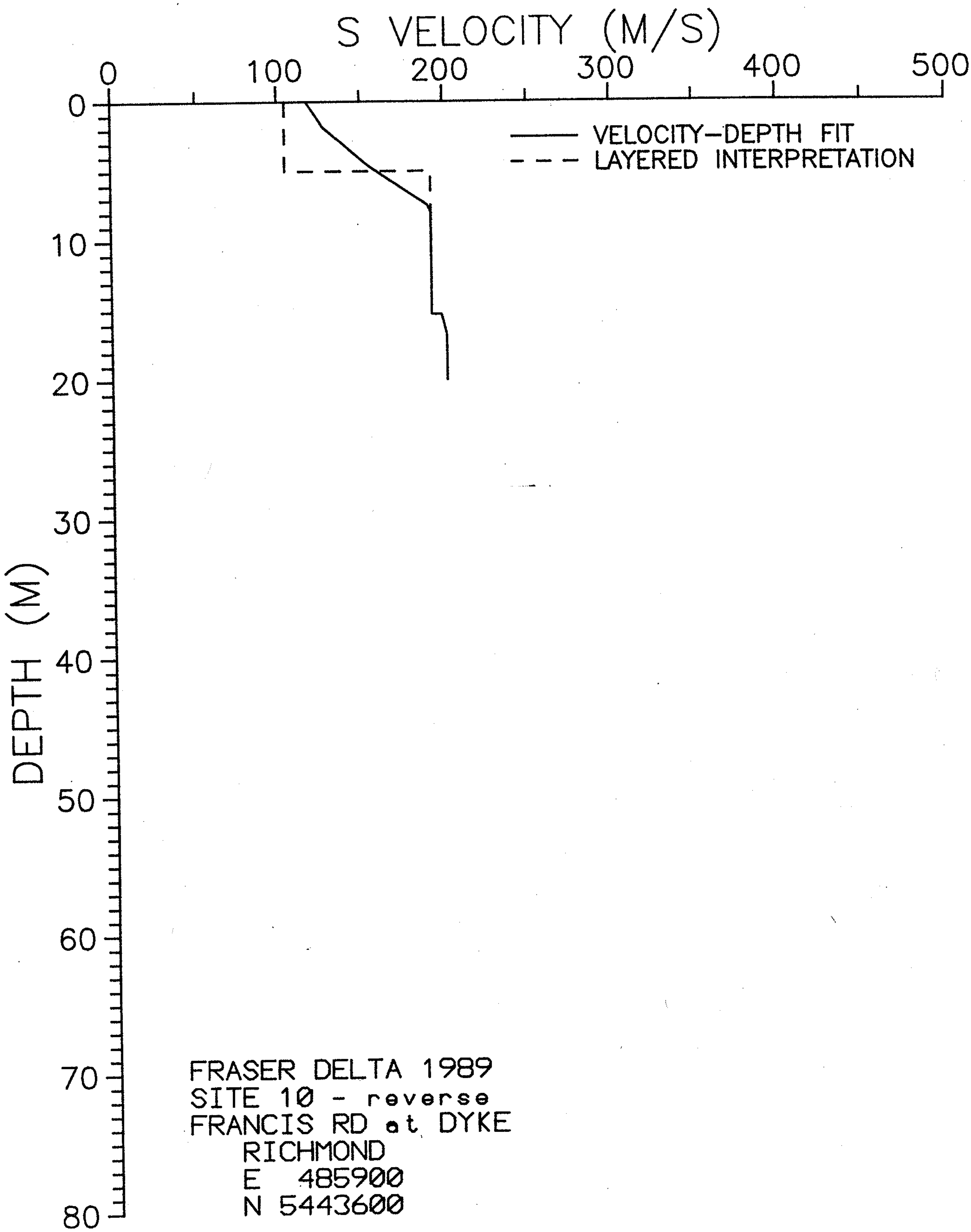


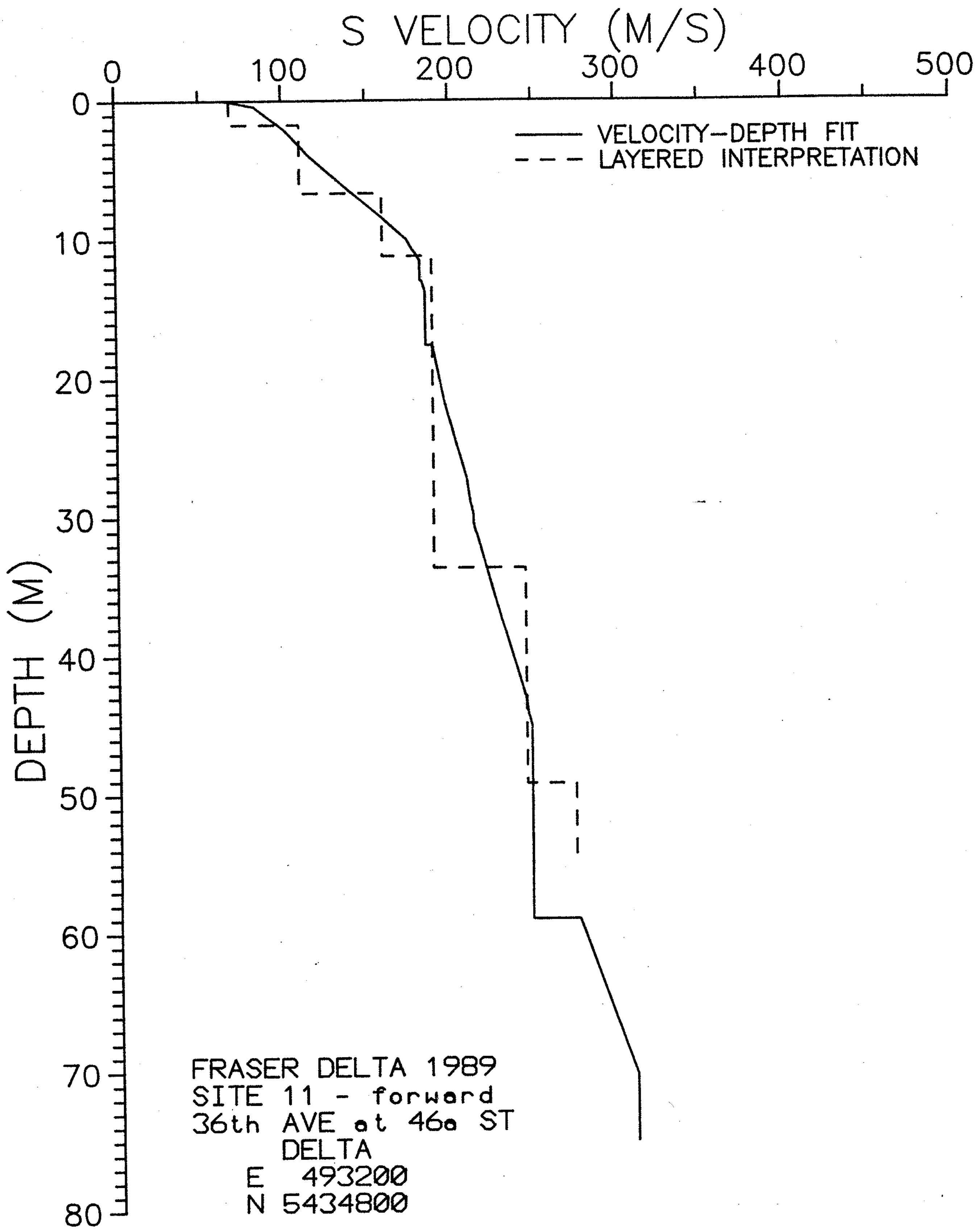
S VELOCITY (M/S)
0
100
200
300
400
500
DEPTH (M)
0
10
20
30
40
50
60
70
80
VELOCITY-DEPTH FIT
LAYERED INTERPRETATION
FRASER DELTA 1989
SITE 8 - reverse
28th AVE at 27b AVE
DELTA
E 493600
N 5433230

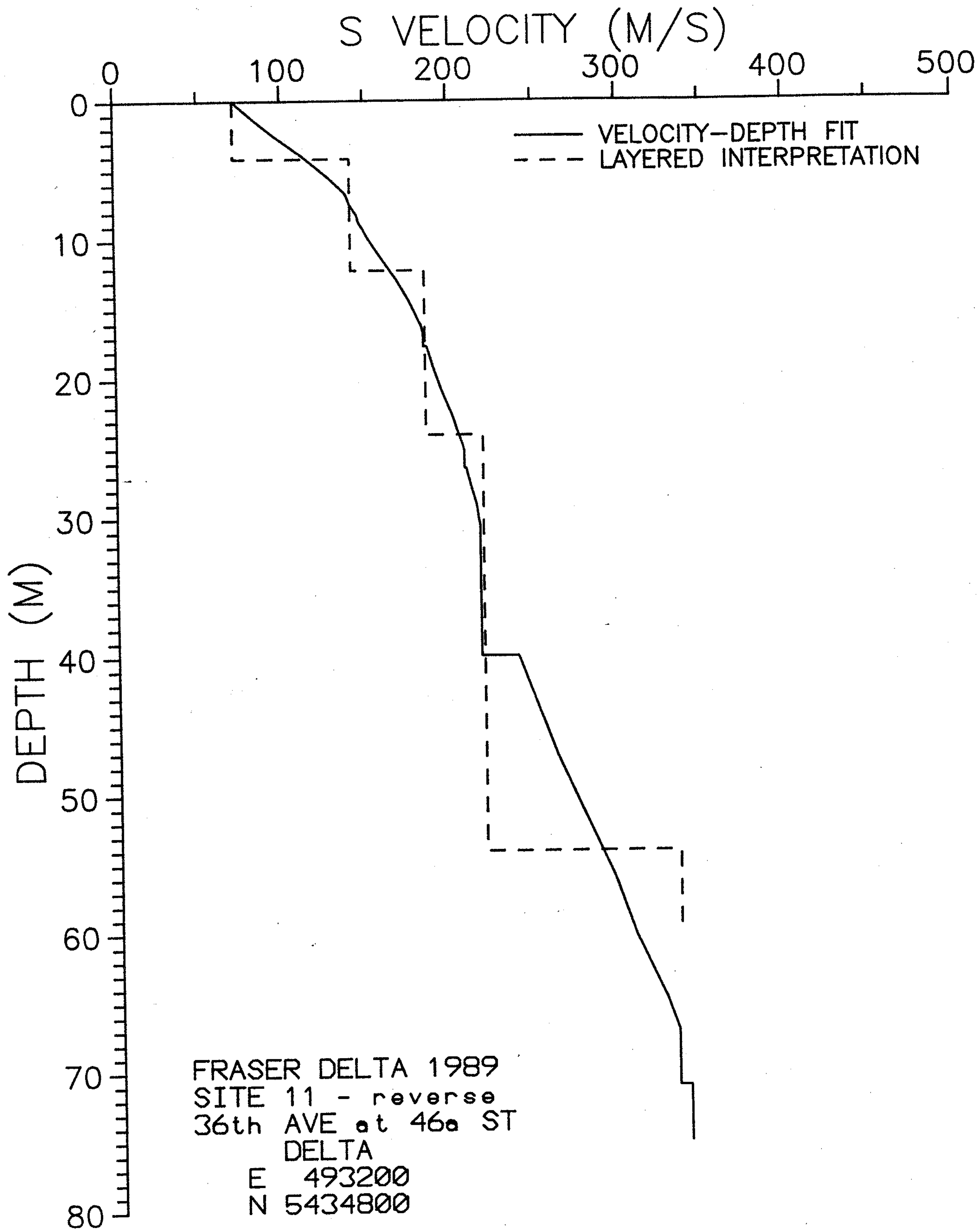

S VELOCITY (M/S)
0 100 200 300 400 500 600 700 800
DEPTH (M)
0 10 20 30 40 50 60 70 80
VELOCITY-DEPTH FIT
LAYERED INTERPRETATION
FRASER DELTA 1989
SITE 9 - forward
TSAWWASSEN GOLF COURSE
DELTA
E 494240
N 5431150

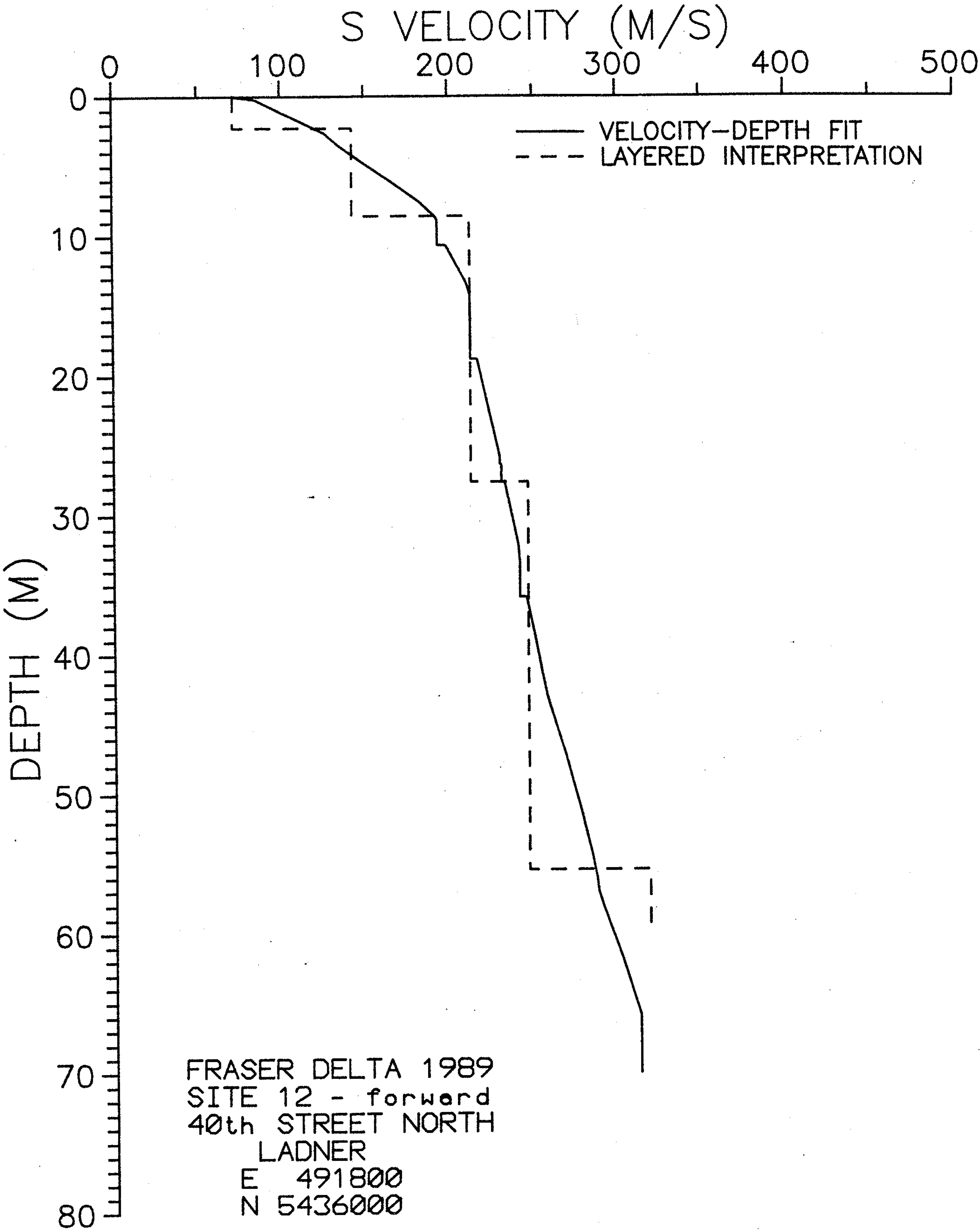

S VELOCITY (M/S)
0
100
200
300
400
500
600
700
800
DEPTH (M)
0
10
20
30
40
50
60
70
80
VELOCITY-DEPTH FIT
LAYERED INTERPRETATION
FRASER DELTA 1989
SITE 9 - reverse
TSAWWASSEN GOLF COURSE
DELTA
E 494240
N 5431150

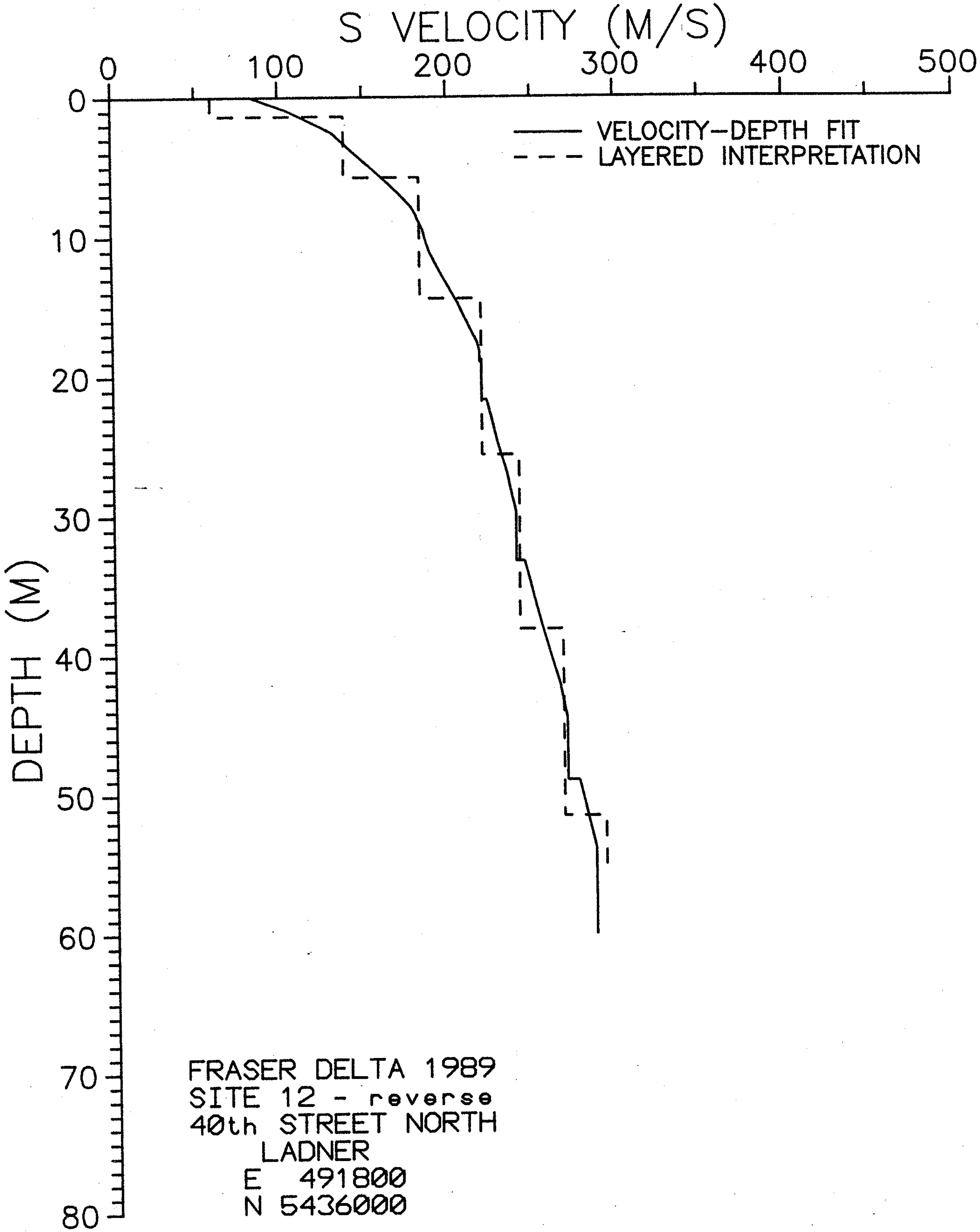

S VELOCITY (M/S)
0
100
200
300
400
500
DEPTH (M)
0
10
20
30
40
50
60
70
80
VELOCITY–DEPTH FIT
LAYERED INTERPRETATION
FRASER DELTA 1989
SITE 10 - forward
FRANCIS RD at DYKE
RICHMOND
E 485900
N 5443600

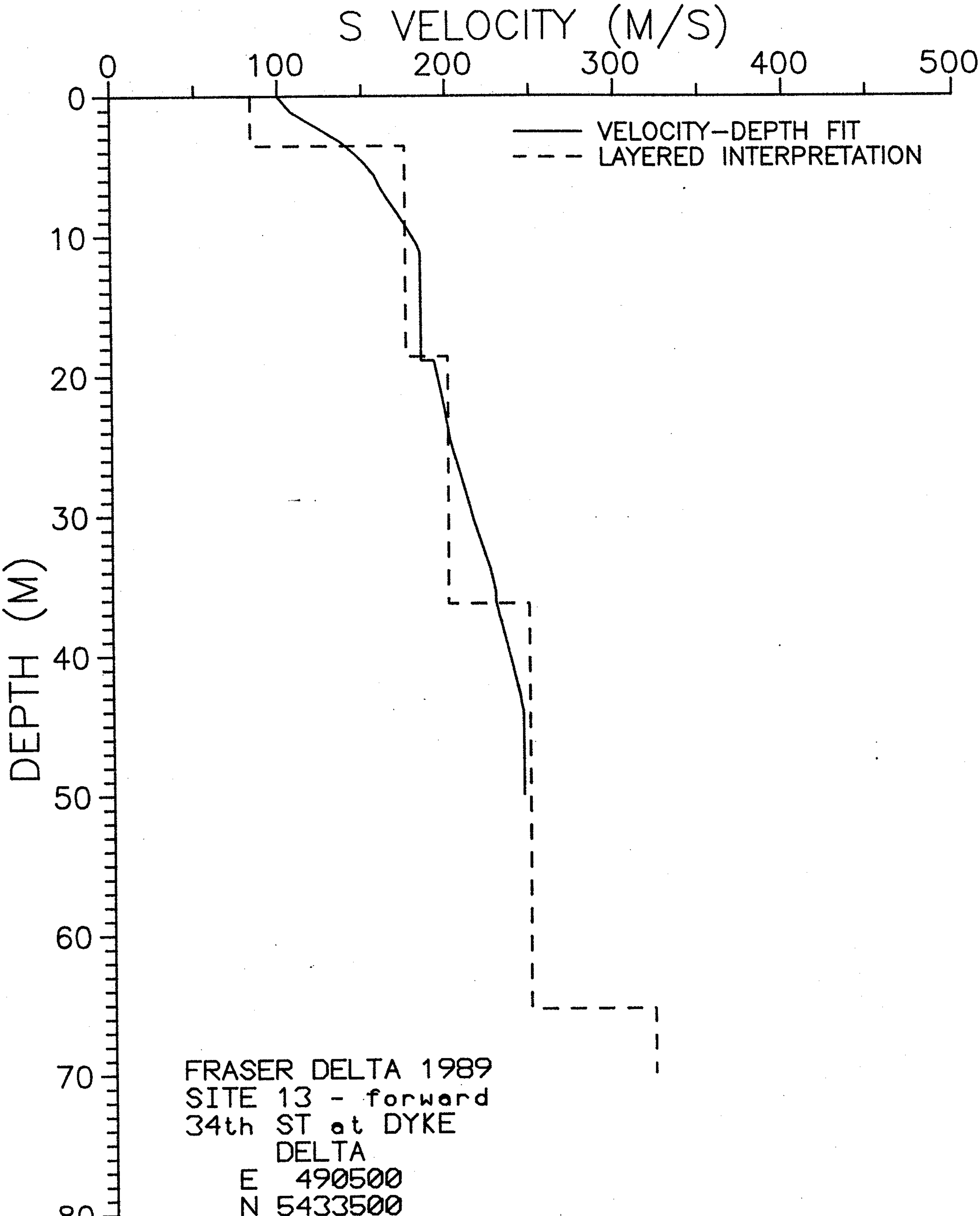

S VELOCITY (M/S)
0
100
200
300
400
500
DEPTH (M)
0
10
20
30
40
50
60
70
80
VELOCITY–DEPTH FIT
LAYERED INTERPRETATION
FRASER DELTA 1989
SITE 10 - reverse
FRANCIS RD at DYKE
RICHMOND
E 485900
N 5443600

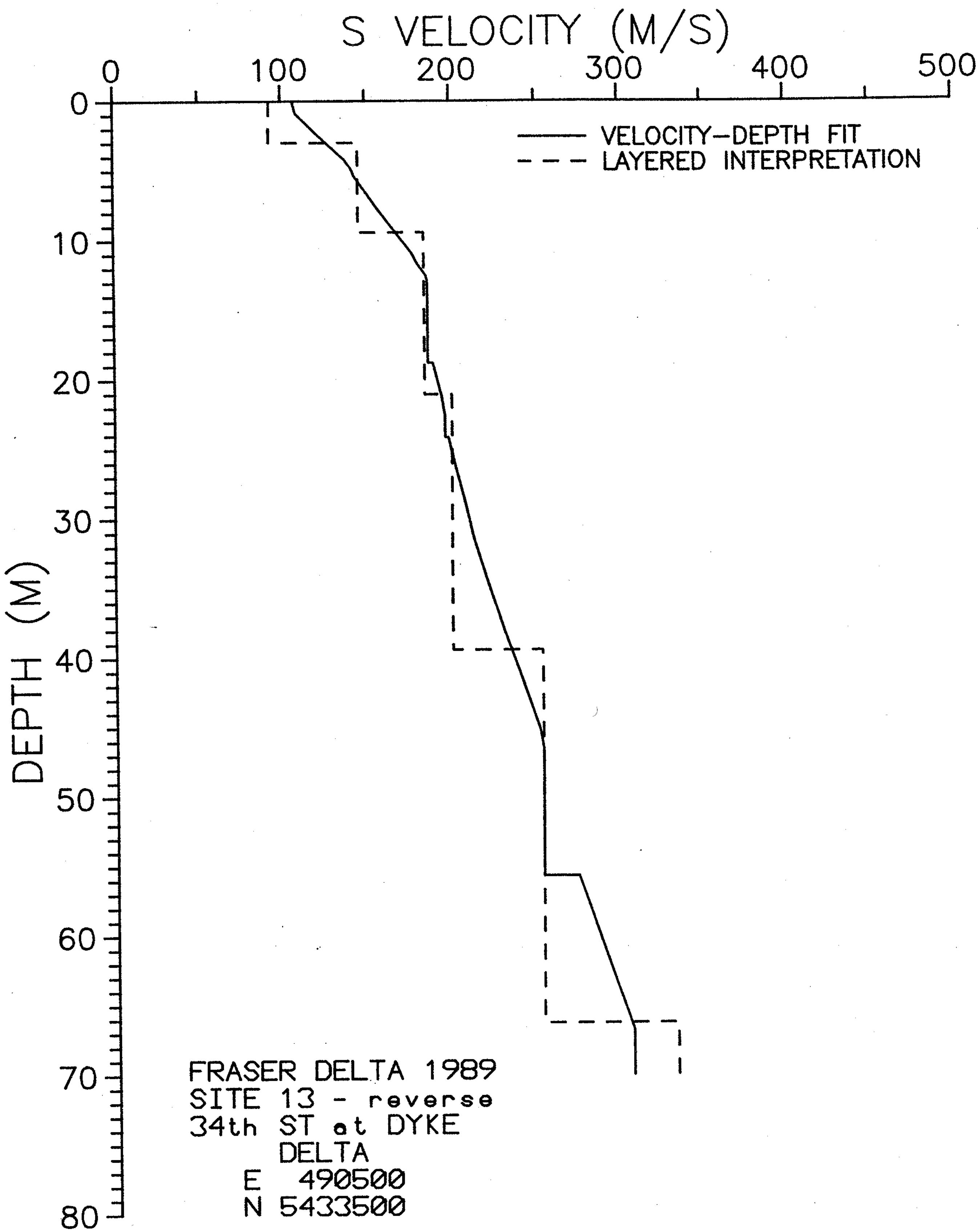

S VELOCITY (M/S)
0
100
200
300
400
500
0
10
20
30
40
50
60
70
80
DEPTH (M)
VELOCITY—DEPTH FIT
LAYERED INTERPRETATION
FRASER DELTA 1989
SITE 11 - forward
36th AVE at 46a ST
DELTA
E 493200
N 5434800

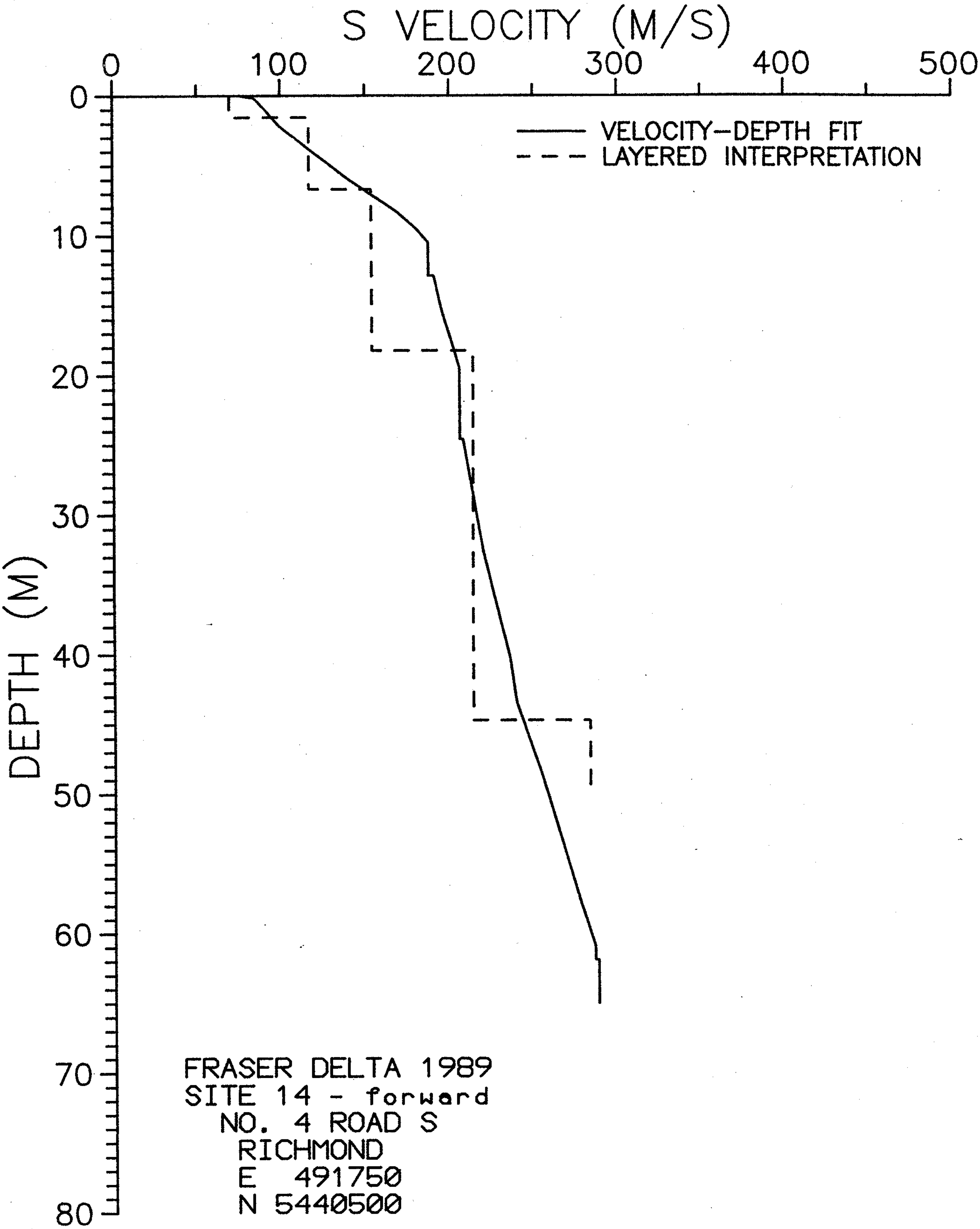

S VELOCITY (M/S)
0
100
200
300
400
500
DEPTH (M)
0
10
20
30
40
50
60
70
80
VELOCITY-DEPTH FIT
LAYERED INTERPRETATION
FRASER DELTA 1989
SITE 11 - reverse
36th AVE at 46a ST
DELTA
E 493200
N 5434800

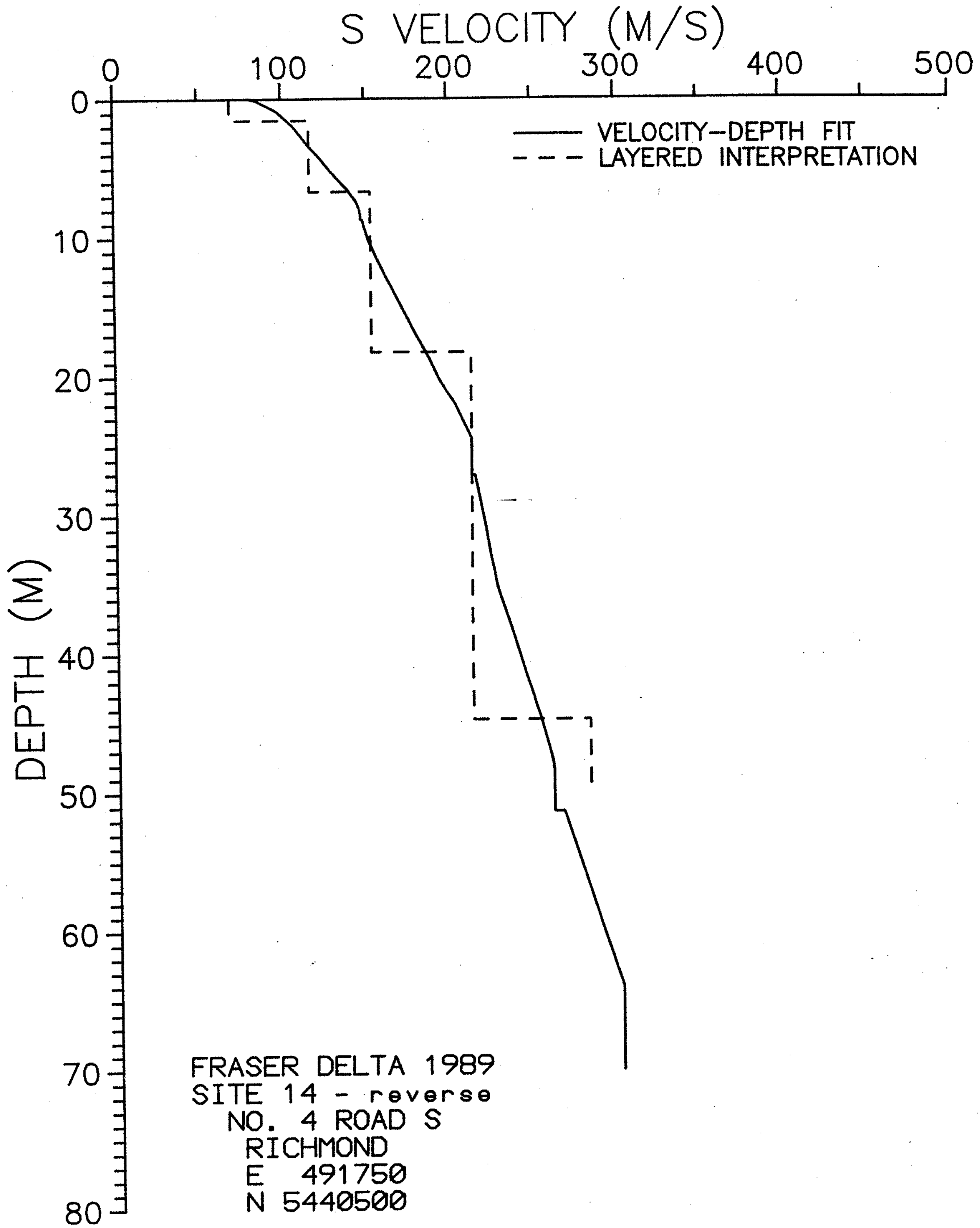

S VELOCITY (M/S)
0
100
200
300
400
500
VELOCITY-DEPTH FIT
LAYERED INTERPRETATION
DEPTH (M)
0
10
20
30
40
50
60
70
80
FRASER DELTA 1989
SITE 12 - forward
40th STREET NORTH
LADNER
E 491800
N 5436000

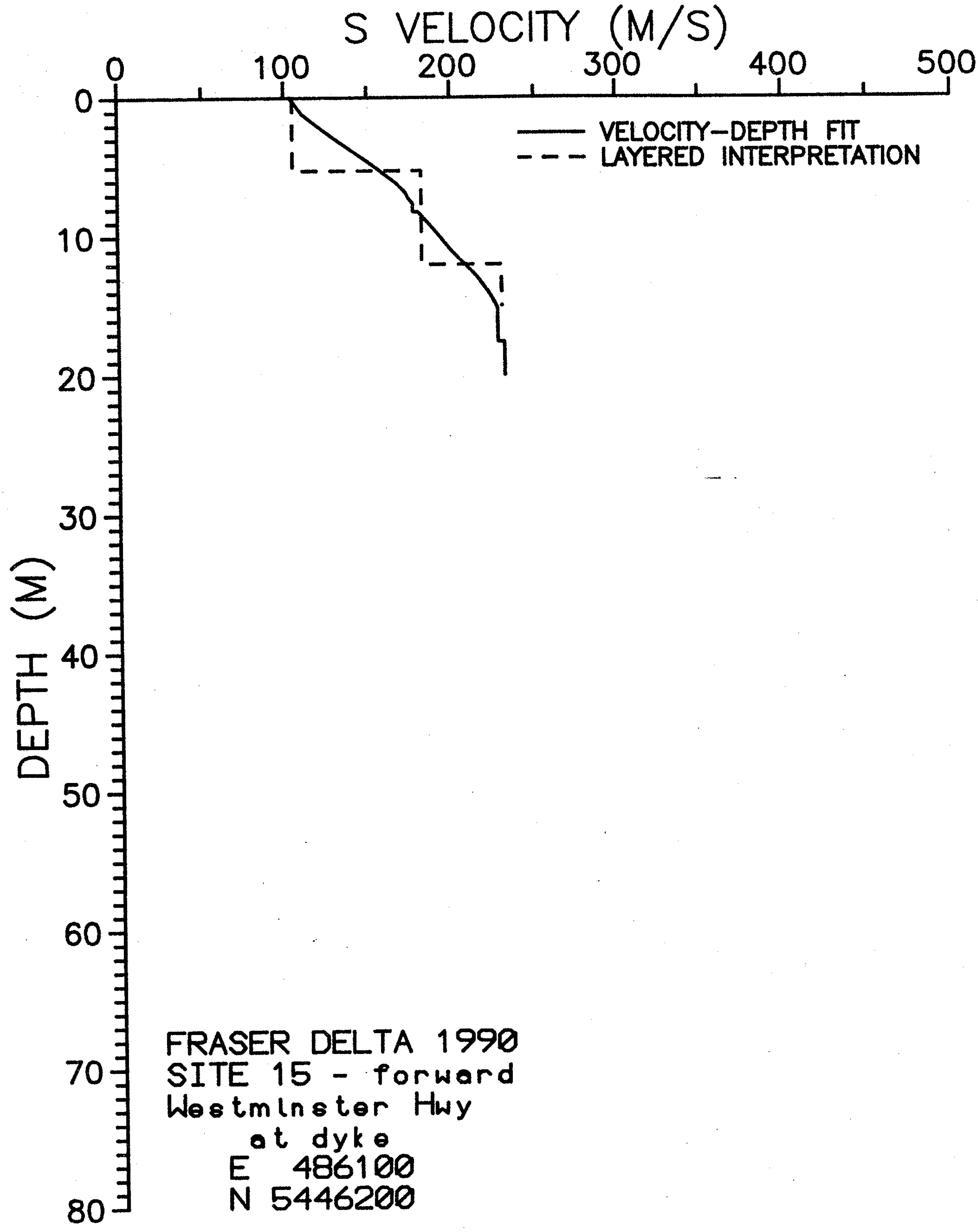

S VELOCITY (M/S)
0
100
200
300
400
500
0
10
20
30
40
50
60
70
80
DEPTH (M)
VELOCITY-DEPTH FIT
LAYERED INTERPRETATION
FRASER DELTA 1989
SITE 12 - reverse
40th STREET NORTH
LADNER
E 491800
N 5436000

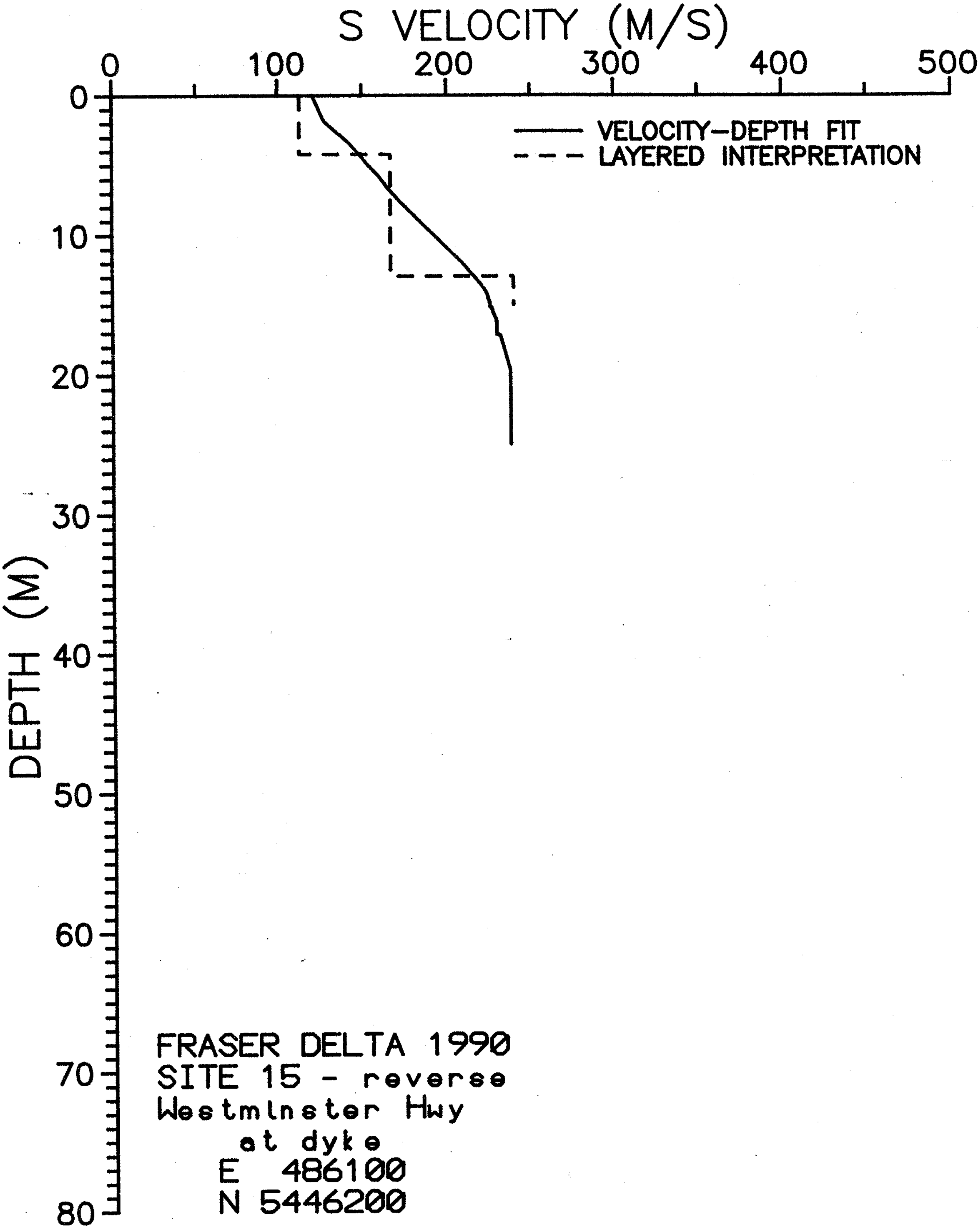

S VELOCITY (M/S)
0
100
200
300
400
500
DEPTH (M)
0
10
20
30
40
50
60
70
80
VELOCITY—DEPTH FIT
LAYERED INTERPRETATION
FRASER DELTA 1989
SITE 13 - forward
34th ST at DYKE
DELTA
E 490500
N 5433500

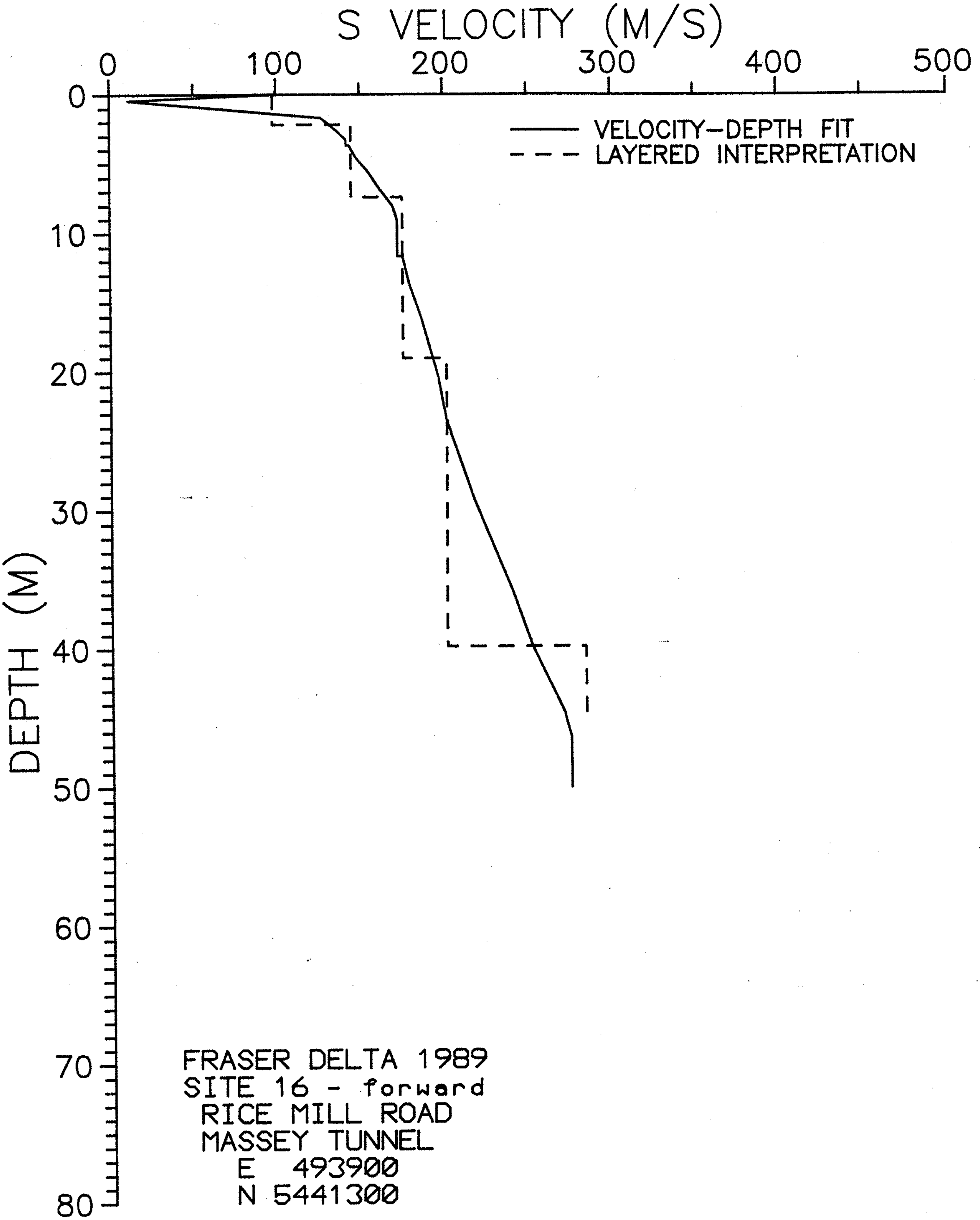

S VELOCITY (M/S)
0
100
200
300
400
500
0
10
20
30
40
50
60
70
80
DEPTH (M)
VELOCITY-DEPTH FIT
LAYERED INTERPRETATION
FRASER DELTA 1989
SITE 13 - reverse
34th ST at DYKE
DELTA
E 490500
N 5433500

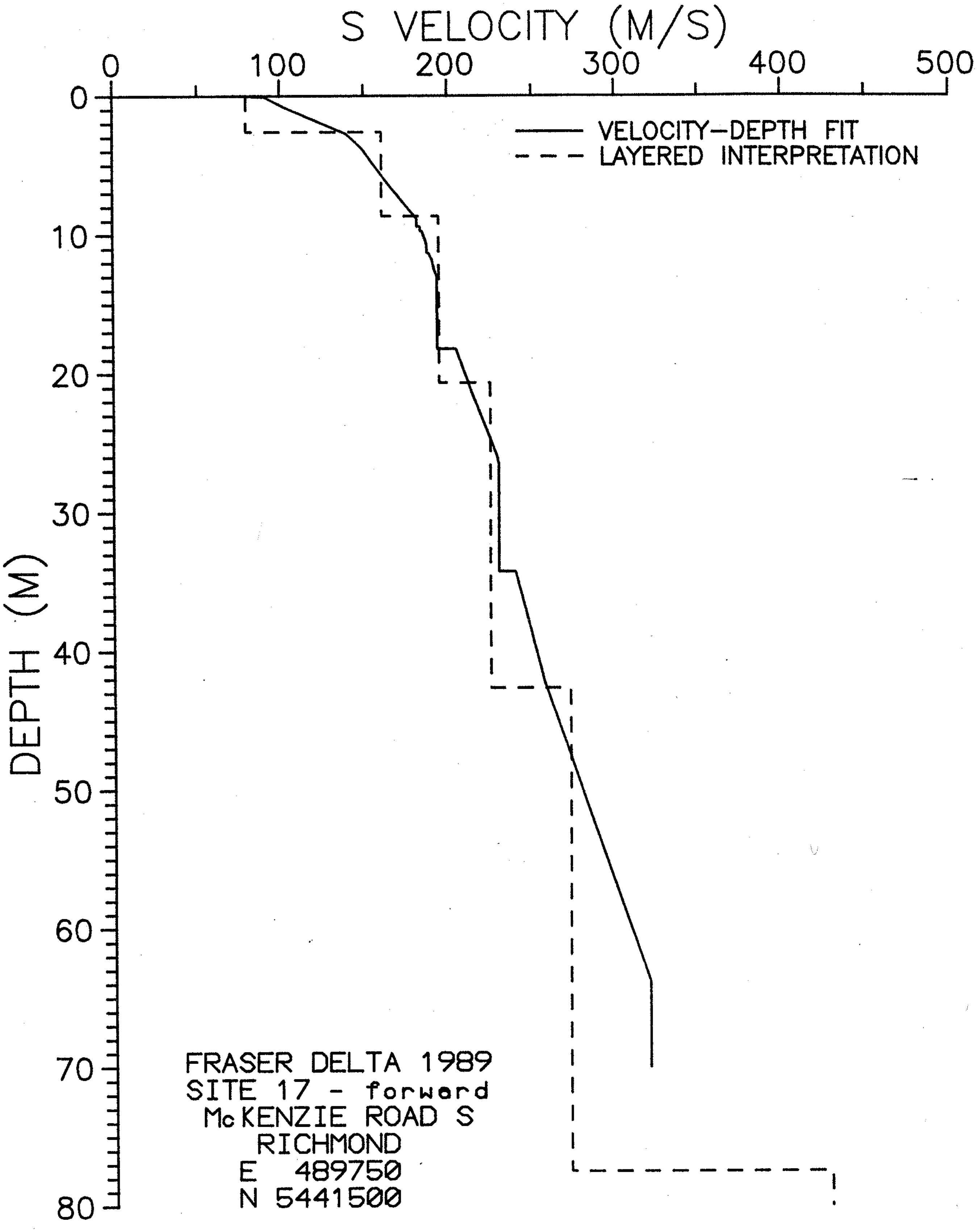

S VELOCITY (M/S)
0
100
200
300
400
500
DEPTH (M)
0
10
20
30
40
50
60
70
80
VELOCITY–DEPTH FIT
LAYERED INTERPRETATION
FRASER DELTA 1989
SITE 14 - forward
NO. 4 ROAD S
RICHMOND
E 491750
N 5440500

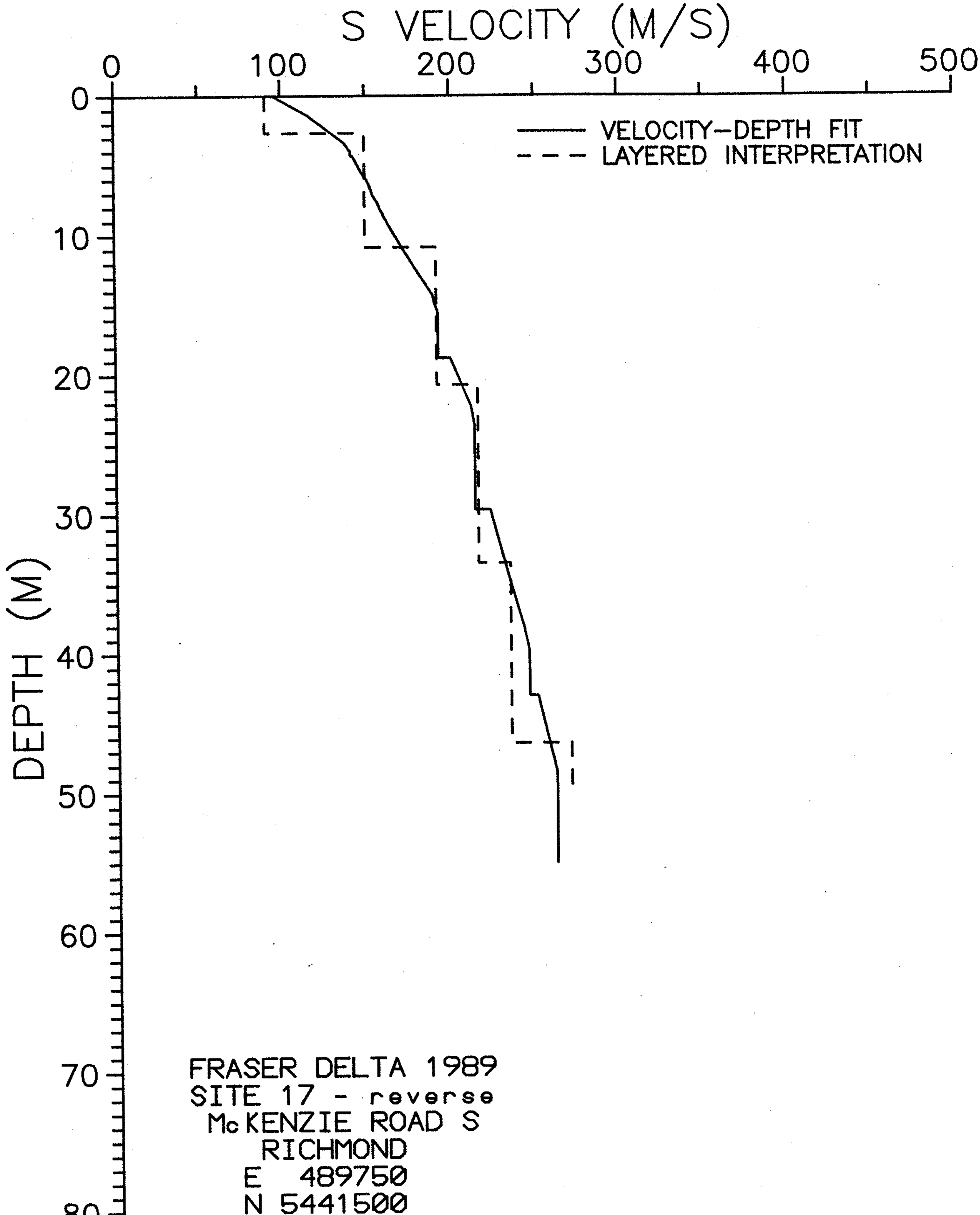

S VELOCITY (M/S)
0
100
200
300
400
500
VELOCITY–DEPTH FIT
LAYERED INTERPRETATION
DEPTH (M)
0
10
20
30
40
50
60
70
80
FRASER DELTA 1989
SITE 14 - reverse
NO. 4 ROAD S
RICHMOND
E 491750
N 5440500

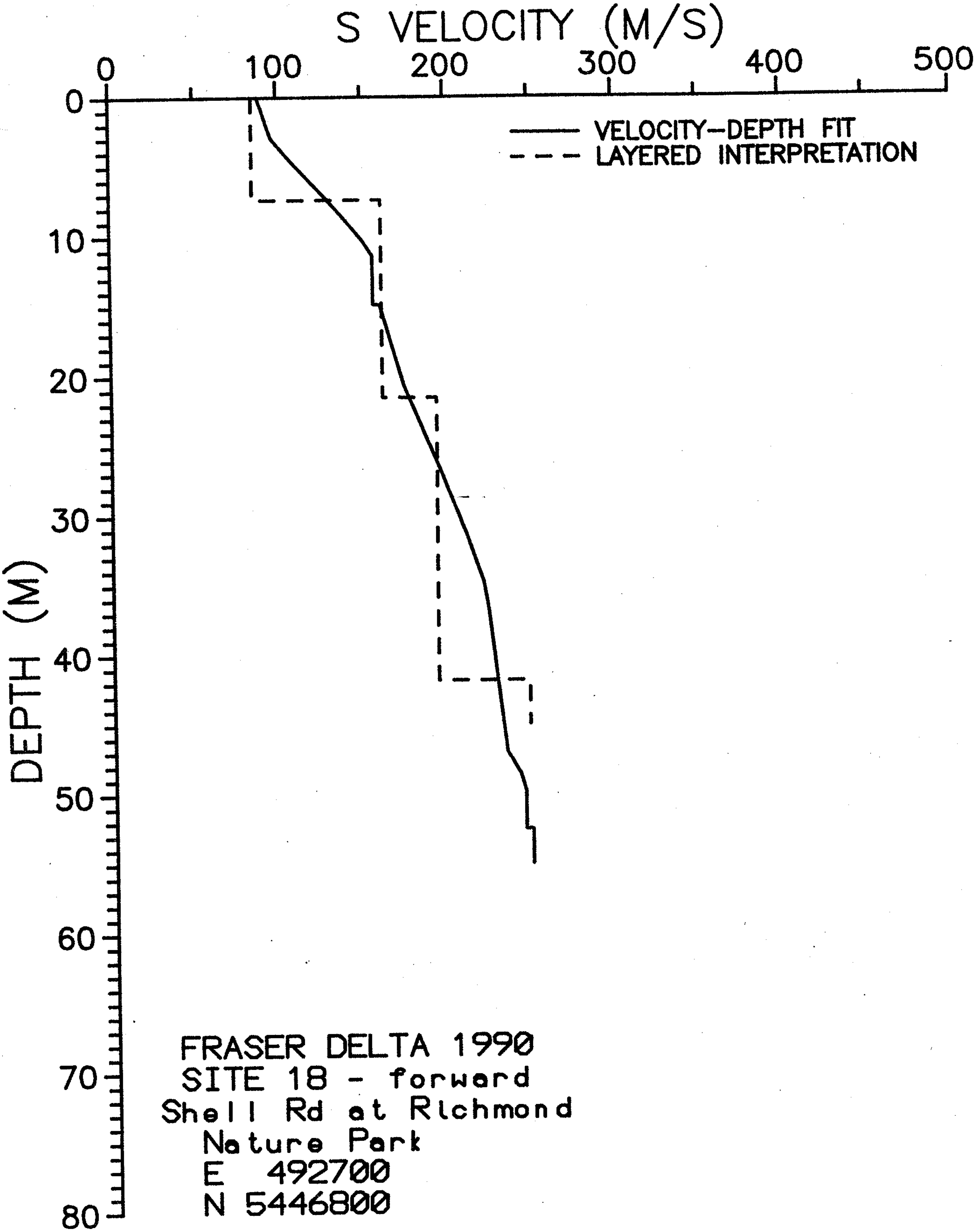

S VELOCITY (M/S)
0
100
200
300
400
500
VELOCITY–DEPTH FIT
LAYERED INTERPRETATION
0
10
20
30
40
50
60
70
80
DEPTH (M)
FRASER DELTA 1990
SITE 15 - forward
Westminster Hwy
at dyke
E 486100
N 5446200

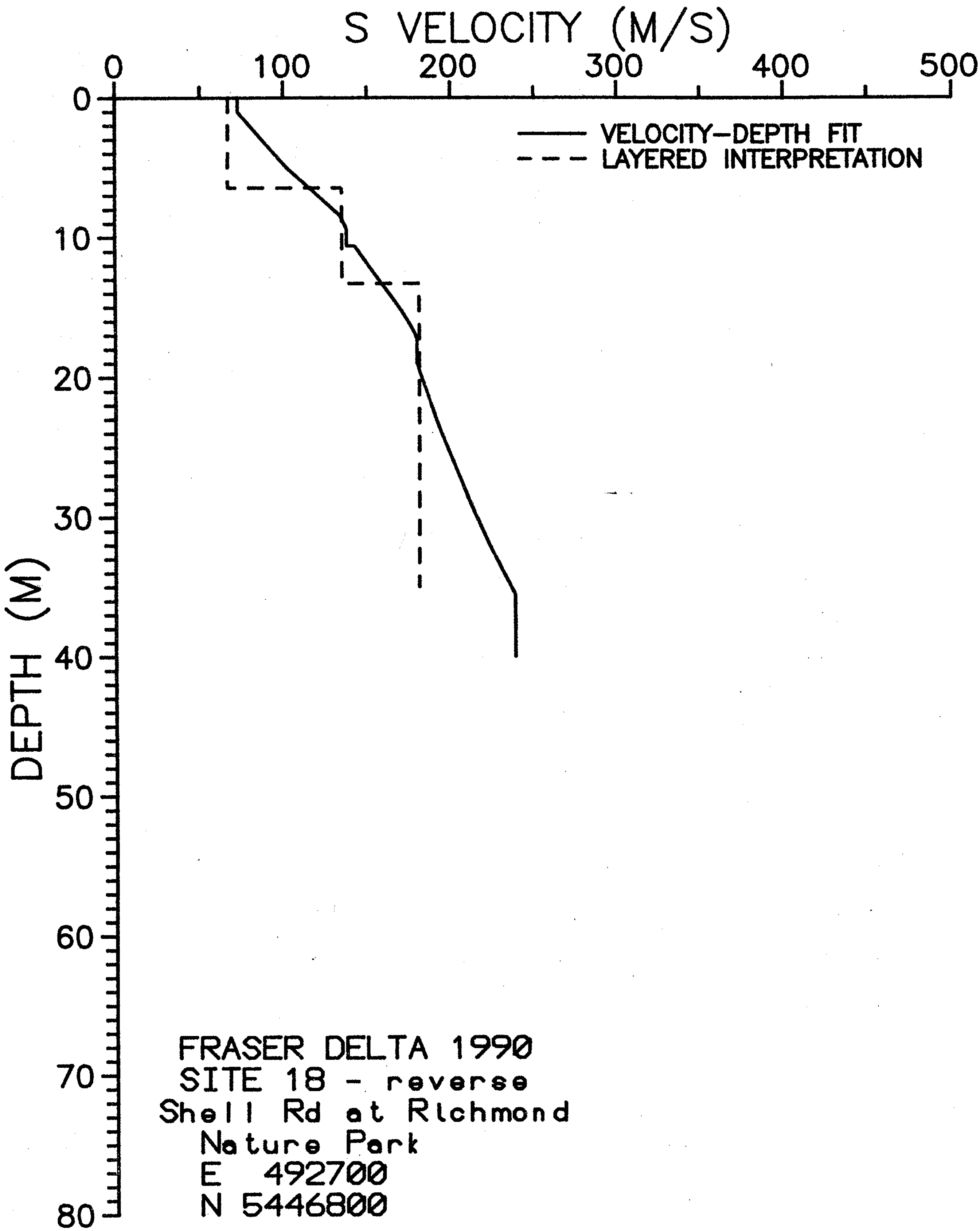

S VELOCITY (M/S)
0
100
200
300
400
500
DEPTH (M)
0
10
20
30
40
50
60
70
80
VELOCITY-DEPTH FIT
LAYERED INTERPRETATION
FRASER DELTA 1990
SITE 15 - reverse
Westminster Hwy
at dyke
E 486100
N 5446200

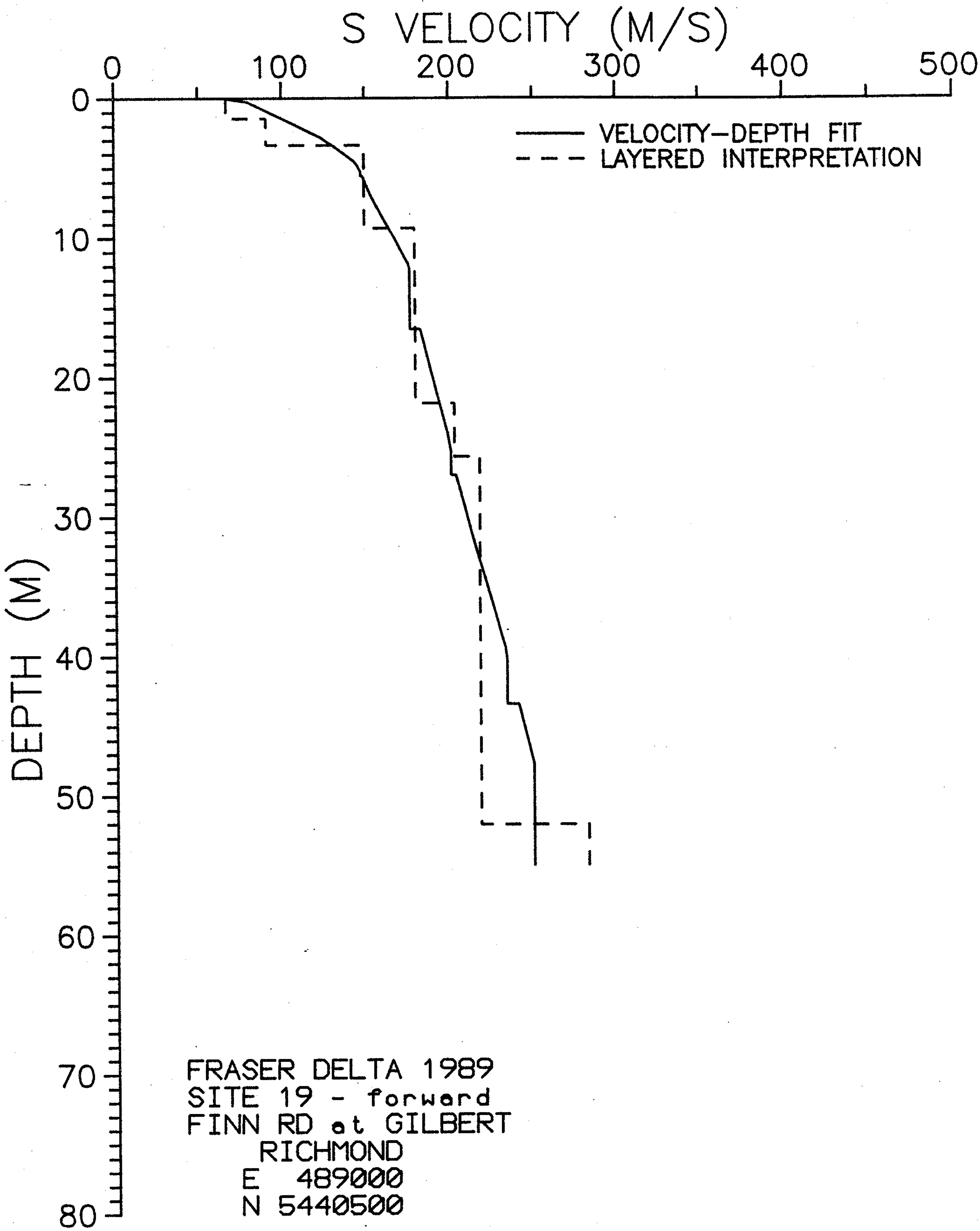

S VELOCITY (M/S)
0
100
200
300
400
500
DEPTH (M)
0
10
20
30
40
50
60
70
80
VELOCITY-DEPTH FIT
LAYERED INTERPRETATION
FRASER DELTA 1989
SITE 16 - forward
RICE MILL ROAD
MASSEY TUNNEL
E 493900
N 5441300

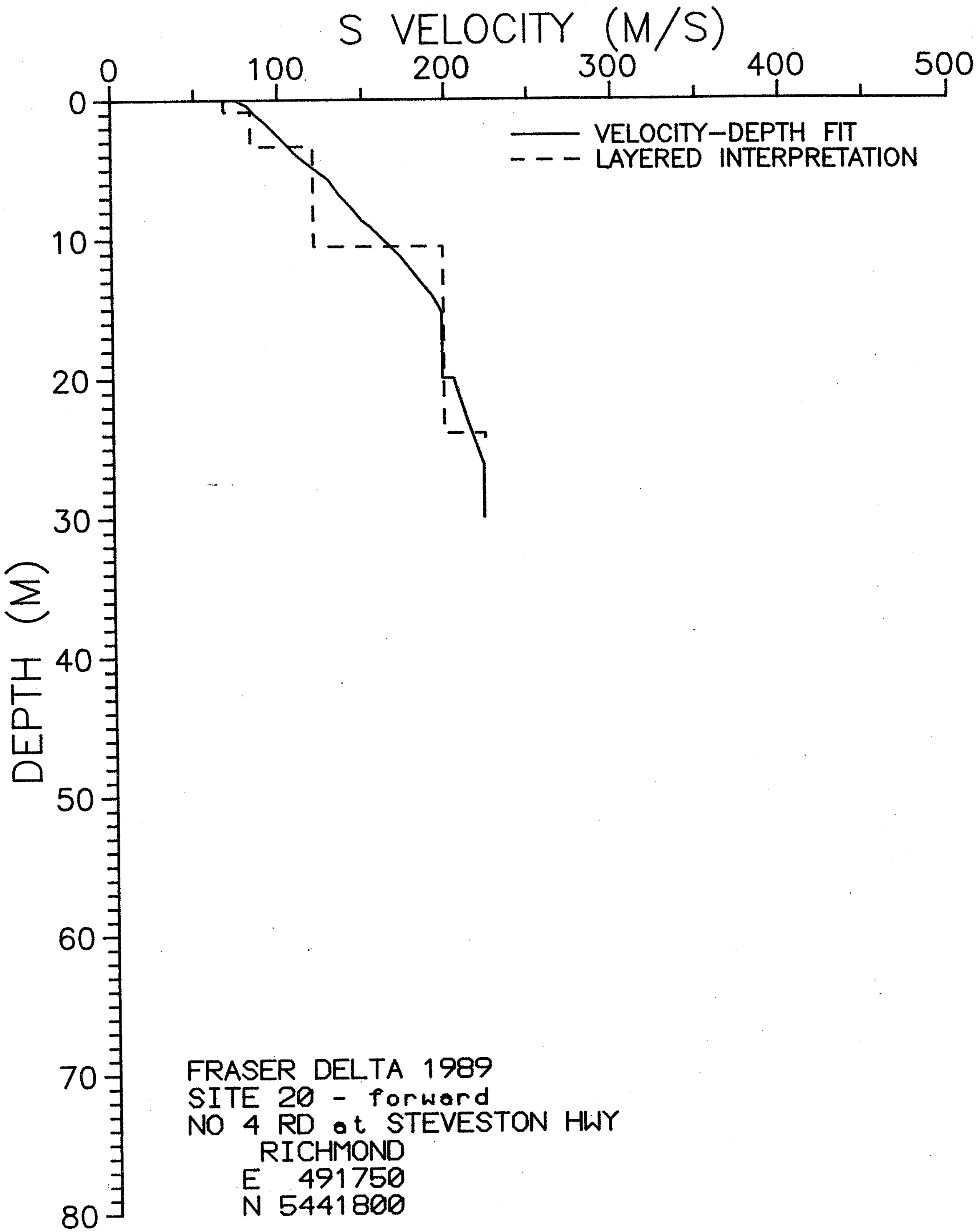

S VELOCITY (M/S)
0
100
200
300
400
500
DEPTH (M)
0
10
20
30
40
50
60
70
80
VELOCITY–DEPTH FIT
LAYERED INTERPRETATION
FRASER DELTA 1989
SITE 17 - forward
McKENZIE ROAD S
RICHMOND
E 489750
N 5441500

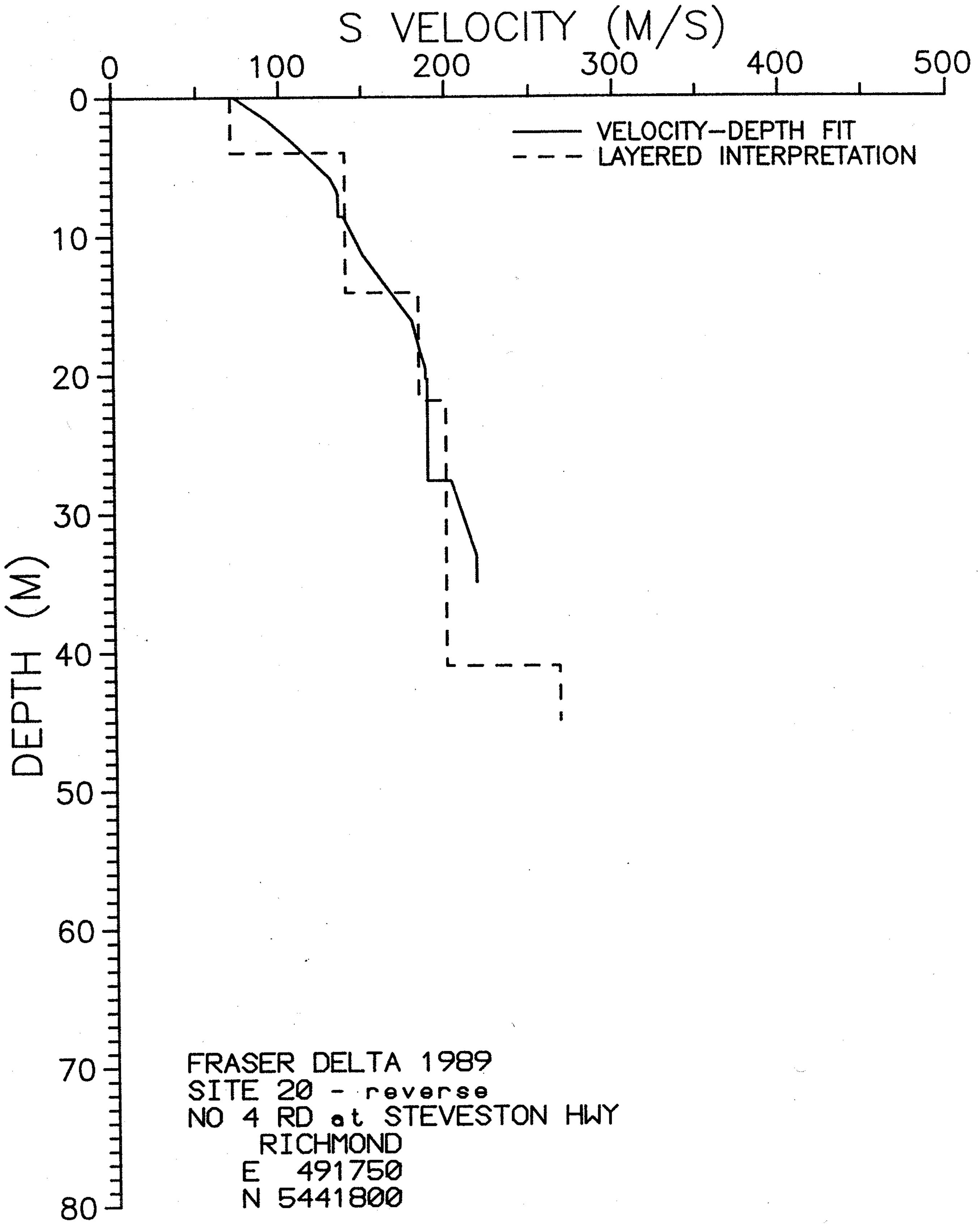

S VELOCITY (M/S)
0
100
200
300
400
500
DEPTH (M)
0
10
20
30
40
50
60
70
80
VELOCITY-DEPTH FIT
LAYERED INTERPRETATION
FRASER DELTA 1989
SITE 17 - reverse
McKENZIE ROAD S
RICHMOND
E 489750
N 5441500

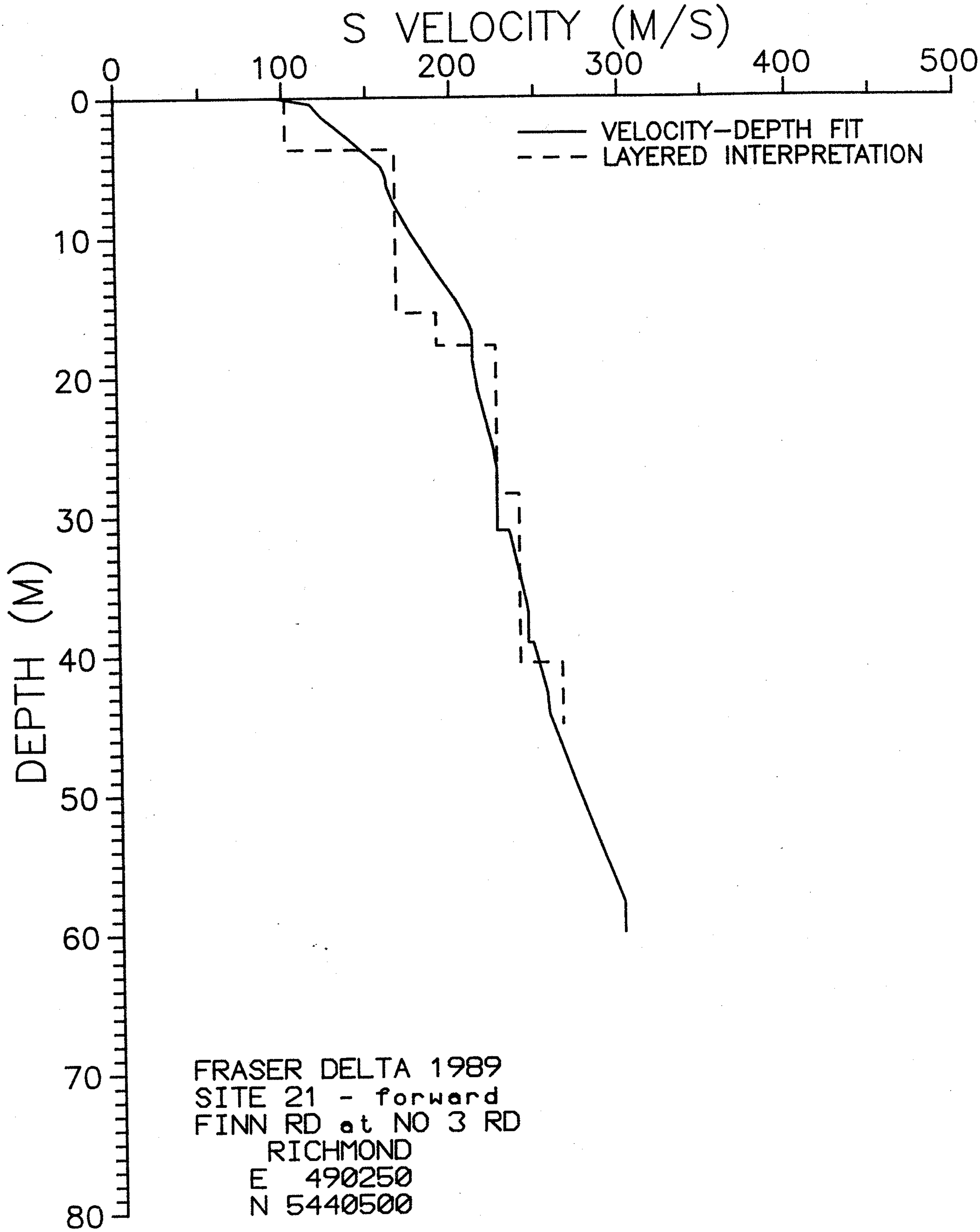

S VELOCITY (M/S)
0
100
200
300
400
500
VELOCITY–DEPTH FIT
LAYERED INTERPRETATION
DEPTH (M)
0
10
20
30
40
50
60
70
80
FRASER DELTA 1990
SITE 18 - forward
Shell Rd at Richmond
Nature Park
E 492700
N 5446800

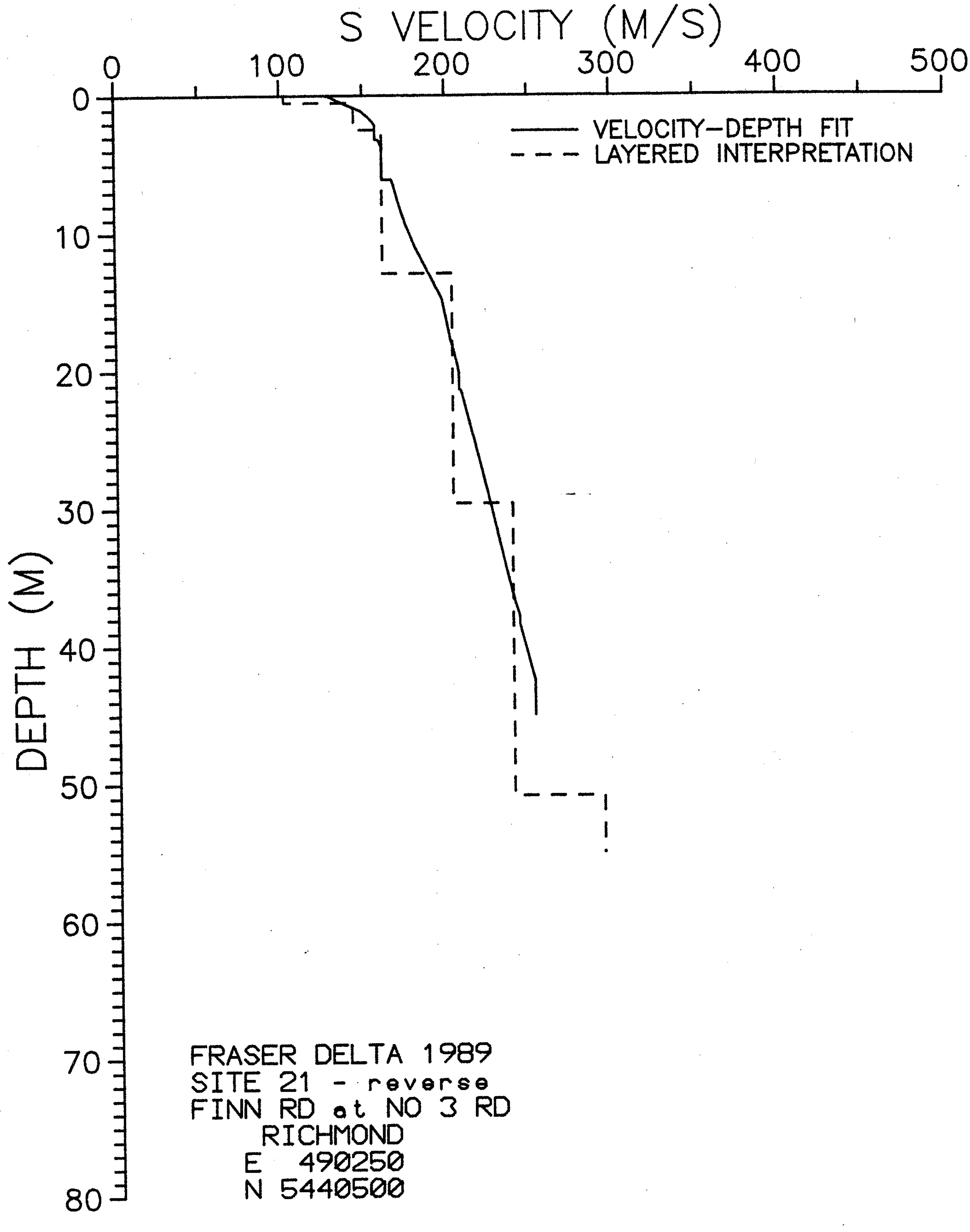

S VELOCITY (M/S)
0
100
200
300
400
500
DEPTH (M)
0
10
20
30
40
50
60
70
80
VELOCITY—DEPTH FIT
LAYERED INTERPRETATION
FRASER DELTA 1990
SITE 18 - reverse
Shell Rd at Richmond
Nature Park
E 492700
N 5446800

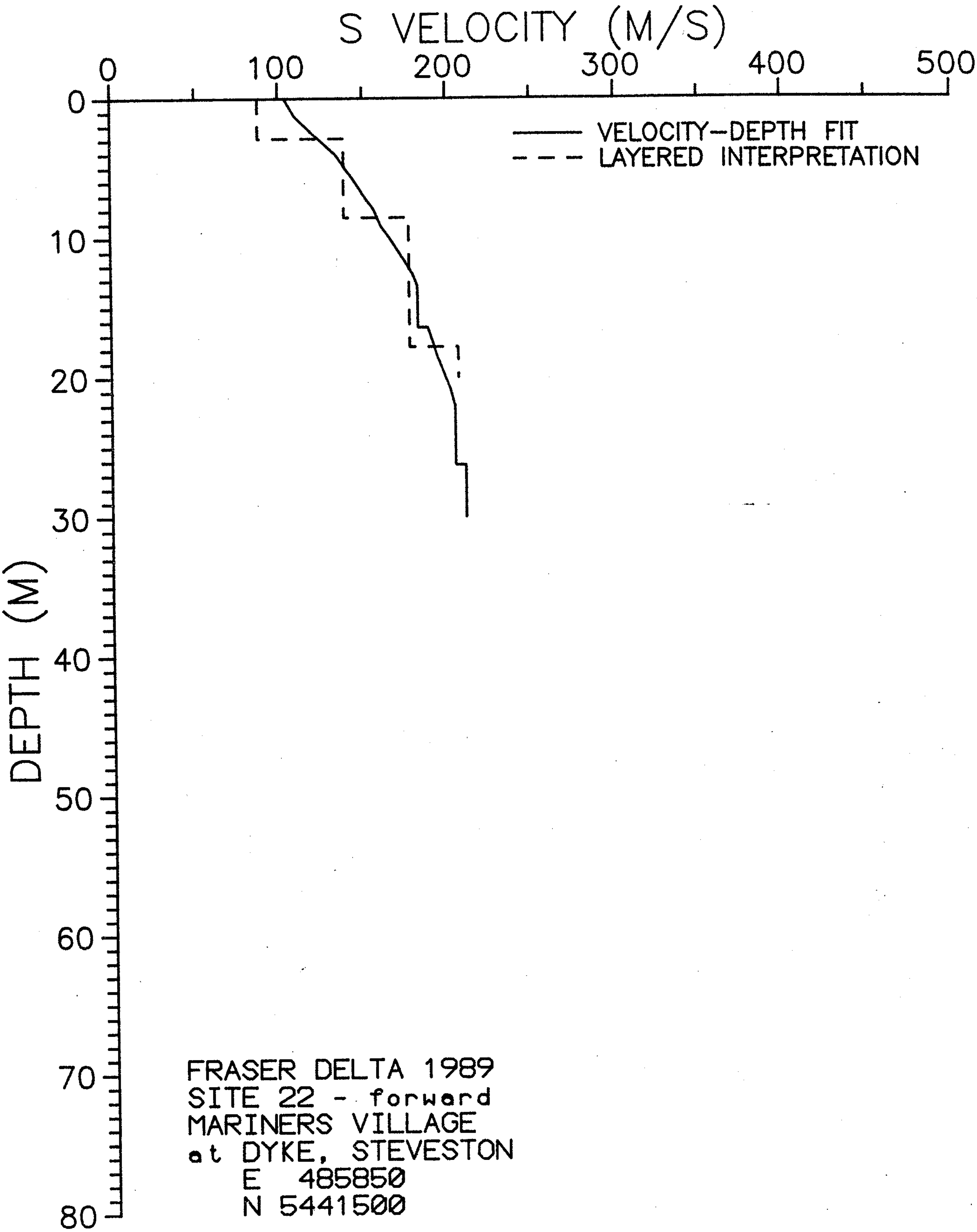

S VELOCITY (M/S)
0
100
200
300
400
500
0
10
20
30
40
50
60
70
80
DEPTH (M)
VELOCITY-DEPTH FIT
LAYERED INTERPRETATION
FRASER DELTA 1989
SITE 19 - forward
FINN RD at GILBERT
RICHMOND
E 489000
N 5440500

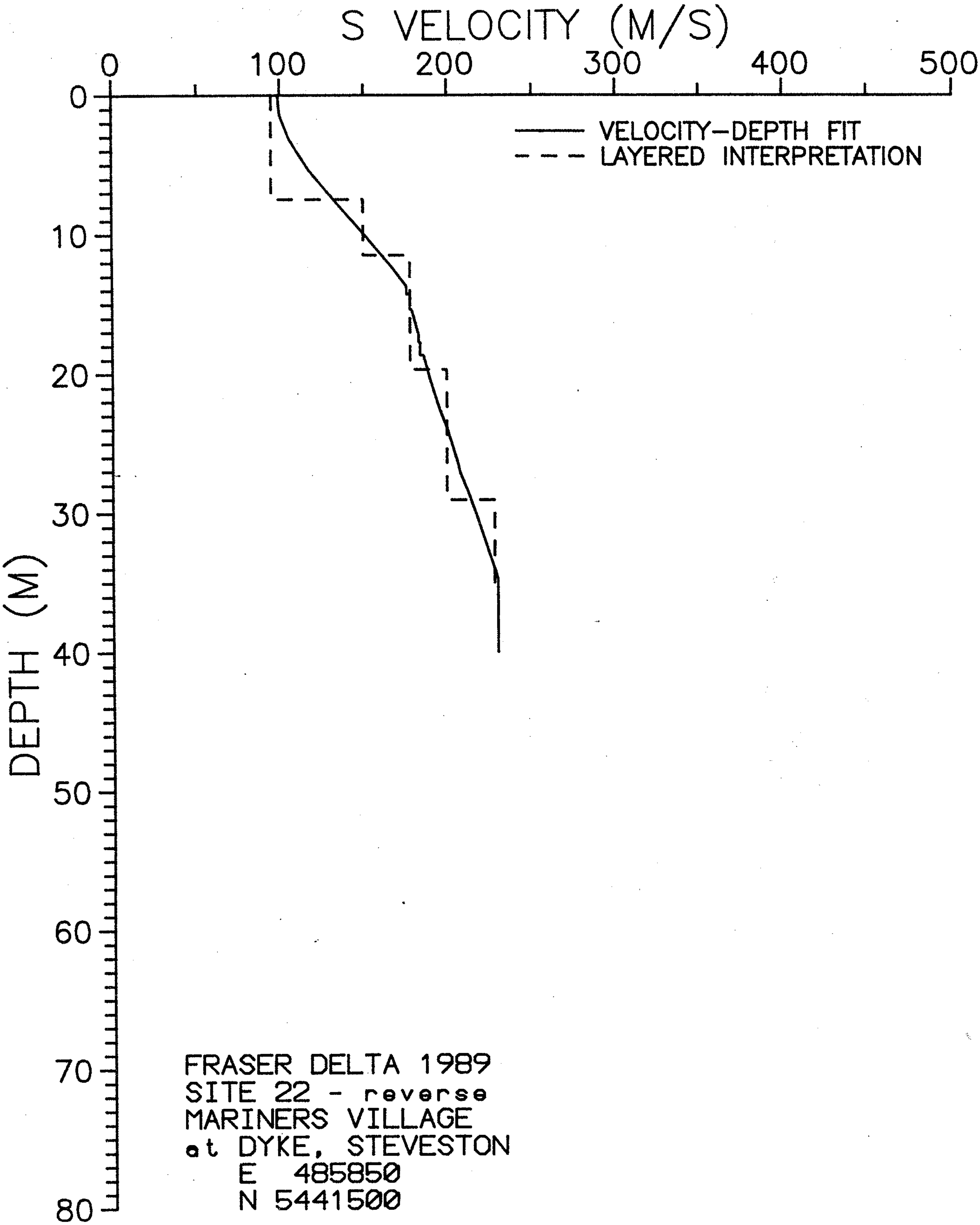

S VELOCITY (M/S)
0
100
200
300
400
500
0
10
20
30
40
50
60
70
80
DEPTH (M)
VELOCITY—DEPTH FIT
LAYERED INTERPRETATION
FRASER DELTA 1989
SITE 20 - forward
NO 4 RD at STEVESTON HWY
RICHMOND
E 491750
N 5441800

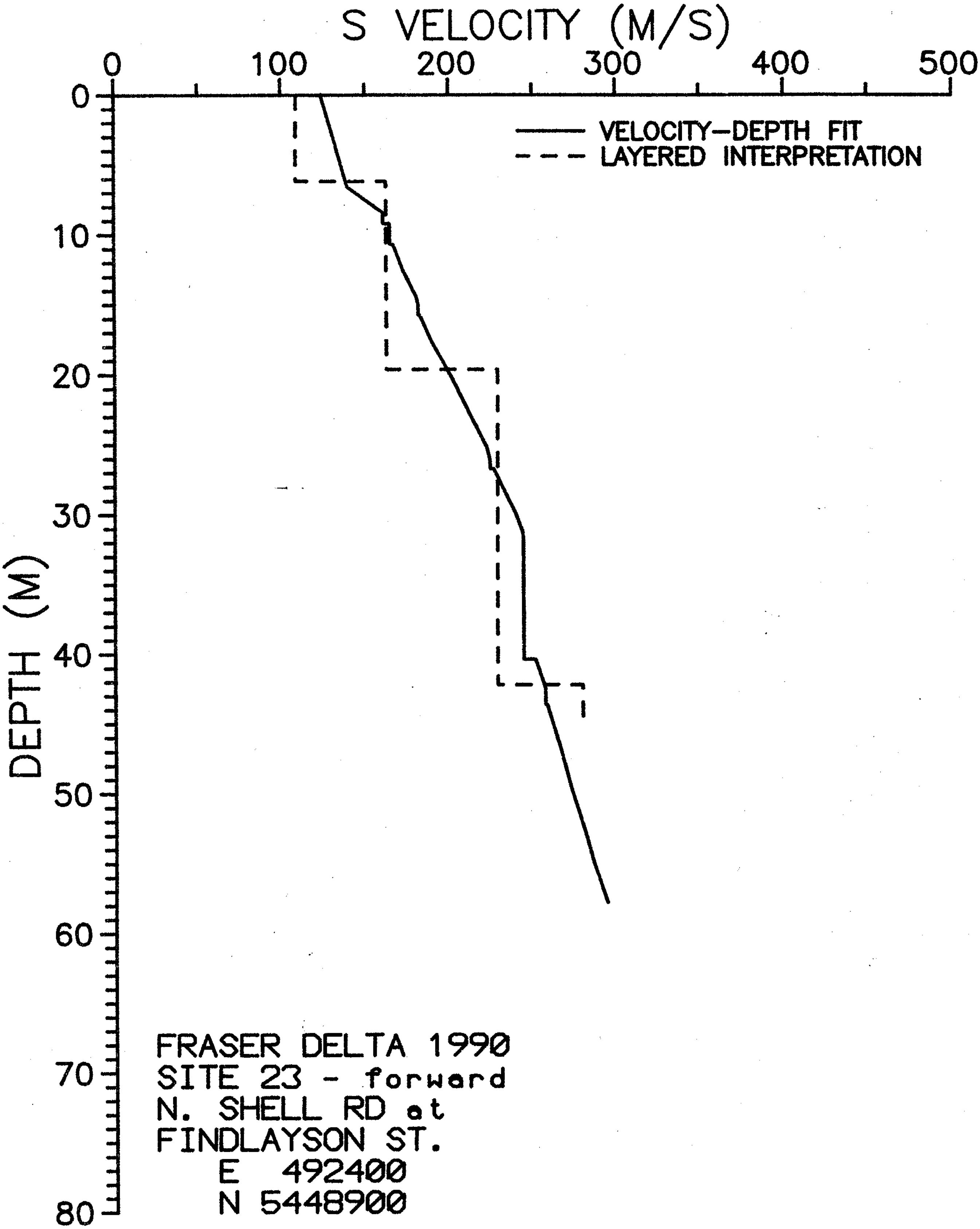

S VELOCITY (M/S)
0
100
200
300
400
500
0
10
20
30
40
50
60
70
80
DEPTH (M)
VELOCITY–DEPTH FIT
LAYERED INTERPRETATION
FRASER DELTA 1989
SITE 20 - reverse
NO 4 RD at STEVESTON HWY
RICHMOND
E 491750
N 5441800


S VELOCITY (M/S)
0
100
200
300
400
500
0
10
20
30
40
50
60
70
80
DEPTH (M)
VELOCITY-DEPTH FIT
LAYERED INTERPRETATION
FRASER DELTA 1989
SITE 21 - forward
FINN RD at NO 3 RD
RICHMOND
E 490250
N 5440500

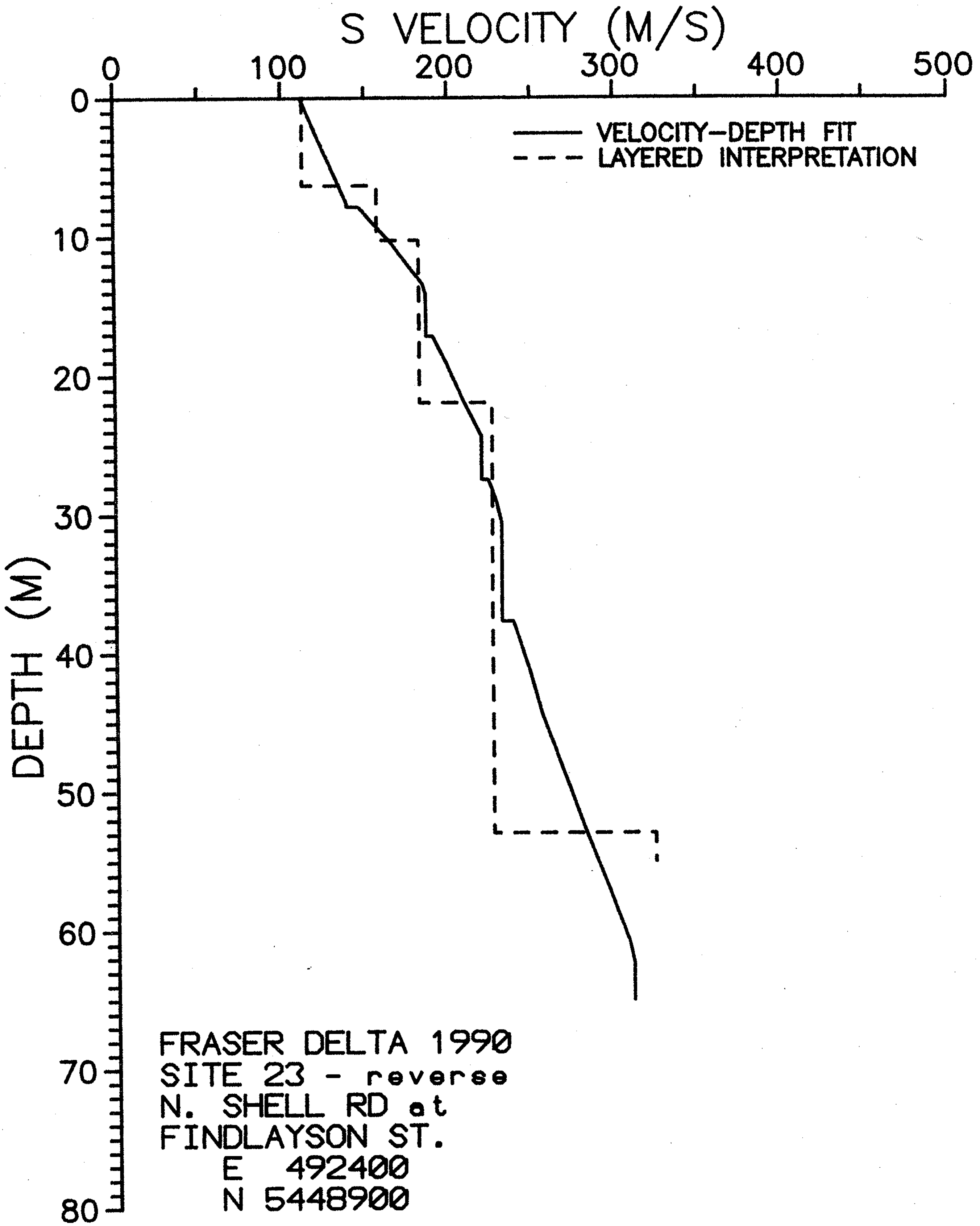

S VELOCITY (M/S)
0
100
200
300
400
500
VELOCITY—DEPTH FIT
LAYERED INTERPRETATION
DEPTH (M)
0
10
20
30
40
50
60
70
80
FRASER DELTA 1989
SITE 21 - reverse
FINN RD at NO 3 RD
RICHMOND
E 490250
N 5440500

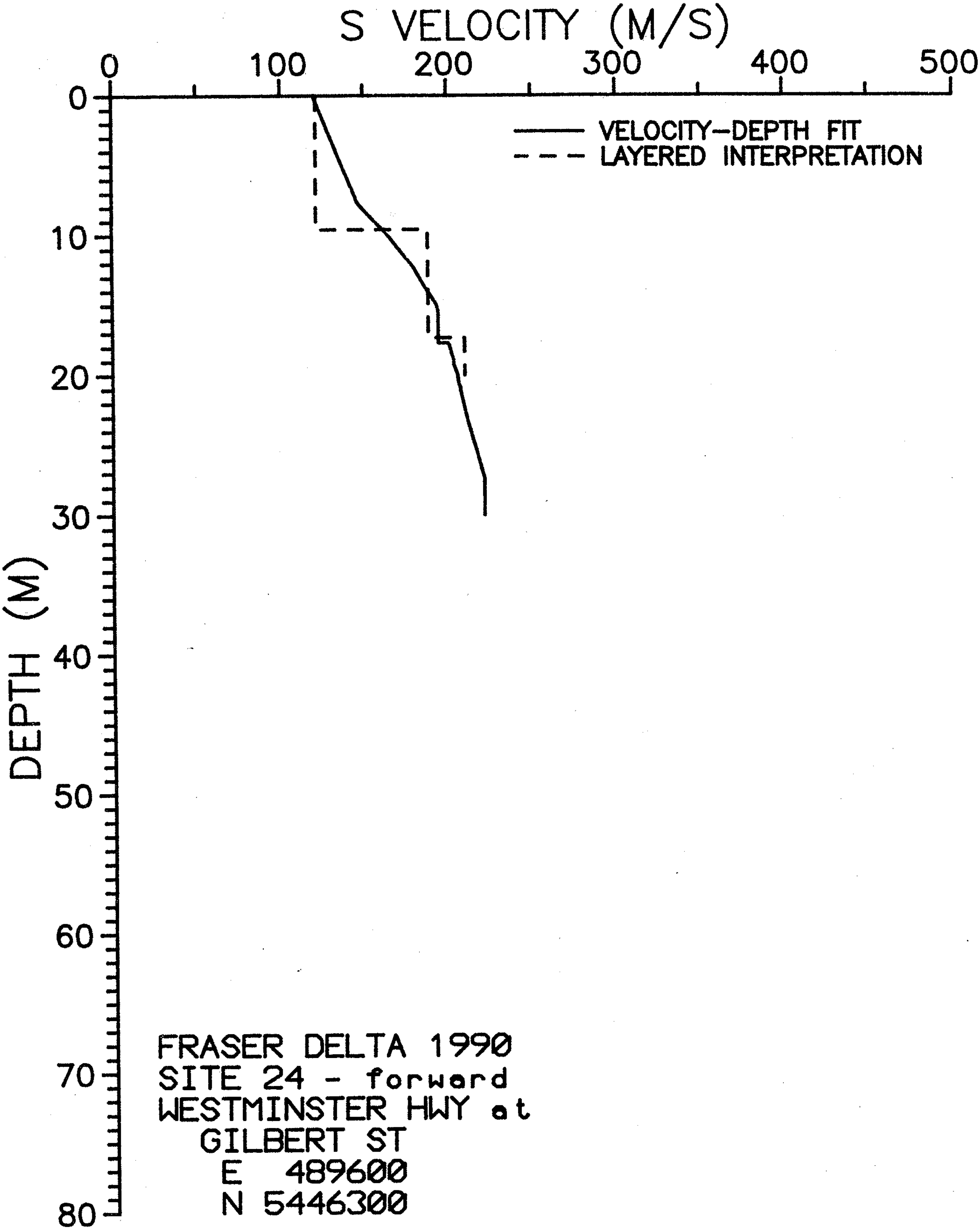

S VELOCITY (M/S)
0
100
200
300
400
500
DEPTH (M)
0
10
20
30
40
50
60
70
80
VELOCITY-DEPTH FIT
LAYERED INTERPRETATION
FRASER DELTA 1989
SITE 22 - forward
MARINERS VILLAGE
at DYKE, STEVESTON
E 485850
N 5441500

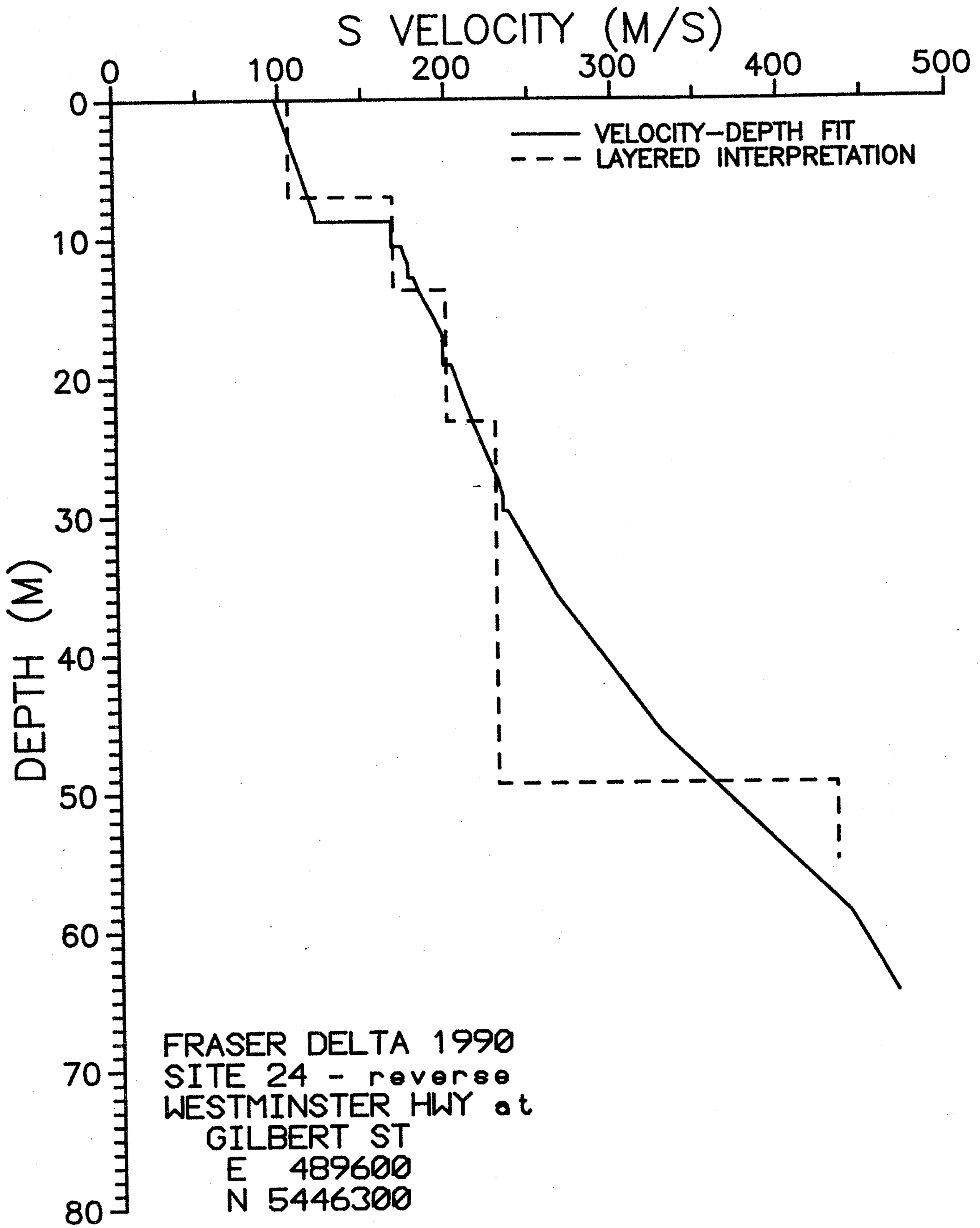

S VELOCITY (M/S)
0
100
200
300
400
500
DEPTH (M)
0
10
20
30
40
50
60
70
80
VELOCITY-DEPTH FIT
LAYERED INTERPRETATION
FRASER DELTA 1989
SITE 22 - reverse
MARINERS VILLAGE
at DYKE, STEVESTON
E 485850
N 5441500

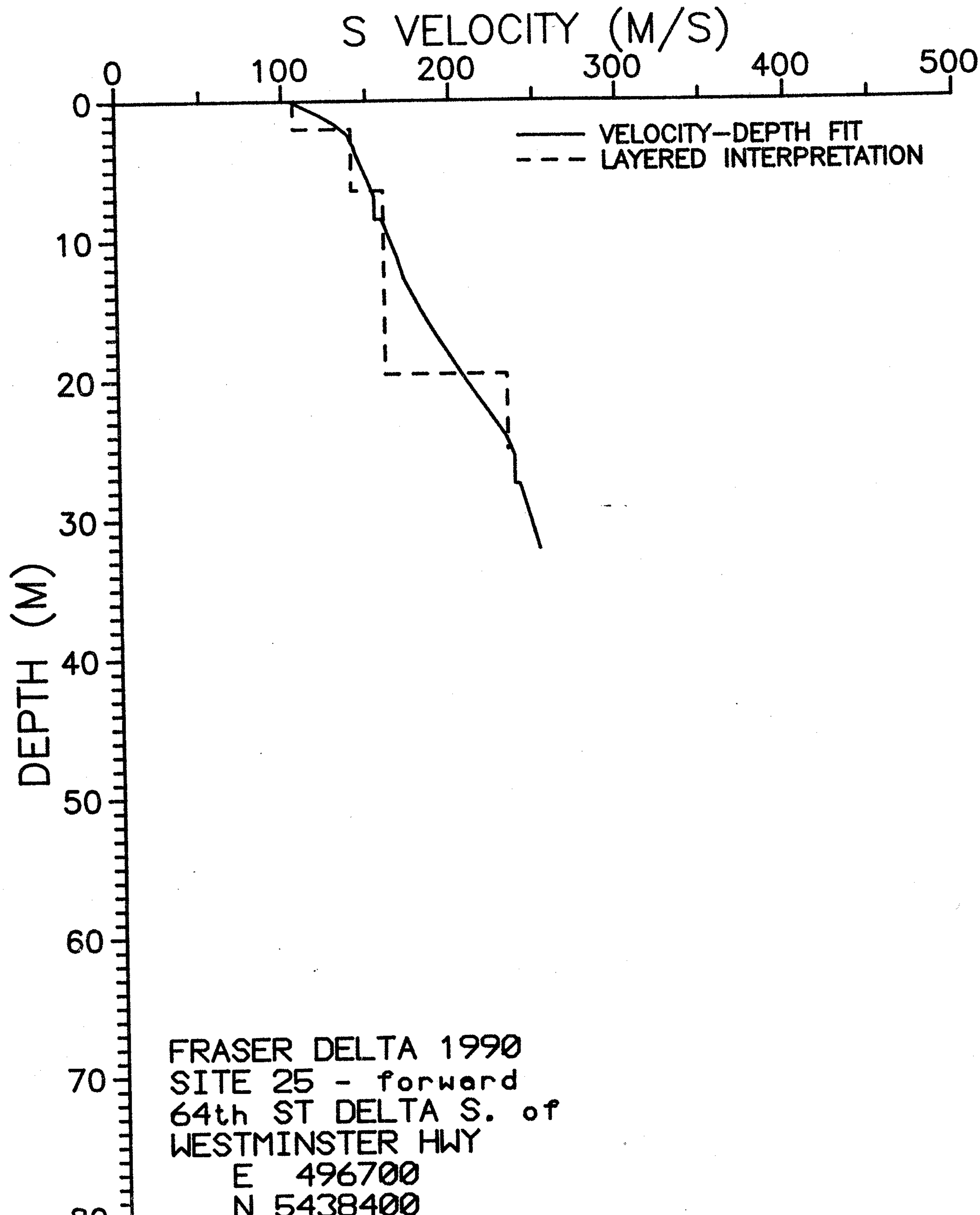


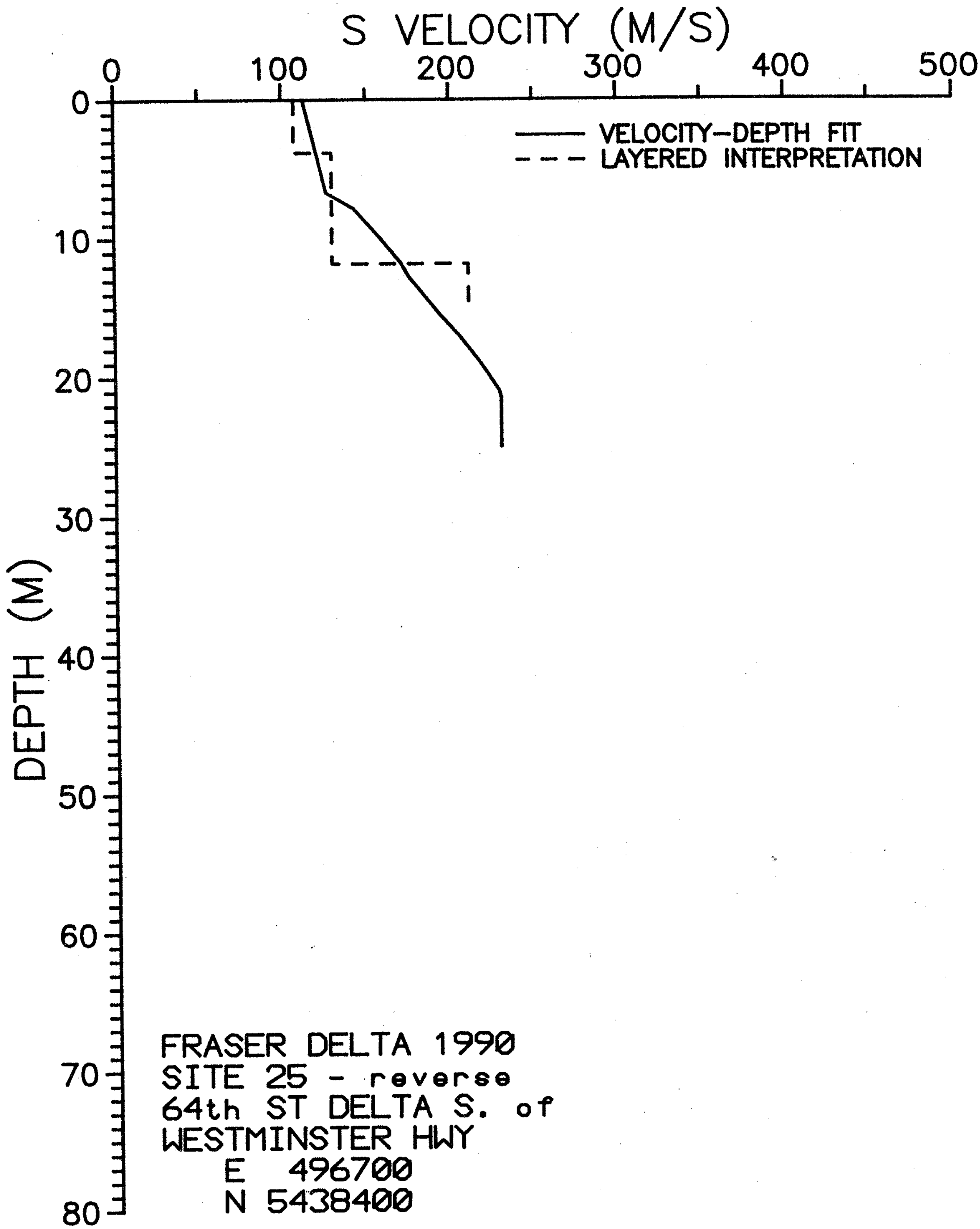
S VELOCITY (M/S)
0
100
200
300
400
500
0
10
20
30
40
50
60
70
80
DEPTH (M)
VELOCITY—DEPTH FIT
LAYERED INTERPRETATION
FRASER DELTA 1990
SITE 23 - forward
N. SHELL RD at
FINDLAYSON ST.
E 492400
N 5448900

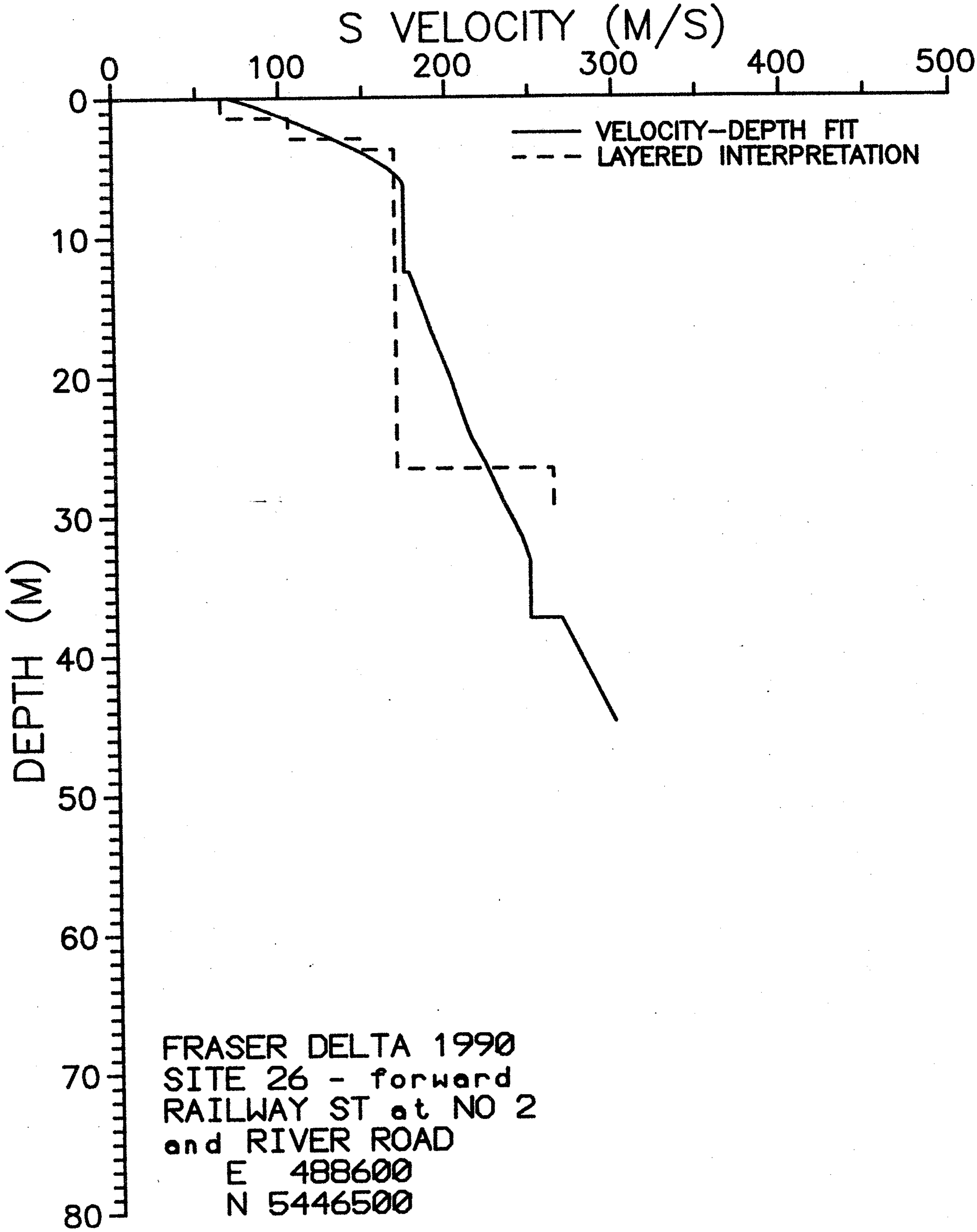

S VELOCITY (M/S)
0
100
200
300
400
500
0
10
20
30
40
50
60
70
80
DEPTH (M)
VELOCITY–DEPTH FIT
LAYERED INTERPRETATION
FRASER DELTA 1990
SITE 23 - reverse
N. SHELL RD at
FINDLAYSON ST.
E 492400
N 5448900

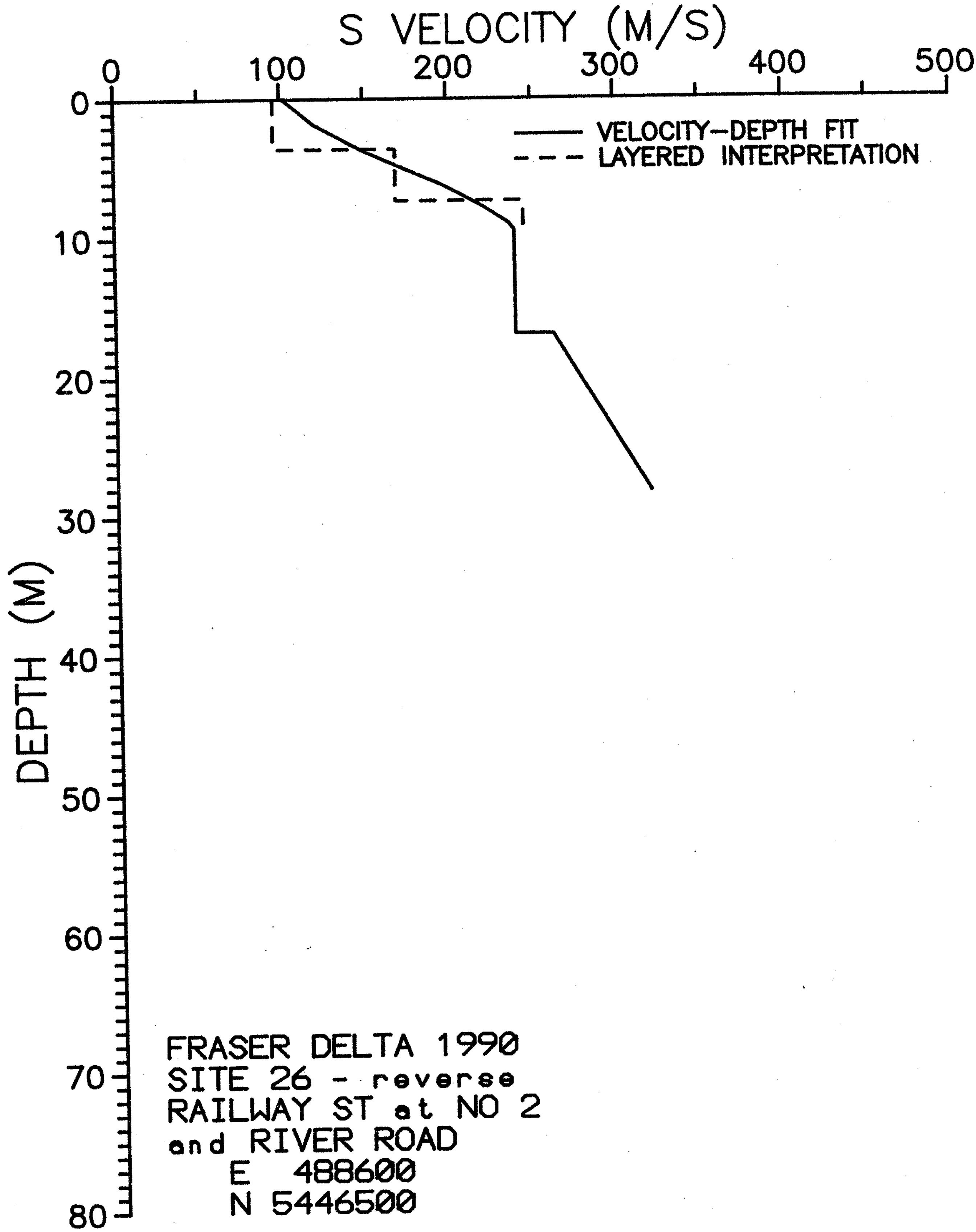

S VELOCITY (M/S)
0
100
200
300
400
500
0
10
20
30
40
50
60
70
80
DEPTH (M)
VELOCITY-DEPTH FIT
LAYERED INTERPRETATION
FRASER DELTA 1990
SITE 24 - forward
WESTMINSTER HWY at
GILBERT ST
E 489600
N 5446300

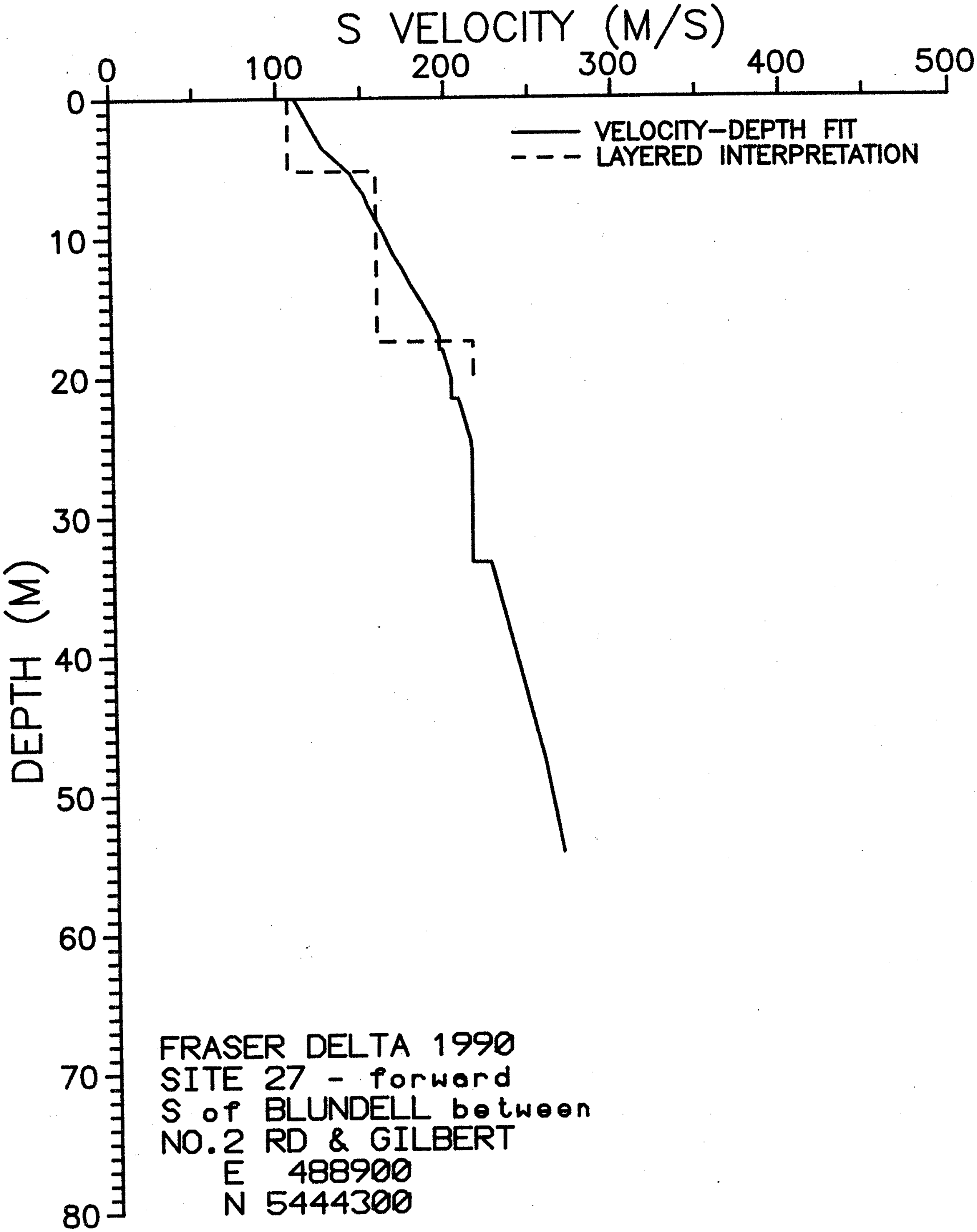

S VELOCITY (M/S)
0
100
200
300
400
500
DEPTH (M)
0
10
20
30
40
50
60
70
80
VELOCITY-DEPTH FIT
LAYERED INTERPRETATION
FRASER DELTA 1990
SITE 24 - reverse
WESTMINSTER HWY at
GILBERT ST
E 489600
N 5446300

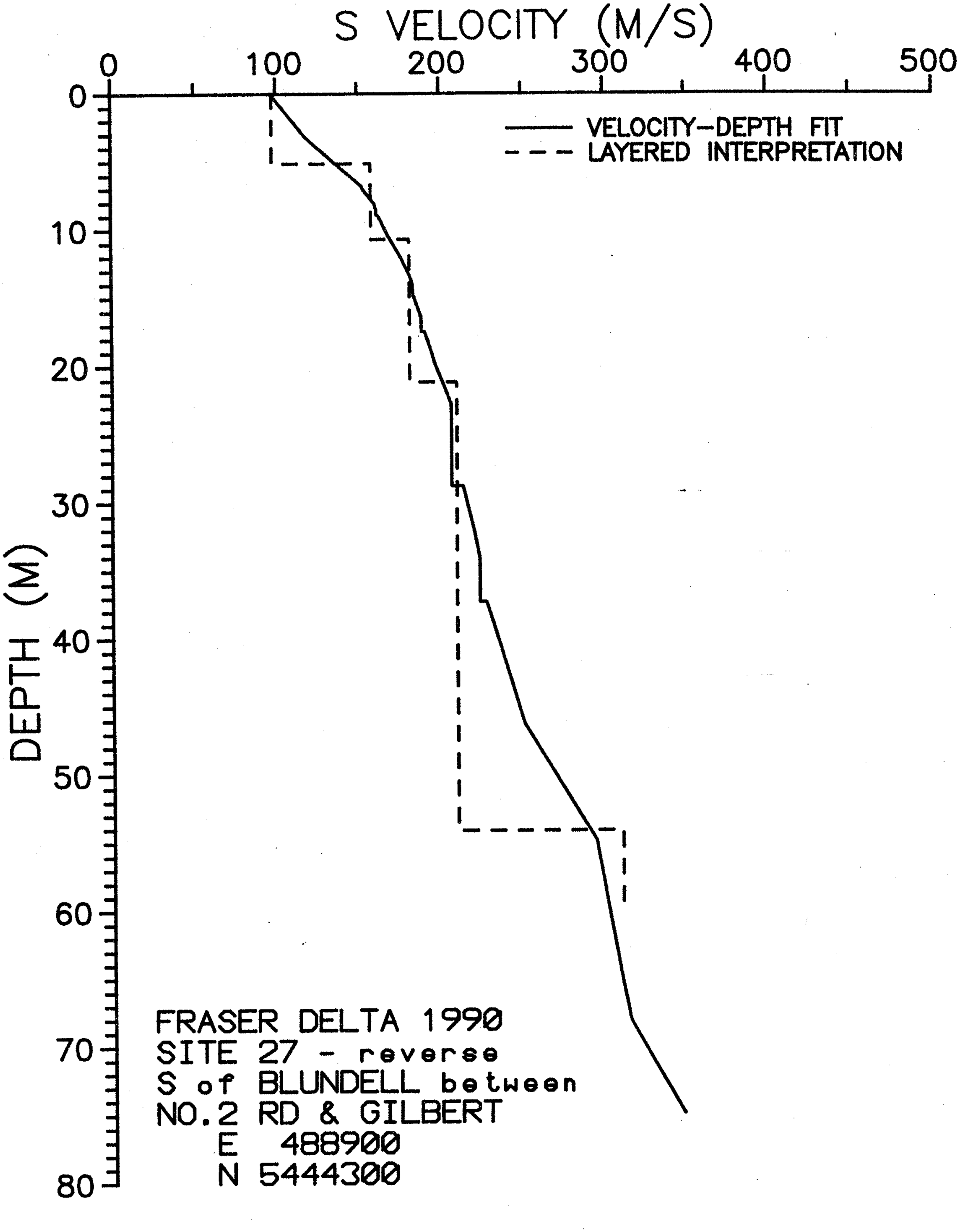

S VELOCITY (M/S)
0
100
200
300
400
500
VELOCITY—DEPTH FIT
LAYERED INTERPRETATION
DEPTH (M)
0
10
20
30
40
50
60
70
80
FRASER DELTA 1990
SITE 25 - forward
64th ST DELTA S. of
WESTMINSTER HWY
E 496700
N 5438400

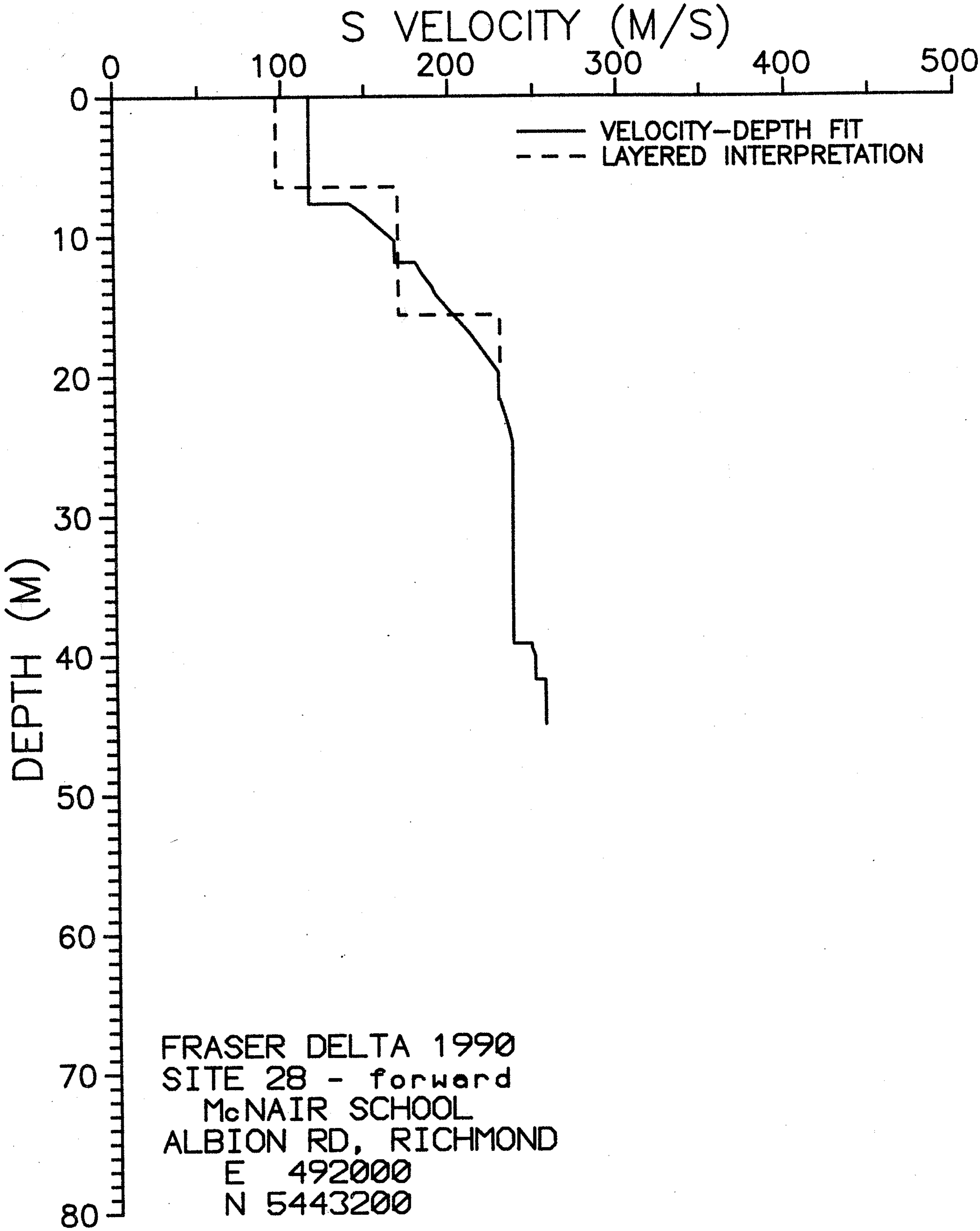

S VELOCITY (M/S)
0
100
200
300
400
500
VELOCITY—DEPTH FIT
LAYERED INTERPRETATION
DEPTH (M)
0
10
20
30
40
50
60
70
80
FRASER DELTA 1990
SITE 25 - reverse
64th ST DELTA S. of
WESTMINSTER HWY
E 496700
N 5438400

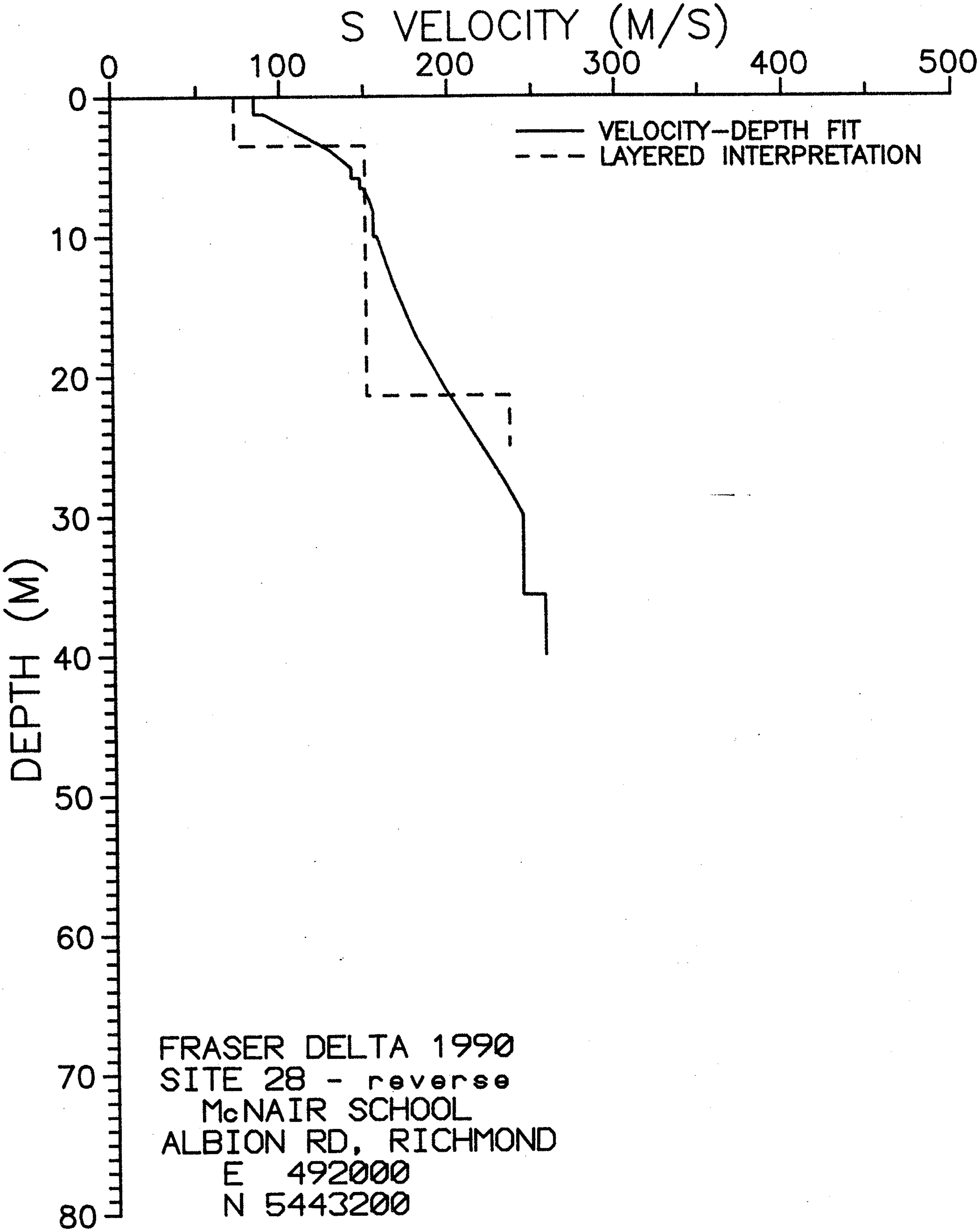

S VELOCITY (M/S)
0
100
200
300
400
500
VELOCITY–DEPTH FIT
LAYERED INTERPRETATION
DEPTH (M)
0
10
20
30
40
50
60
70
80
FRASER DELTA 1990
SITE 26 - forward
RAILWAY ST at NO 2
and RIVER ROAD
E 488600
N 5446500

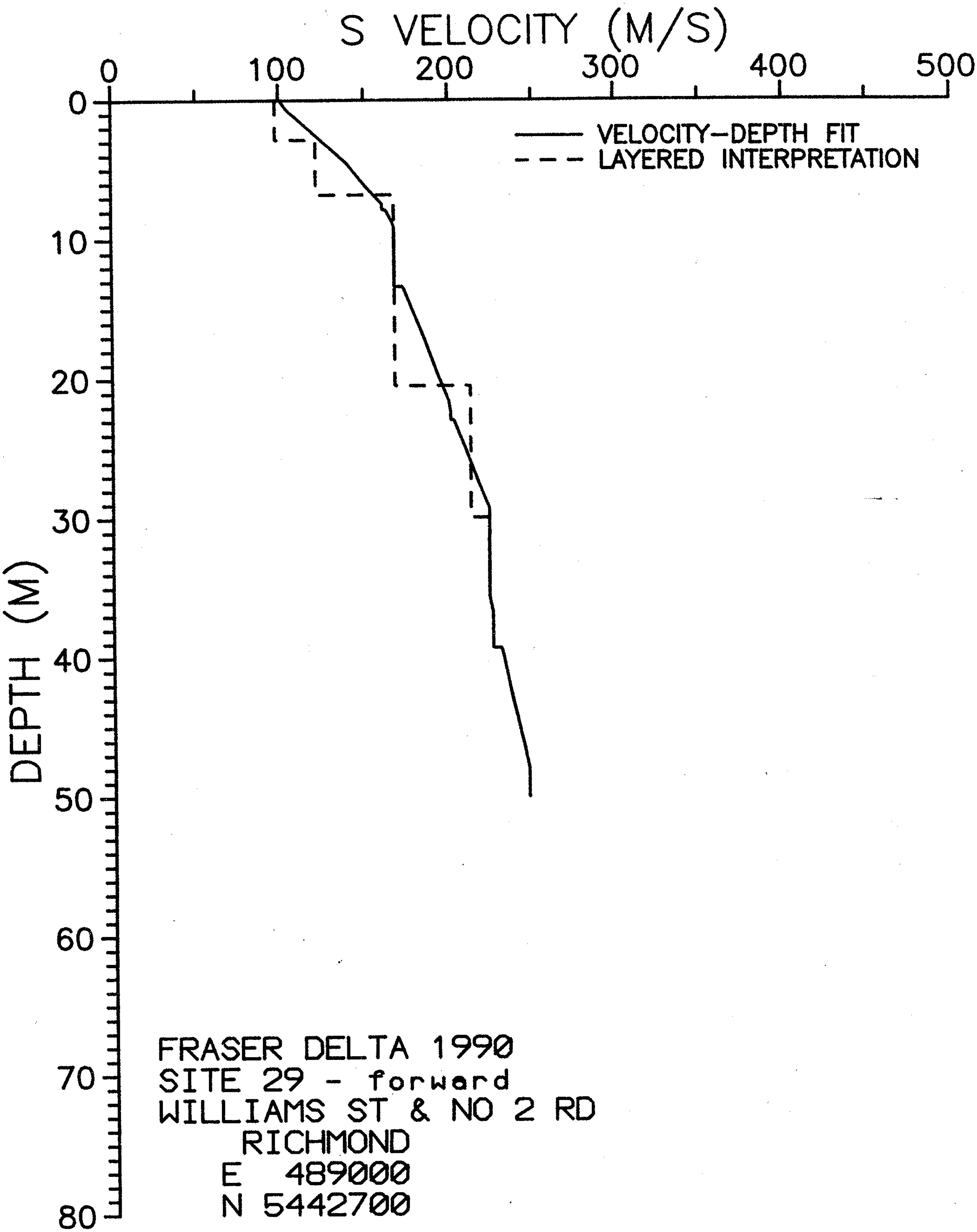

S VELOCITY (M/S)
0
100
200
300
400
500
DEPTH (M)
0
10
20
30
40
50
60
70
80
VELOCITY–DEPTH FIT
LAYERED INTERPRETATION
FRASER DELTA 1990
SITE 26 - reverse
RAILWAY ST at NO 2
and RIVER ROAD
E 488600
N 5446500

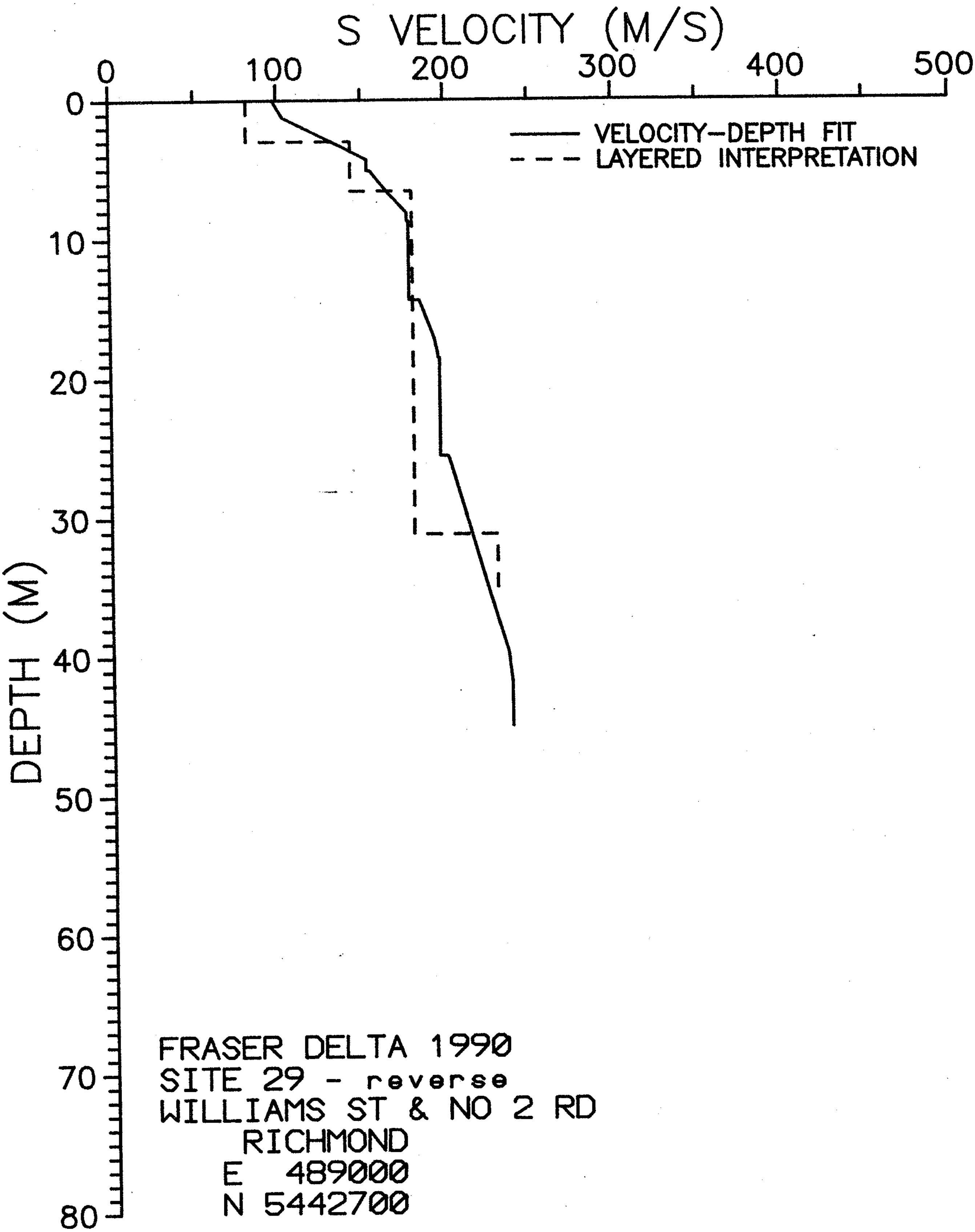

S VELOCITY (M/S)
0
100
200
300
400
500
0
10
20
30
40
50
60
70
80
DEPTH (M)
VELOCITY—DEPTH FIT
LAYERED INTERPRETATION
FRASER DELTA 1990
SITE 27 - forward
S of BLUNDELL between
NO.2 RD & GILBERT
E 488900
N 5444300

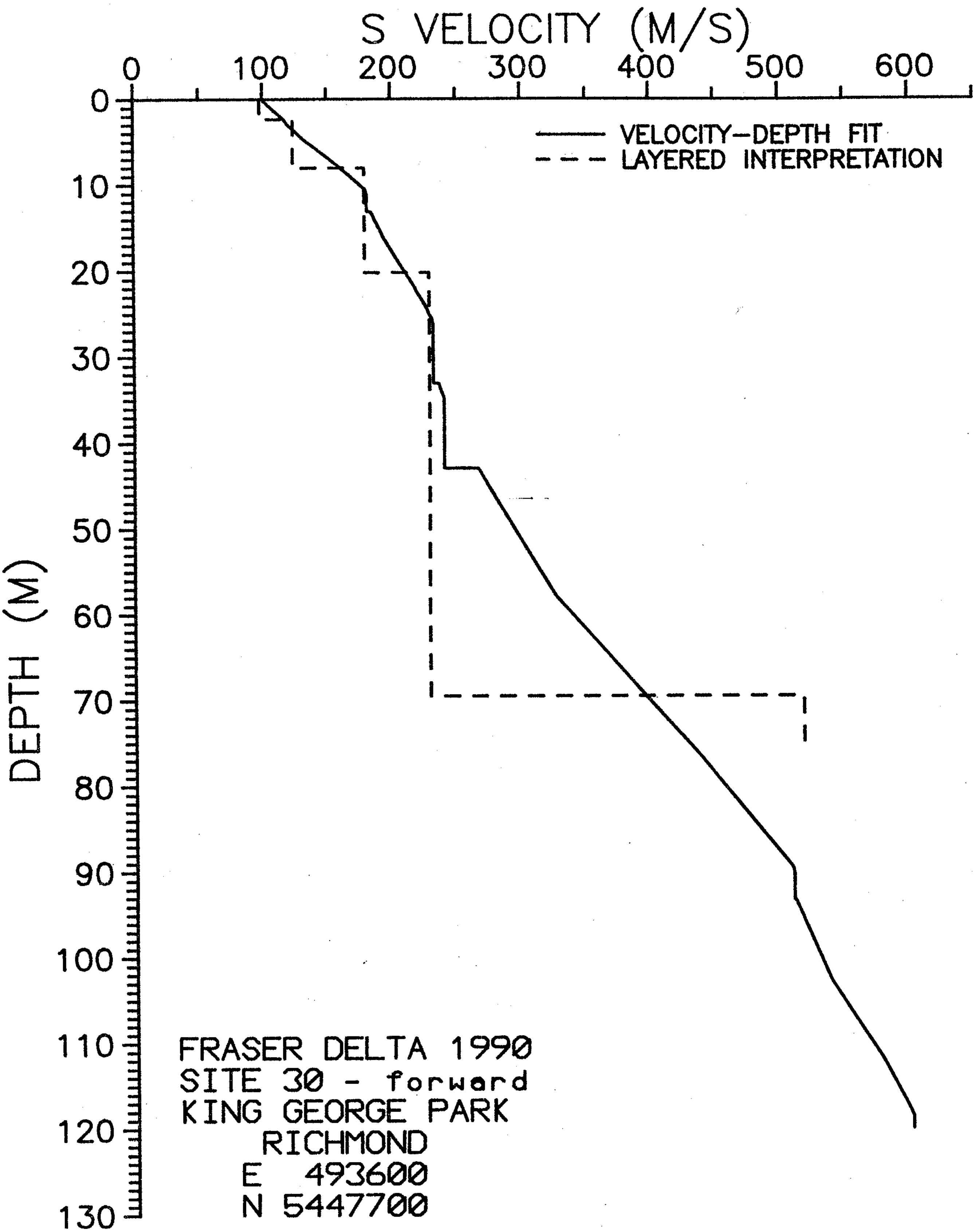

S VELOCITY (M/S)
0
100
200
300
400
500
0
10
20
30
40
50
60
70
80
DEPTH (M)
VELOCITY-DEPTH FIT
LAYERED INTERPRETATION
FRASER DELTA 1990
SITE 27 - reverse
S of BLUNDELL between
NO.2 RD & GILBERT
E 488900
N 5444300

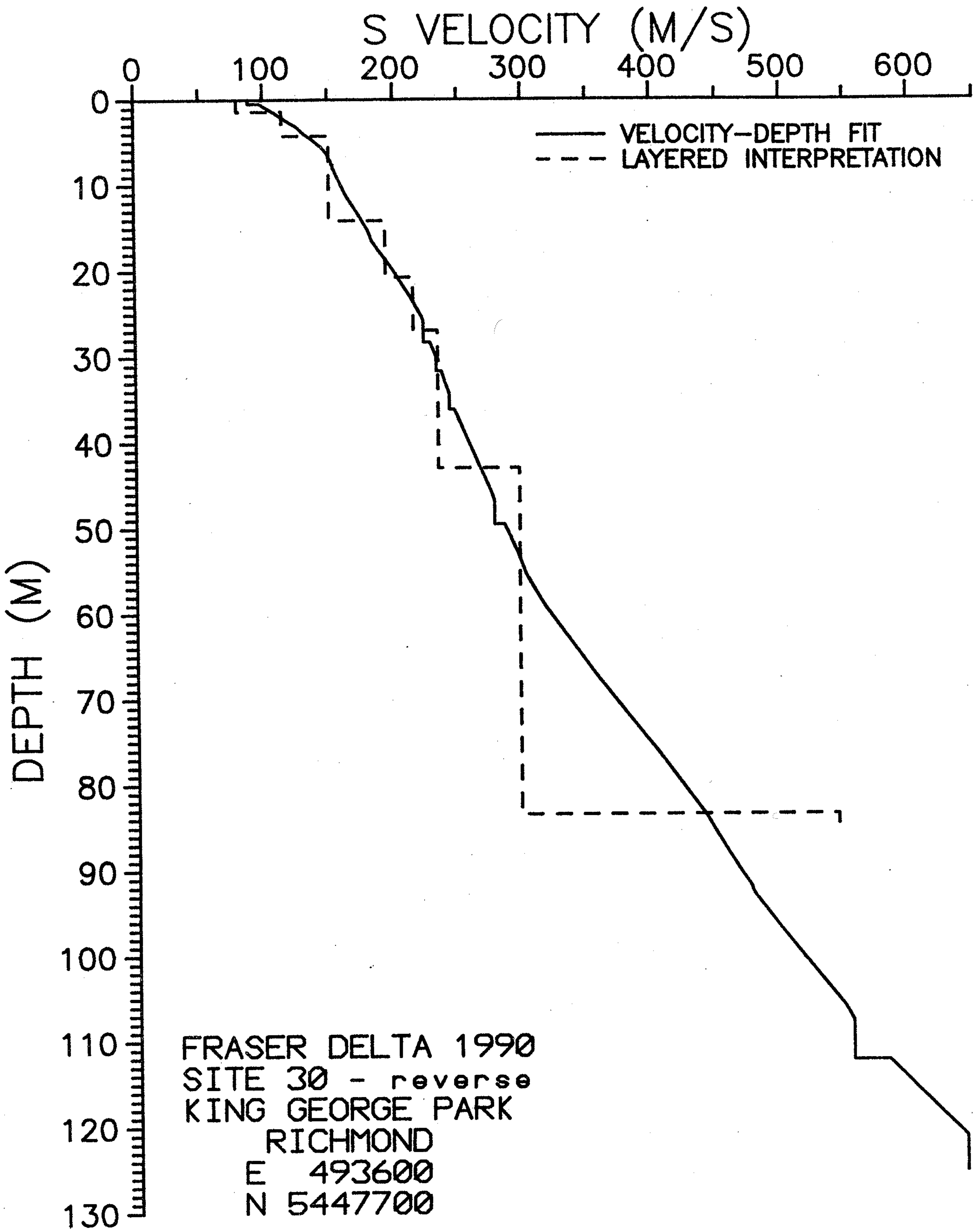

S VELOCITY (M/S)
0
100
200
300
400
500
VELOCITY–DEPTH FIT
LAYERED INTERPRETATION
DEPTH (M)
0
10
20
30
40
50
60
70
80
FRASER DELTA 1990
SITE 28 - forward
McNAIR SCHOOL
ALBION RD, RICHMOND
E 492000
N 5443200

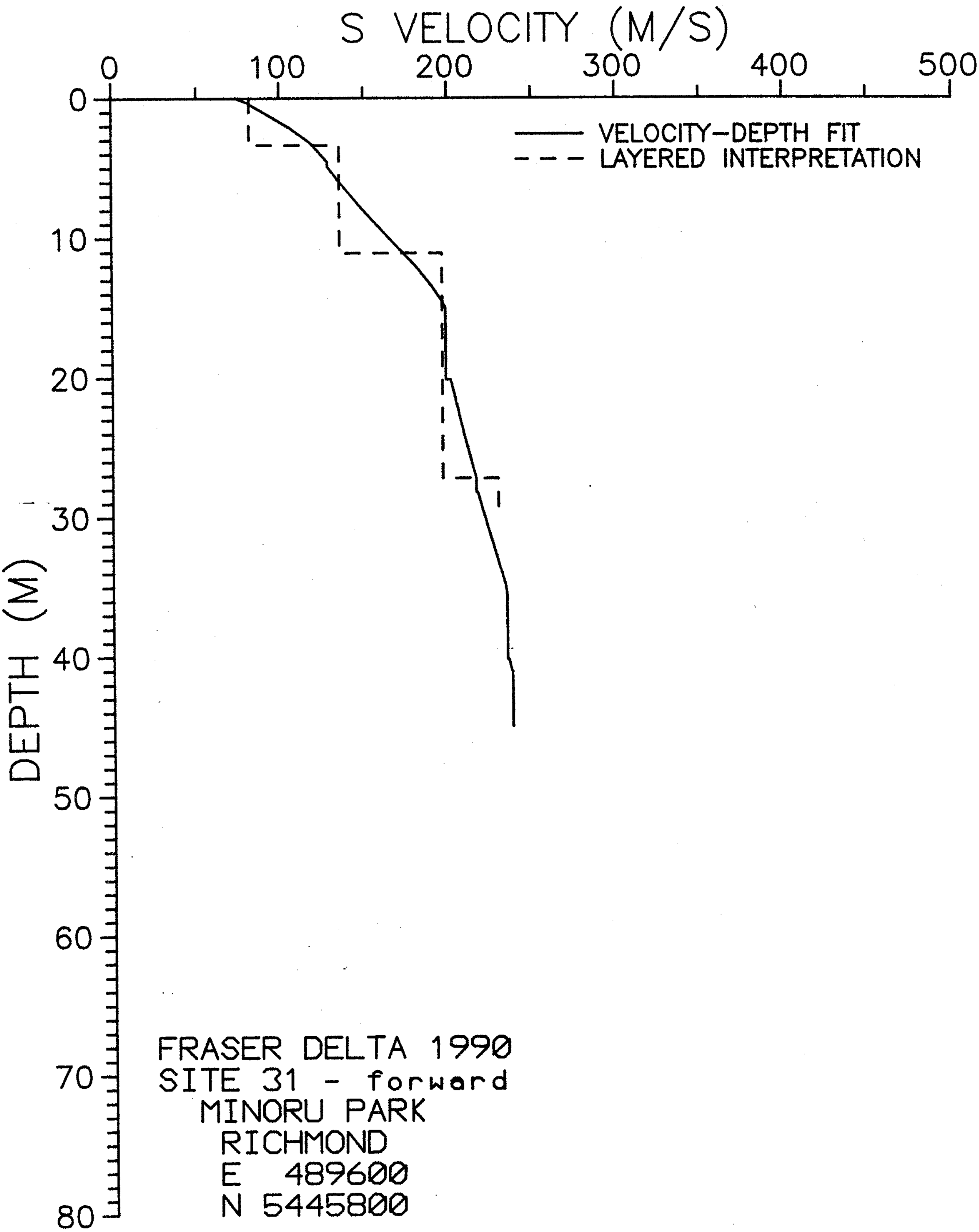

S VELOCITY (M/S)
0
100
200
300
400
500
VELOCITY-DEPTH FIT
LAYERED INTERPRETATION
DEPTH (M)
0
10
20
30
40
50
60
70
80
FRASER DELTA 1990
SITE 28 - reverse
McNAIR SCHOOL
ALBION RD, RICHMOND
E 492000
N 5443200

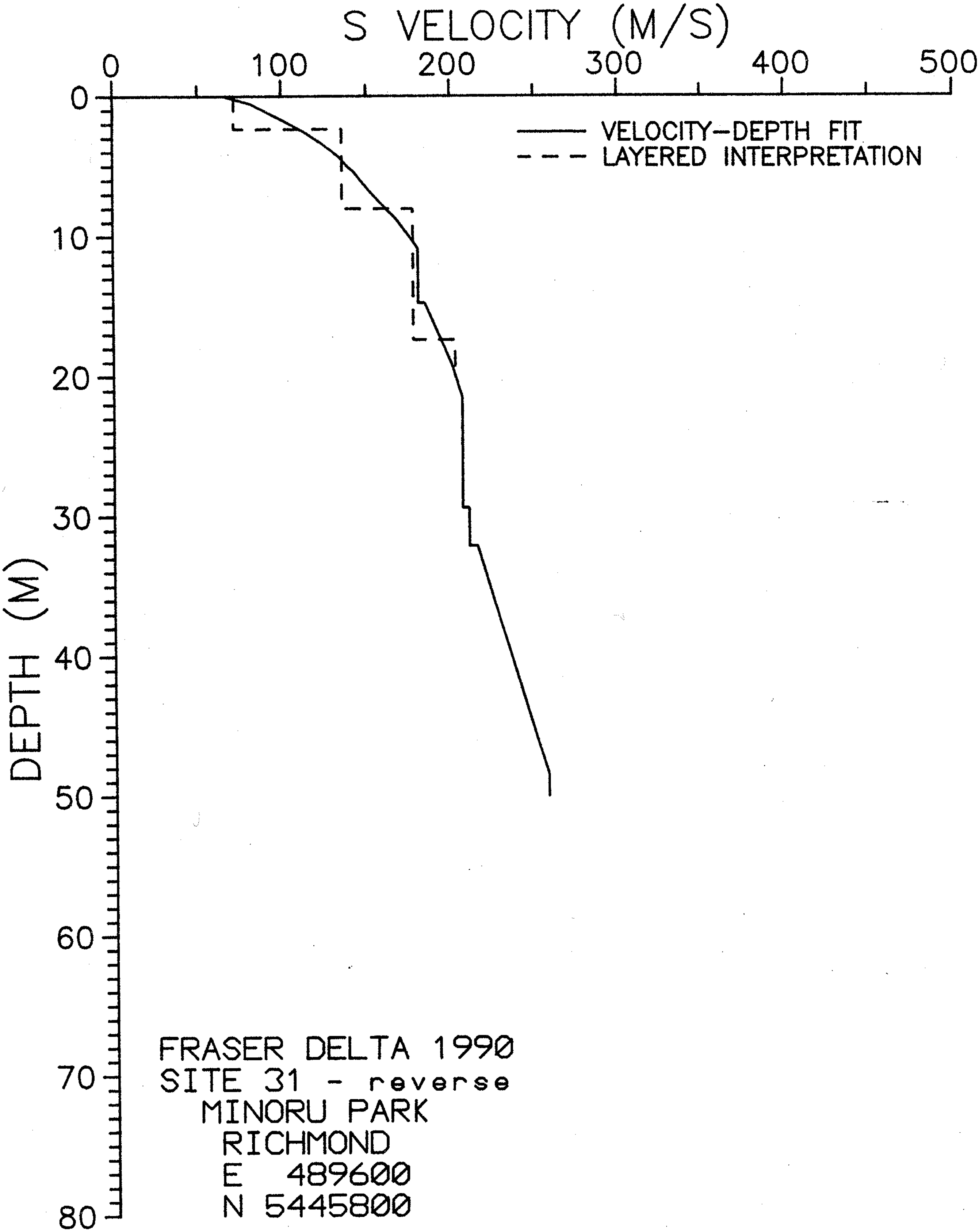

S VELOCITY (M/S)
0
100
200
300
400
500
VELOCITY–DEPTH FIT
LAYERED INTERPRETATION
DEPTH (M)
0
10
20
30
40
50
60
70
80
FRASER DELTA 1990
SITE 29 - forward
WILLIAMS ST & NO 2 RD
RICHMOND
E 489000
N 5442700

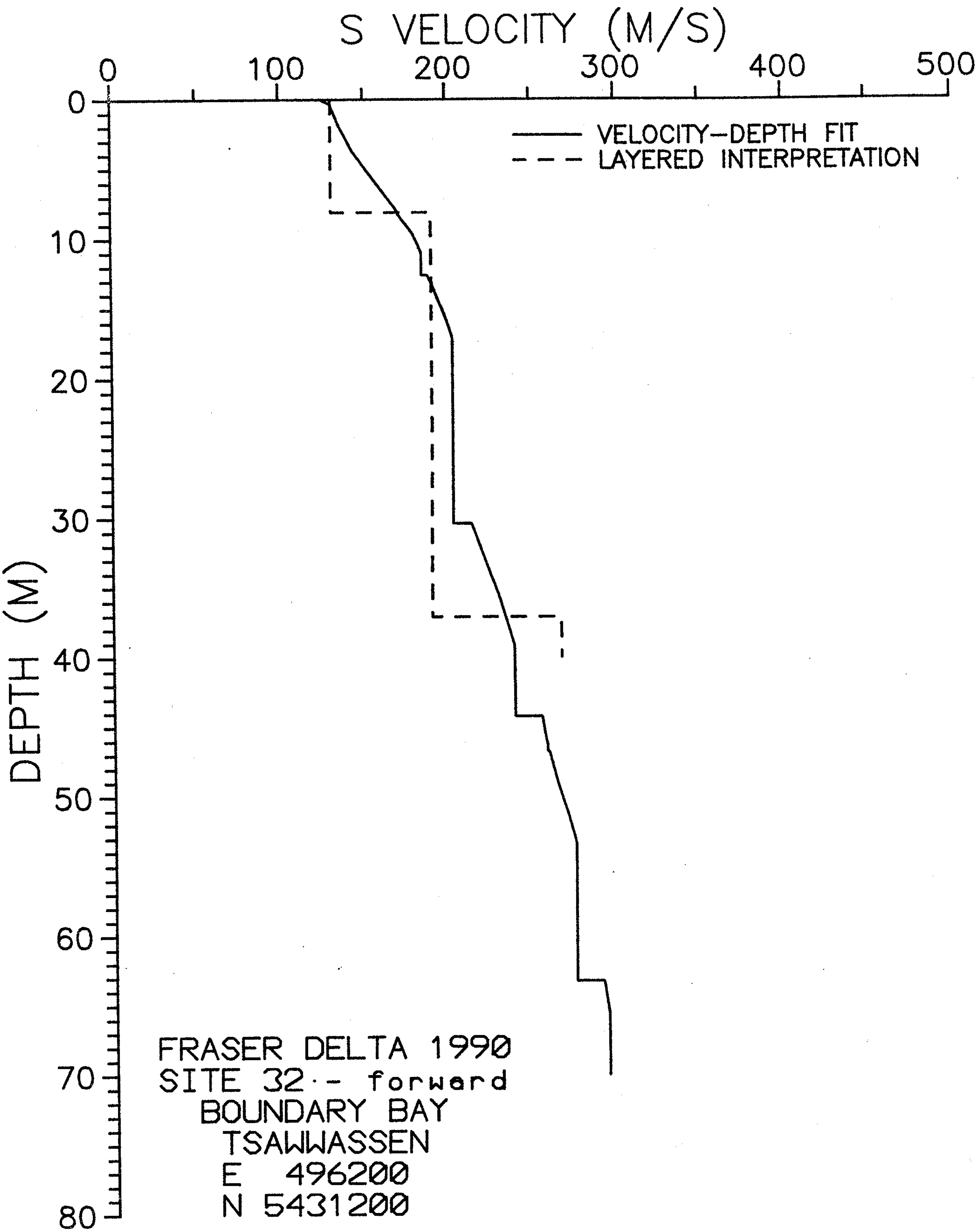

S VELOCITY (M/S)
0
100
200
300
400
500
DEPTH (M)
0
10
20
30
40
50
60
70
80
VELOCITY-DEPTH FIT
LAYERED INTERPRETATION
FRASER DELTA 1990
SITE 29 - reverse
WILLIAMS ST & NO 2 RD
RICHMOND
E 489000
N 5442700

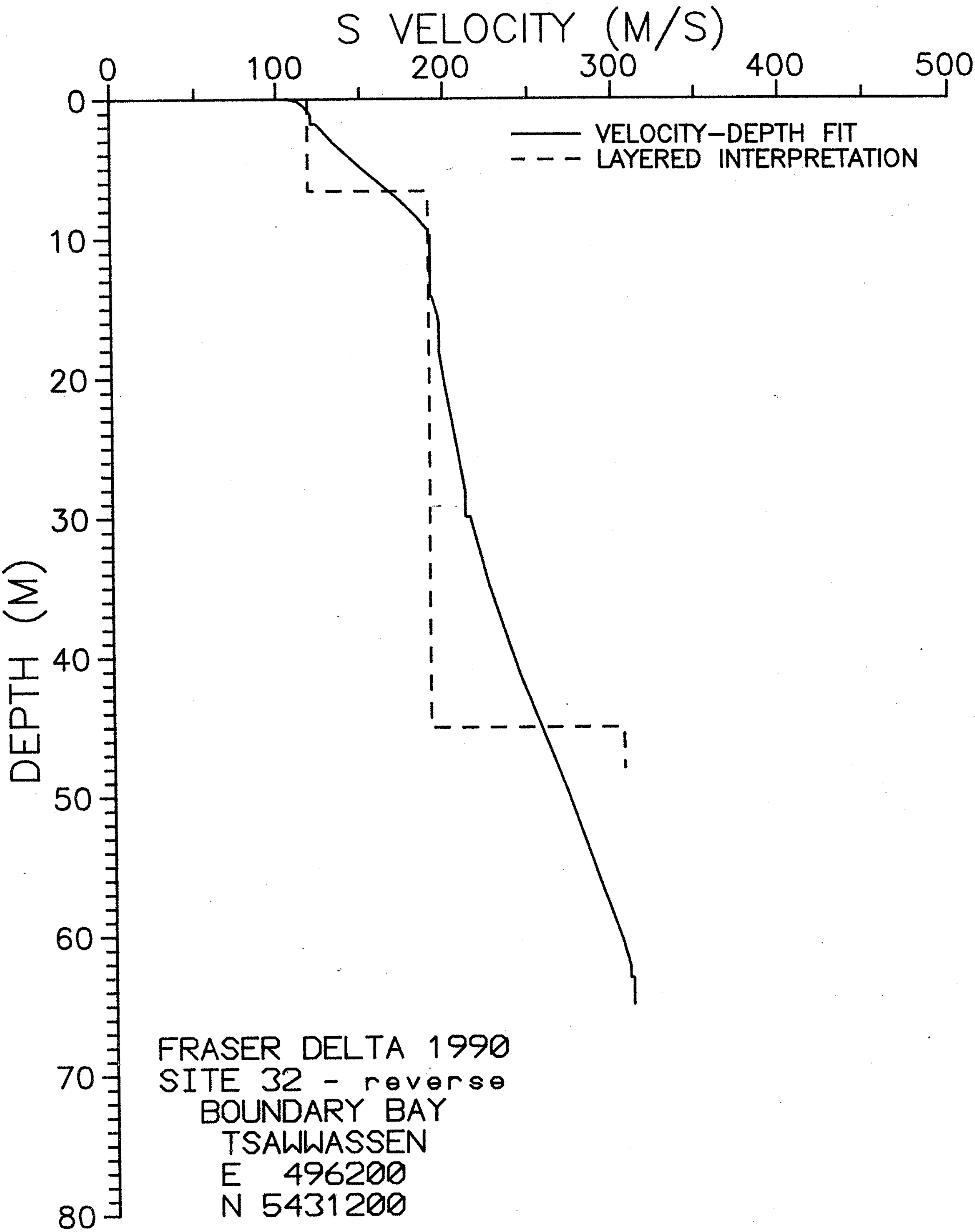

S VELOCITY (M/S)
0
100
200
300
400
500
600
0
10
20
30
40
50
60
70
80
90
100
110
120
130
DEPTH (M)
VELOCITY-DEPTH FIT
LAYERED INTERPRETATION
FRASER DELTA 1990
SITE 30 - forward
KING GEORGE PARK
RICHMOND
E 493600
N 5447700

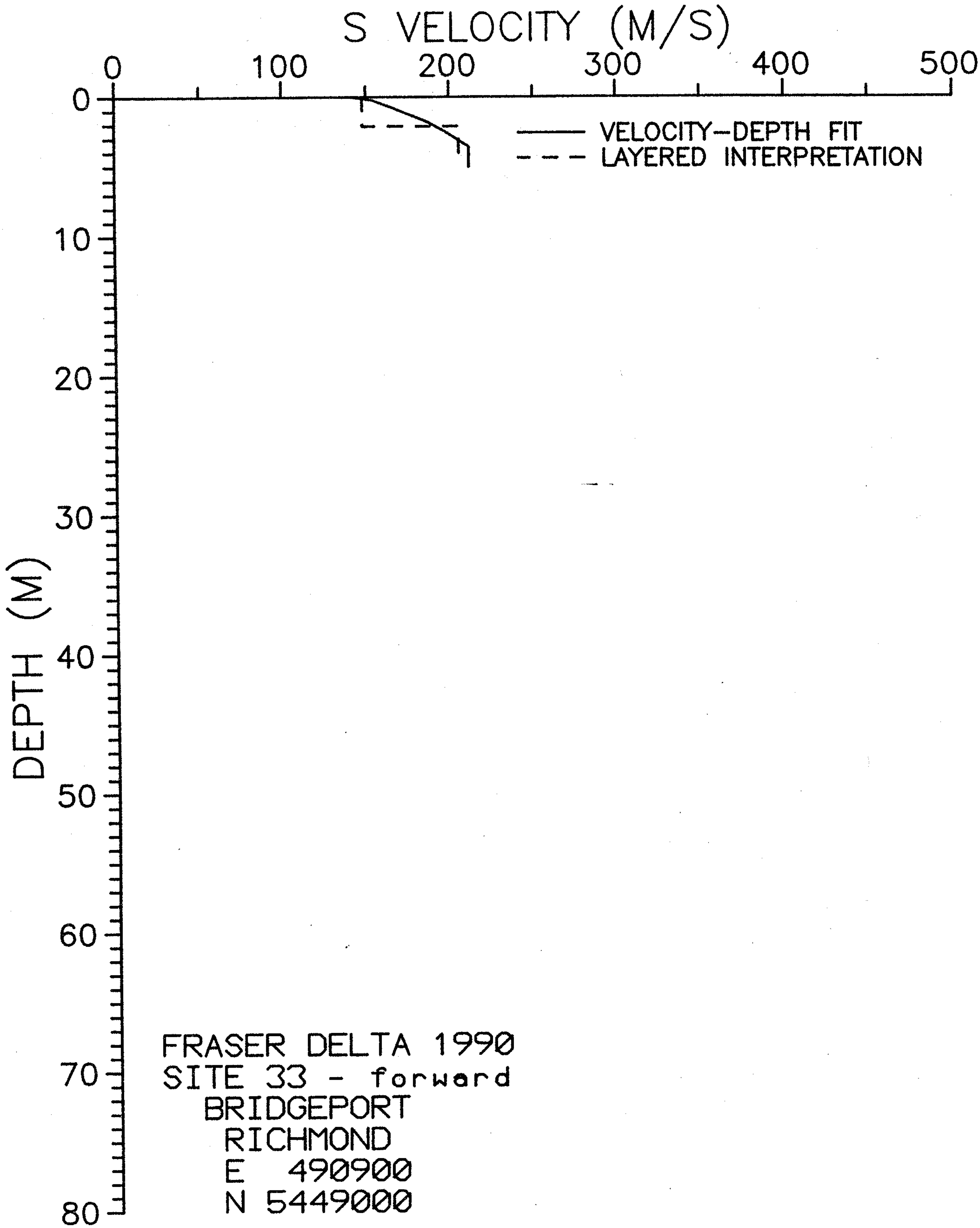

S VELOCITY (M/S)
0
100
200
300
400
500
600
VELOCITY—DEPTH FIT
LAYERED INTERPRETATION
DEPTH (M)
0
10
20
30
40
50
60
70
80
90
100
110
120
130
FRASER DELTA 1990
SITE 30 - reverse
KING GEORGE PARK
RICHMOND
E 493600
N 5447700

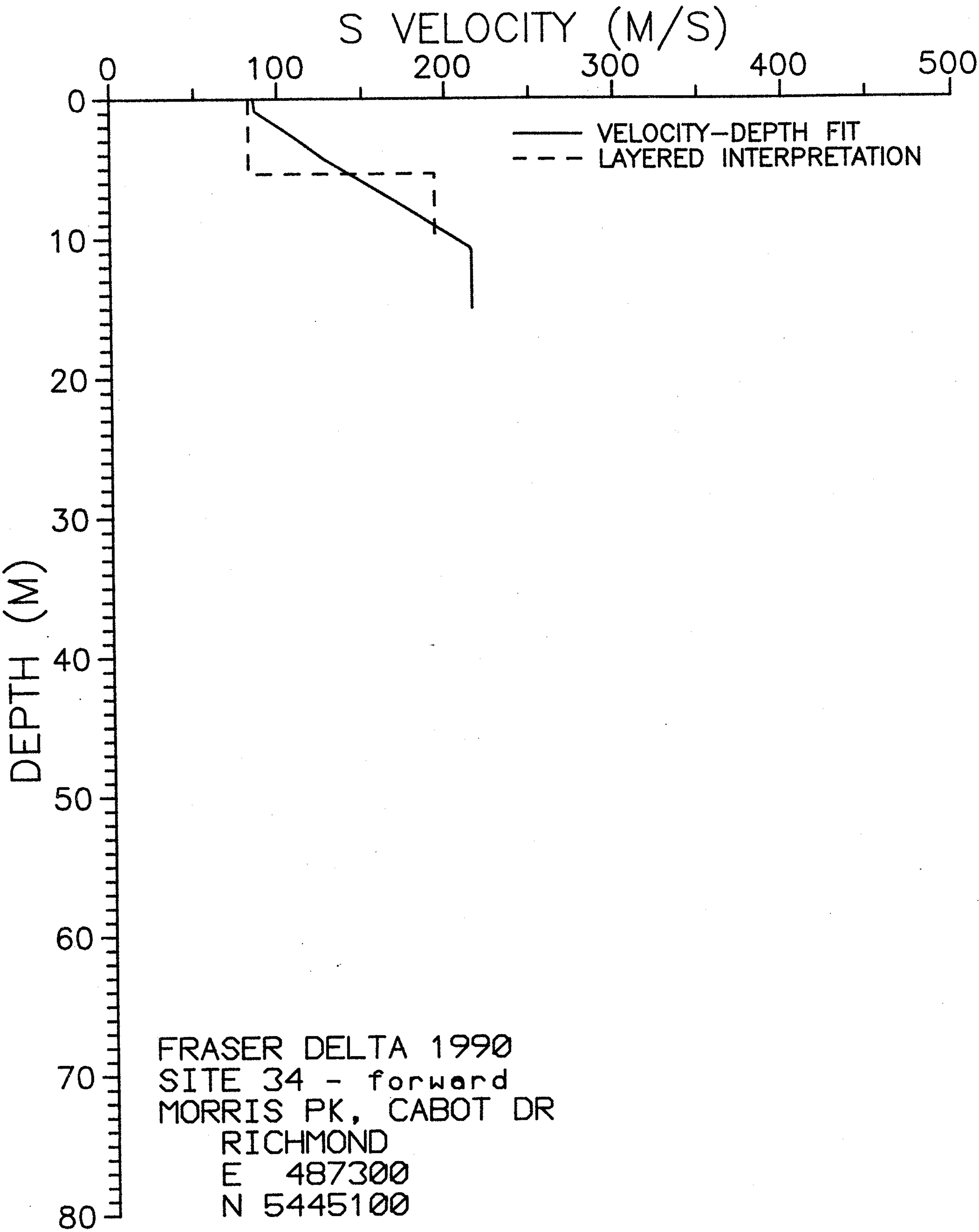

S VELOCITY (M/S)
0
100
200
300
400
500
DEPTH (M)
0
10
20
30
40
50
60
70
80
VELOCITY-DEPTH FIT
LAYERED INTERPRETATION
FRASER DELTA 1990
SITE 31 - forward
MINORU PARK
RICHMOND
E 489600
N 5445800

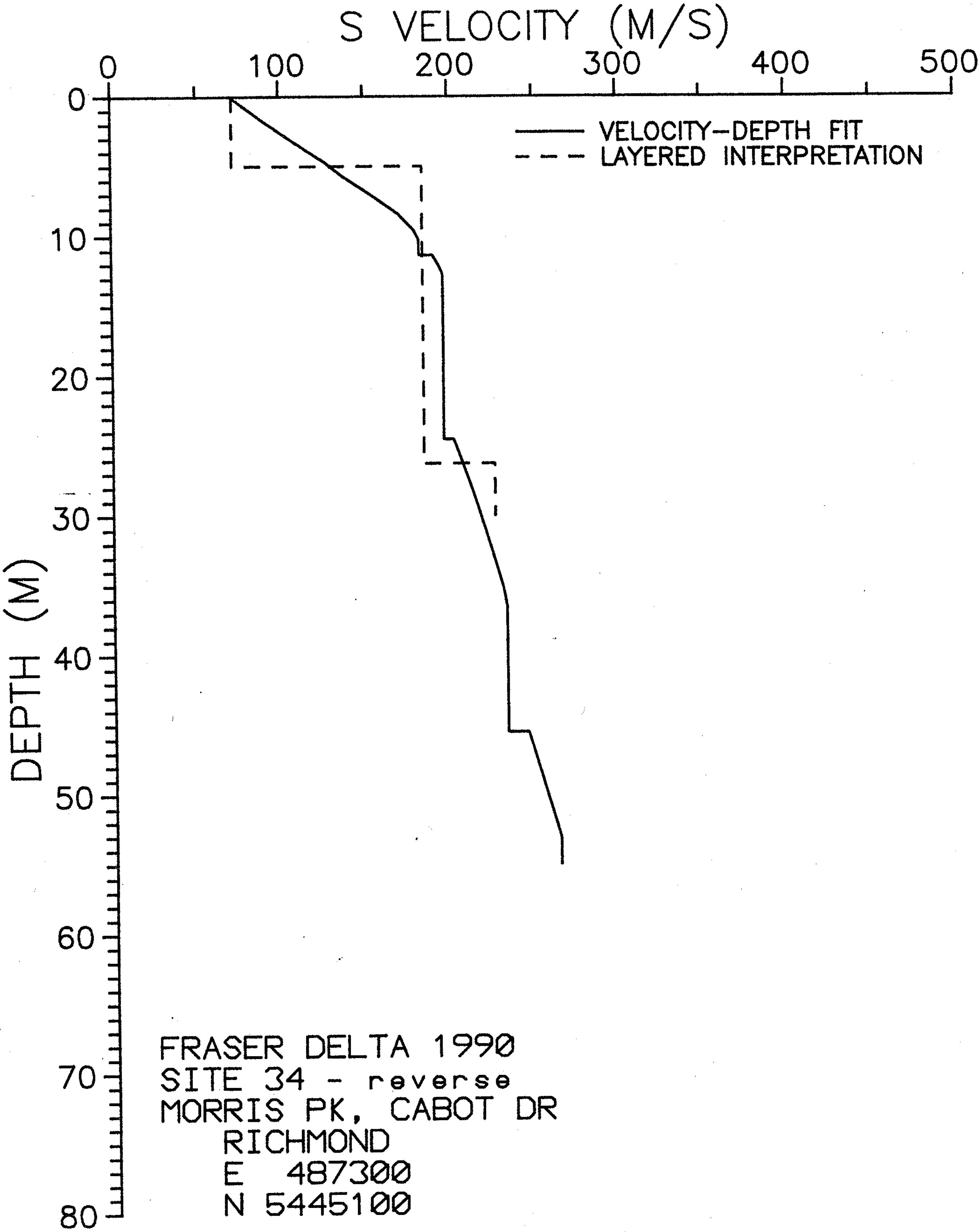

S VELOCITY (M/S)
0
100
200
300
400
500
VELOCITY–DEPTH FIT
LAYERED INTERPRETATION
DEPTH (M)
0
10
20
30
40
50
60
70
80
FRASER DELTA 1990
SITE 31 - reverse
MINORU PARK
RICHMOND
E 489600
N 5445800

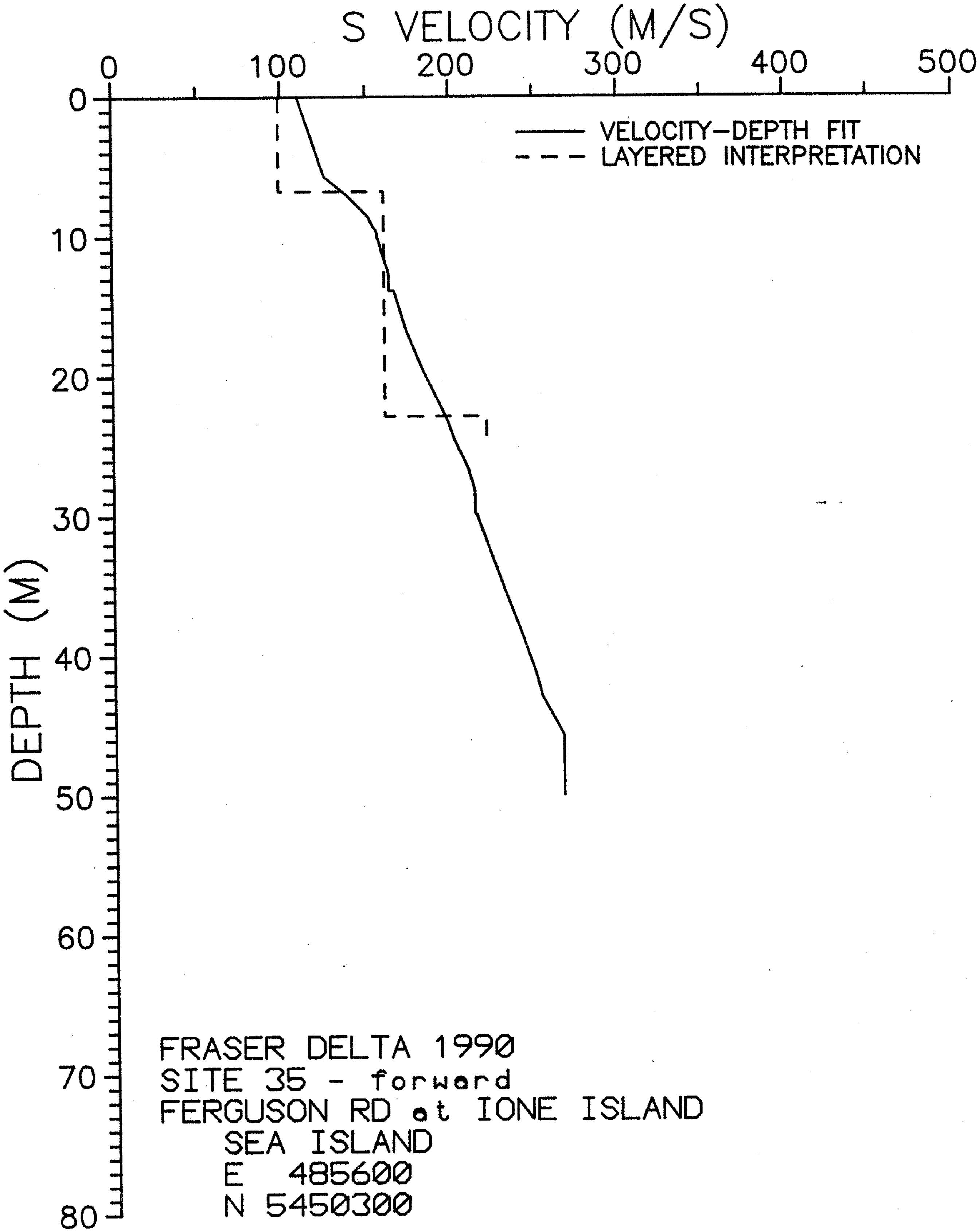

S VELOCITY (M/S)
0
100
200
300
400
500
0
10
20
30
40
50
60
70
80
DEPTH (M)
VELOCITY—DEPTH FIT
LAYERED INTERPRETATION
FRASER DELTA 1990
SITE 32 - forward
BOUNDARY BAY
TSAWWASSEN
E 496200
N 5431200

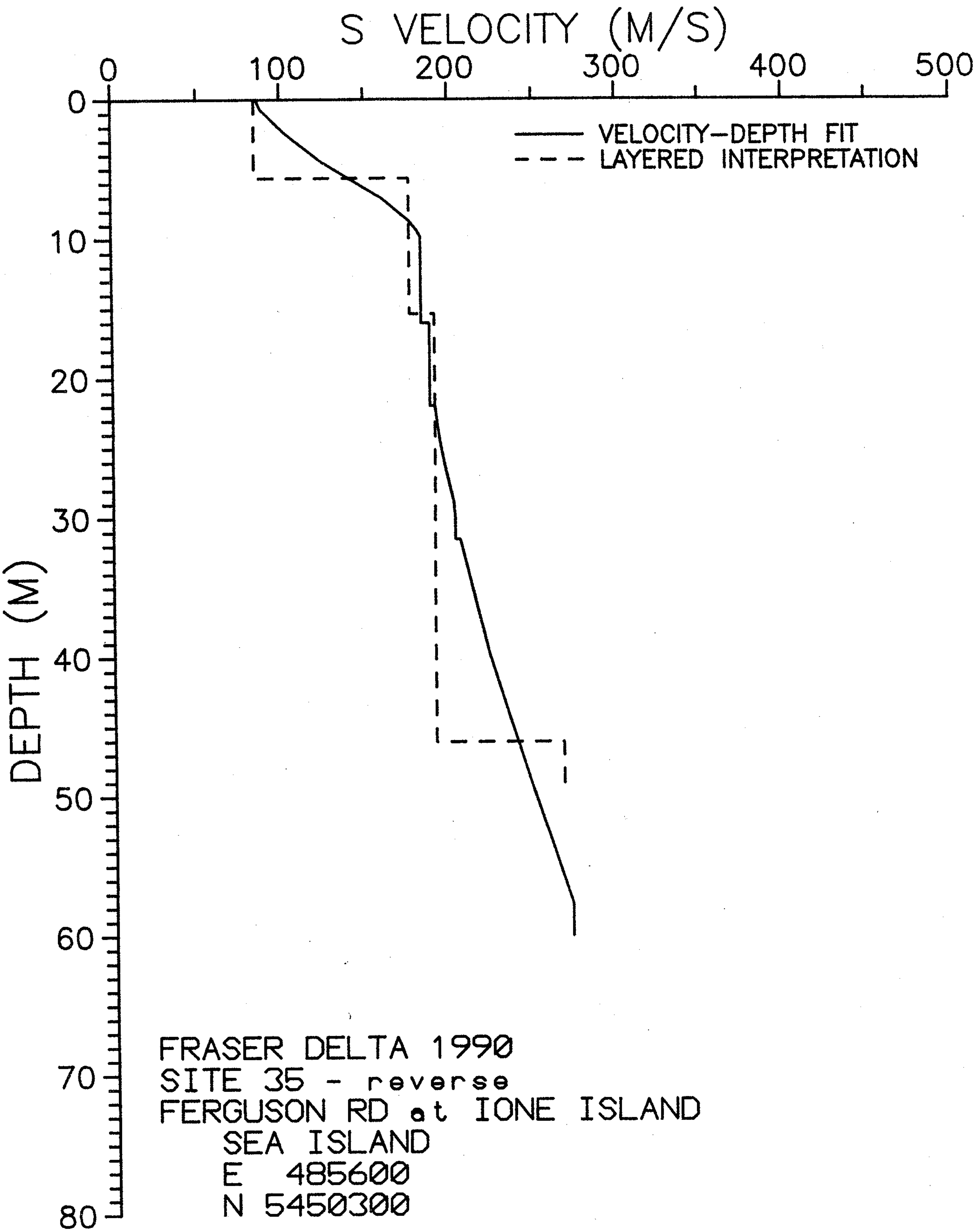

S VELOCITY (M/S)
0 100 200 300 400 500
0 10 20 30 40 50 60 70 80
DEPTH (M)
VELOCITY-DEPTH FIT
LAYERED INTERPRETATION
FRASER DELTA 1990
SITE 32 - reverse
BOUNDARY BAY
TSAWWASSEN
E 496200
N 5431200

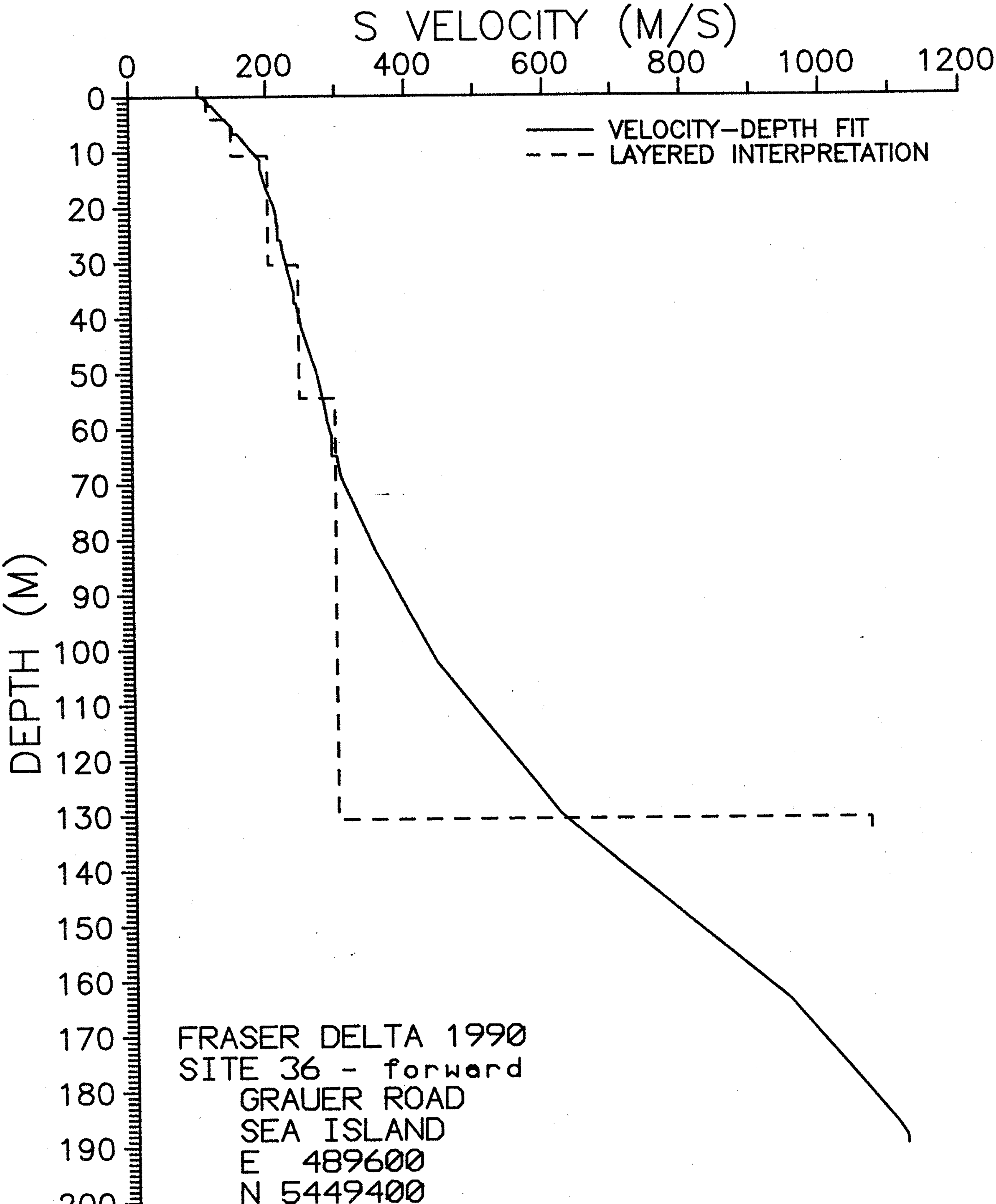

S VELOCITY (M/S)
0
100
200
300
400
500
0
10
20
30
40
50
60
70
80
DEPTH (M)
VELOCITY–DEPTH FIT
LAYERED INTERPRETATION
FRASER DELTA 1990
SITE 33 - forward
BRIDGEPORT
RICHMOND
E 490900
N 5449000


S VELOCITY (M/S)
0
100
200
300
400
500
VELOCITY–DEPTH FIT
LAYERED INTERPRETATION
0
10
20
30
40
50
60
70
80
DEPTH (M)
FRASER DELTA 1990
SITE 34 - forward
MORRIS PK, CABOT DR
RICHMOND
E 487300
N 5445100

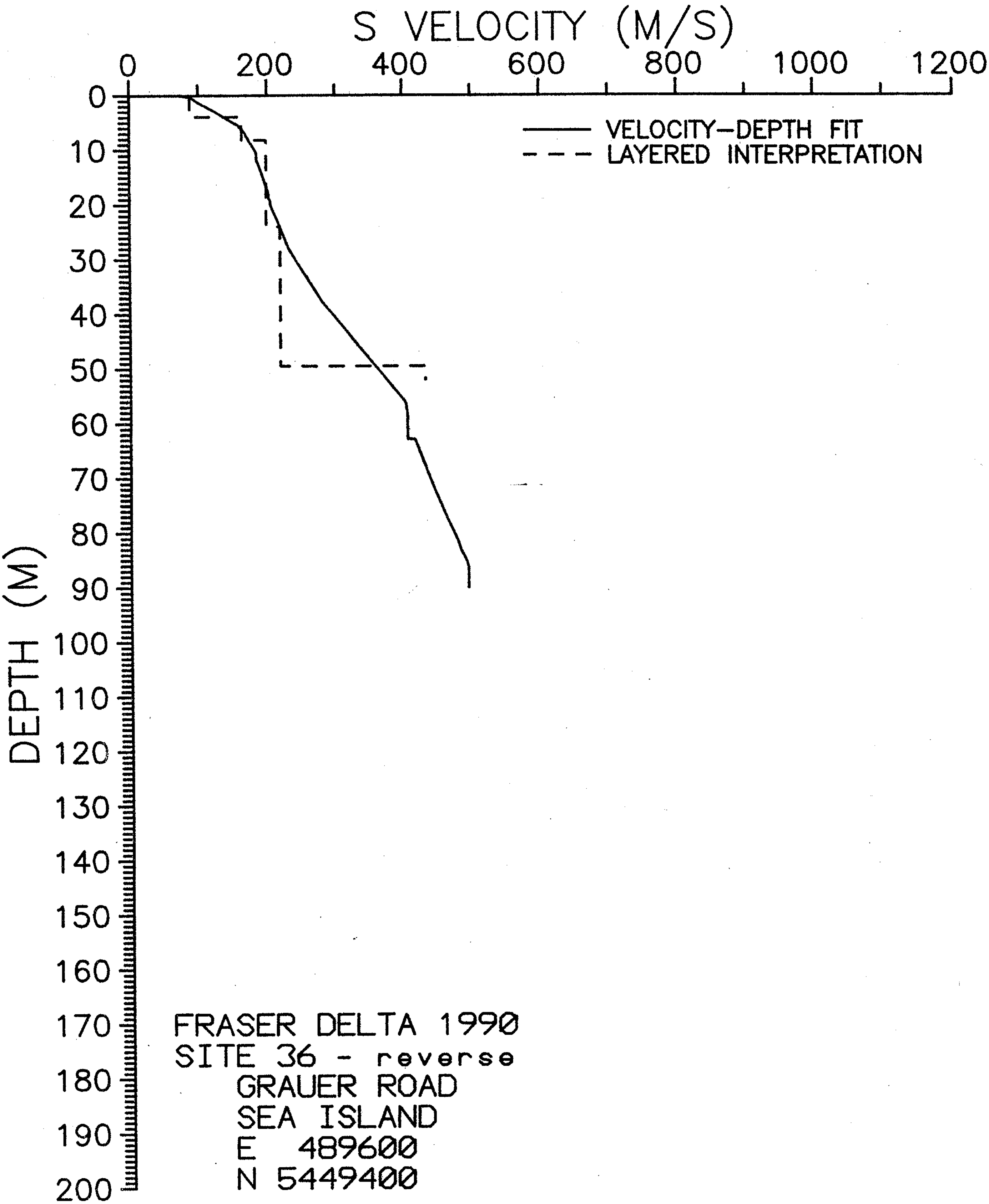

S VELOCITY (M/S)
0
100
200
300
400
500
0
10
20
30
40
50
60
70
80
DEPTH (M)
VELOCITY-DEPTH FIT
LAYERED INTERPRETATION
FRASER DELTA 1990
SITE 34 - reverse
MORRIS PK, CABOT DR
RICHMOND
E 487300
N 5445100


S VELOCITY (M/S)
0
100
200
300
400
500
0
10
20
30
40
50
60
70
80
DEPTH (M)
VELOCITY-DEPTH FIT
LAYERED INTERPRETATION
FRASER DELTA 1990
SITE 35 - forward
FERGUSON RD at IONE ISLAND
SEA ISLAND
E 485600
N 5450300

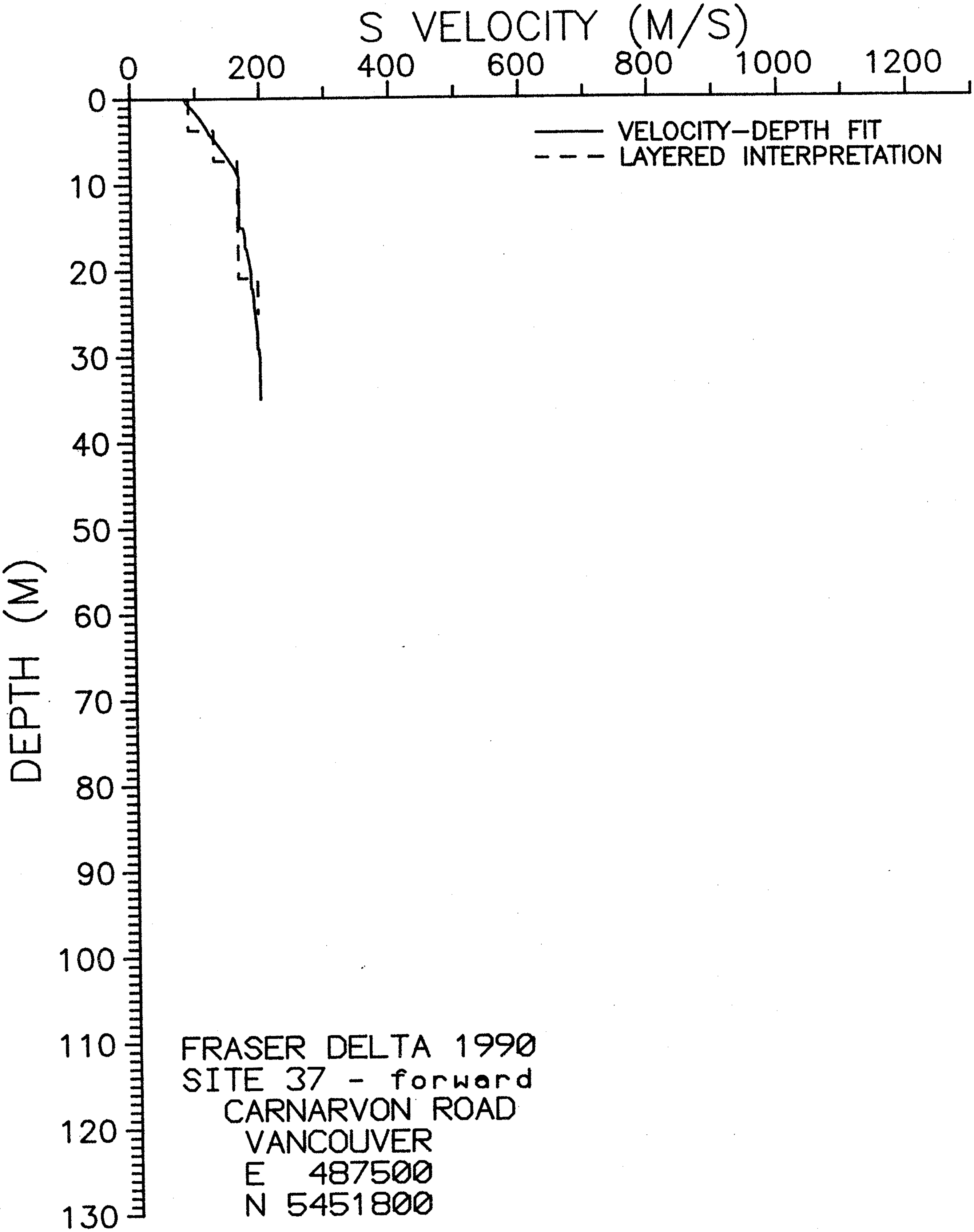

S VELOCITY (M/S)
0
100
200
300
400
500
0
10
20
30
40
50
60
70
80
DEPTH (M)
VELOCITY–DEPTH FIT
LAYERED INTERPRETATION
FRASER DELTA 1990
SITE 35 - reverse
FERGUSON RD at IONE ISLAND
SEA ISLAND
E 485600
N 5450300

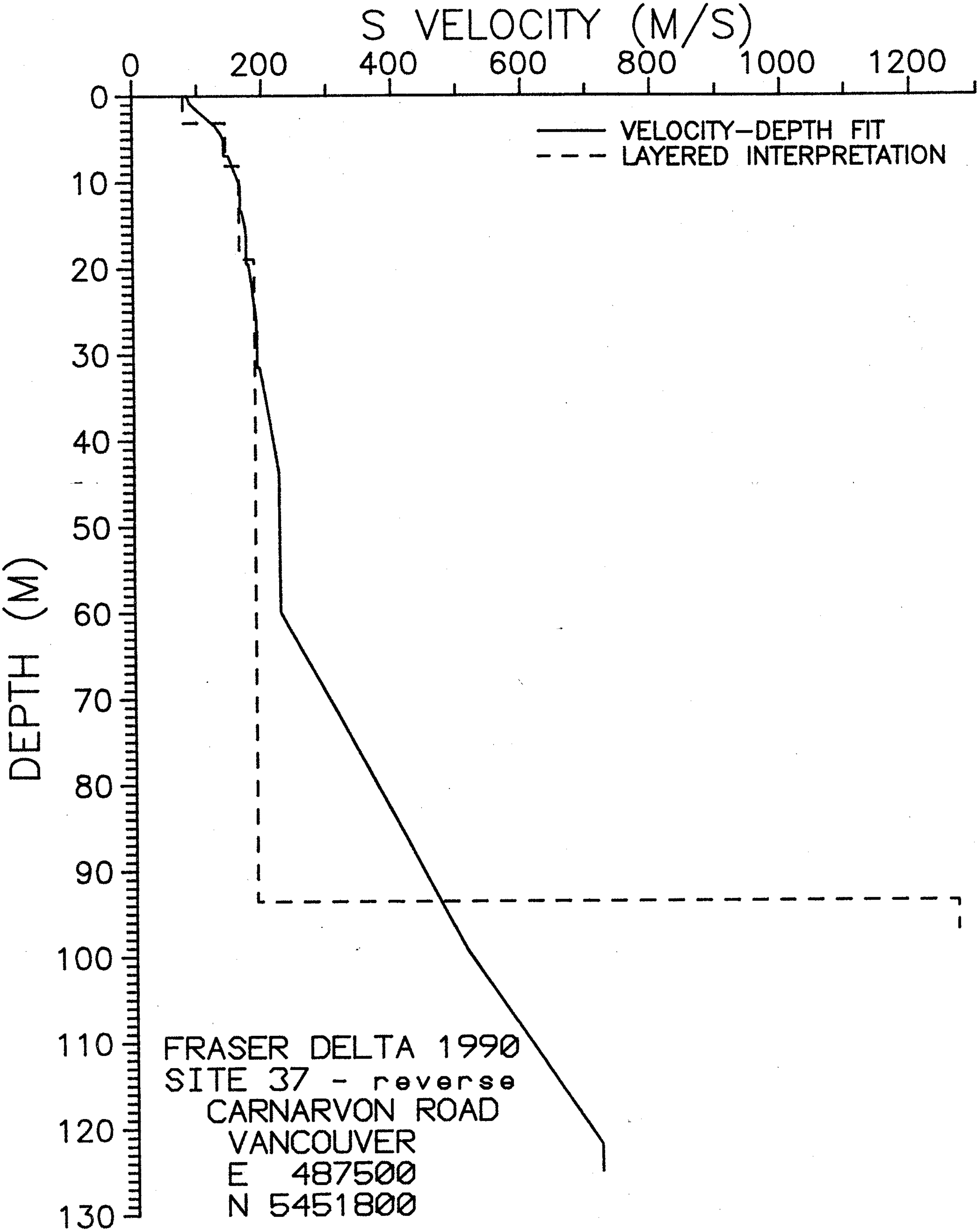


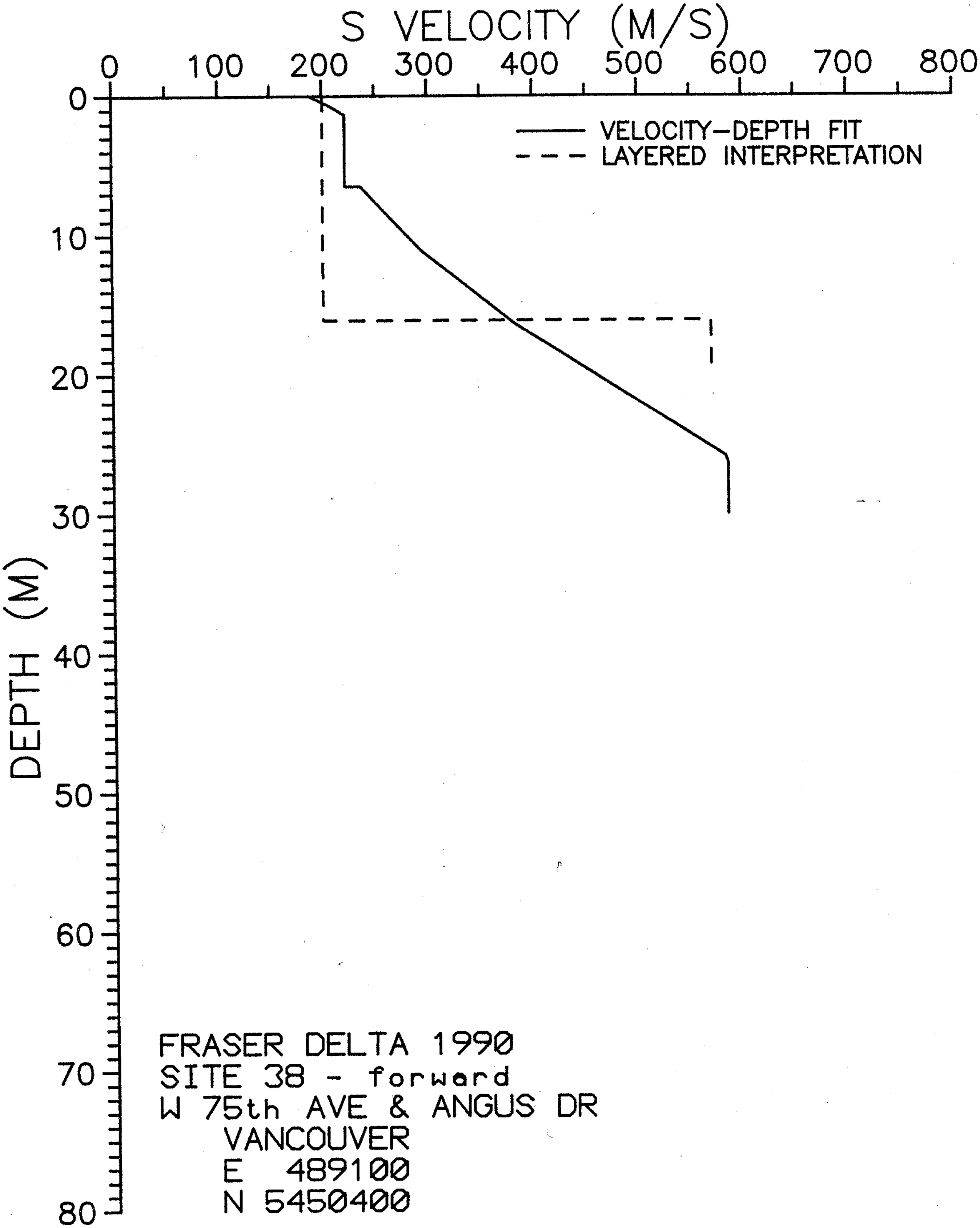
S VELOCITY (M/S)
0
200
400
600
800
1000
1200
DEPTH (M)
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160
170
180
190
200
VELOCITY–DEPTH FIT
LAYERED INTERPRETATION
FRASER DELTA 1990
SITE 36 - forward
GRAUER ROAD
SEA ISLAND
E 489600
N 5449400

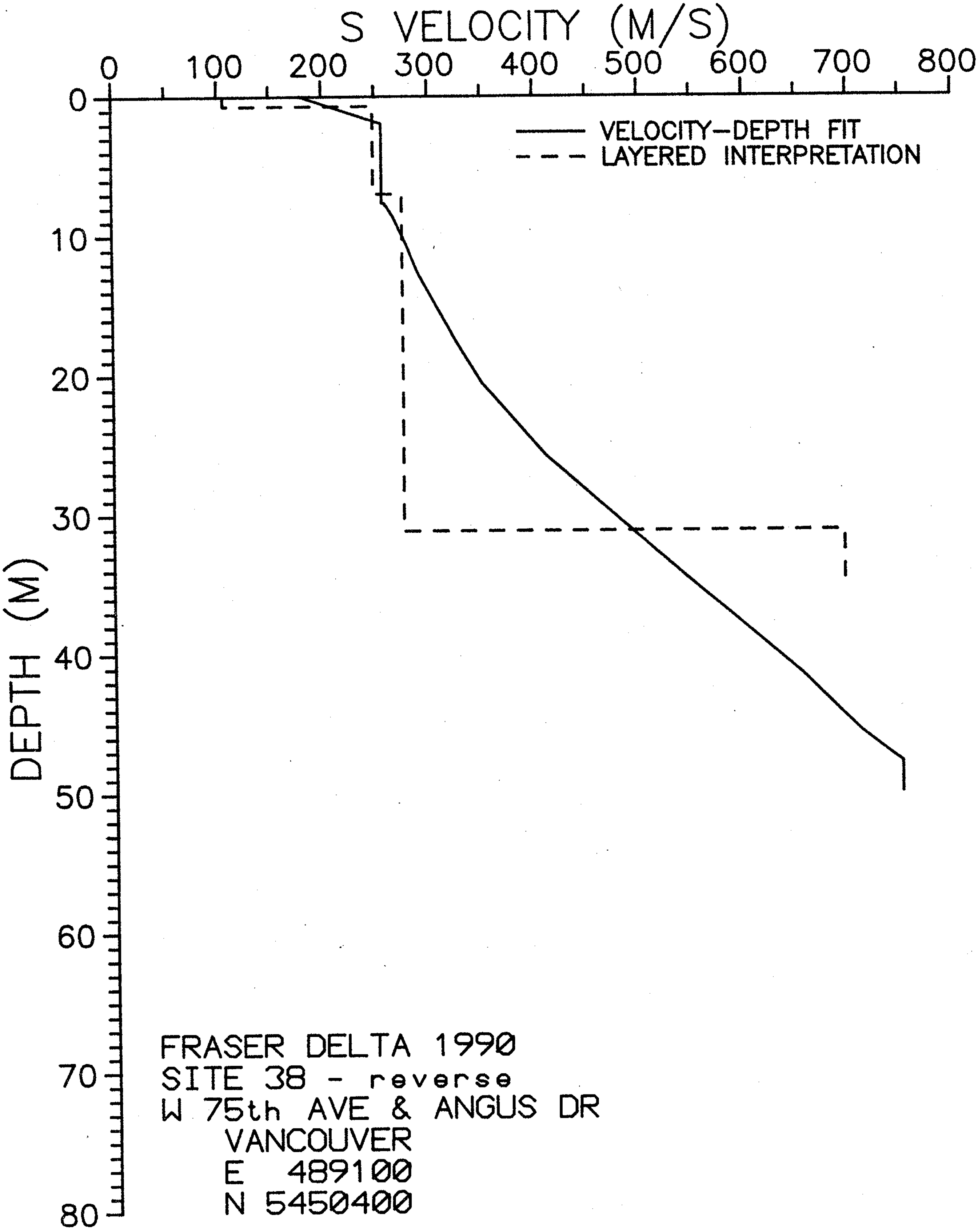


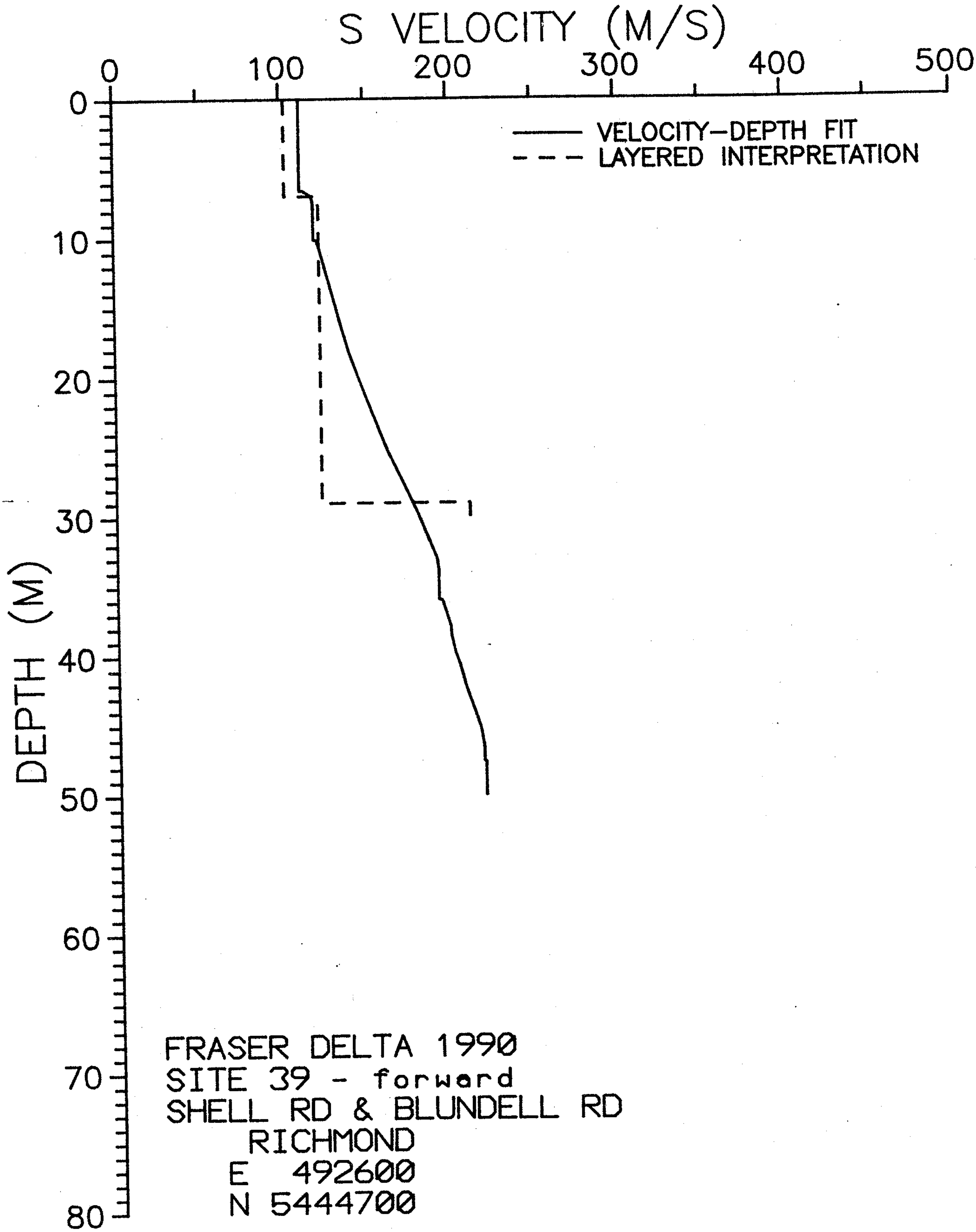
S VELOCITY (M/S)
0
200
400
600
800
1000
1200
DEPTH (M)
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160
170
180
190
200
VELOCITY–DEPTH FIT
LAYERED INTERPRETATION
FRASER DELTA 1990
SITE 36 - reverse
GRAUER ROAD
SEA ISLAND
E 489600
N 5449400

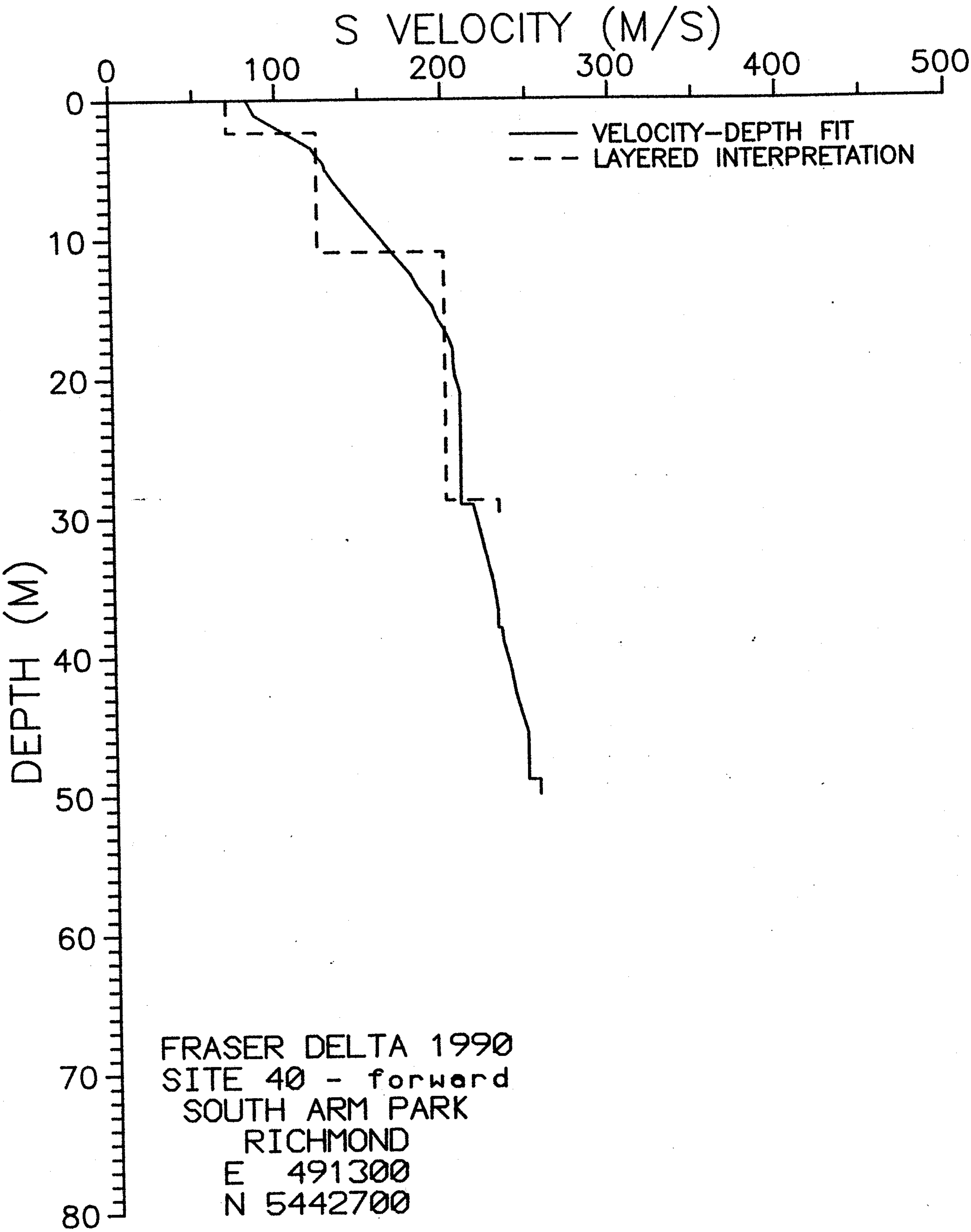

S VELOCITY (M/S)
0
200
400
600
800
1000
1200
VELOCITY-DEPTH FIT
LAYERED INTERPRETATION
DEPTH (M)
0
10
20
30
40
50
60
70
80
90
100
110
120
130
FRASER DELTA 1990
SITE 37 - forward
CARNARVON ROAD
VANCOUVER
E 487500
N 5451800


S VELOCITY (M/S)
0
200
400
600
800
1000
1200
0
10
20
30
40
50
60
70
80
90
100
110
120
130
DEPTH (M)
VELOCITY–DEPTH FIT
LAYERED INTERPRETATION
FRASER DELTA 1990
SITE 37 - reverse
CARNARVON ROAD
VANCOUVER
E 487500
N 5451800

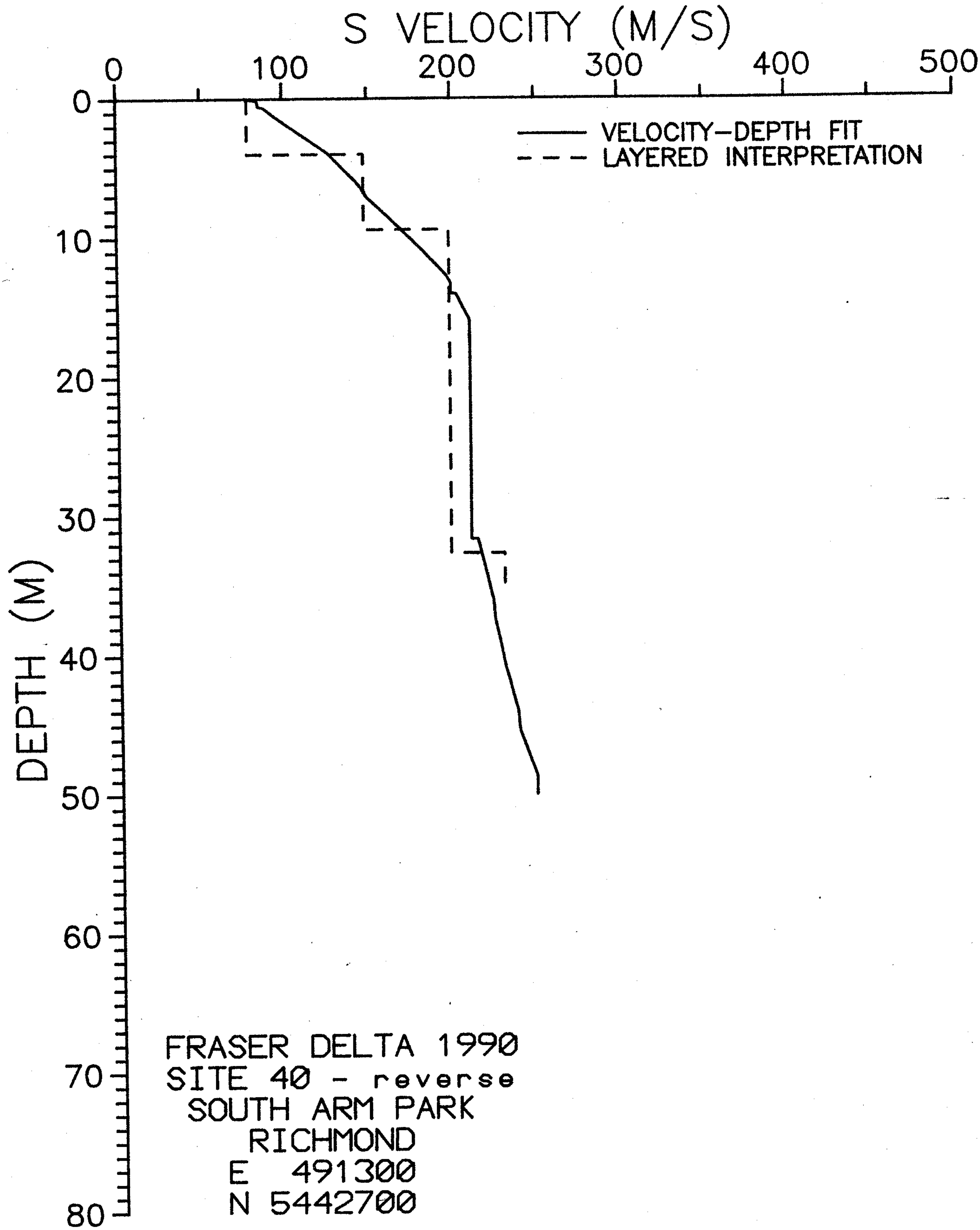

S VELOCITY (M/S)
0 100 200 300 400 500 600 700 800
0 10 20 30 40 50 60 70 80
DEPTH (M)
VELOCITY—DEPTH FIT
LAYERED INTERPRETATION
FRASER DELTA 1990
SITE 38 - forward
W 75th AVE & ANGUS DR
VANCOUVER
E 489100
N 5450400

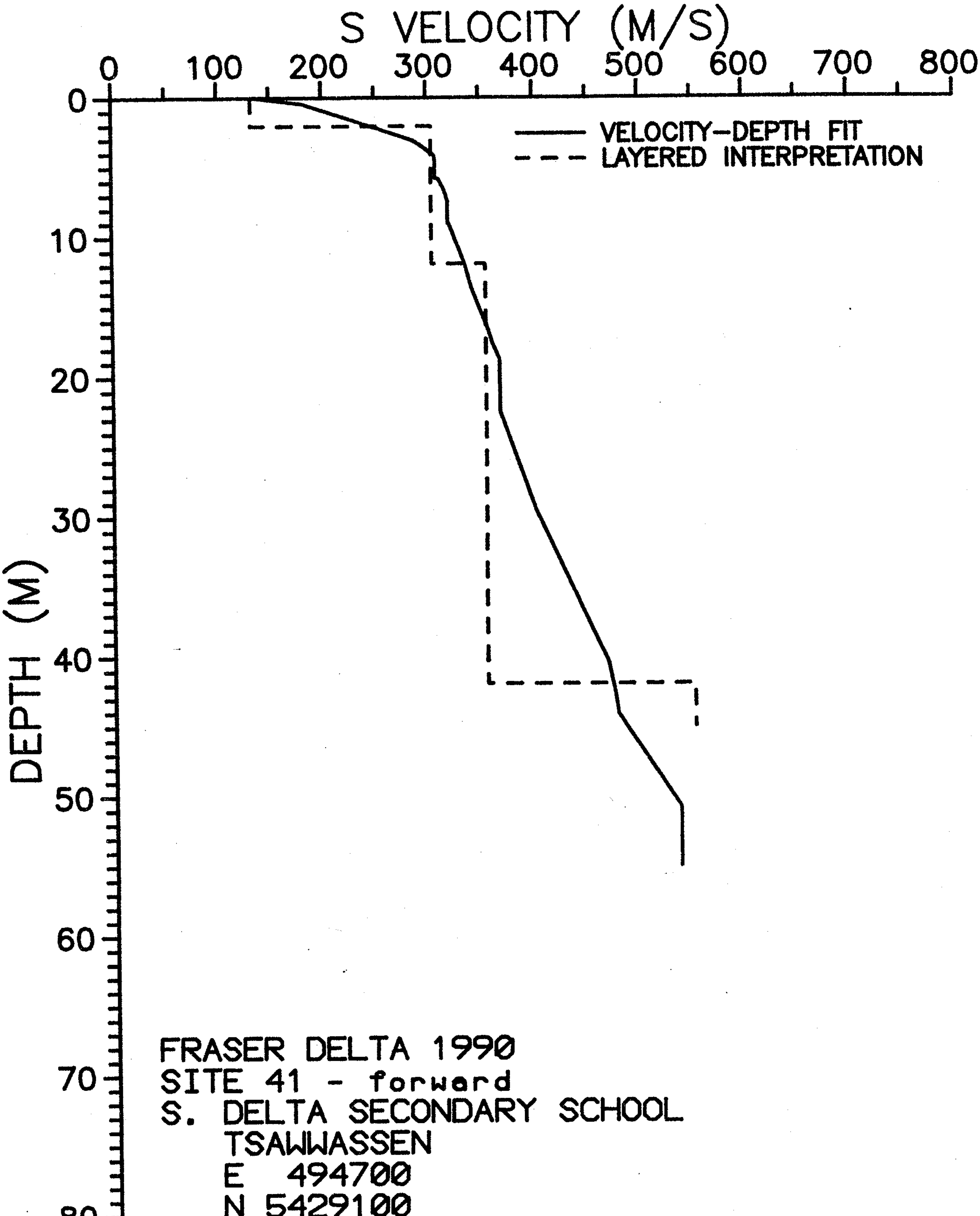

S VELOCITY (M/S)
0 100 200 300 400 500 600 700 800
0 10 20 30 40 50 60 70 80
DEPTH (M)
VELOCITY-DEPTH FIT
LAYERED INTERPRETATION
FRASER DELTA 1990
SITE 38 - reverse
W 75th AVE & ANGUS DR
VANCOUVER
E 489100
N 5450400

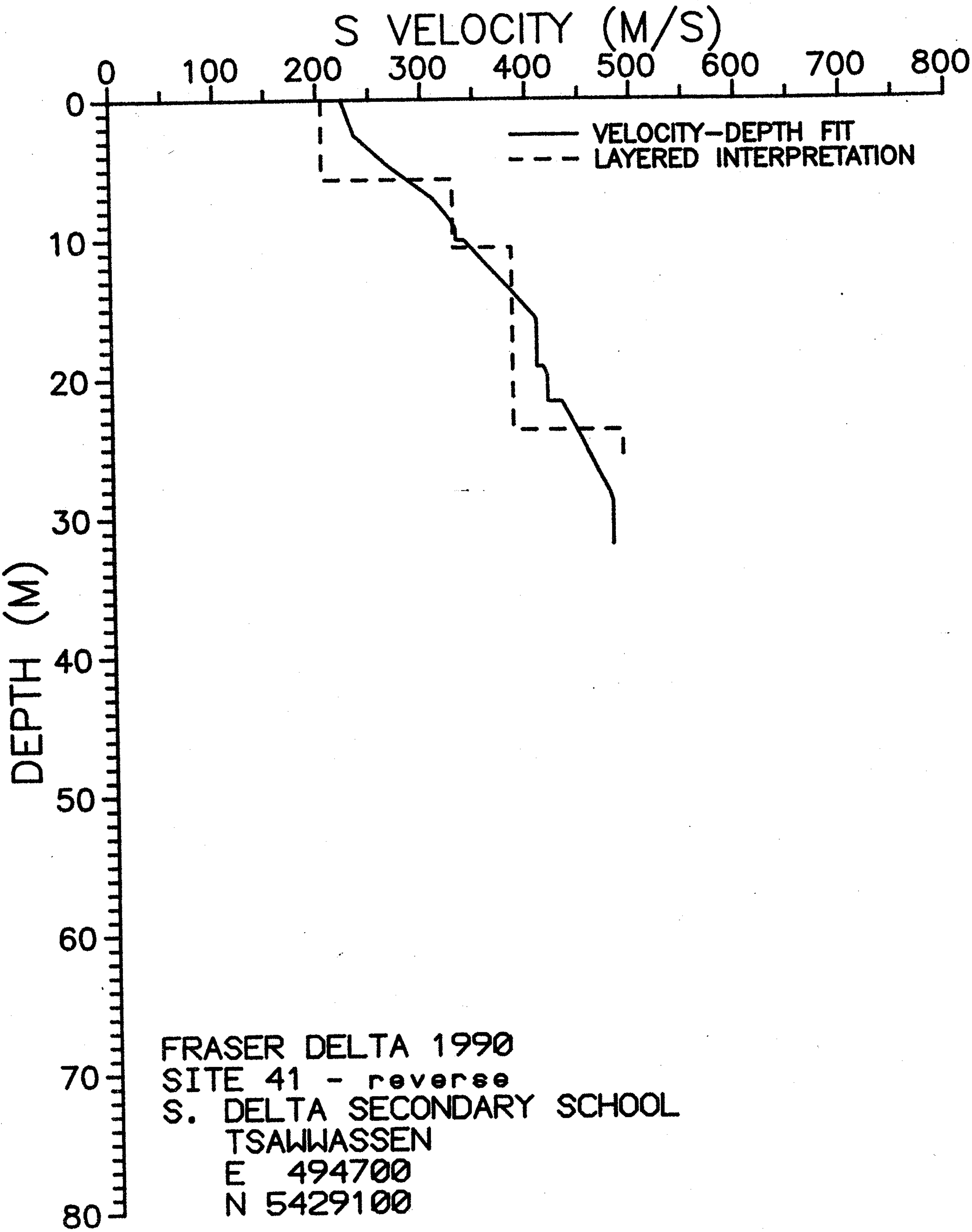

S VELOCITY (M/S)
0
100
200
300
400
500
0
10
20
30
40
50
60
70
80
DEPTH (M)
VELOCITY–DEPTH FIT
LAYERED INTERPRETATION
FRASER DELTA 1990
SITE 39 - forward
SHELL RD & BLUNDELL RD
RICHMOND
E 492600
N 5444700

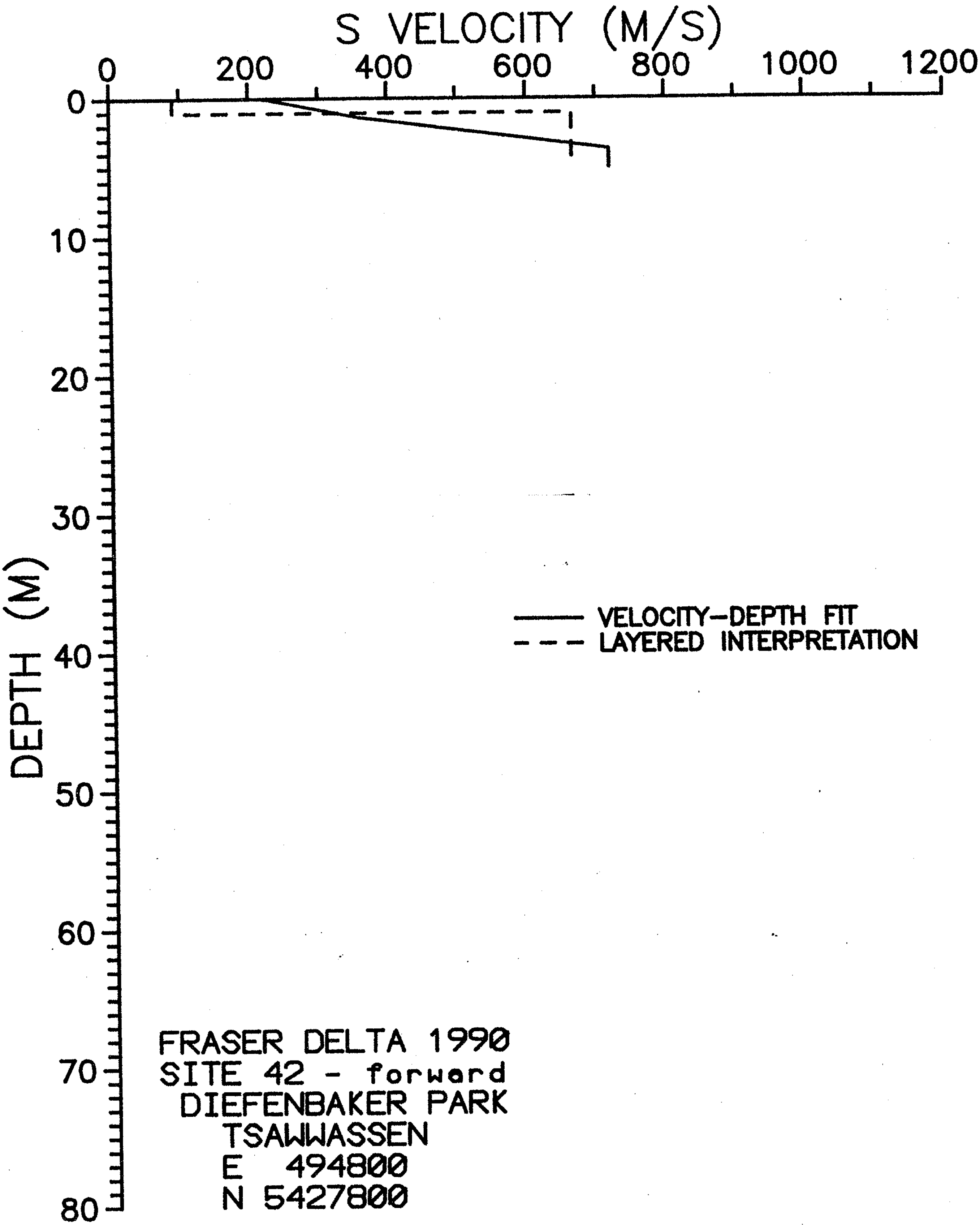


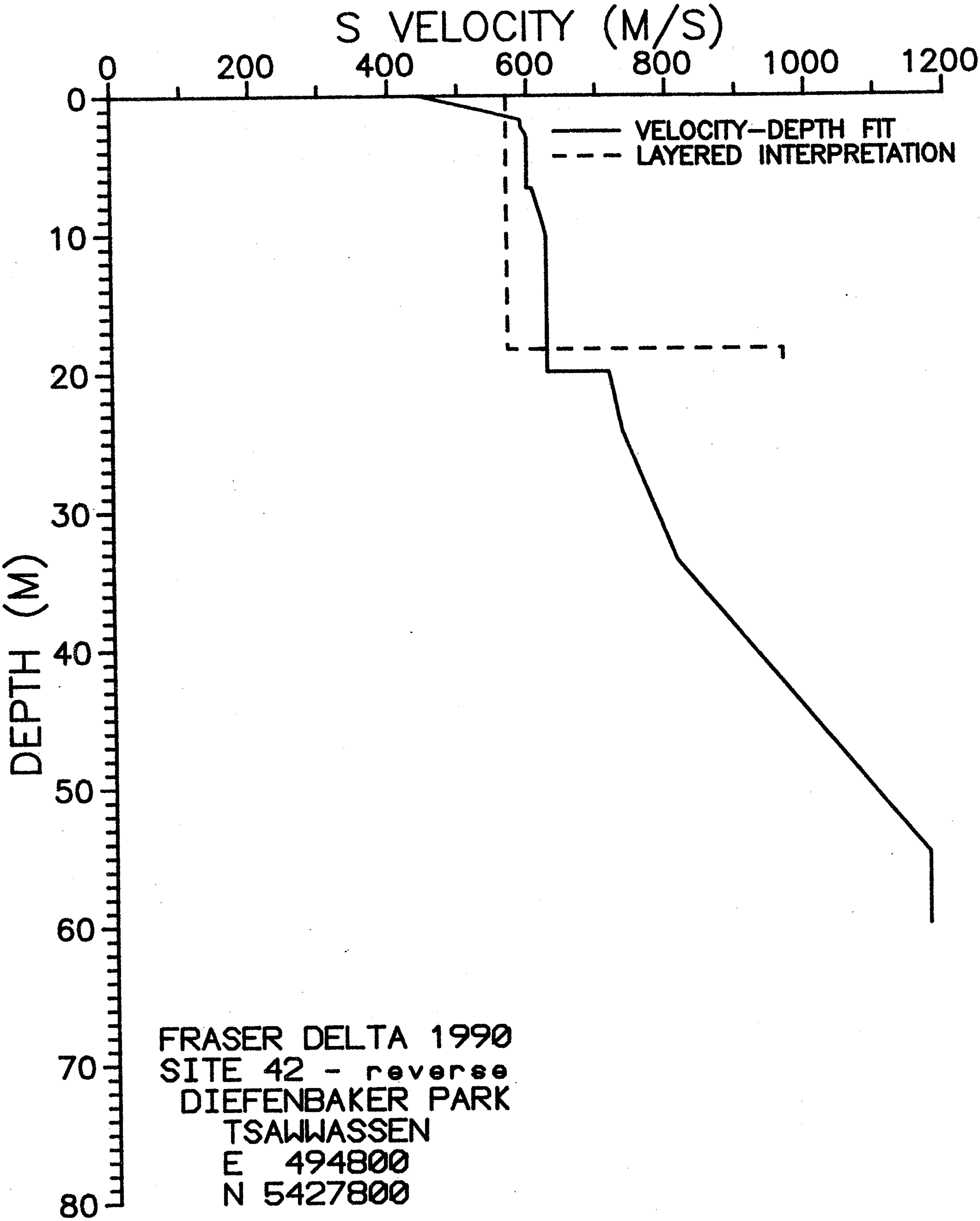
S VELOCITY (M/S)
0
100
200
300
400
500
0
10
20
30
40
50
60
70
80
DEPTH (M)
VELOCITY-DEPTH FIT
LAYERED INTERPRETATION
FRASER DELTA 1990
SITE 40 - forward
SOUTH ARM PARK
RICHMOND
E 491300
N 5442700

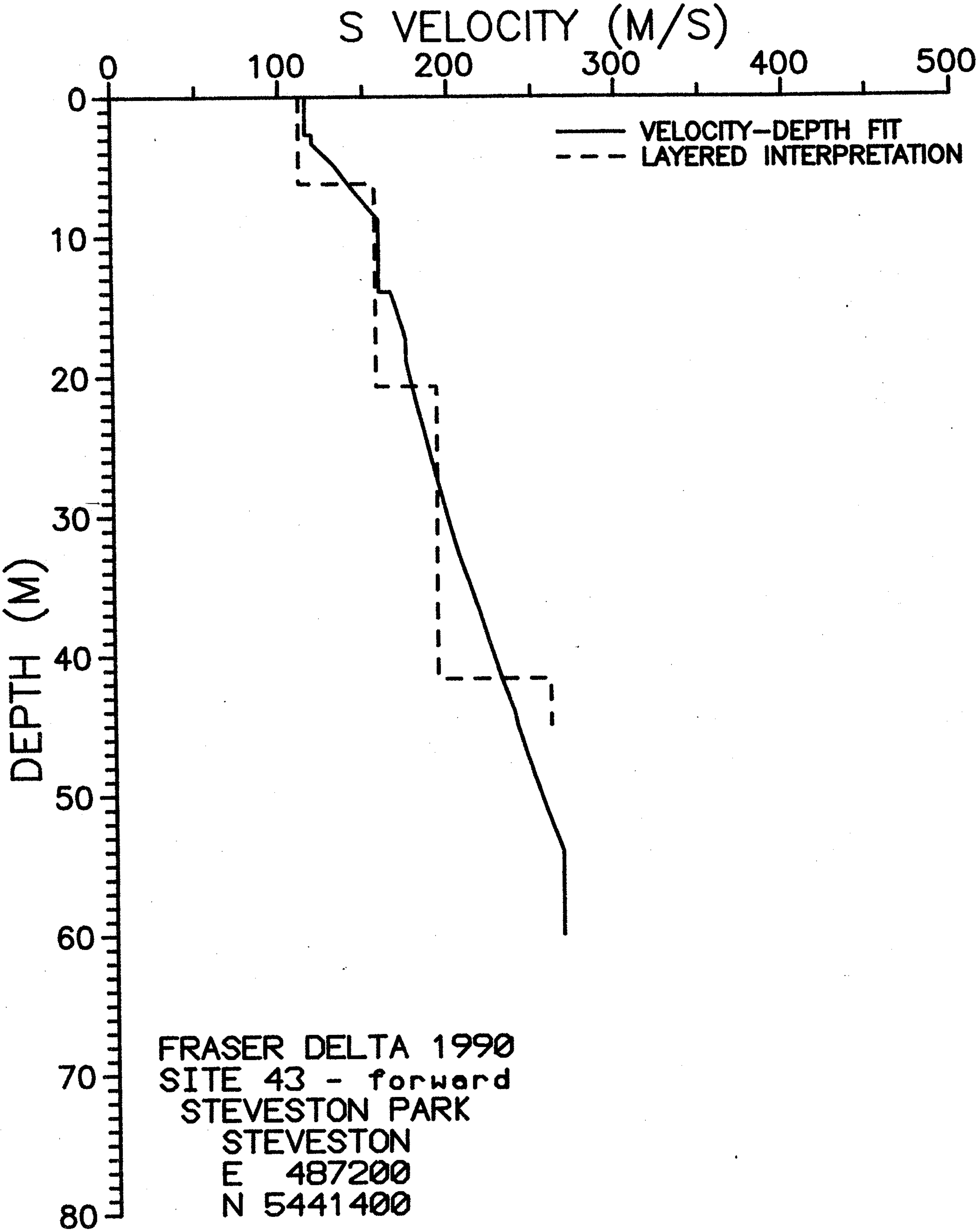

S VELOCITY (M/S)
0
100
200
300
400
500
0
10
20
30
40
50
60
70
80
DEPTH (M)
VELOCITY–DEPTH FIT
LAYERED INTERPRETATION
FRASER DELTA 1990
SITE 40 - reverse
SOUTH ARM PARK
RICHMOND
E 491300
N 5442700

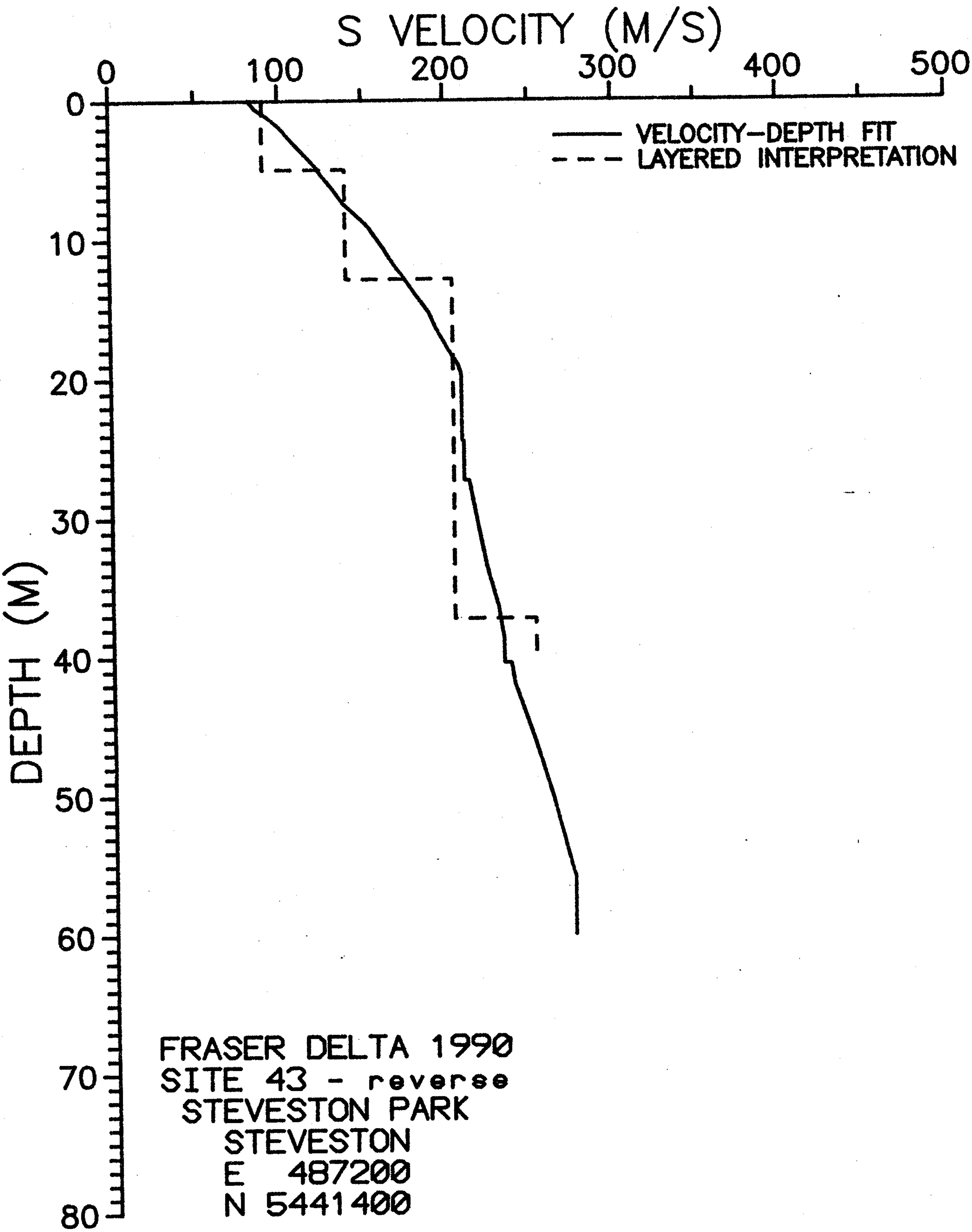

S VELOCITY (M/S)
0 100 200 300 400 500 600 700 800
0 10 20 30 40 50 60 70 80
DEPTH (M)
VELOCITY-DEPTH FIT
LAYERED INTERPRETATION
FRASER DELTA 1990
SITE 41 - forward
S. DELTA SECONDARY SCHOOL
TSAWWASSEN
E 494700
N 5429100

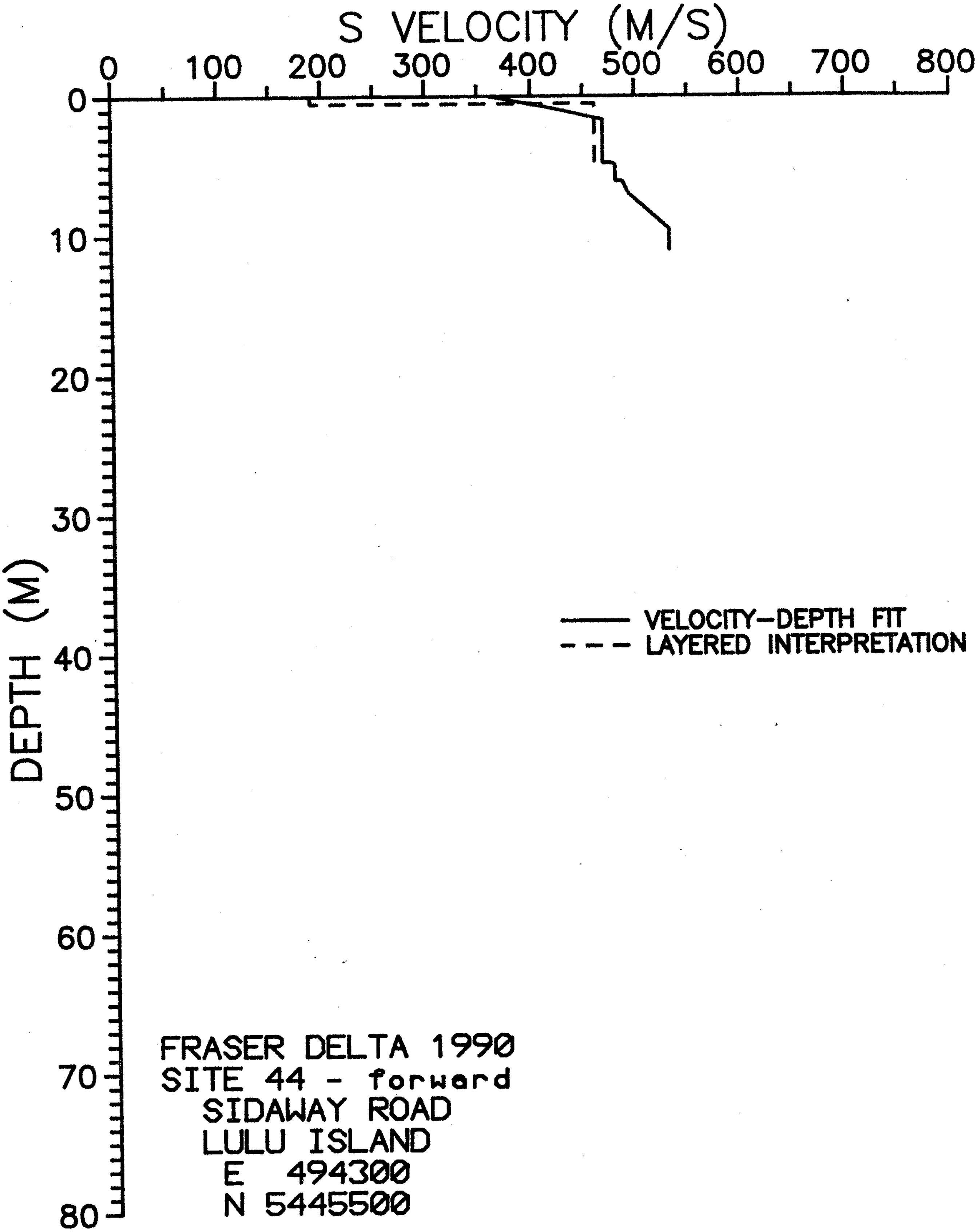

S VELOCITY (M/S)
0 100 200 300 400 500 600 700 800
DEPTH (M)
0 10 20 30 40 50 60 70 80
VELOCITY-DEPTH FIT
LAYERED INTERPRETATION
FRASER DELTA 1990
SITE 41 - reverse
S. DELTA SECONDARY SCHOOL
TSAWWASSEN
E 494700
N 5429100

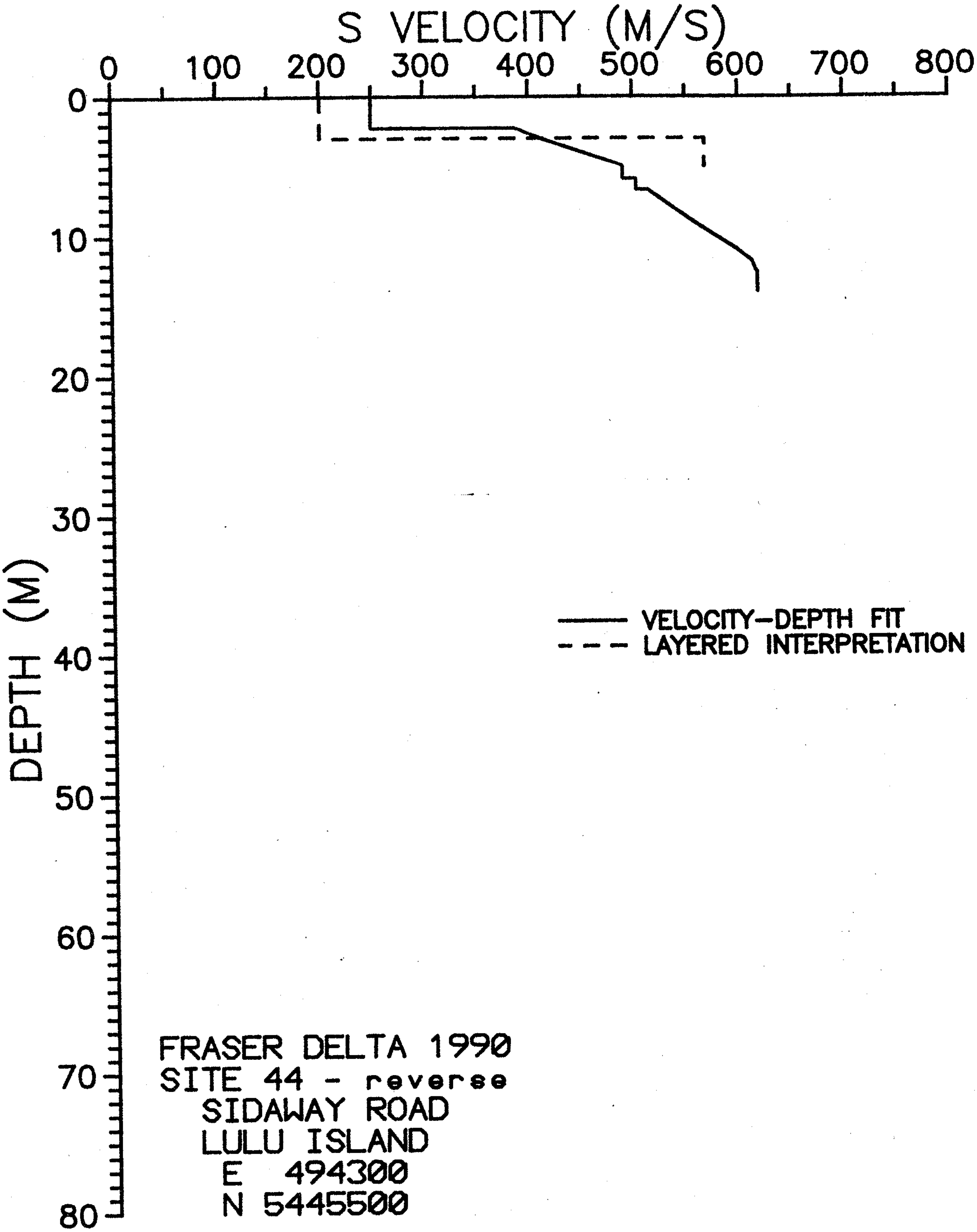

S VELOCITY (M/S)
0
200
400
600
800
1000
1200
0
10
20
30
40
50
60
70
80
DEPTH (M)
VELOCITY-DEPTH FIT
LAYERED INTERPRETATION
FRASER DELTA 1990
SITE 42 - forward
DIEFENBAKER PARK
TSAWWASSEN
E 494800
N 5427800

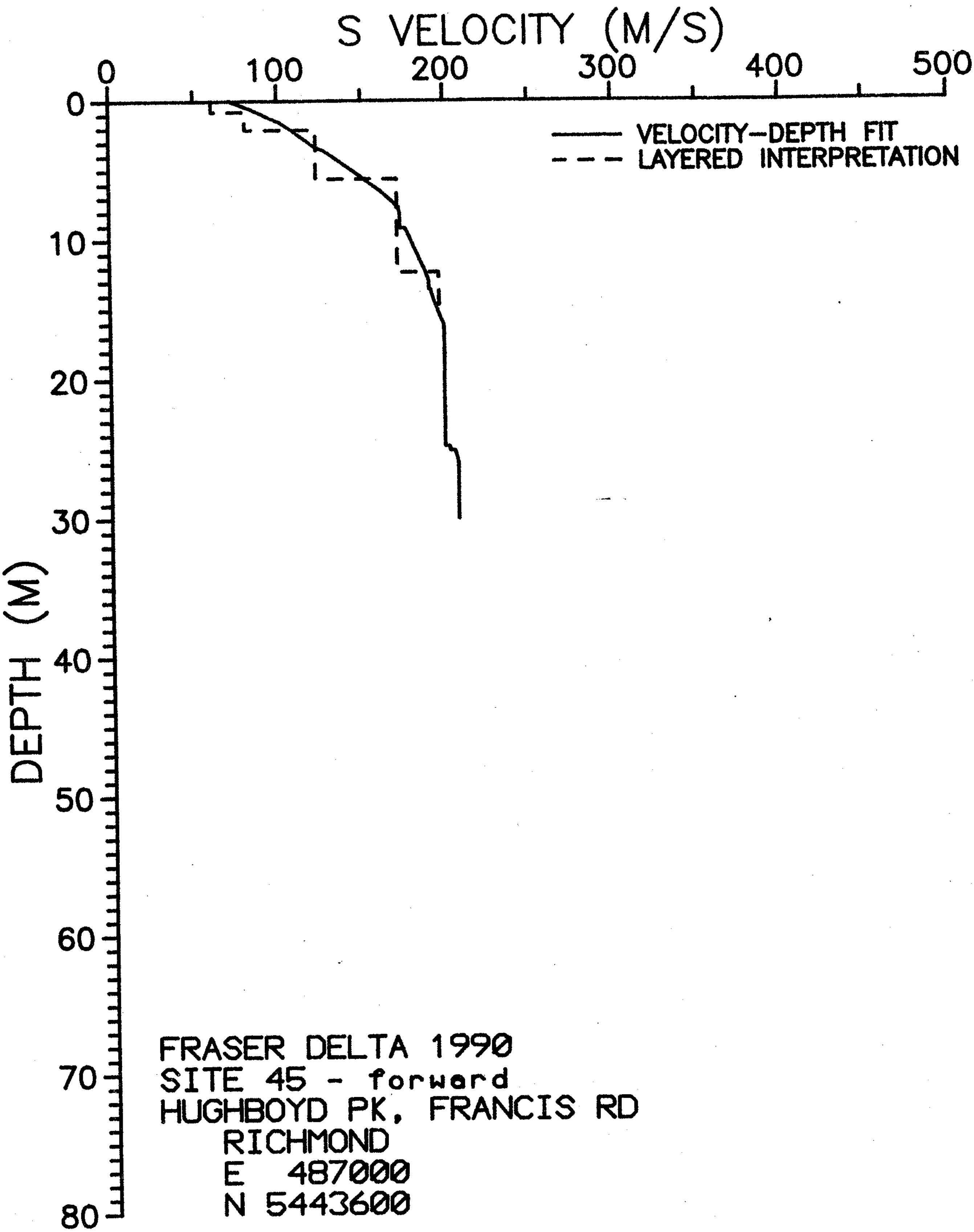

S VELOCITY (M/S)
0
200
400
600
800
1000
1200
VELOCITY—DEPTH FIT
LAYERED INTERPRETATION
DEPTH (M)
0
10
20
30
40
50
60
70
80
1
FRASER DELTA 1990
SITE 42 - reverse
DIEFENBAKER PARK
TSAWWASSEN
E 494800
N 5427800


S VELOCITY (M/S)
0
100
200
300
400
500
0
10
20
30
40
50
60
70
80
DEPTH (M)
VELOCITY-DEPTH FIT
LAYERED INTERPRETATION
FRASER DELTA 1990
SITE 43 - forward
STEVESTON PARK
STEVESTON
E 487200
N 5441400

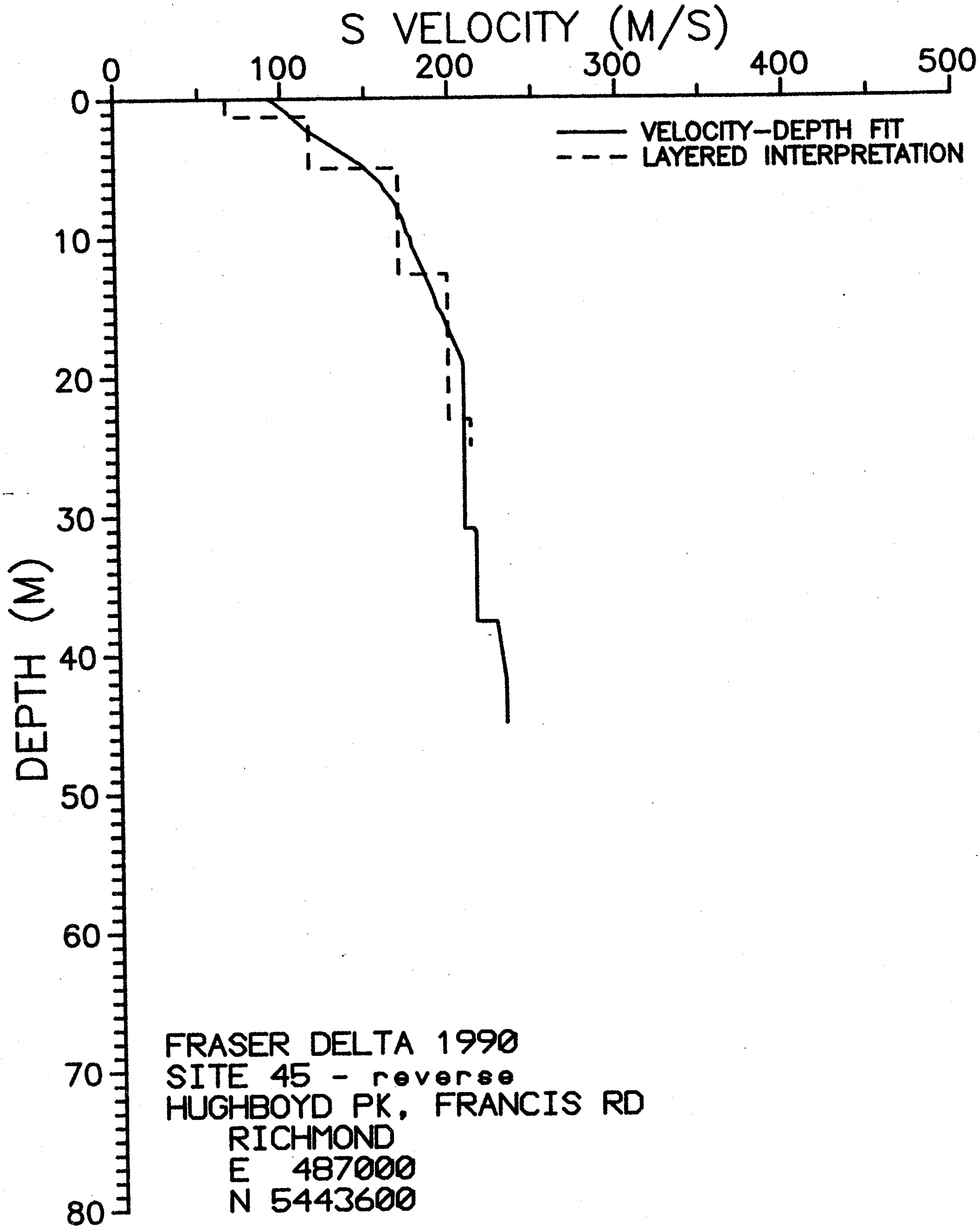

S VELOCITY (M/S)
0
100
200
300
400
500
0
10
20
30
40
50
60
70
80
DEPTH (M)
VELOCITY–DEPTH FIT
LAYERED INTERPRETATION
FRASER DELTA 1990
SITE 43 - reverse
STEVESTON PARK
STEVESTON
E 487200
N 5441400

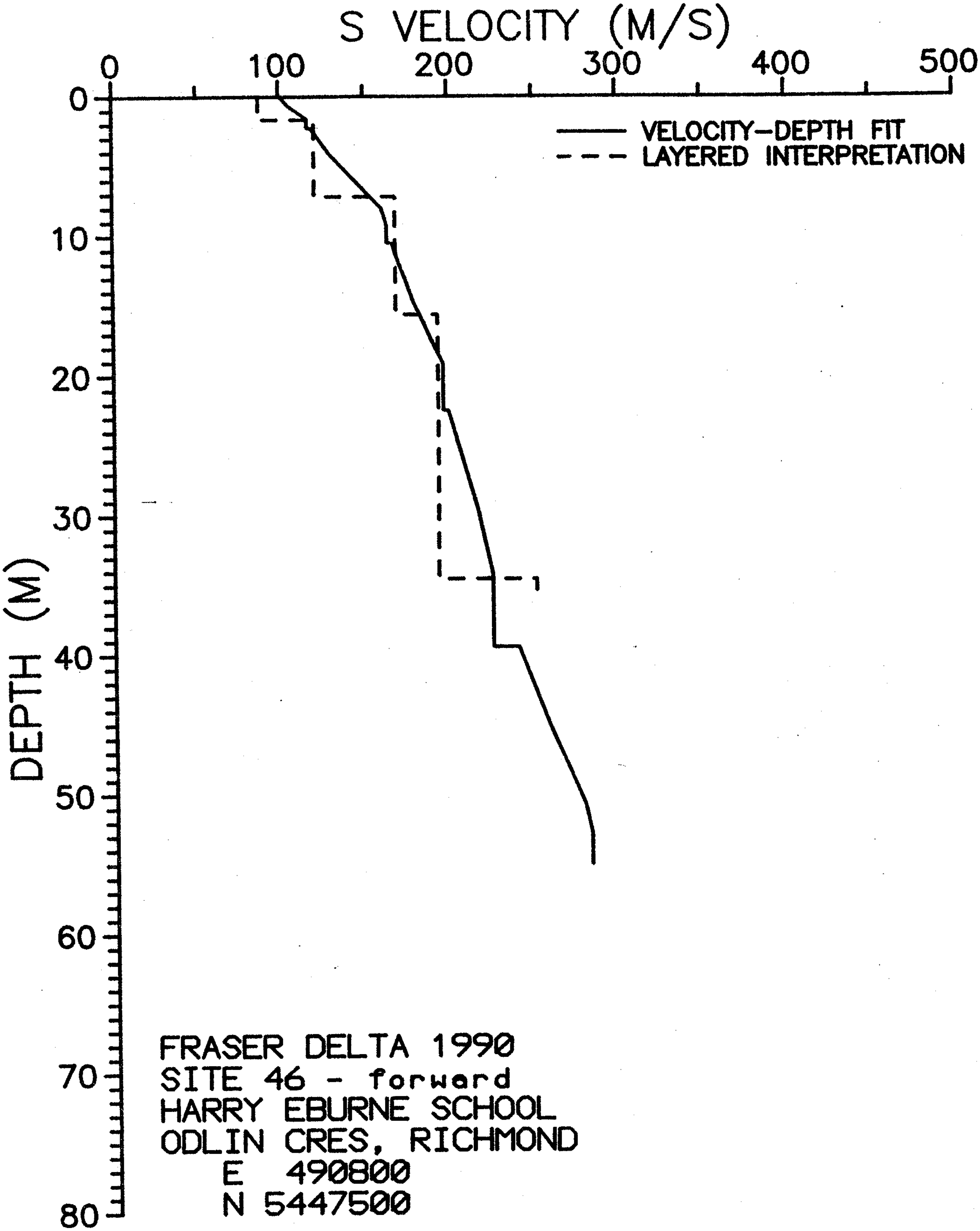

S VELOCITY (M/S)
0
100
200
300
400
500
600
700
800
DEPTH (M)
0
10
20
30
40
50
60
70
80
VELOCITY-DEPTH FIT
LAYERED INTERPRETATION
FRASER DELTA 1990
SITE 44 - forward
SIDAWAY ROAD
LULU ISLAND
E 494300
N 5445500

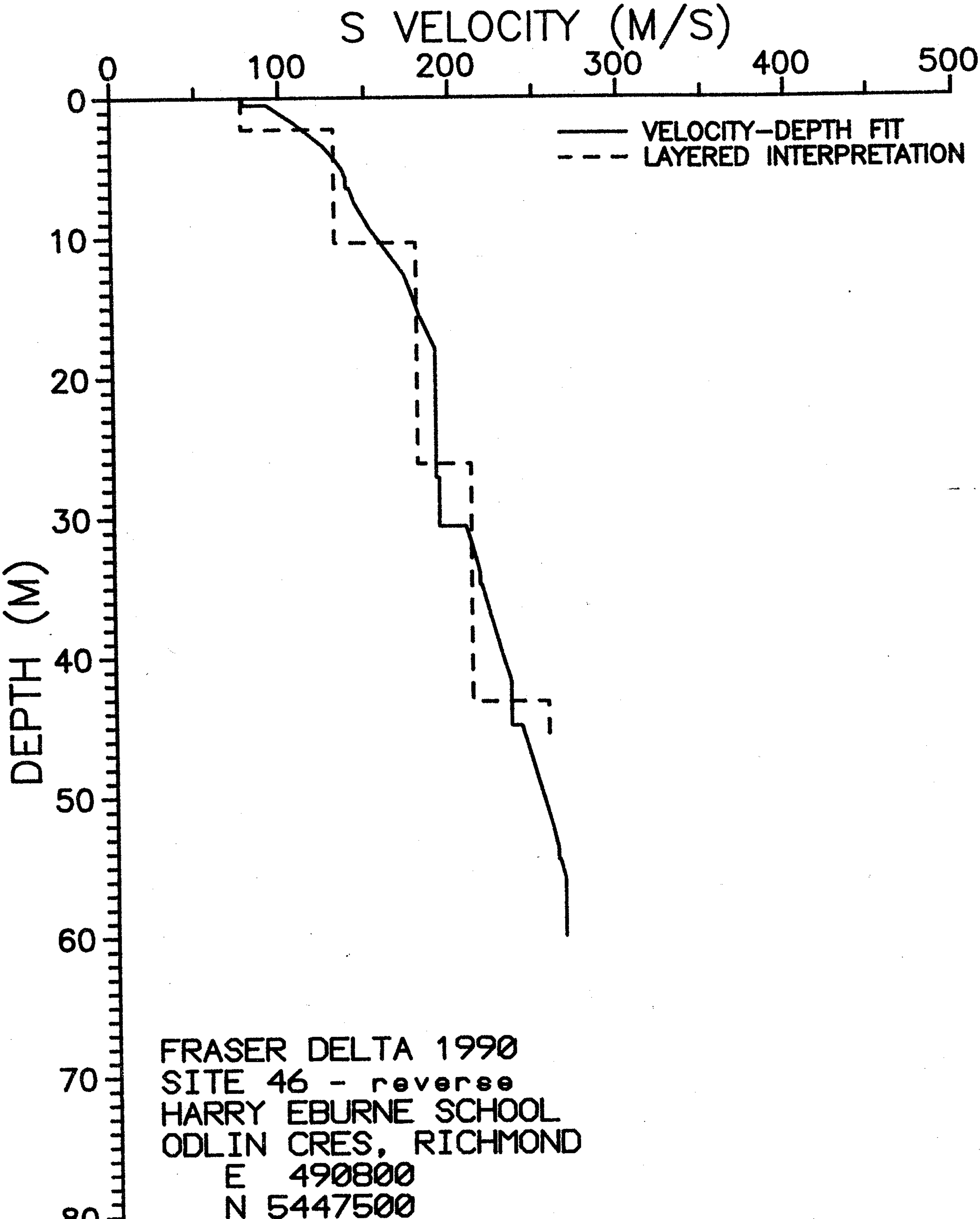

S VELOCITY (M/S)
0 100 200 300 400 500 600 700 800
0 10 20 30 40 50 60 70 80
DEPTH (M)
VELOCITY-DEPTH FIT
LAYERED INTERPRETATION
FRASER DELTA 1990
SITE 44 - reverse
SIDAWAY ROAD
LULU ISLAND
E 494300
N 5445500

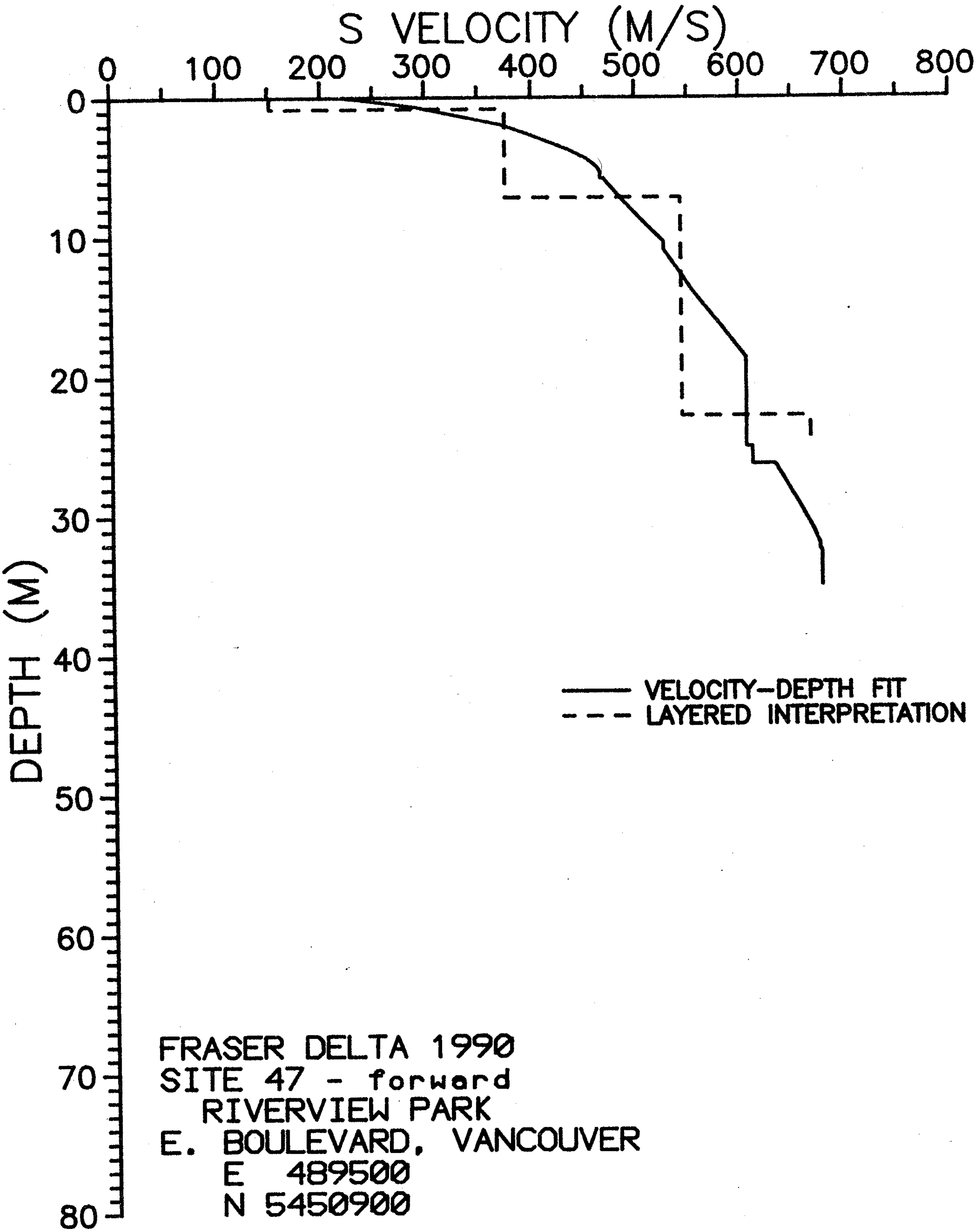


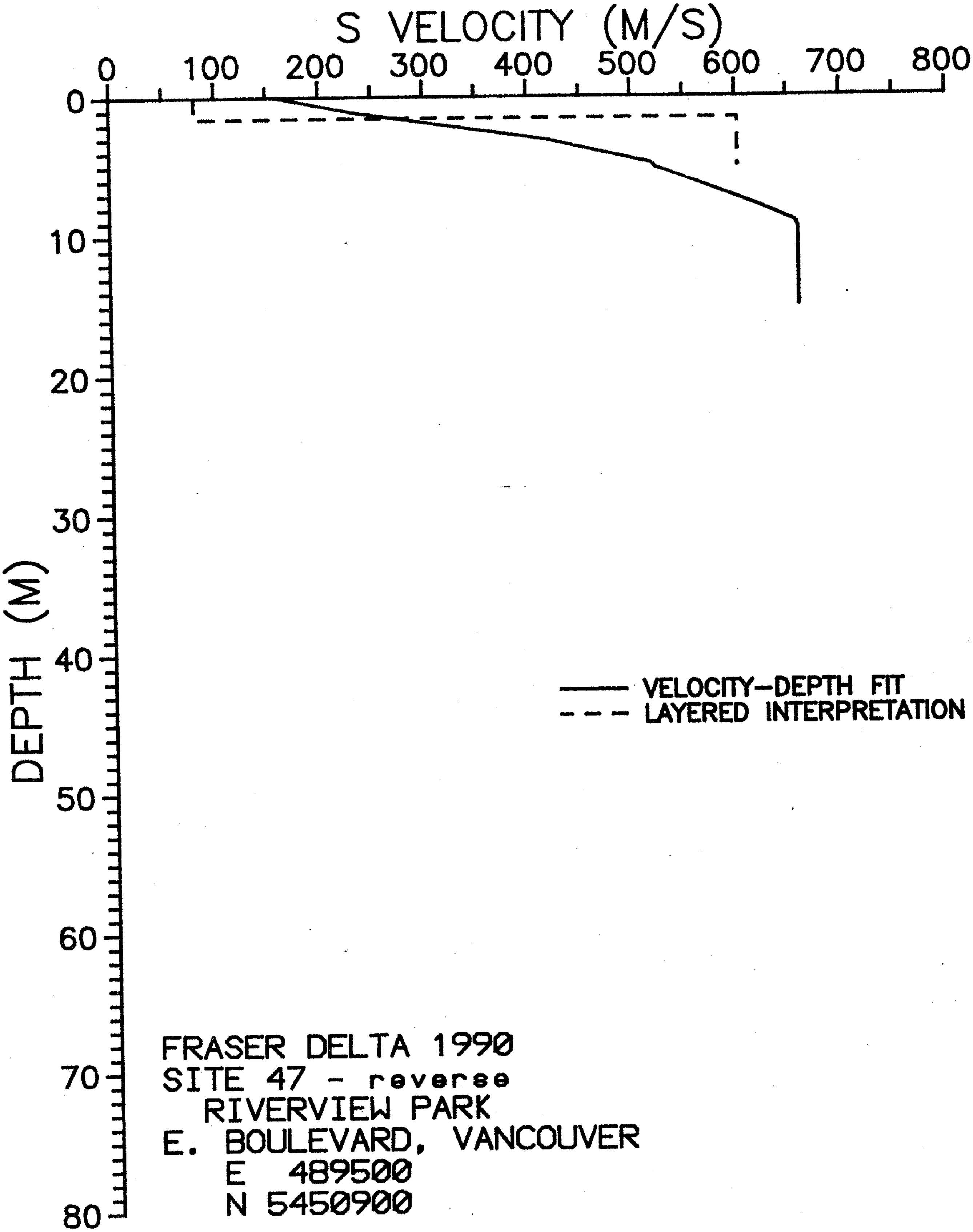
S VELOCITY (M/S)
0
100
200
300
400
500
VELOCITY-DEPTH FIT
LAYERED INTERPRETATION
DEPTH (M)
0
10
20
30
40
50
60
70
80
FRASER DELTA 1990
SITE 45 - forward
HUGHBOYD PK, FRANCIS RD
RICHMOND
E 487000
N 5443600

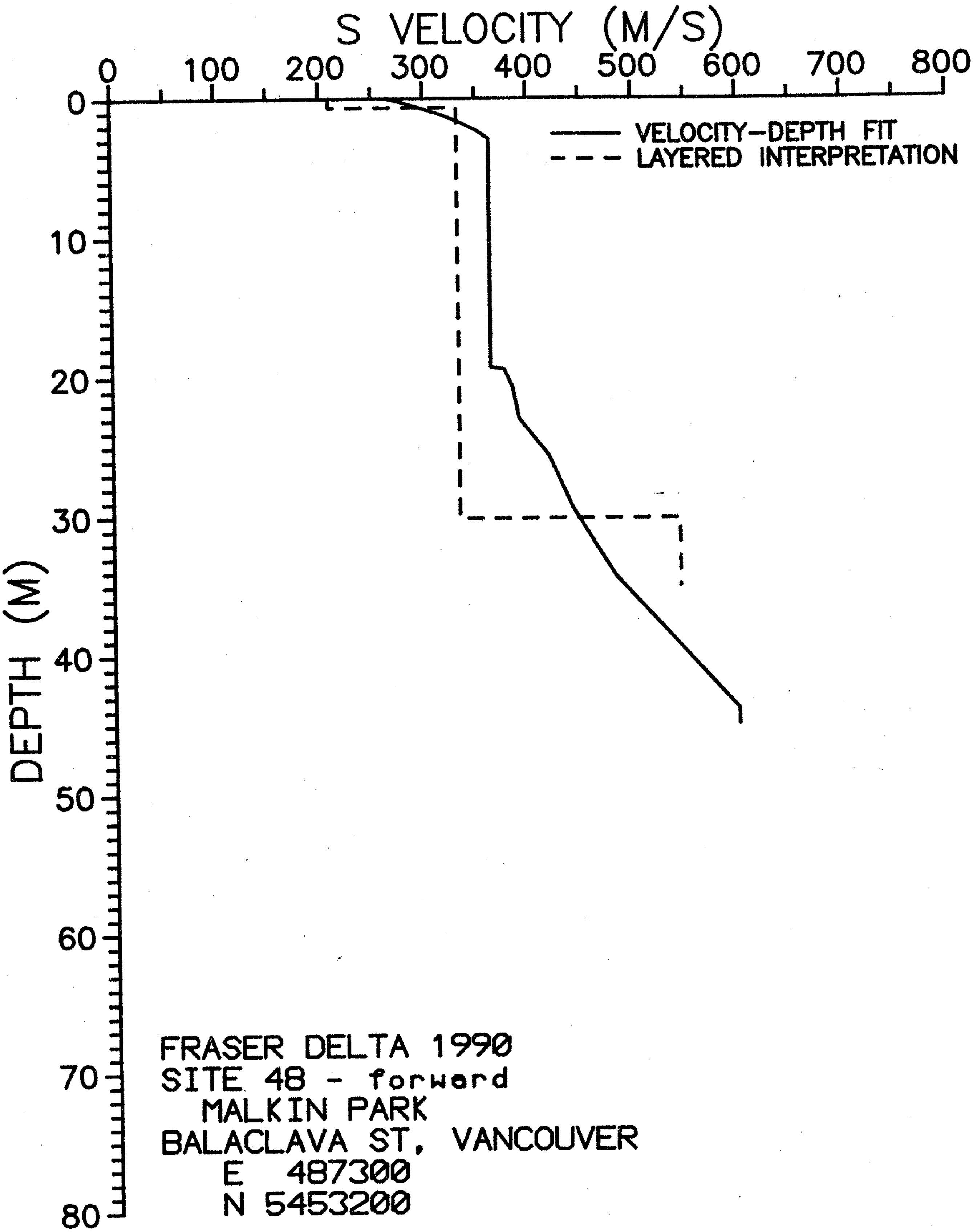

S VELOCITY (M/S)
0
100
200
300
400
500
0
10
20
30
40
50
60
70
80
DEPTH (M)
VELOCITY–DEPTH FIT
LAYERED INTERPRETATION
FRASER DELTA 1990
SITE 45 - reverse
HUGHBOYD PK, FRANCIS RD
RICHMOND
E 487000
N 5443600

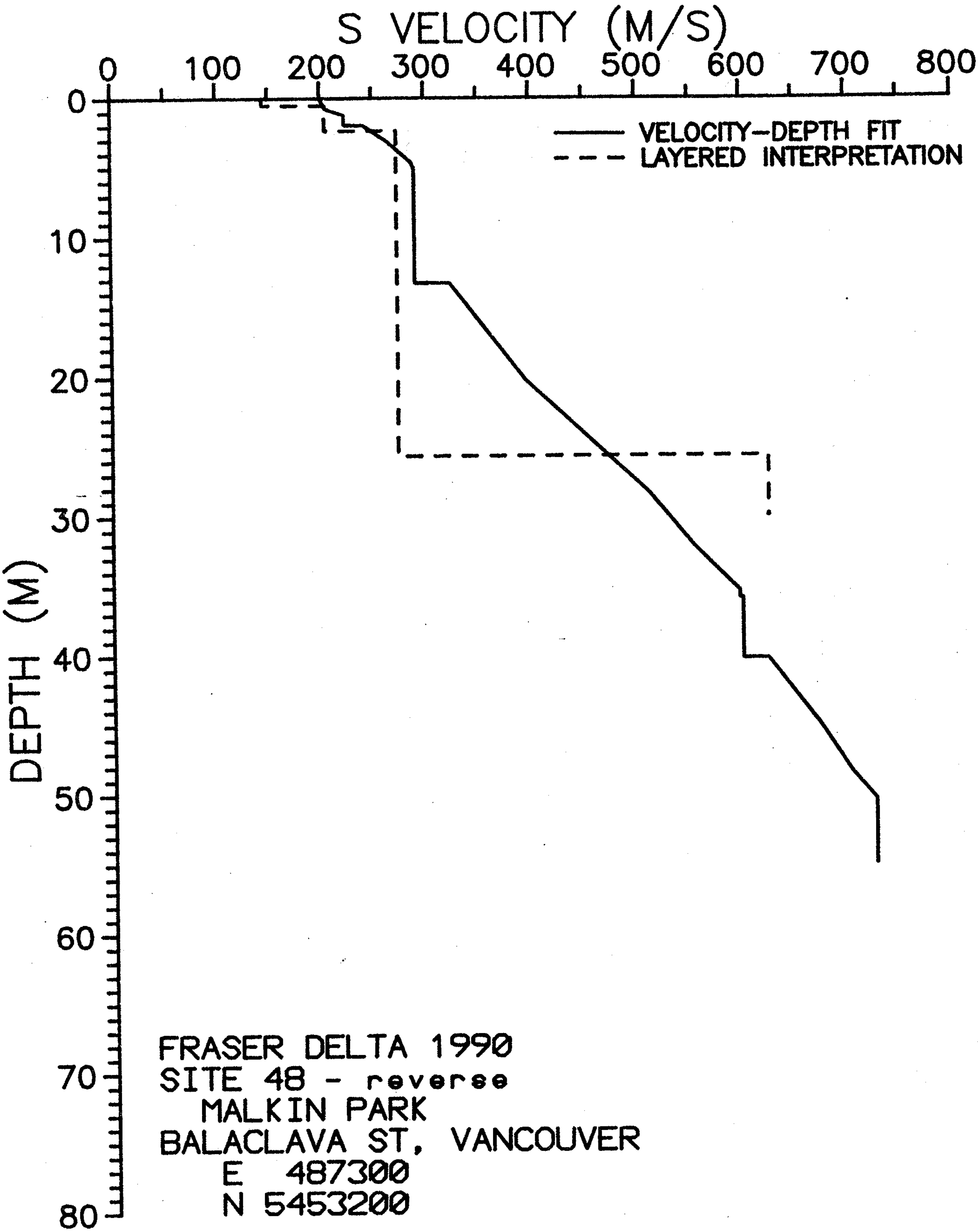

S VELOCITY (M/S)
0
100
200
300
400
500
VELOCITY-DEPTH FIT
LAYERED INTERPRETATION
DEPTH (M)
0
10
20
30
40
50
60
70
80
FRASER DELTA 1990
SITE 46 - forward
HARRY EBURNE SCHOOL
ODLIN CRES, RICHMOND
E 490800
N 5447500

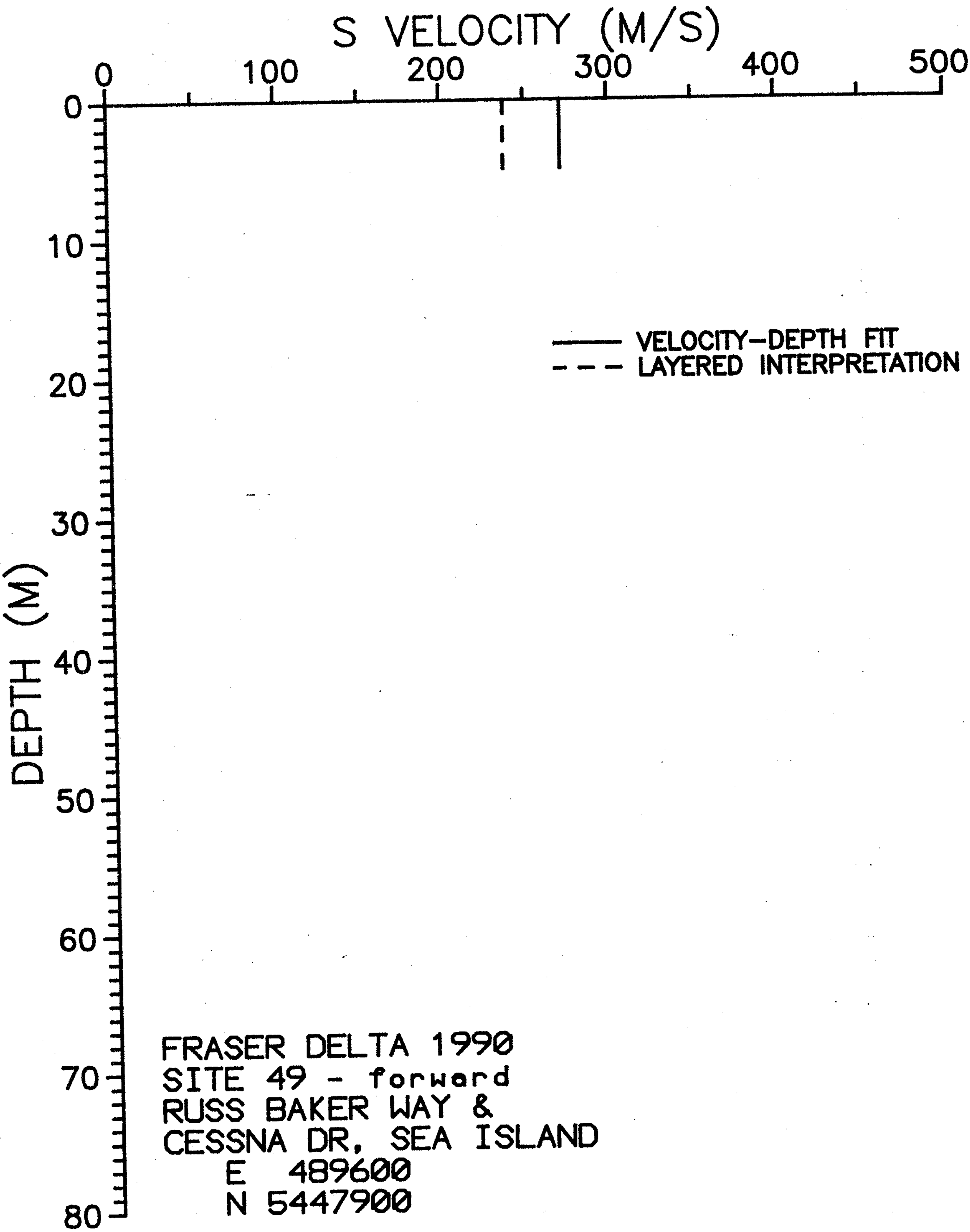

S VELOCITY (M/S)
0
100
200
300
400
500
0
10
20
30
40
50
60
70
80
DEPTH (M)
VELOCITY-DEPTH FIT
LAYERED INTERPRETATION
FRASER DELTA 1990
SITE 46 - reverse
HARRY EBURNE SCHOOL
ODLIN CRES, RICHMOND
E 490800
N 5447500

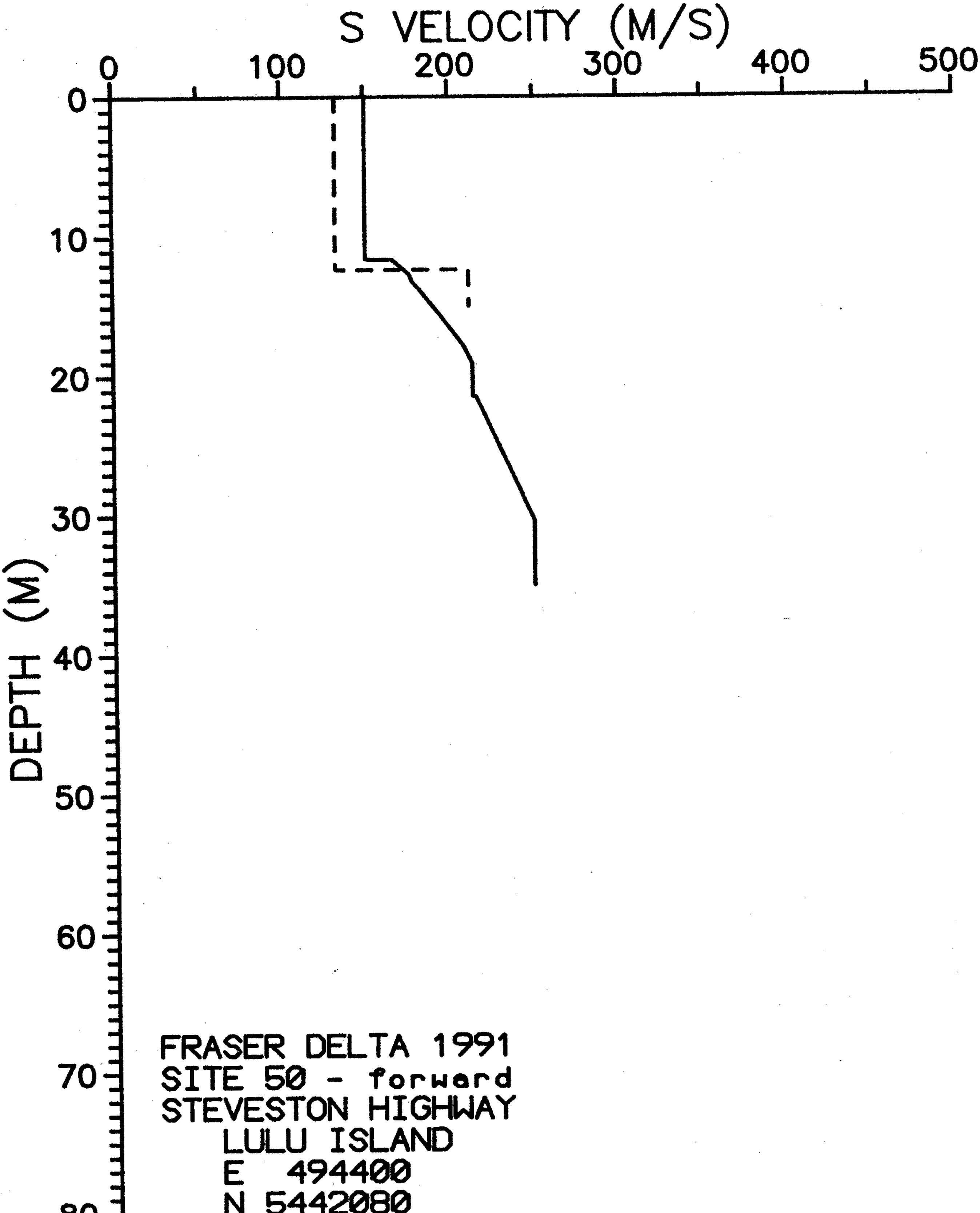

S VELOCITY (M/S)
0 100 200 300 400 500 600 700 800
DEPTH (M)
0 10 20 30 40 50 60 70 80
VELOCITY-DEPTH FIT
LAYERED INTERPRETATION
FRASER DELTA 1990
SITE 47 - forward
RIVERVIEW PARK
E. BOULEVARD, VANCOUVER
E 489500
N 5450900

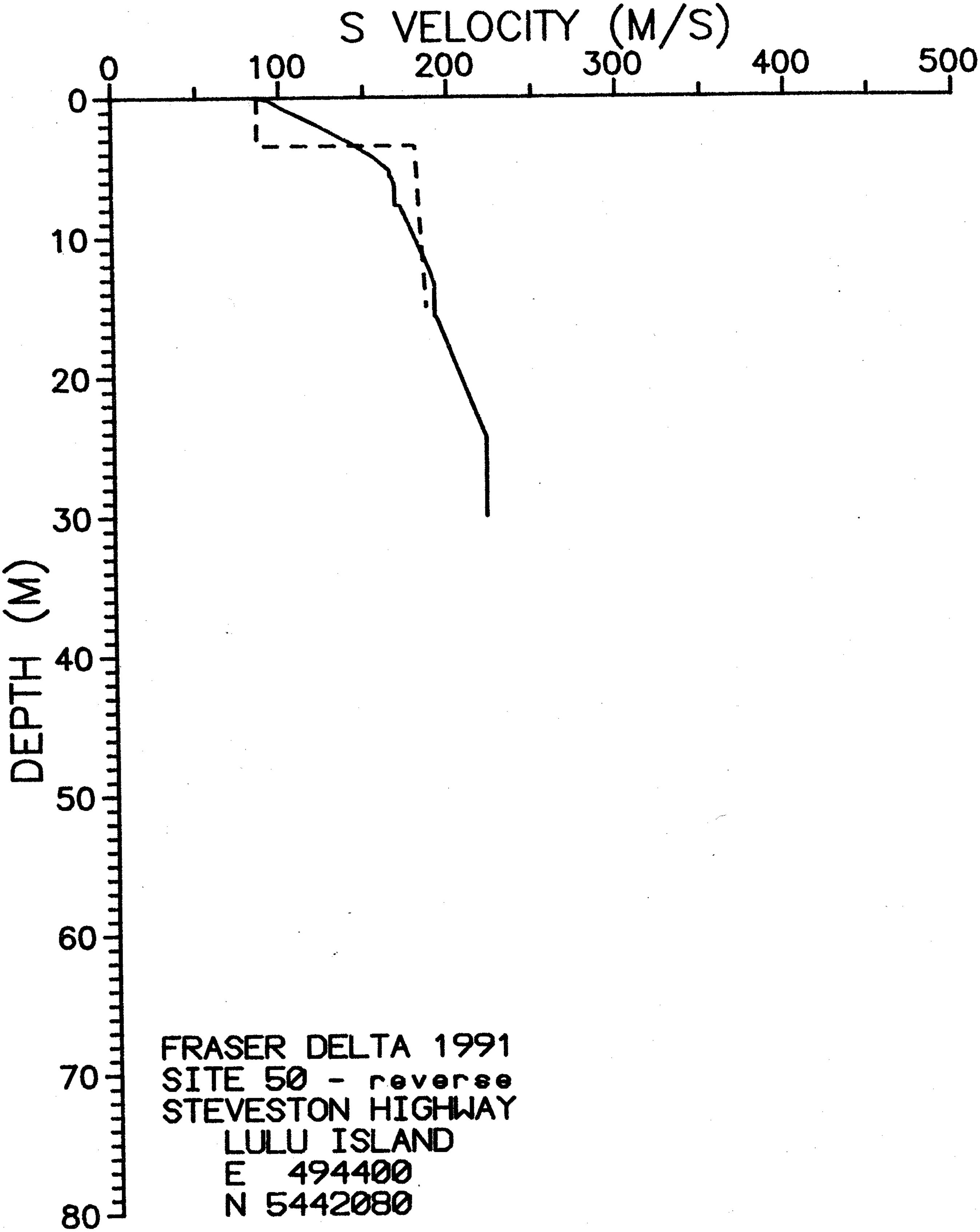

S VELOCITY (M/S)
0
100
200
300
400
500
600
700
800
DEPTH (M)
0
10
20
30
40
50
60
70
80
VELOCITY-DEPTH FIT
LAYERED INTERPRETATION
FRASER DELTA 1990
SITE 47 - reverse
RIVERVIEW PARK
E. BOULEVARD, VANCOUVER
E 489500
N 5450900

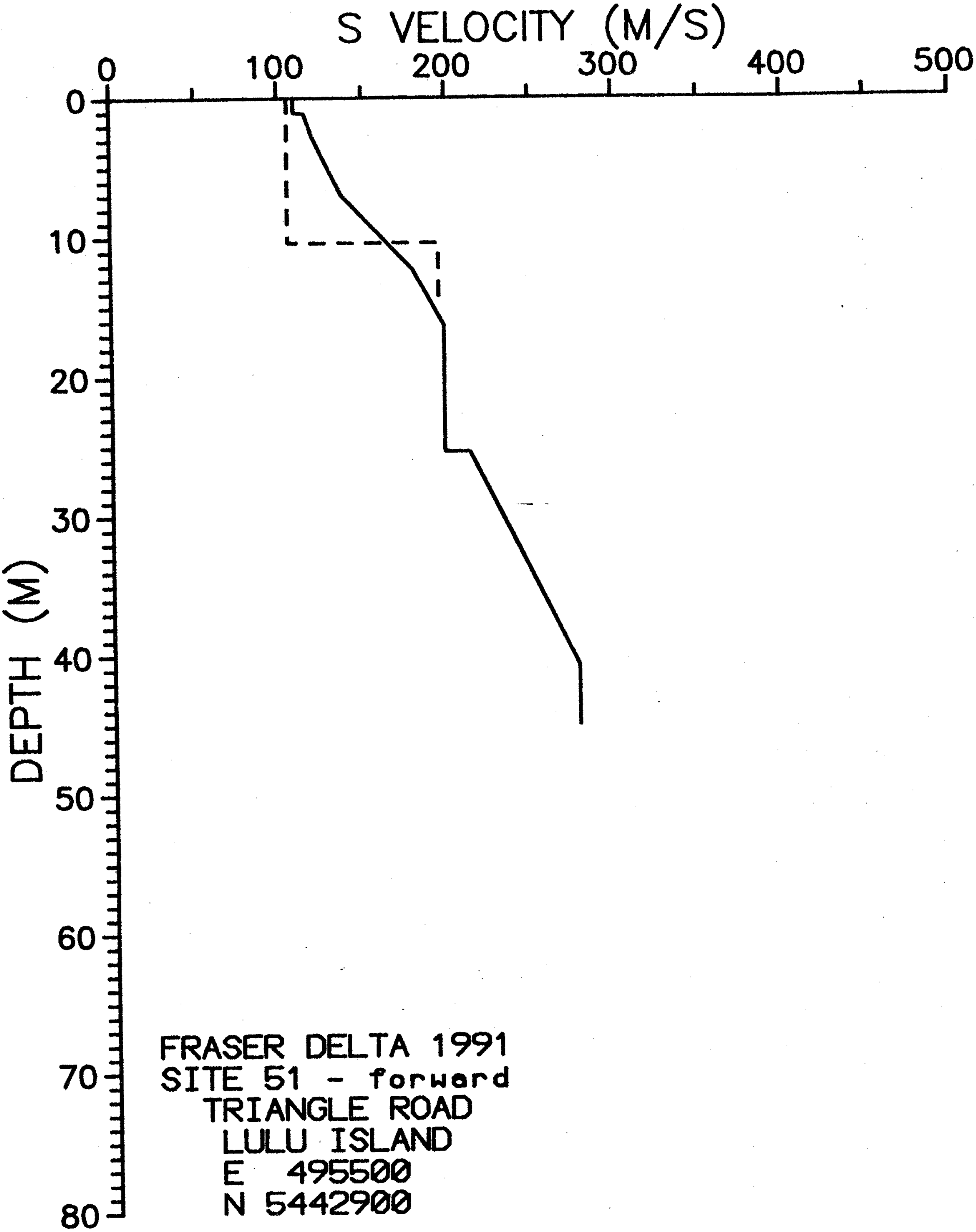

S VELOCITY (M/S)
0 100 200 300 400 500 600 700 800
DEPTH (M)
0 10 20 30 40 50 60 70 80
VELOCITY-DEPTH FIT
LAYERED INTERPRETATION
FRASER DELTA 1990
SITE 48 - forward
MALKIN PARK
BALACLAVA ST, VANCOUVER
E 487300
N 5453200

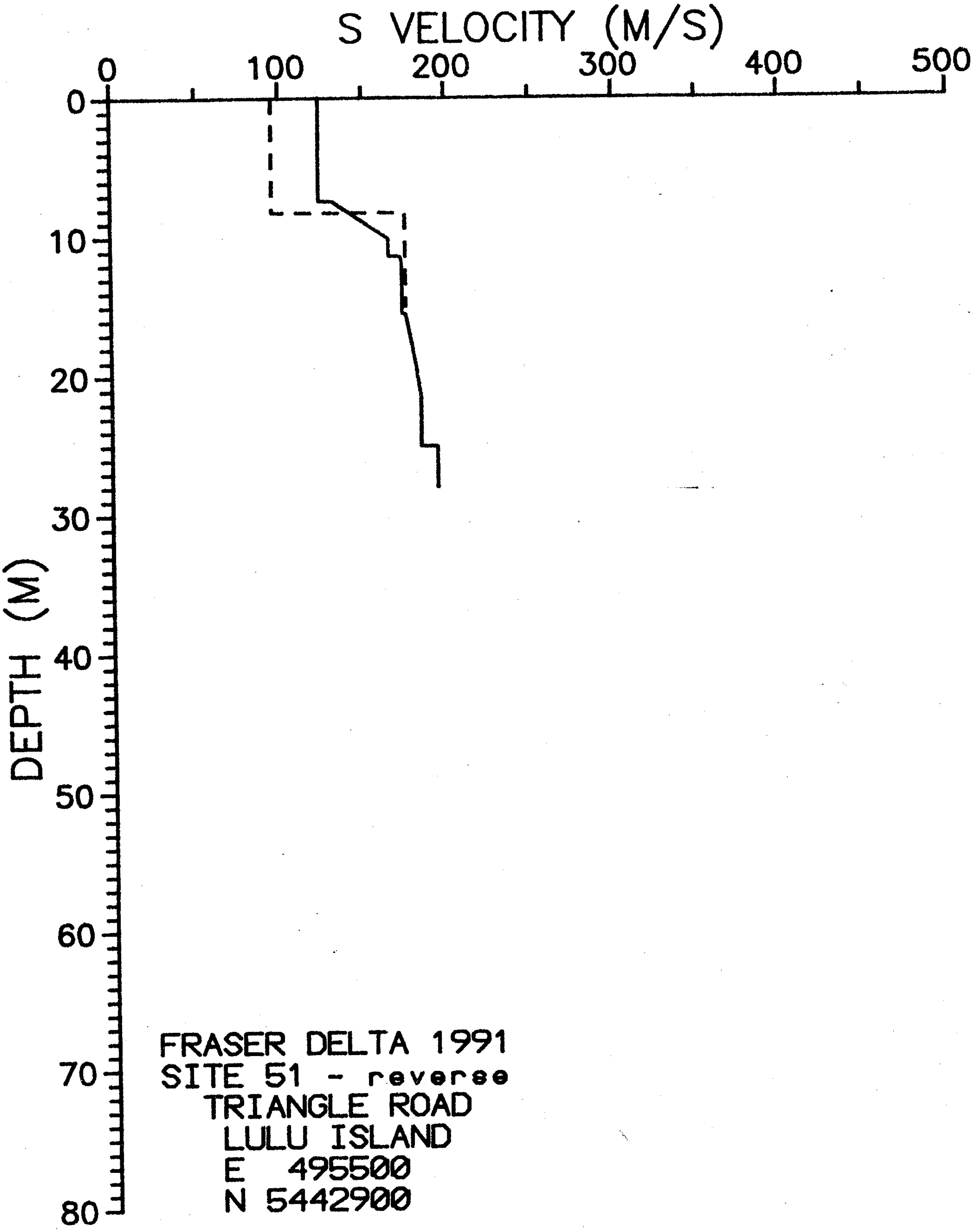

S VELOCITY (M/S)
0
100
200
300
400
500
600
700
800
VELOCITY—DEPTH FIT
LAYERED INTERPRETATION
DEPTH (M)
0
10
20
30
40
50
60
70
80
FRASER DELTA 1990
SITE 48 - reverse
MALKIN PARK
BALACLAVA ST, VANCOUVER
E 487300
N 5453200

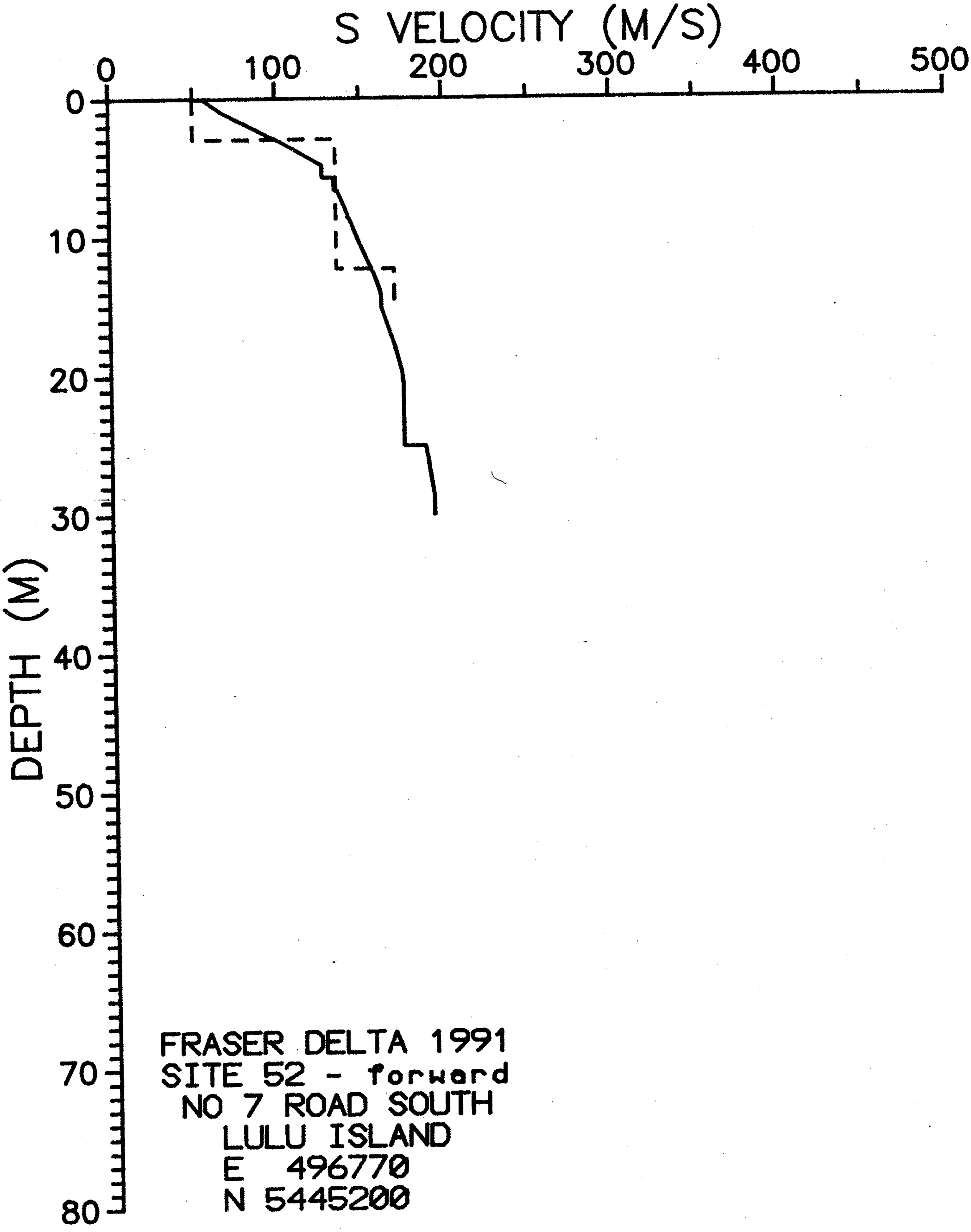

S VELOCITY (M/S)
0
100
200
300
400
500
0
10
20
30
40
50
60
70
80
DEPTH (M)
VELOCITY-DEPTH FIT
LAYERED INTERPRETATION
FRASER DELTA 1990
SITE 49 - forward
RUSS BAKER WAY &
CESSNA DR, SEA ISLAND
E 489600
N 5447900


S VELOCITY (M/S)
0
100
200
300
400
500
0
10
20
30
40
50
60
70
80
DEPTH (M)
FRASER DELTA 1991
SITE 50 - forward
STEVESTON HIGHWAY
LULU ISLAND
E 494400
N 5442080

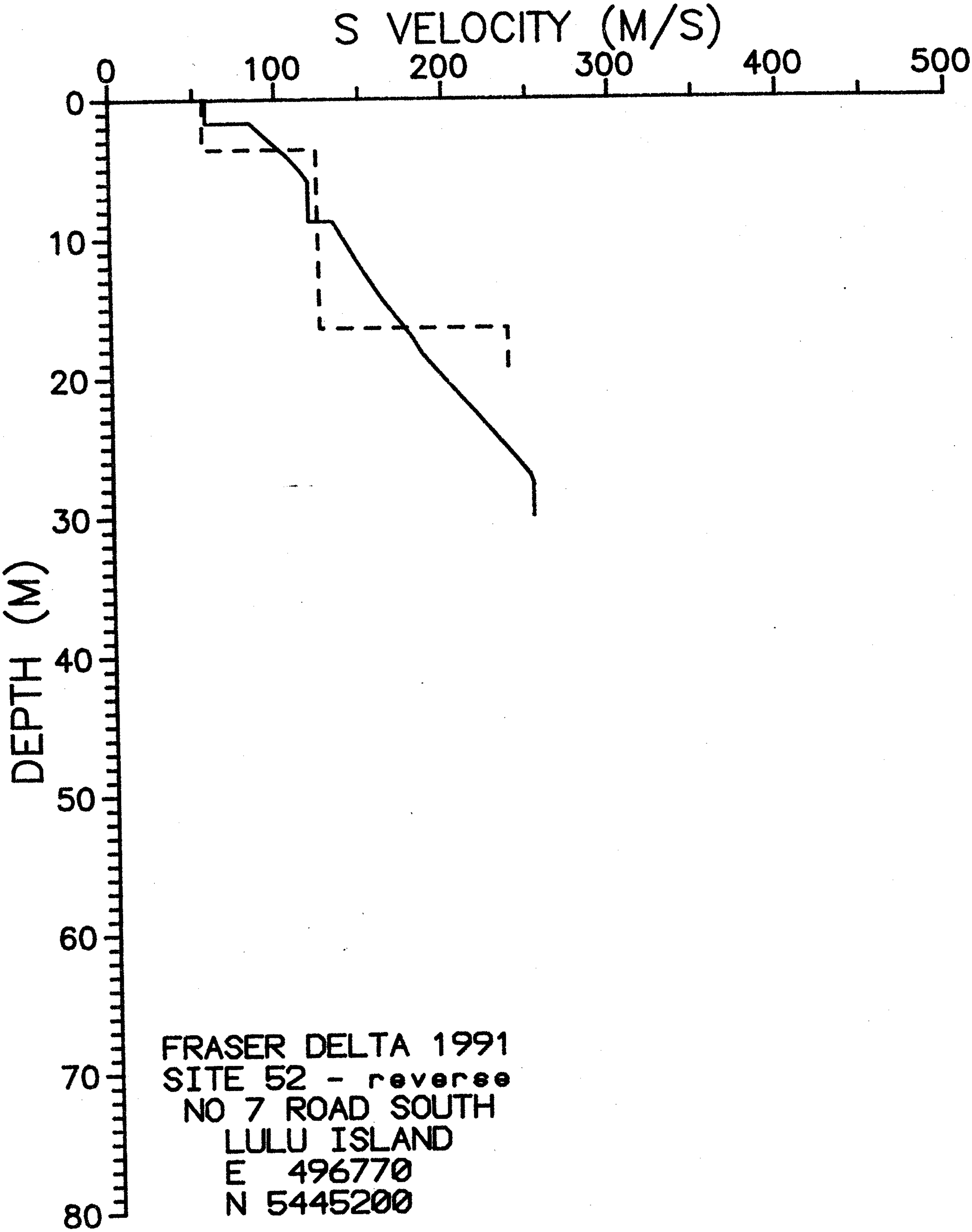

S VELOCITY (M/S)
0
100
200
300
400
500
0
10
20
30
40
50
60
70
80
DEPTH (M)
FRASER DELTA 1991
SITE 50 - reverse
STEVESTON HIGHWAY
LULU ISLAND
E 494400
N 5442080

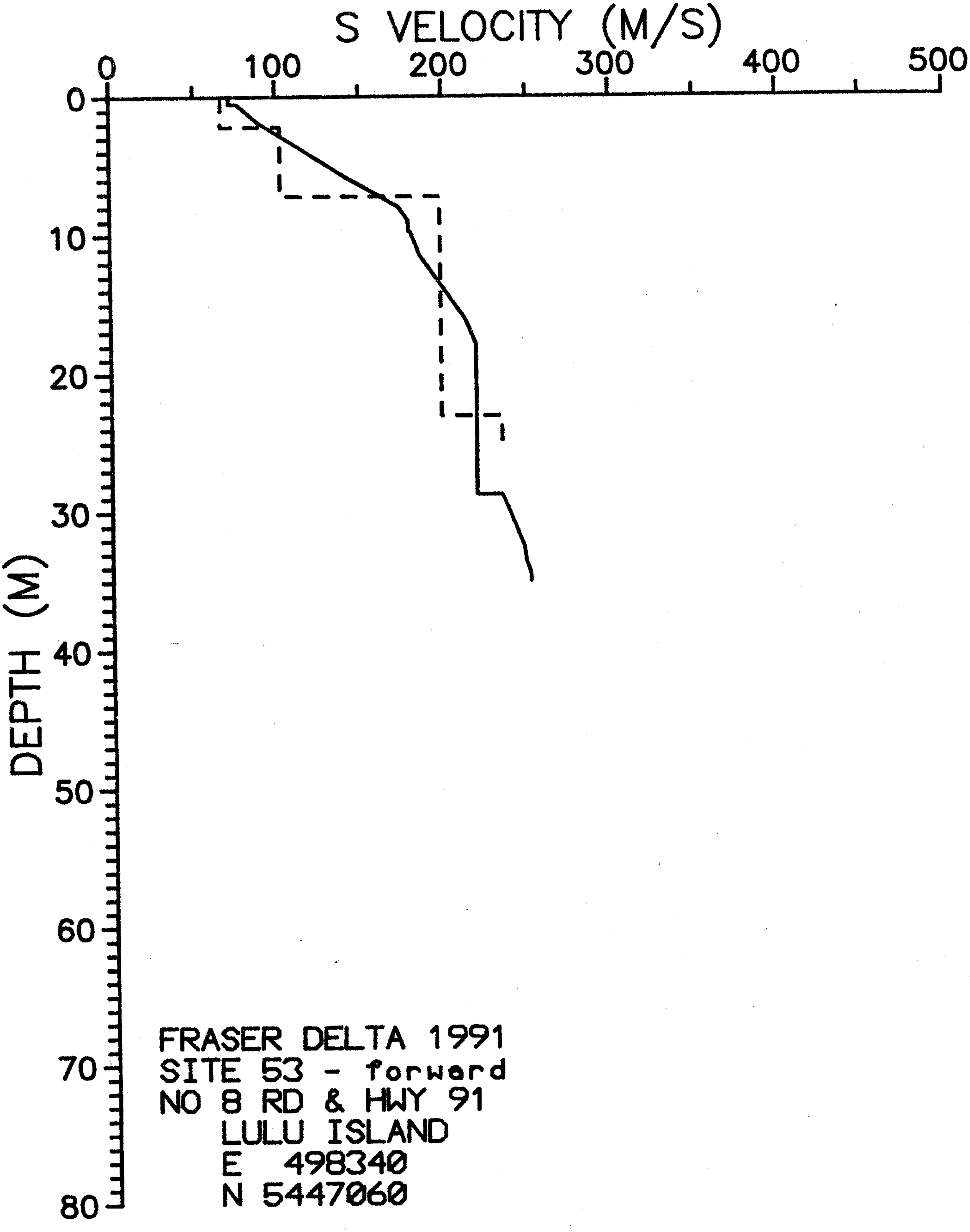

S VELOCITY (M/S)
0
100
200
300
400
500
DEPTH (M)
0
10
20
30
40
50
60
70
80
FRASER DELTA 1991
SITE 51 - forward
TRIANGLE ROAD
LULU ISLAND
E 495500
N 5442900

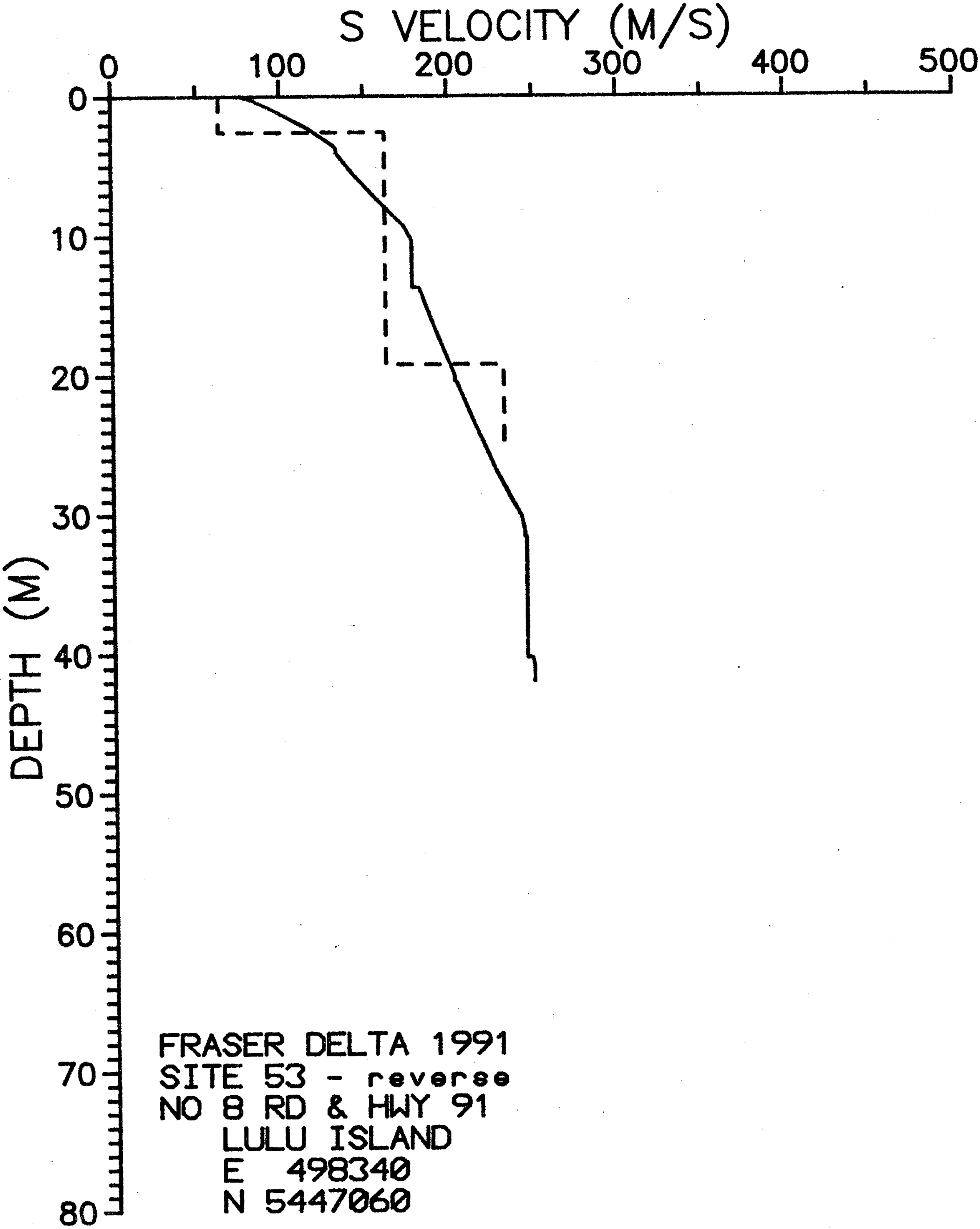

S VELOCITY (M/S)
0
100
200
300
400
500
0
10
20
30
40
50
60
70
80
DEPTH (M)
FRASER DELTA 1991
SITE 51 - reverse
TRIANGLE ROAD
LULU ISLAND
E 495500
N 5442900

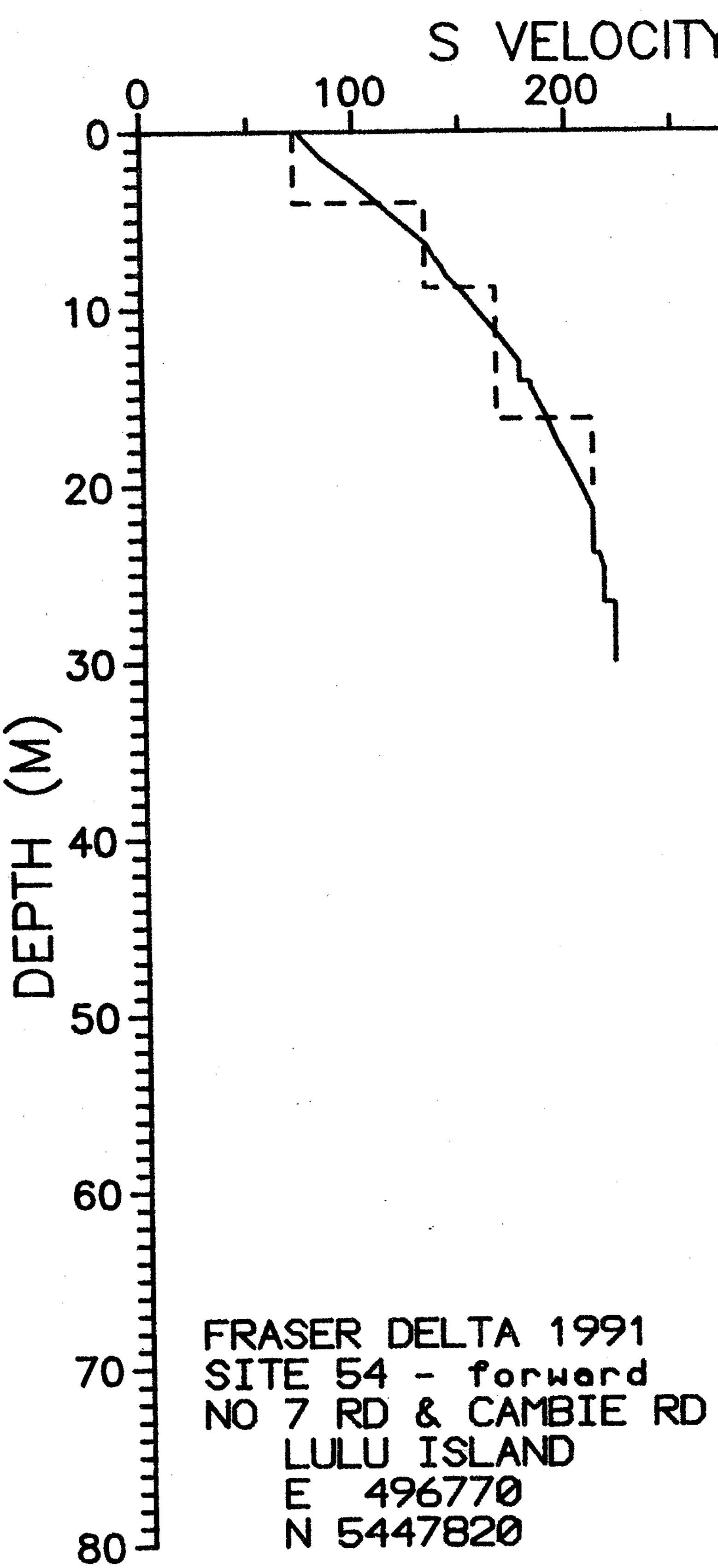


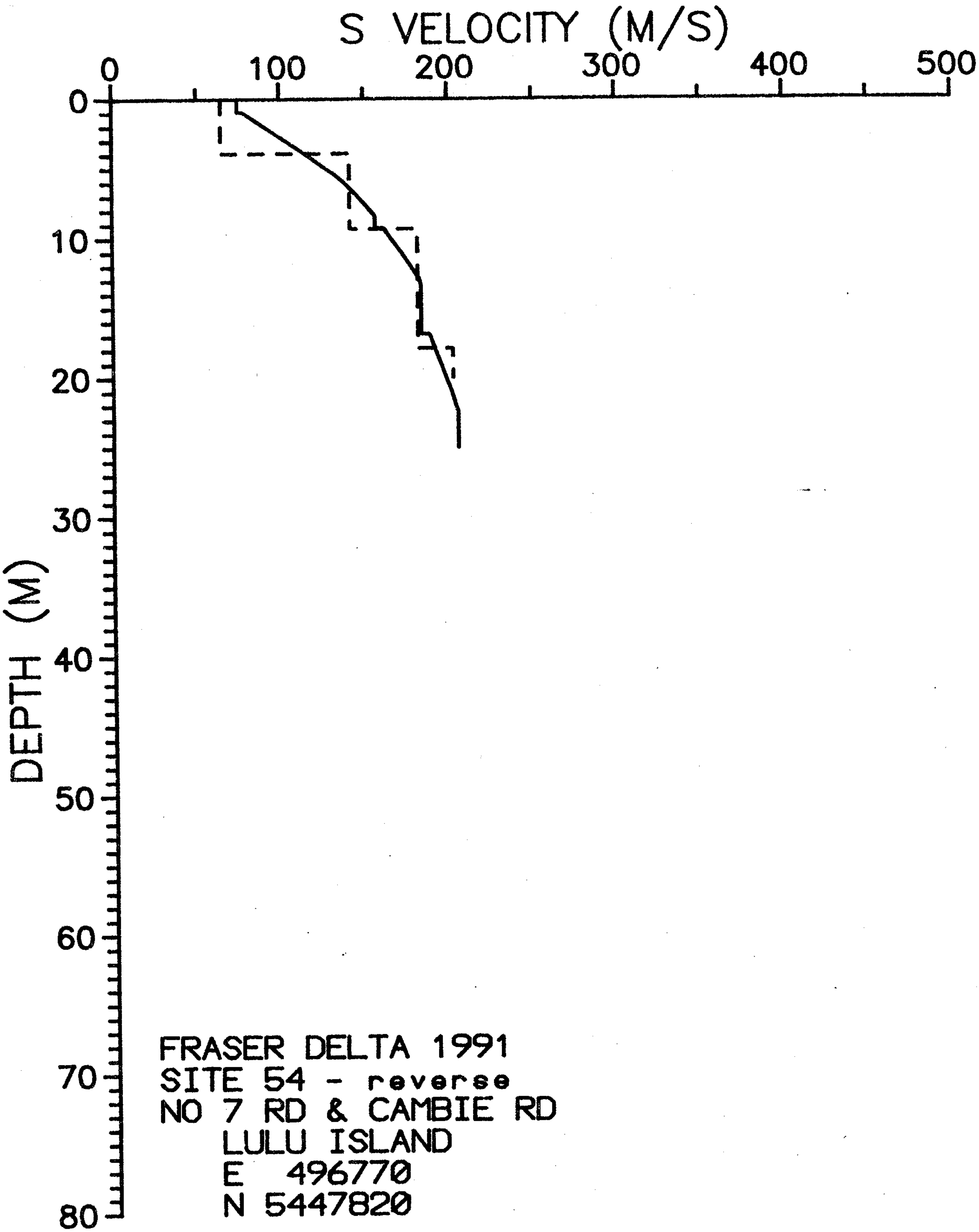
S VELOCITY (M/S)
0
100
200
300
400
500
DEPTH (M)
0
10
20
30
40
50
60
70
80
FRASER DELTA 1991
SITE 52 - forward
NO 7 ROAD SOUTH
LULU ISLAND
E 496770
N 5445200

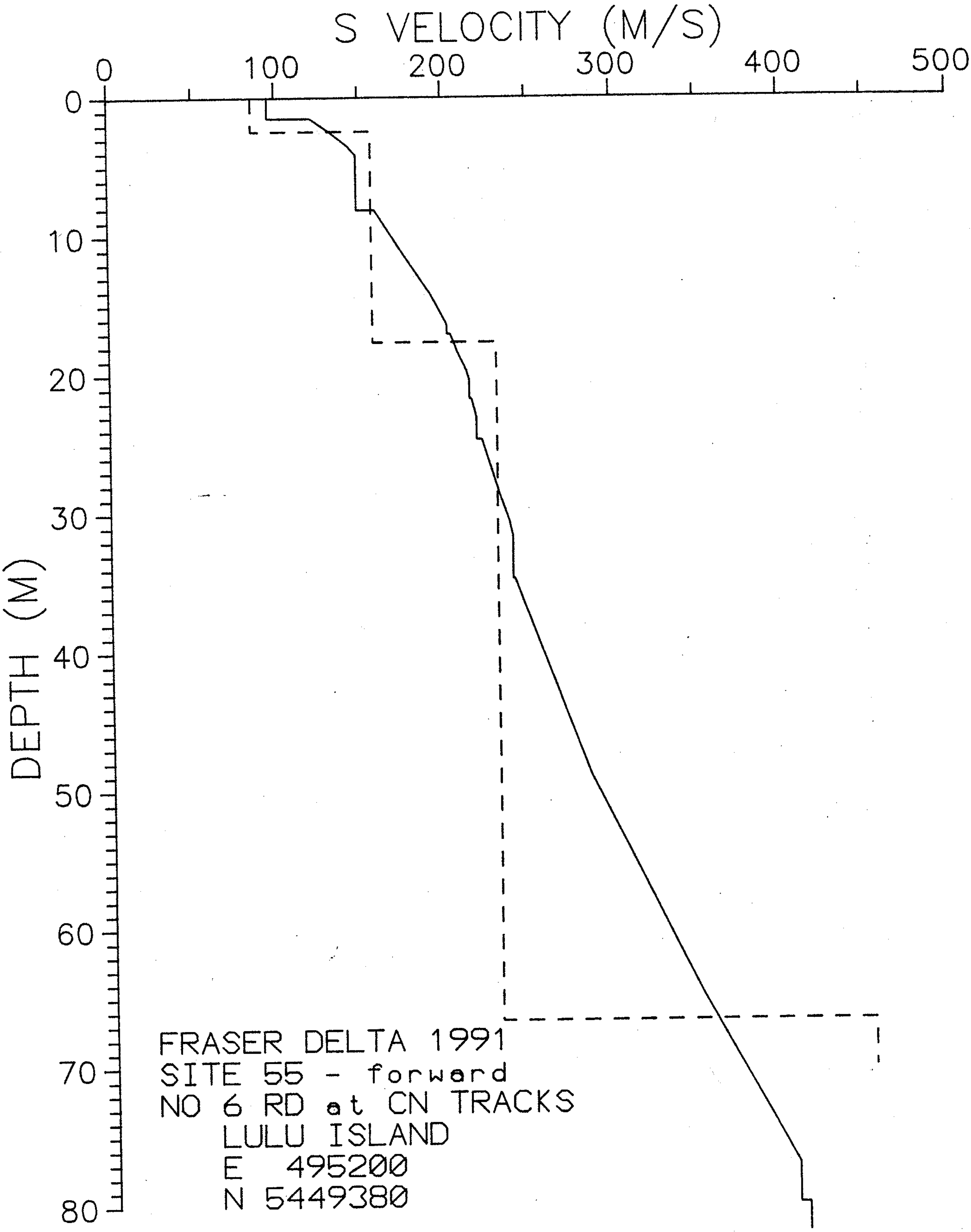

S VELOCITY (M/S)
0
100
200
300
400
500
0
10
20
30
40
50
60
70
80
DEPTH (M)
FRASER DELTA 1991
SITE 52 - reverse
NO 7 ROAD SOUTH
LULU ISLAND
E 496770
N 5445200

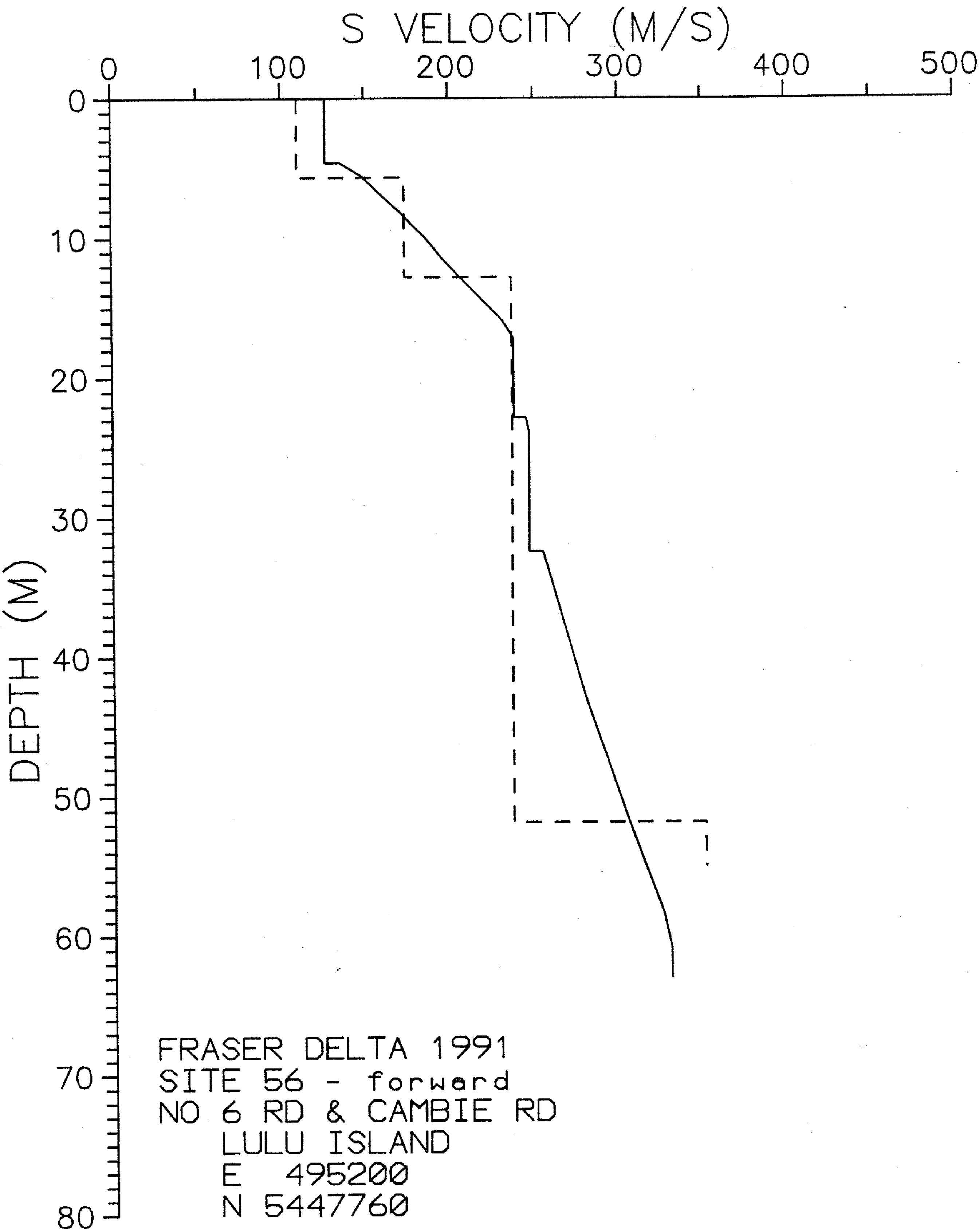

S VELOCITY (M/S)
0
100
200
300
400
500
0
10
20
30
40
50
60
70
80
DEPTH (M)
FRASER DELTA 1991
SITE 53 - forward
NO 8 RD & HWY 91
LULU ISLAND
E 498340
N 5447060

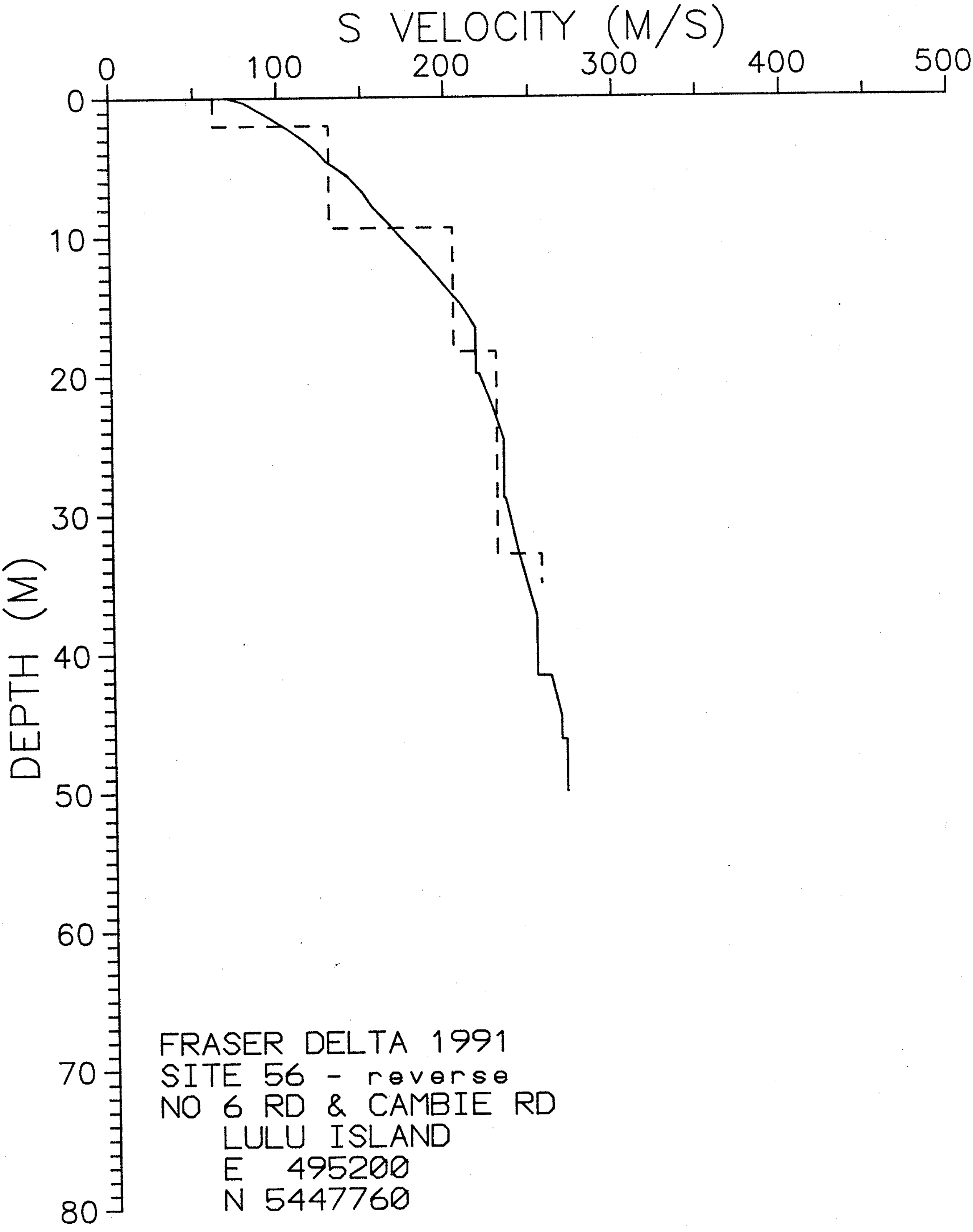

S VELOCITY (M/S)
0
100
200
300
400
500
0
10
20
30
40
50
60
70
80
DEPTH (M)
FRASER DELTA 1991
SITE 53 - reverse
NO 8 RD & HWY 91
LULU ISLAND
E 498340
N 5447060

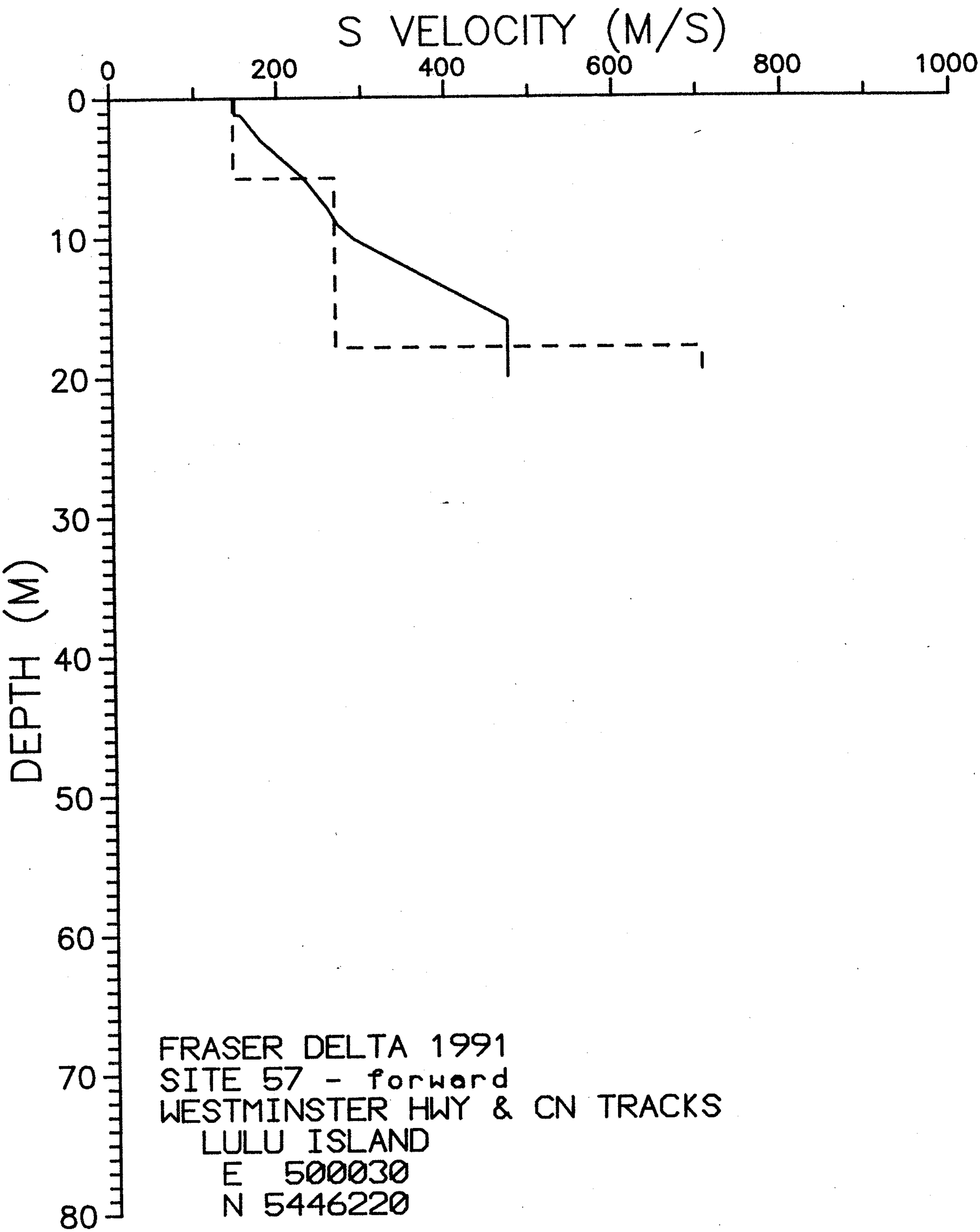

S VELOCITY (M/S)
0
100
200
300
400
500
DEPTH (M)
0
10
20
30
40
50
60
70
80
FRASER DELTA 1991
SITE 54 - forward
NO 7 RD & CAMBIE RD
LULU ISLAND
E 496770
N 5447820

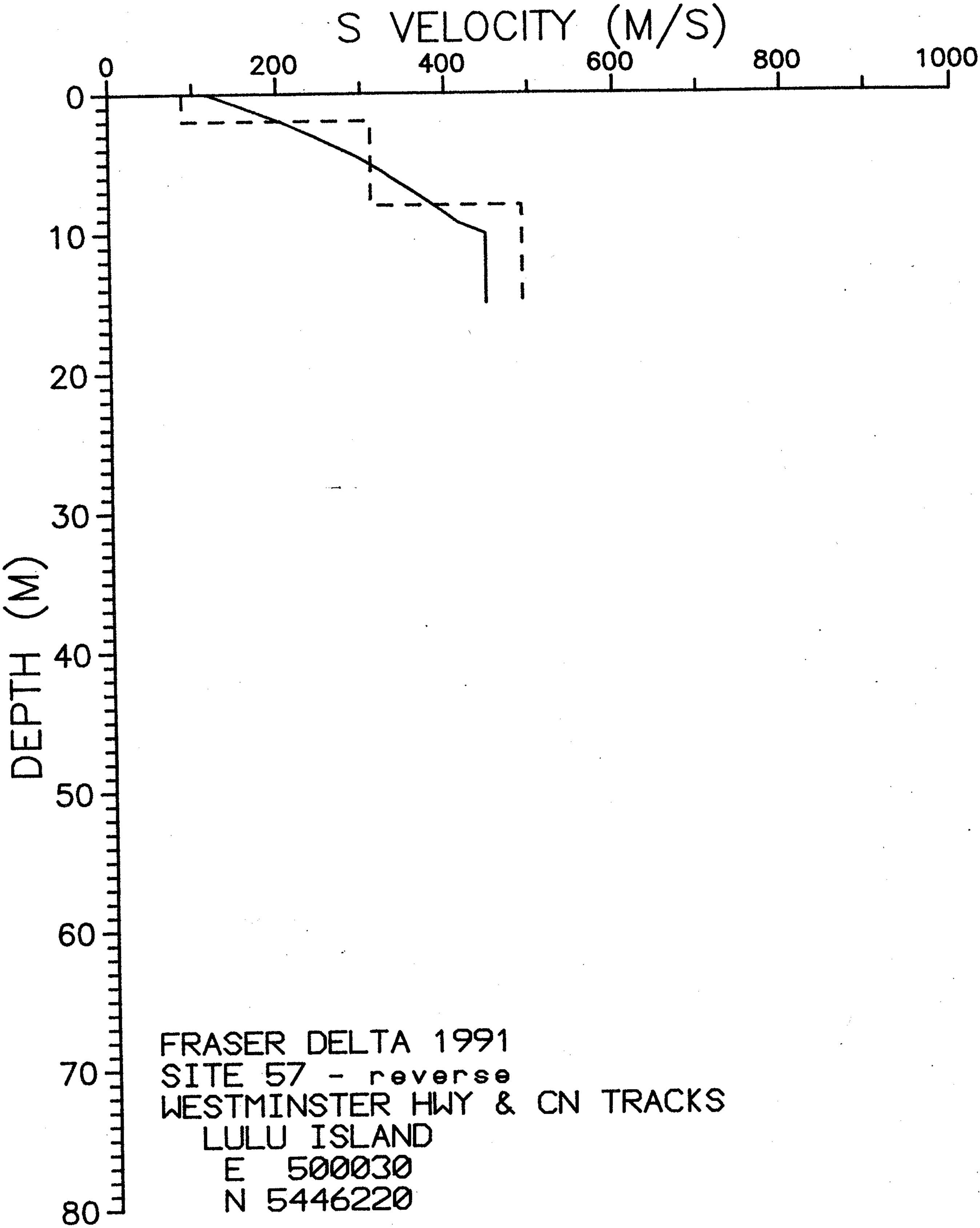

S VELOCITY (M/S)
0
100
200
300
400
500
0
10
20
30
40
50
60
70
80
DEPTH (M)
FRASER DELTA 1991
SITE 54 - reverse
NO 7 RD & CAMBIE RD
LULU ISLAND
E 496770
N 5447820

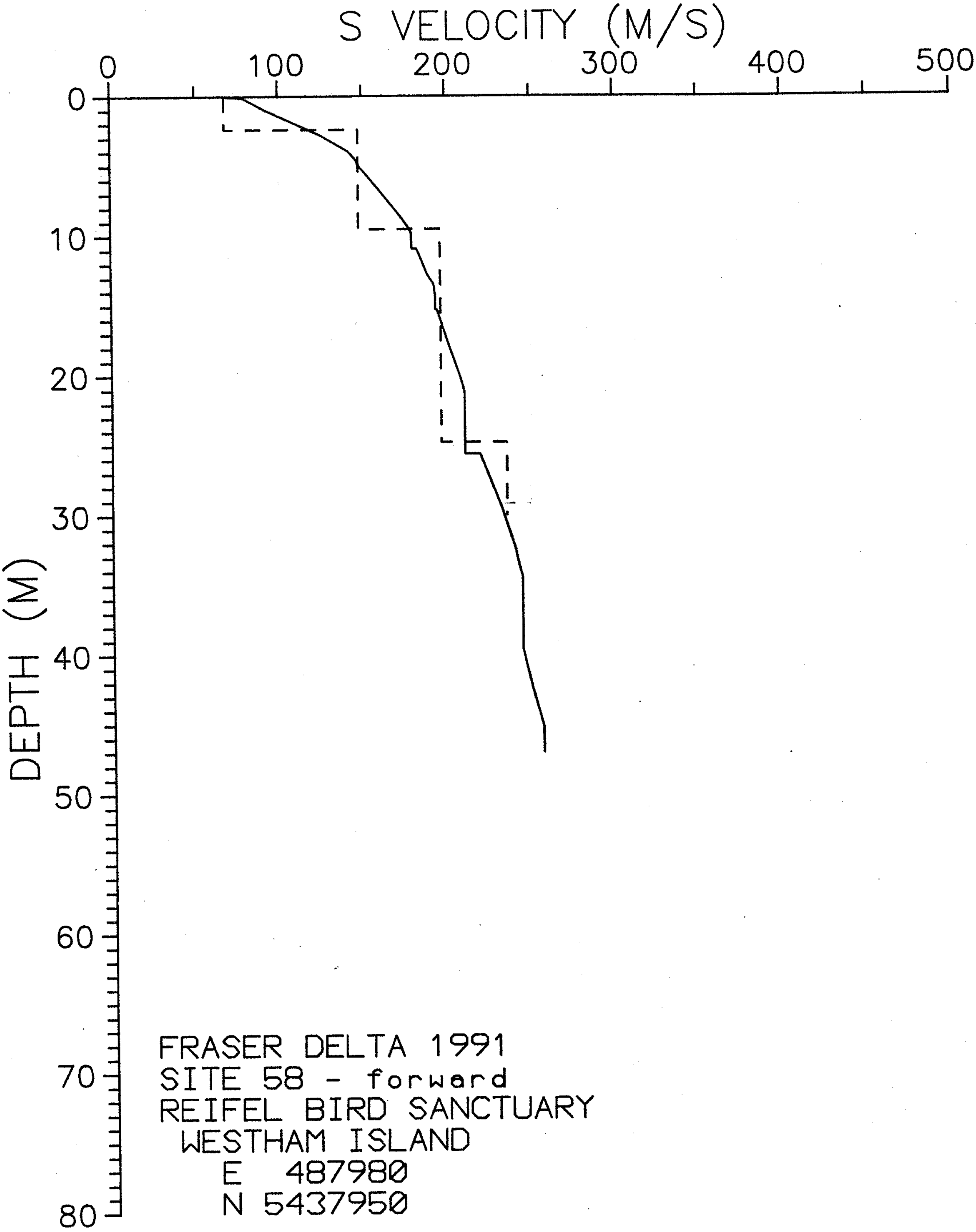

S VELOCITY (M/S)
0
100
200
300
400
500
DEPTH (M)
0
10
20
30
40
50
60
70
80
FRASER DELTA 1991
SITE 55 - forward
NO 6 RD at CN TRACKS
LULU ISLAND
E 495200
N 5449380

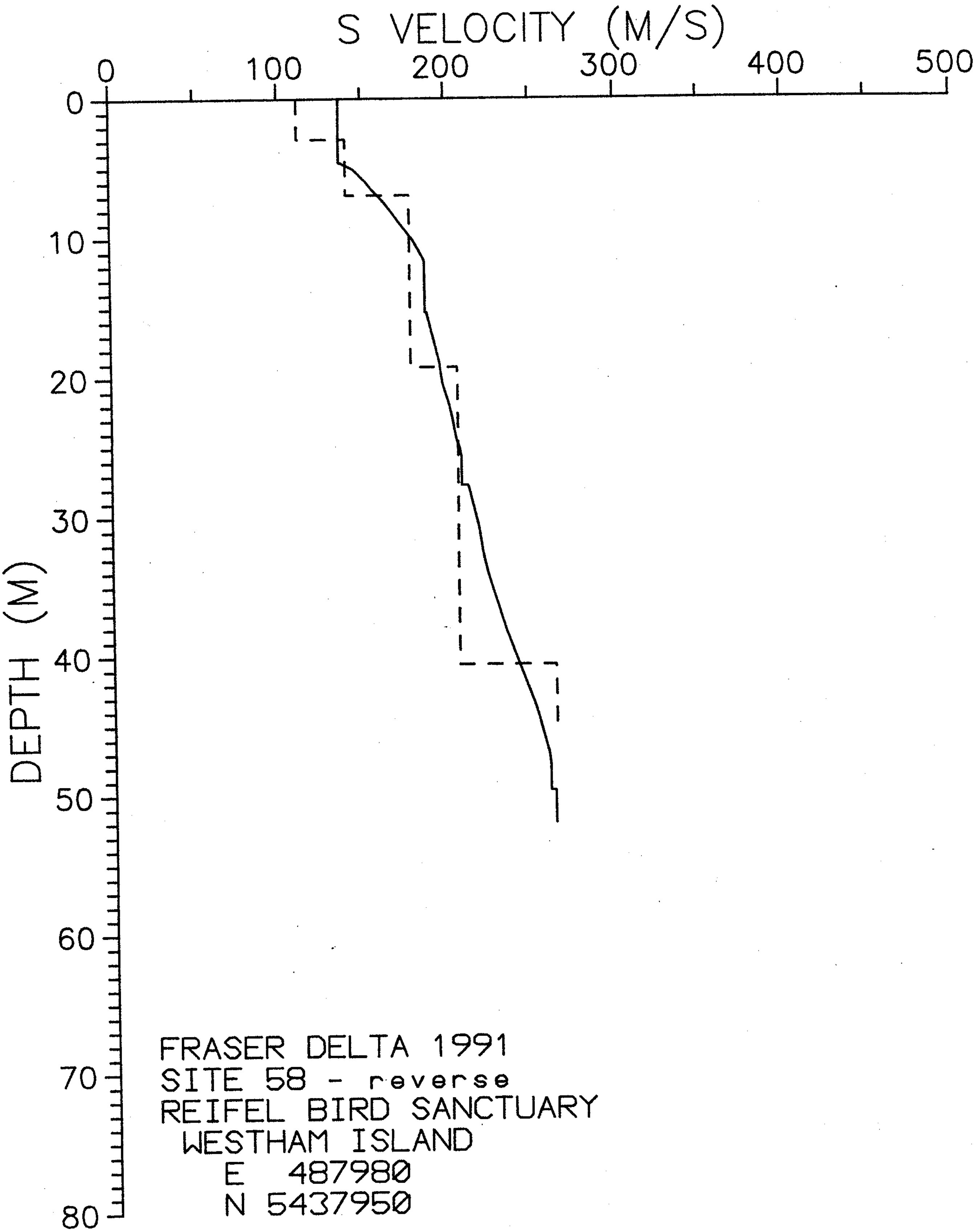

S VELOCITY (M/S)
0
100
200
300
400
500
DEPTH (M)
0
10
20
30
40
50
60
70
80
FRASER DELTA 1991
SITE 56 - forward
NO 6 RD & CAMBIE RD
LULU ISLAND
E 495200
N 5447760

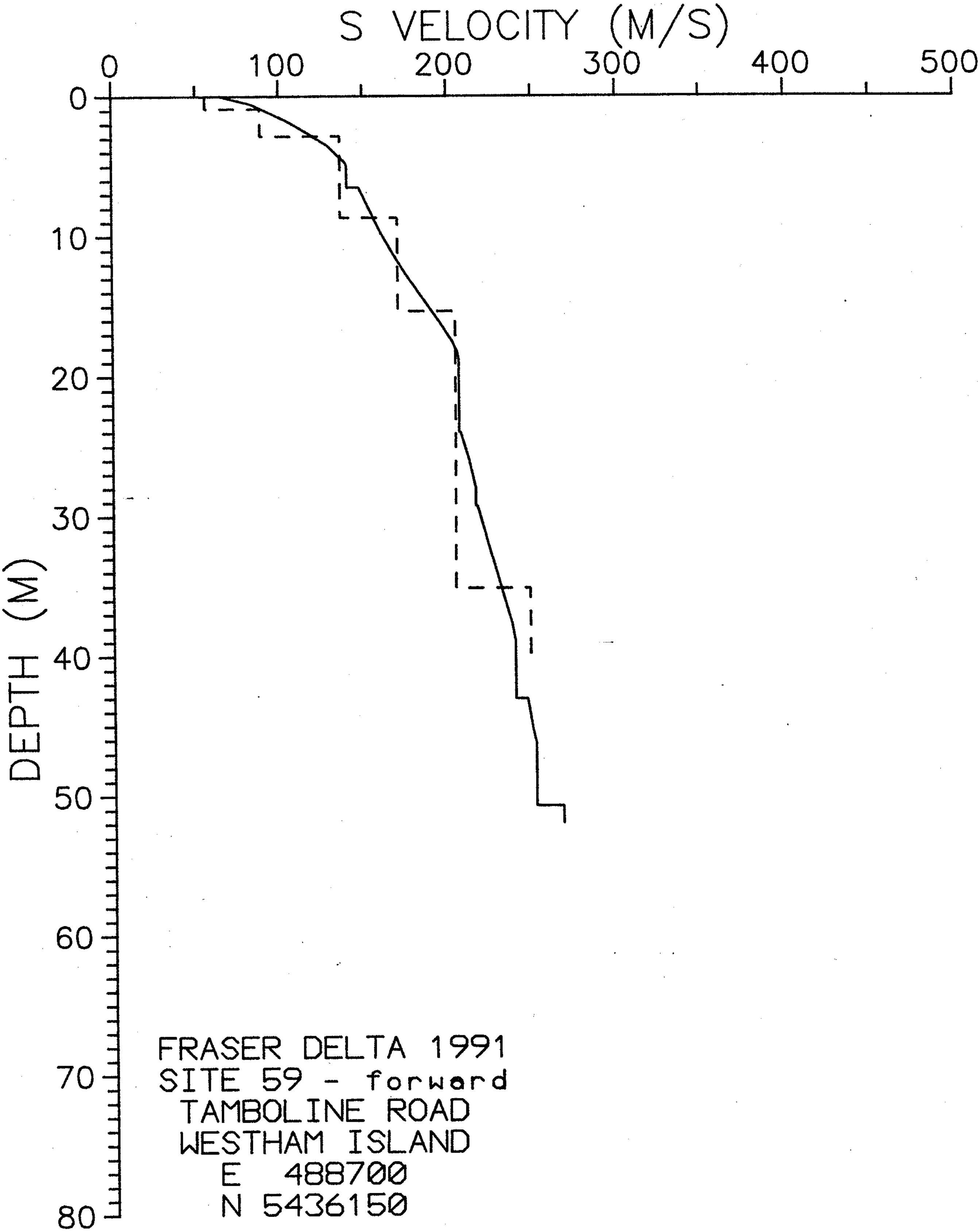

S VELOCITY (M/S)
0
100
200
300
400
500
DEPTH (M)
0
10
20
30
40
50
60
70
80
FRASER DELTA 1991
SITE 56 - reverse
NO 6 RD & CAMBIE RD
LULU ISLAND
E 495200
N 5447760

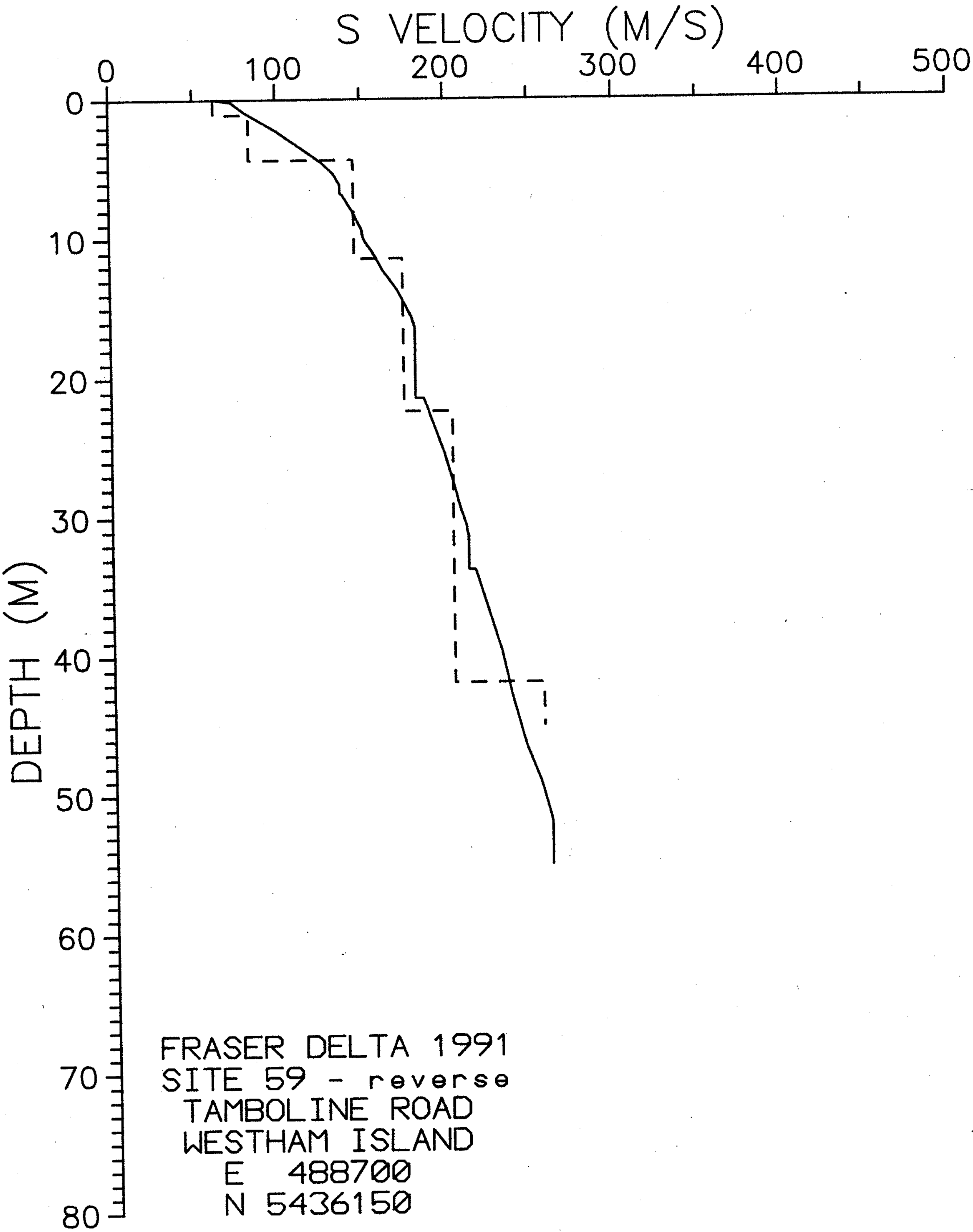

S VELOCITY (M/S)
0
200
400
600
800
1000
DEPTH (M)
0
10
20
30
40
50
60
70
80
FRASER DELTA 1991
SITE 57 - forward
WESTMINSTER HWY & CN TRACKS
LULU ISLAND
E 500030
N 5446220

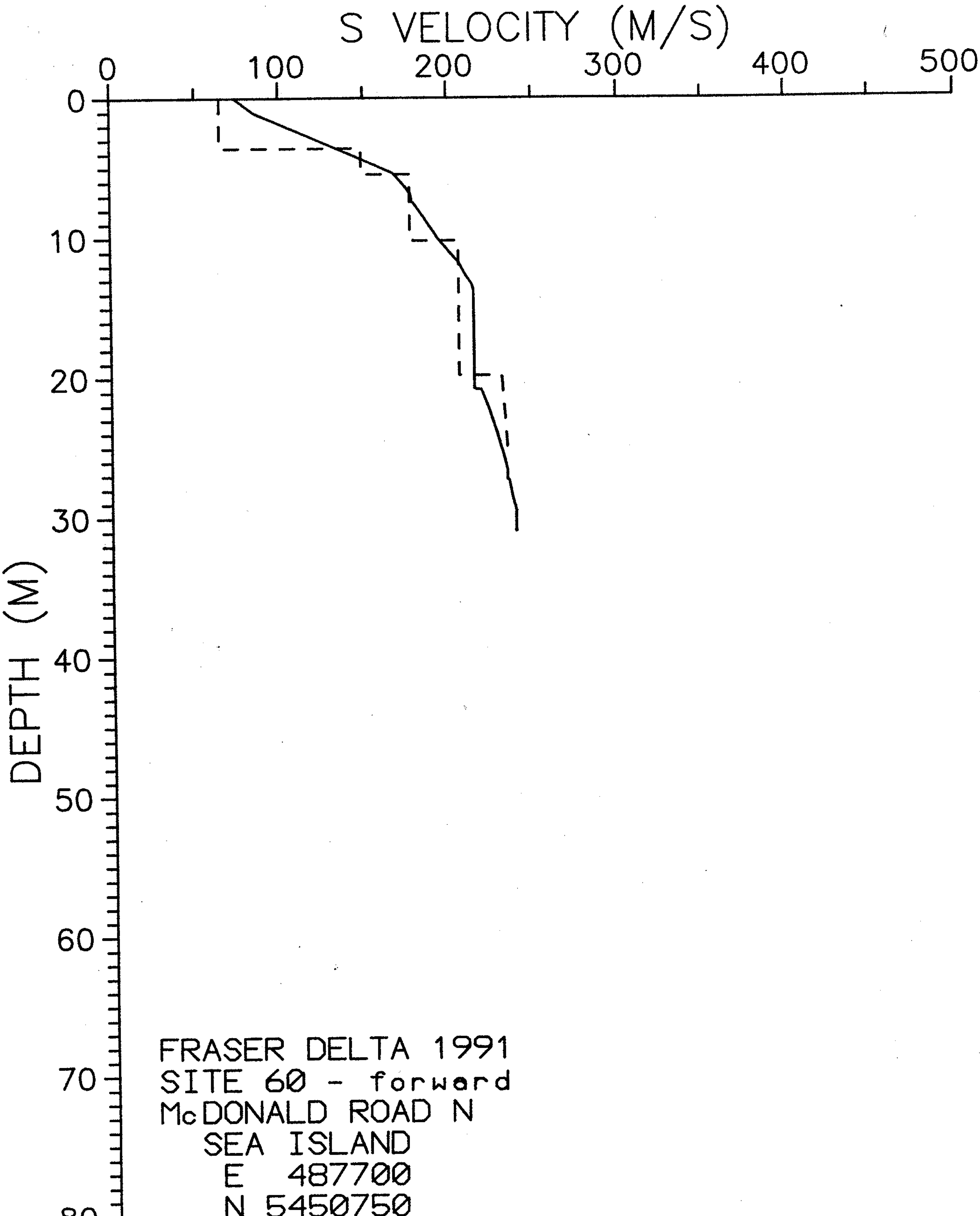

S VELOCITY (M/S)
0
200
400
600
800
1000
DEPTH (M)
0
10
20
30
40
50
60
70
80
FRASER DELTA 1991
SITE 57 - reverse
WESTMINSTER HWY & CN TRACKS
LULU ISLAND
E 500030
N 5446220

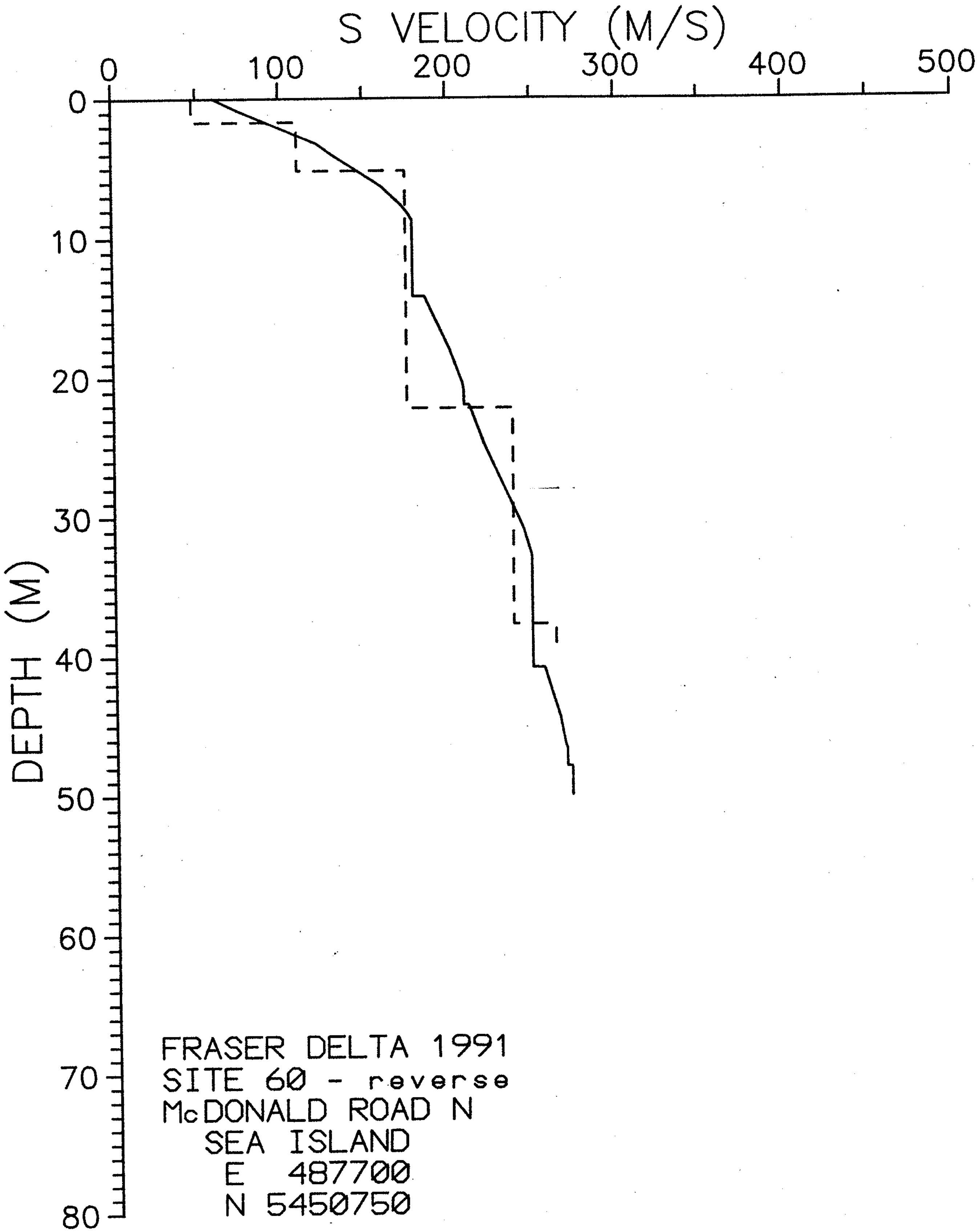

S VELOCITY (M/S)
0
100
200
300
400
500
DEPTH (M)
0
10
20
30
40
50
60
70
80
FRASER DELTA 1991
SITE 58 - forward
REIFEL BIRD SANCTUARY
WESTHAM ISLAND
E 487980
N 5437950

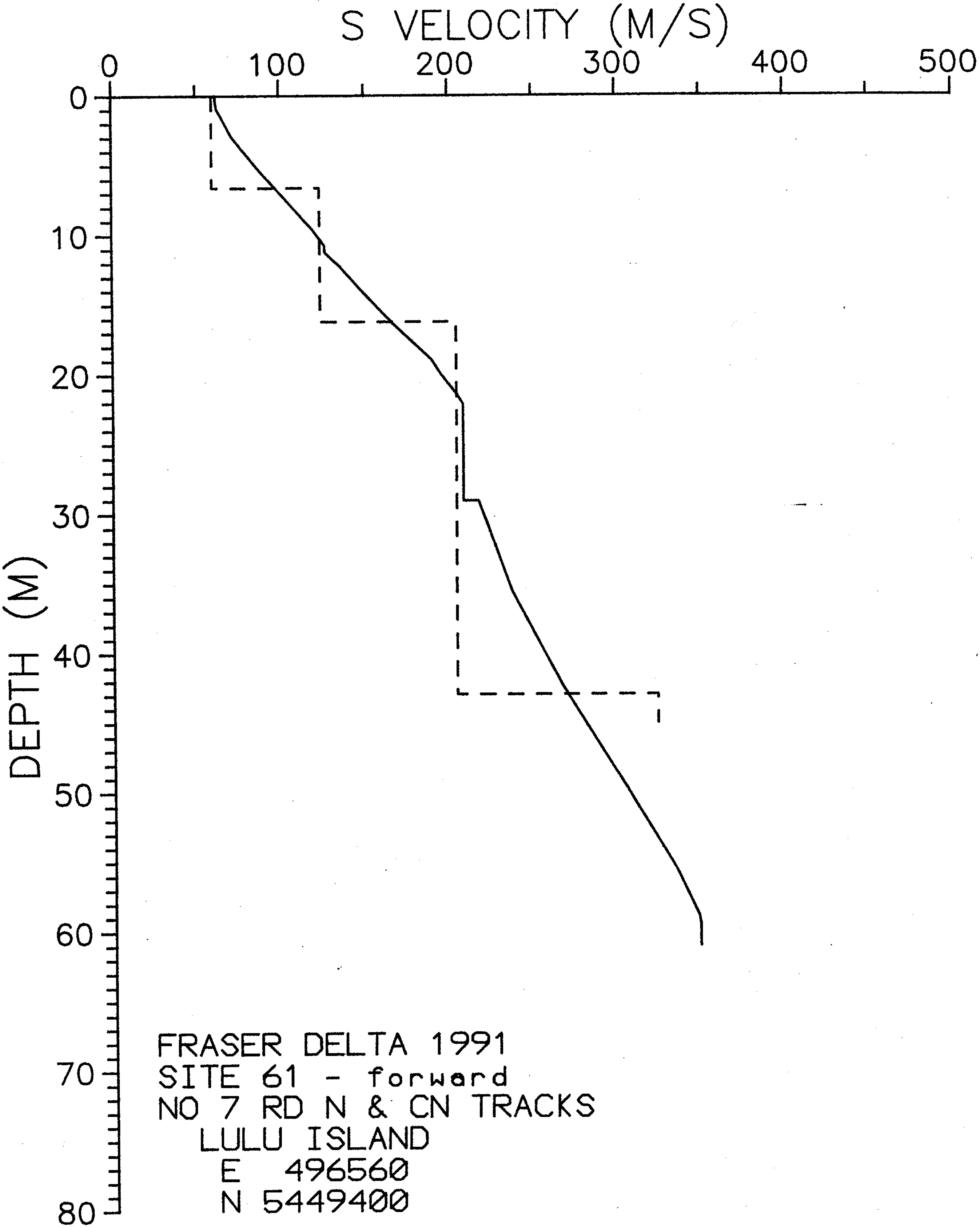

S VELOCITY (M/S)
0
100
200
300
400
500
DEPTH (M)
0
10
20
30
40
50
60
70
80
FRASER DELTA 1991
SITE 58 - reverse
REIFEL BIRD SANCTUARY
WESTHAM ISLAND
E 487980
N 5437950

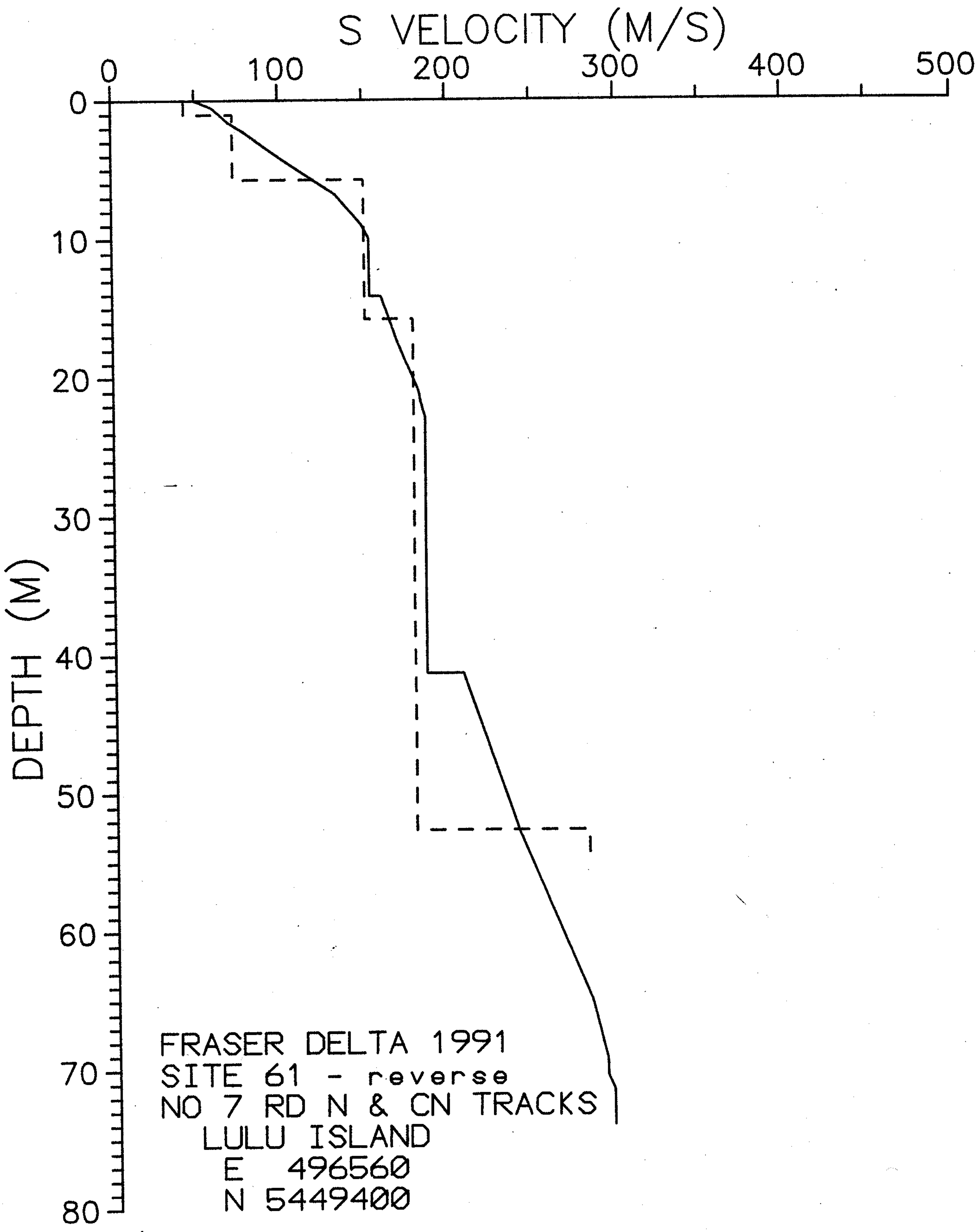

S VELOCITY (M/S)
0
100
200
300
400
500
0
10
20
30
40
50
60
70
80
DEPTH (M)
FRASER DELTA 1991
SITE 59 - forward
TAMBOLINE ROAD
WESTHAM ISLAND
E 488700
N 5436150

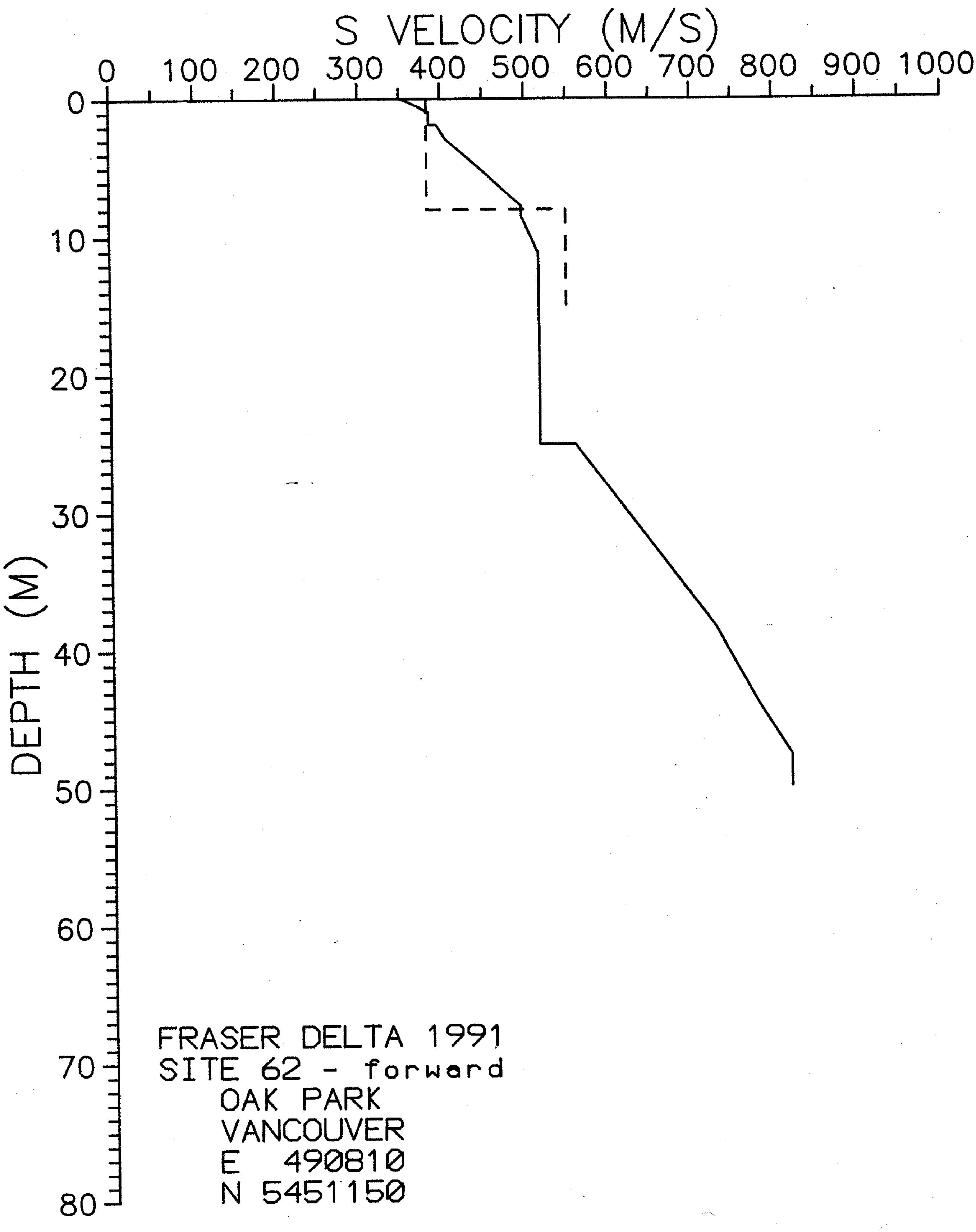

S VELOCITY (M/S)
0
100
200
300
400
500
0
10
20
30
40
50
60
70
80
DEPTH (M)
FRASER DELTA 1991
SITE 59 - reverse
TAMBOLINE ROAD
WESTHAM ISLAND
E 488700
N 5436150

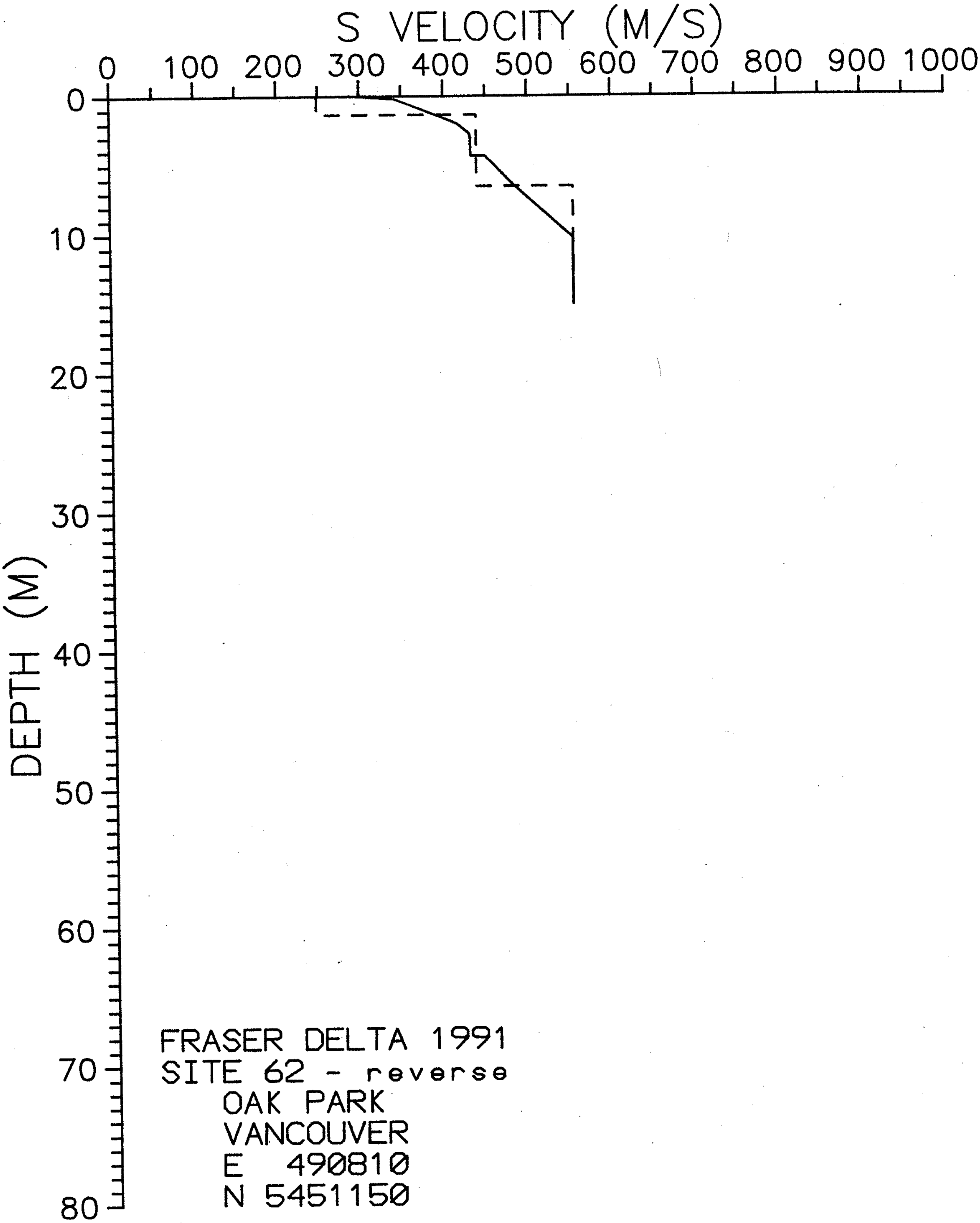

S VELOCITY (M/S)
0
100
200
300
400
500
0
10
20
30
40
50
60
70
80
DEPTH (M)
FRASER DELTA 1991
SITE 60 - forward
McDONALD ROAD N
SEA ISLAND
E 487700
N 5450750

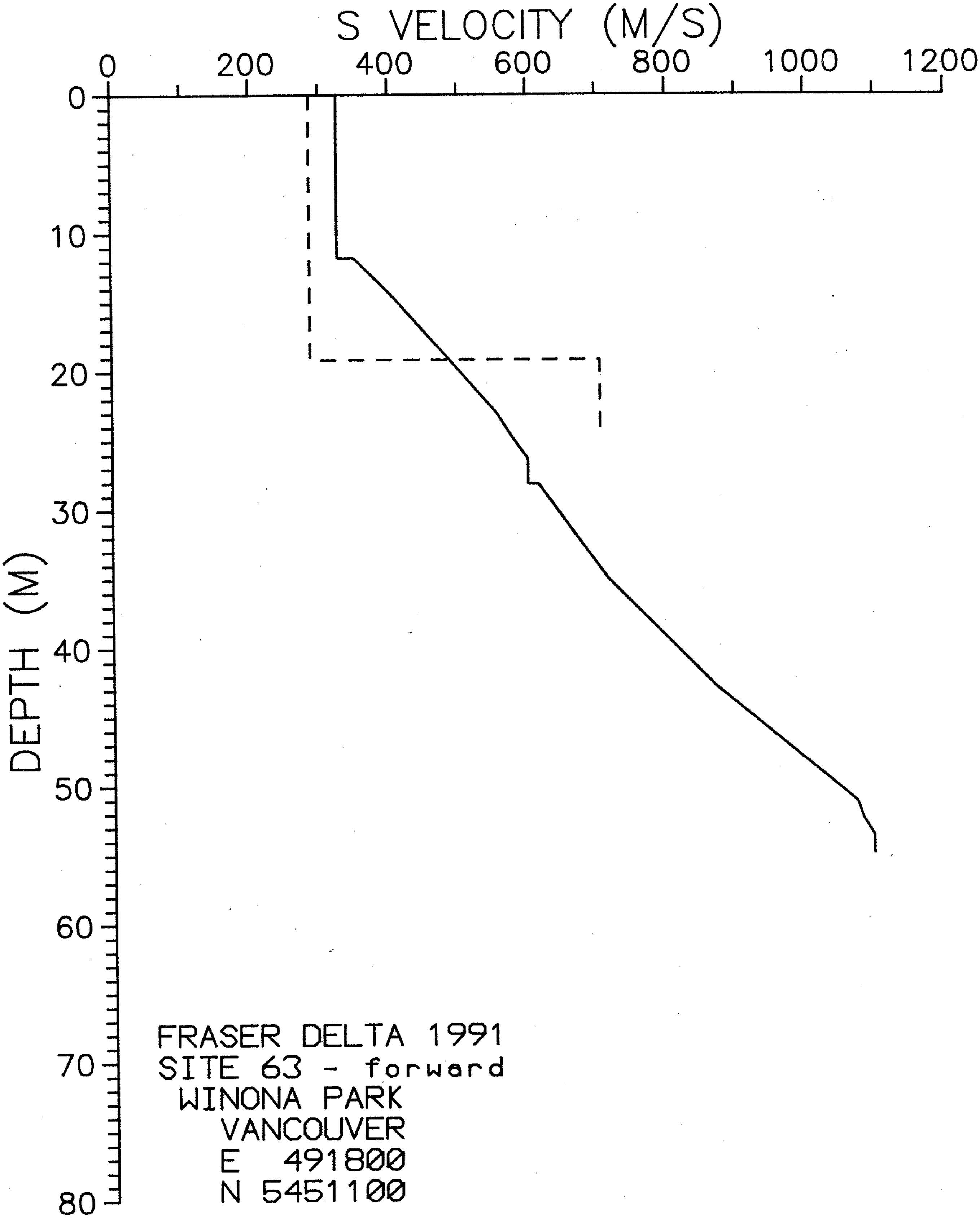

S VELOCITY (M/S)
0
100
200
300
400
500
0
10
20
30
40
50
60
70
80
DEPTH (M)
FRASER DELTA 1991
SITE 60 - reverse
McDONALD ROAD N
SEA ISLAND
E 487700
N 5450750

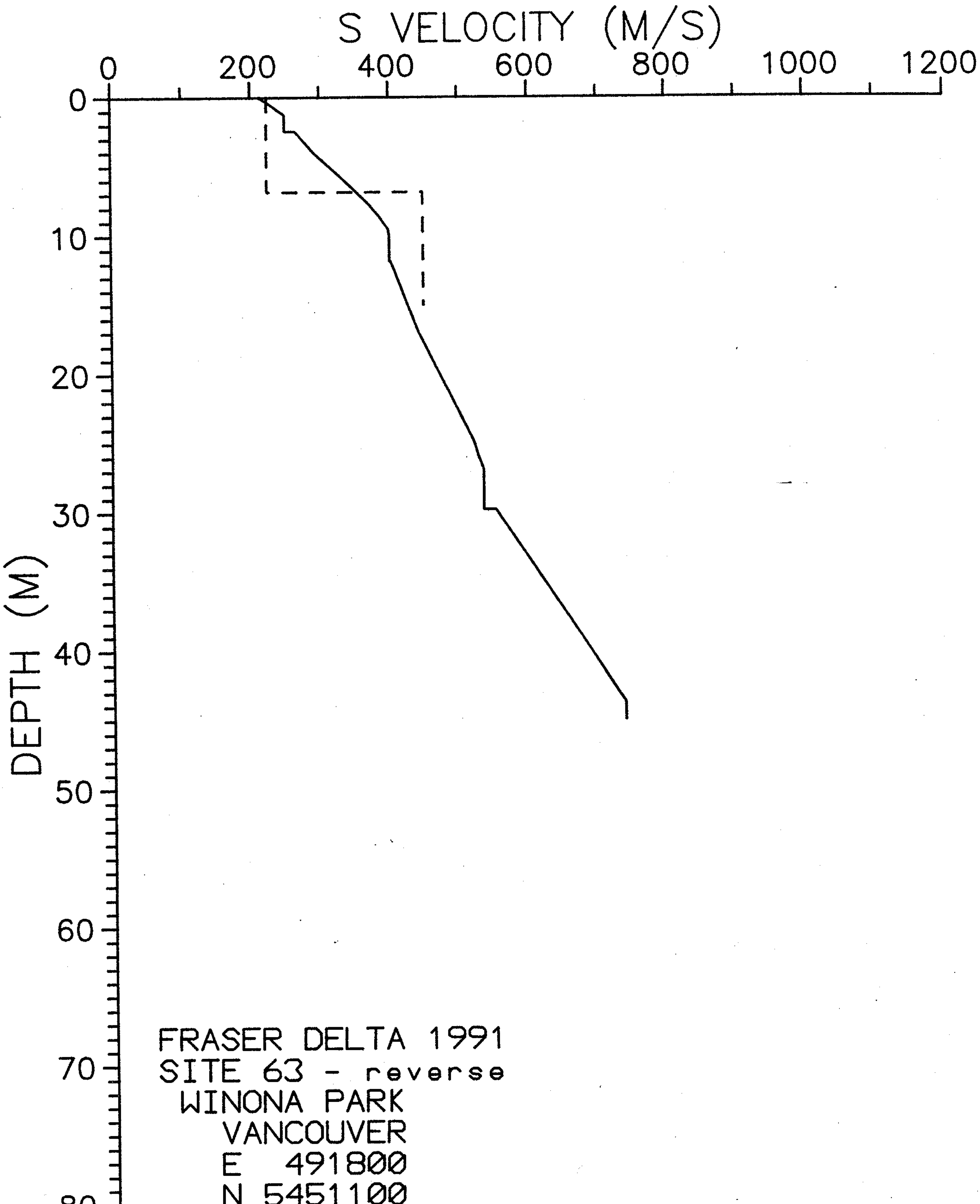

S VELOCITY (M/S)
0
100
200
300
400
500
0
10
20
30
40
50
60
70
80
DEPTH (M)
FRASER DELTA 1991
SITE 61 - forward
NO 7 RD N & CN TRACKS
LULU ISLAND
E 496560
N 5449400

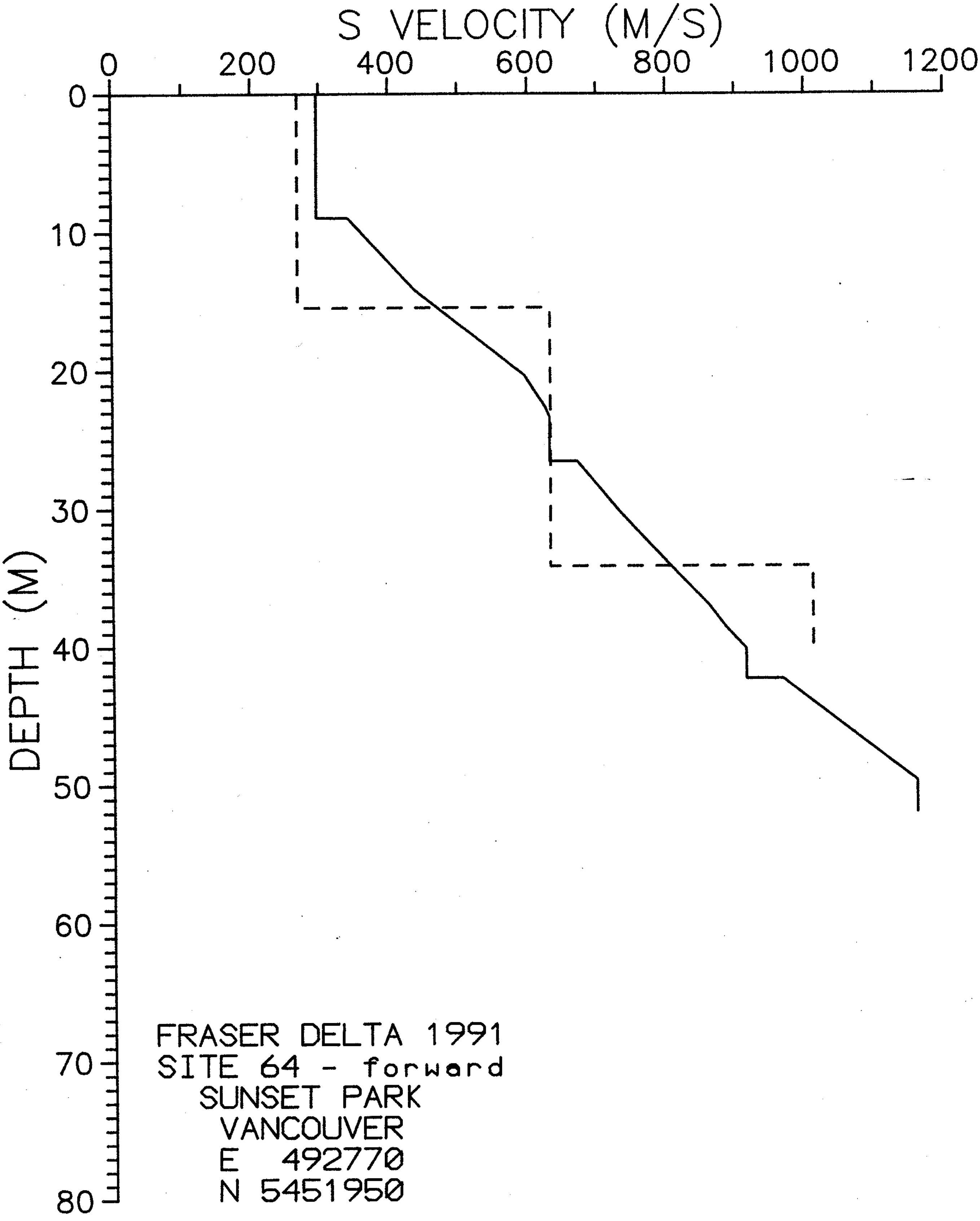

S VELOCITY (M/S)
0
100
200
300
400
500
DEPTH (M)
0
10
20
30
40
50
60
70
80
FRASER DELTA 1991
SITE 61 - reverse
NO 7 RD N & CN TRACKS
LULU ISLAND
E 496560
N 5449400

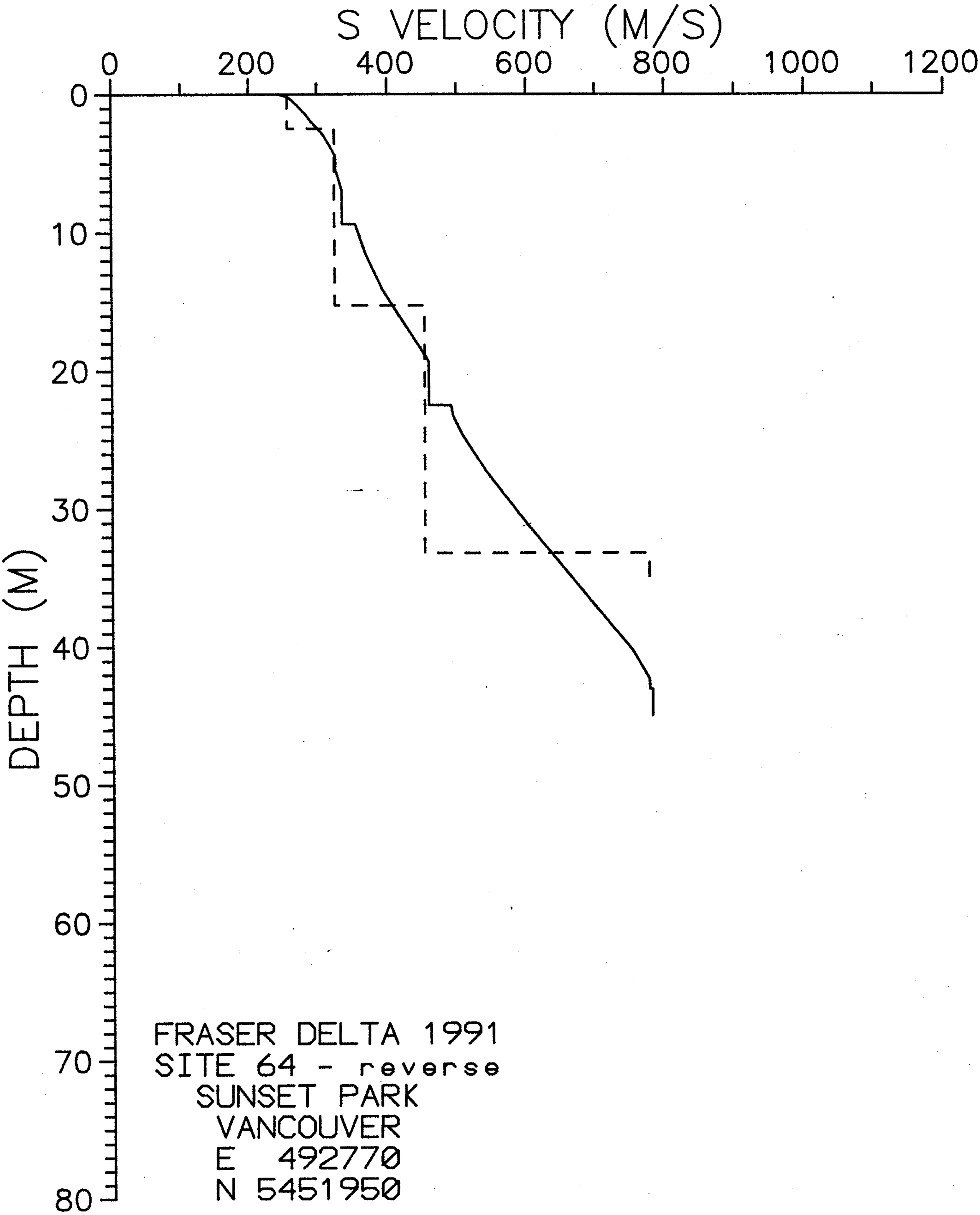

S VELOCITY (M/S)
0 100 200 300 400 500 600 700 800 900 1000
0 10 20 30 40 50 60 70 80
DEPTH (M)
FRASER DELTA 1991
SITE 62 - forward
OAK PARK
VANCOUVER
E 490810
N 5451150

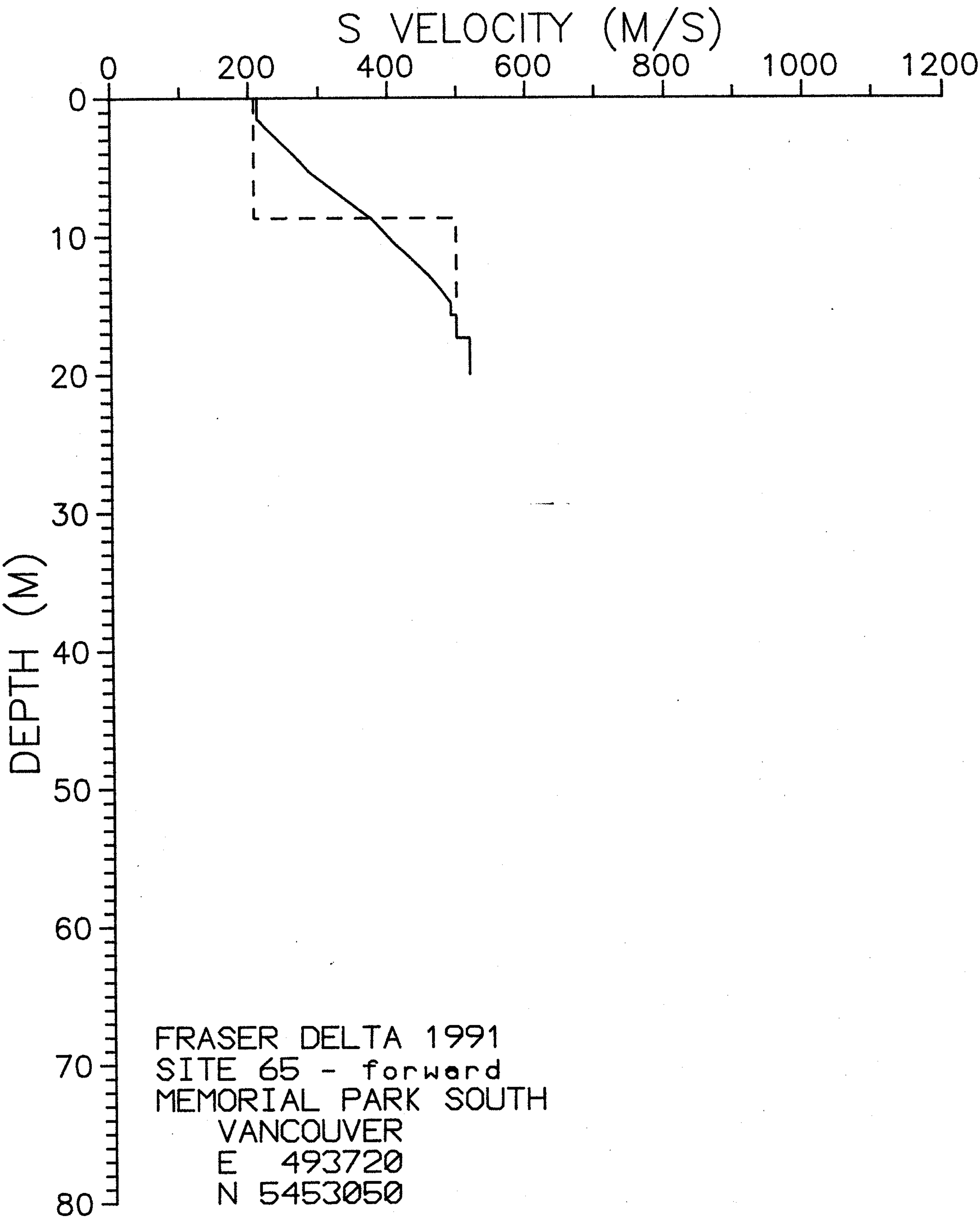

S VELOCITY (M/S)
0 100 200 300 400 500 600 700 800 900 1000
DEPTH (M)
0 10 20 30 40 50 60 70 80
FRASER DELTA 1991
SITE 62 - reverse
OAK PARK
VANCOUVER
E 490810
N 5451150

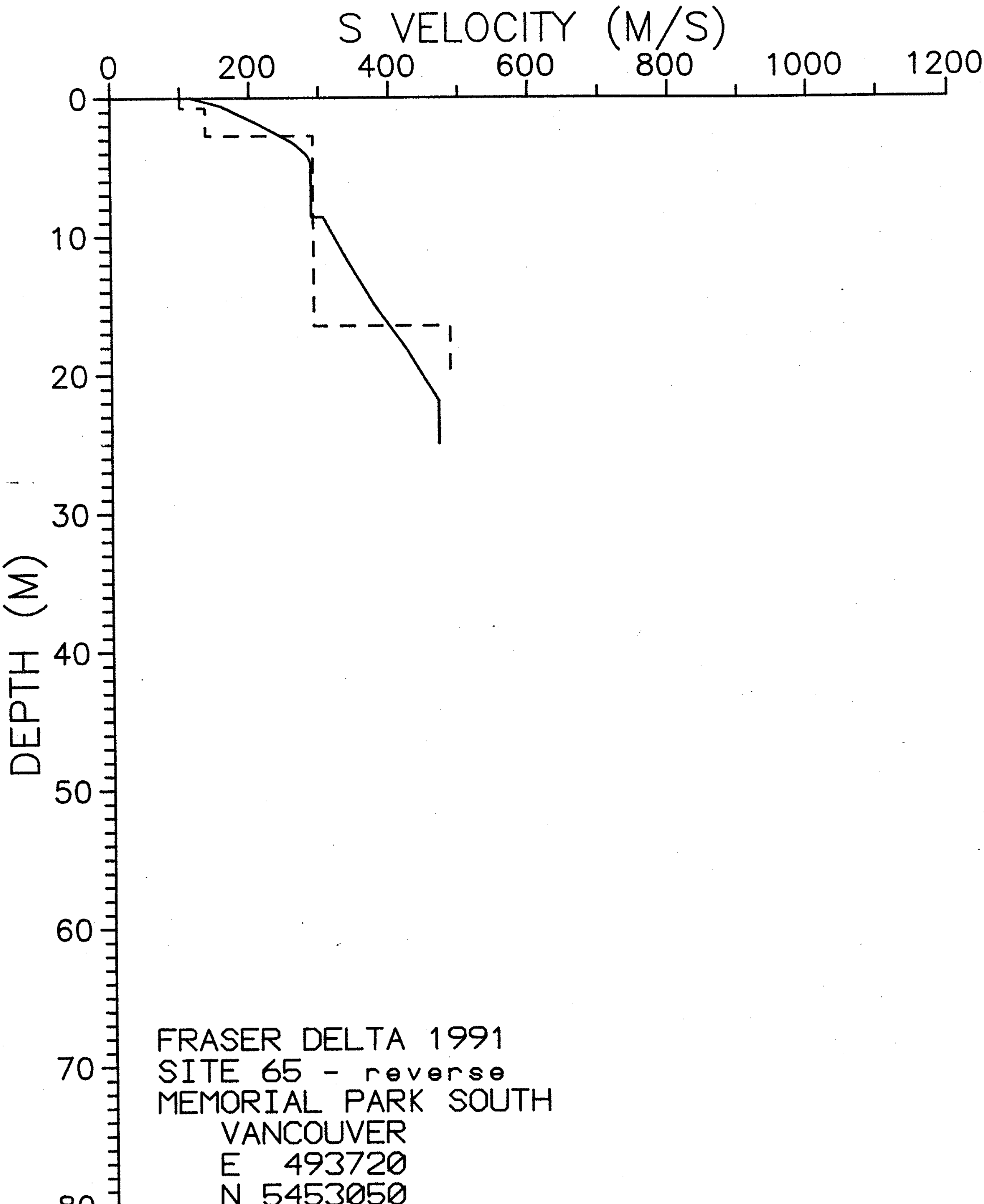

S VELOCITY (M/S)
0
200
400
600
800
1000
1200
0
10
20
30
40
50
60
70
80
DEPTH (M)
FRASER DELTA 1991
SITE 63 - forward
WINONA PARK
VANCOUVER
E 491800
N 5451100

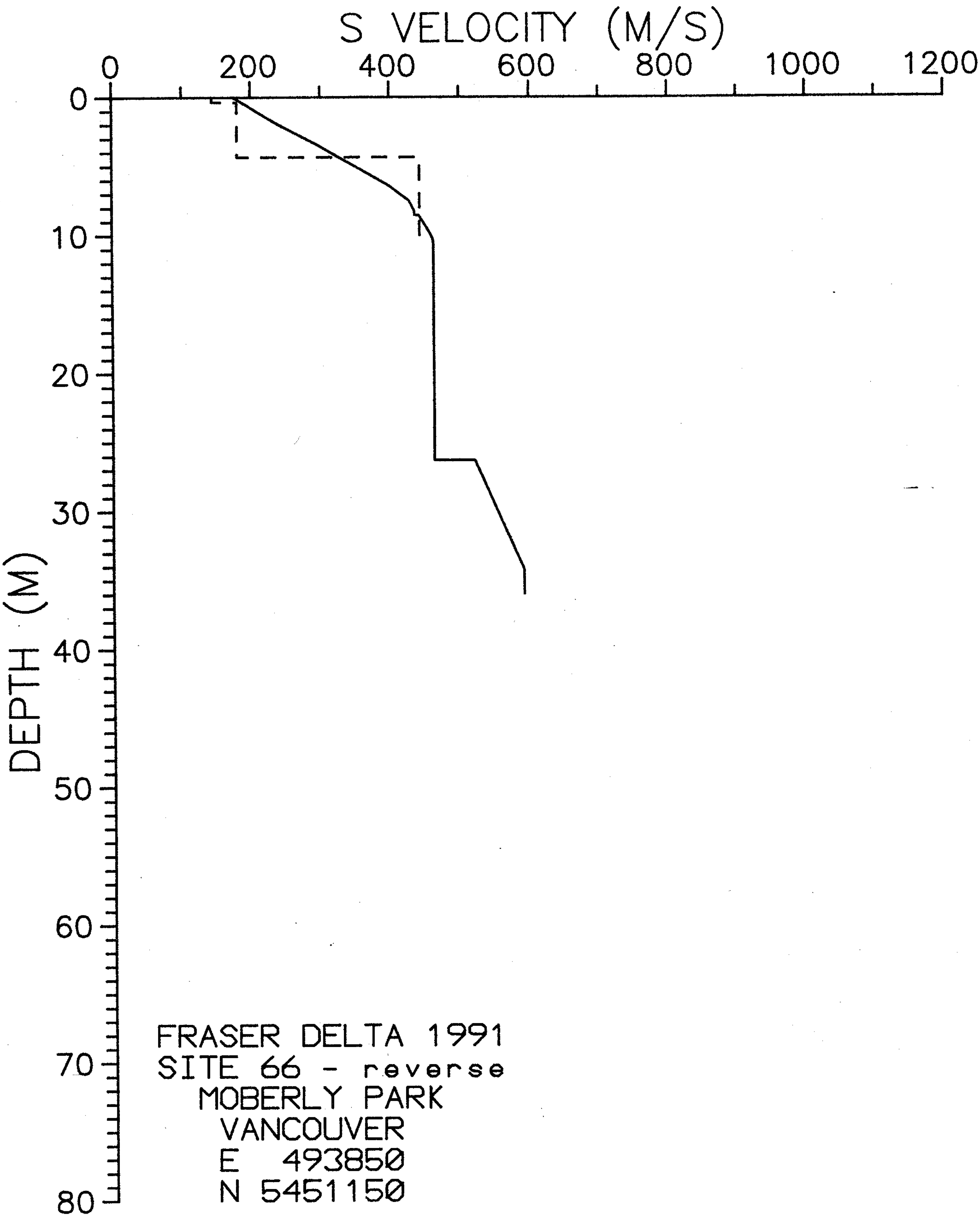

S VELOCITY (M/S)
0
200
400
600
800
1000
1200
DEPTH (M)
0
10
20
30
40
50
60
70
80
FRASER DELTA 1991
SITE 63 - reverse
WINONA PARK
VANCOUVER
E 491800
N 5451100

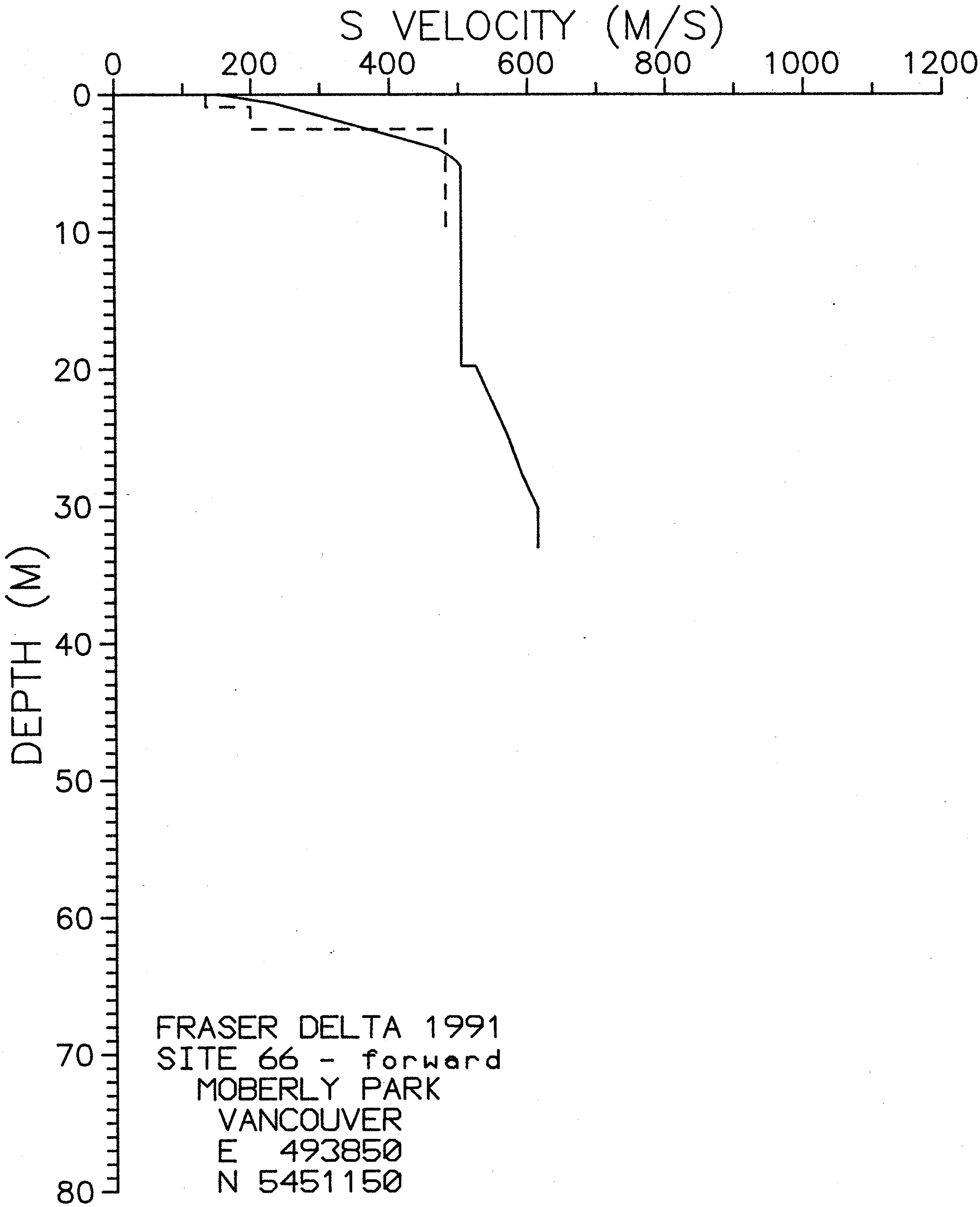

S VELOCITY (M/S)
0
200
400
600
800
1000
1200
0
10
20
30
40
50
60
70
80
DEPTH (M)
FRASER DELTA 1991
SITE 64 - forward
SUNSET PARK
VANCOUVER
E 492770
N 5451950

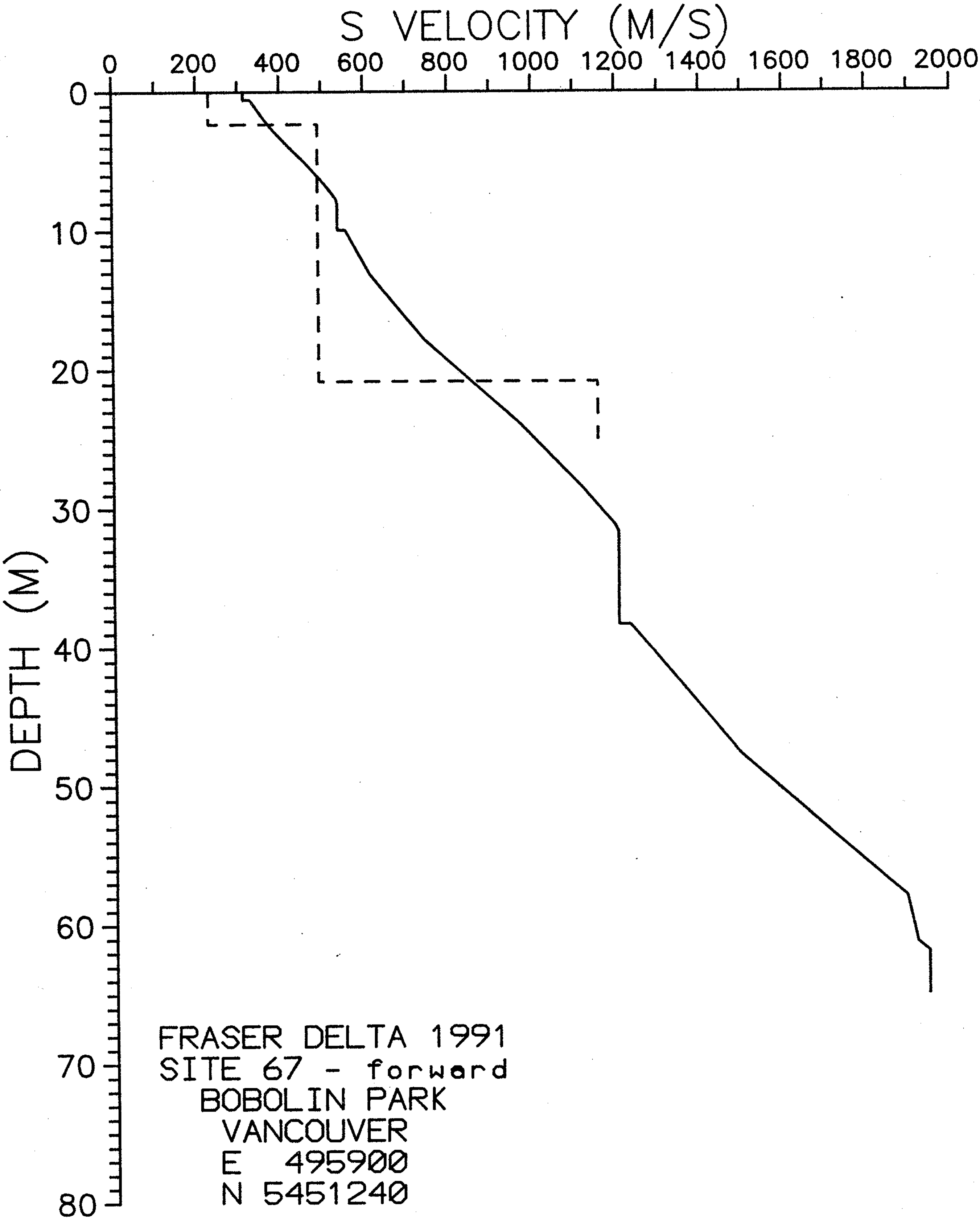

S VELOCITY (M/S)
0
200
400
600
800
1000
1200
0
10
20
30
40
50
60
70
80
DEPTH (M)
FRASER DELTA 1991
SITE 64 - reverse
SUNSET PARK
VANCOUVER
E 492770
N 5451950

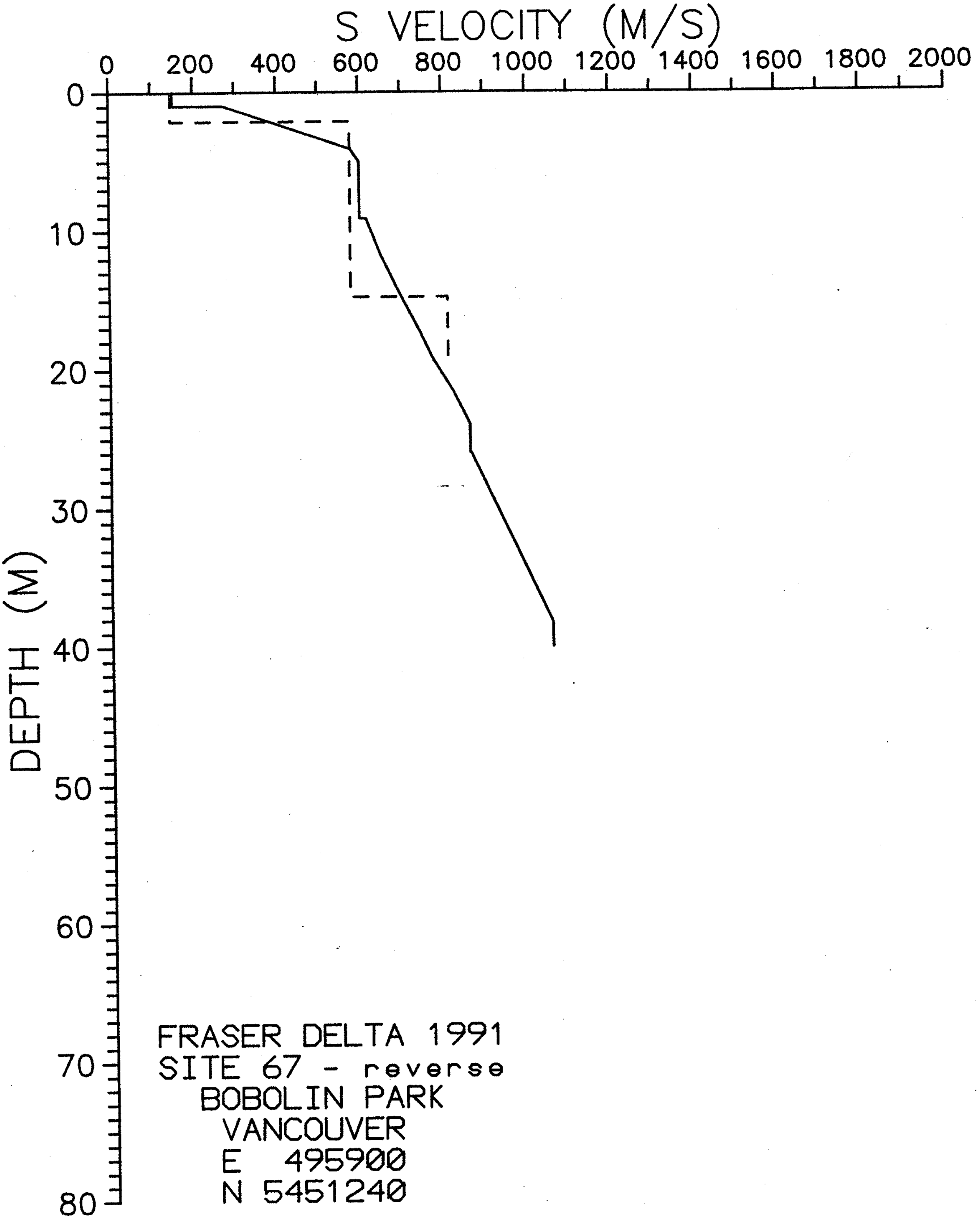

S VELOCITY (M/S)
0
200
400
600
800
1000
1200
0
10
20
30
40
50
60
70
80
DEPTH (M)
FRASER DELTA 1991
SITE 65 - forward
MEMORIAL PARK SOUTH
VANCOUVER
E 493720
N 5453050

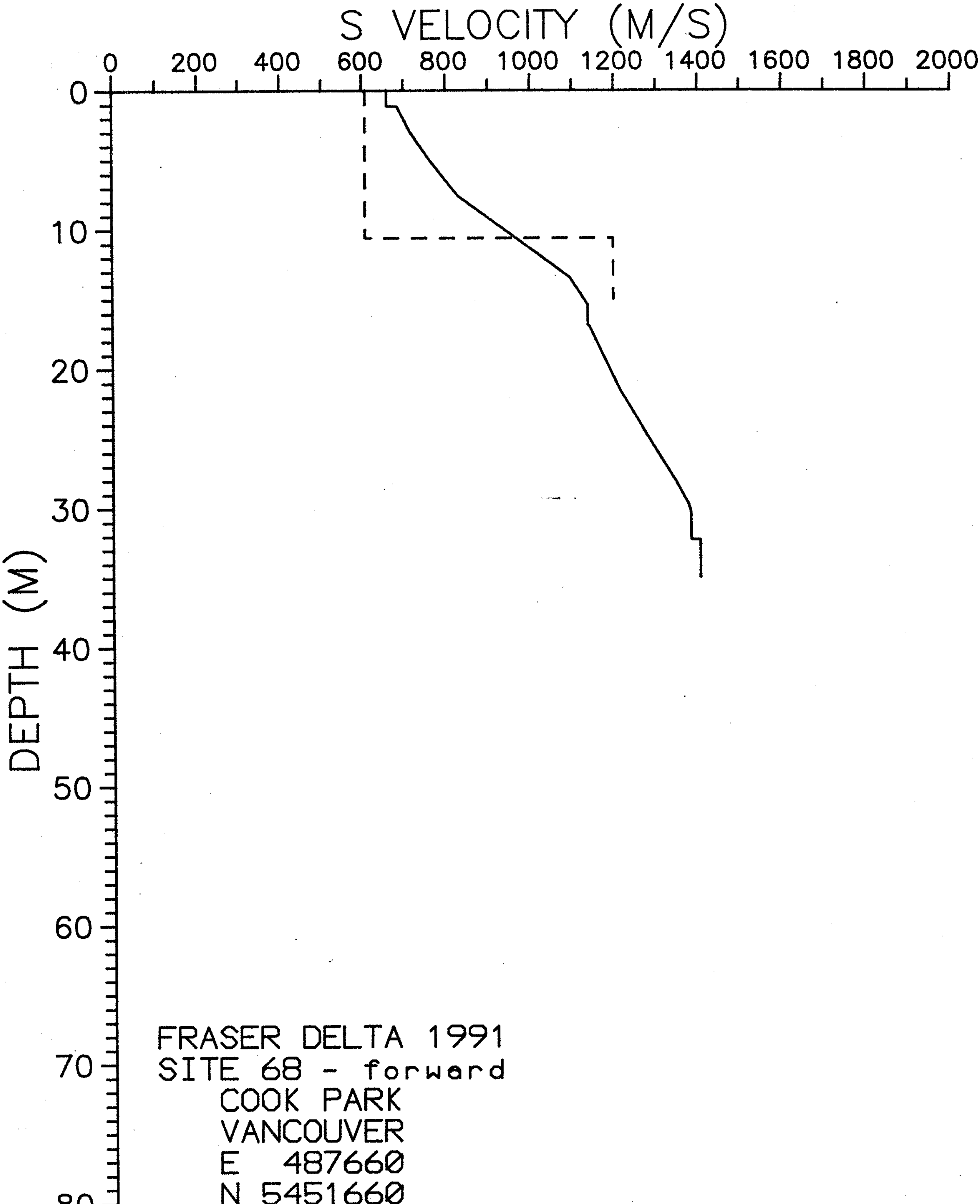

S VELOCITY (M/S)
0
200
400
600
800
1000
1200
0
10
20
30
40
50
60
70
80
DEPTH (M)
FRASER DELTA 1991
SITE 65 - reverse
MEMORIAL PARK SOUTH
VANCOUVER
E 493720
N 5453050

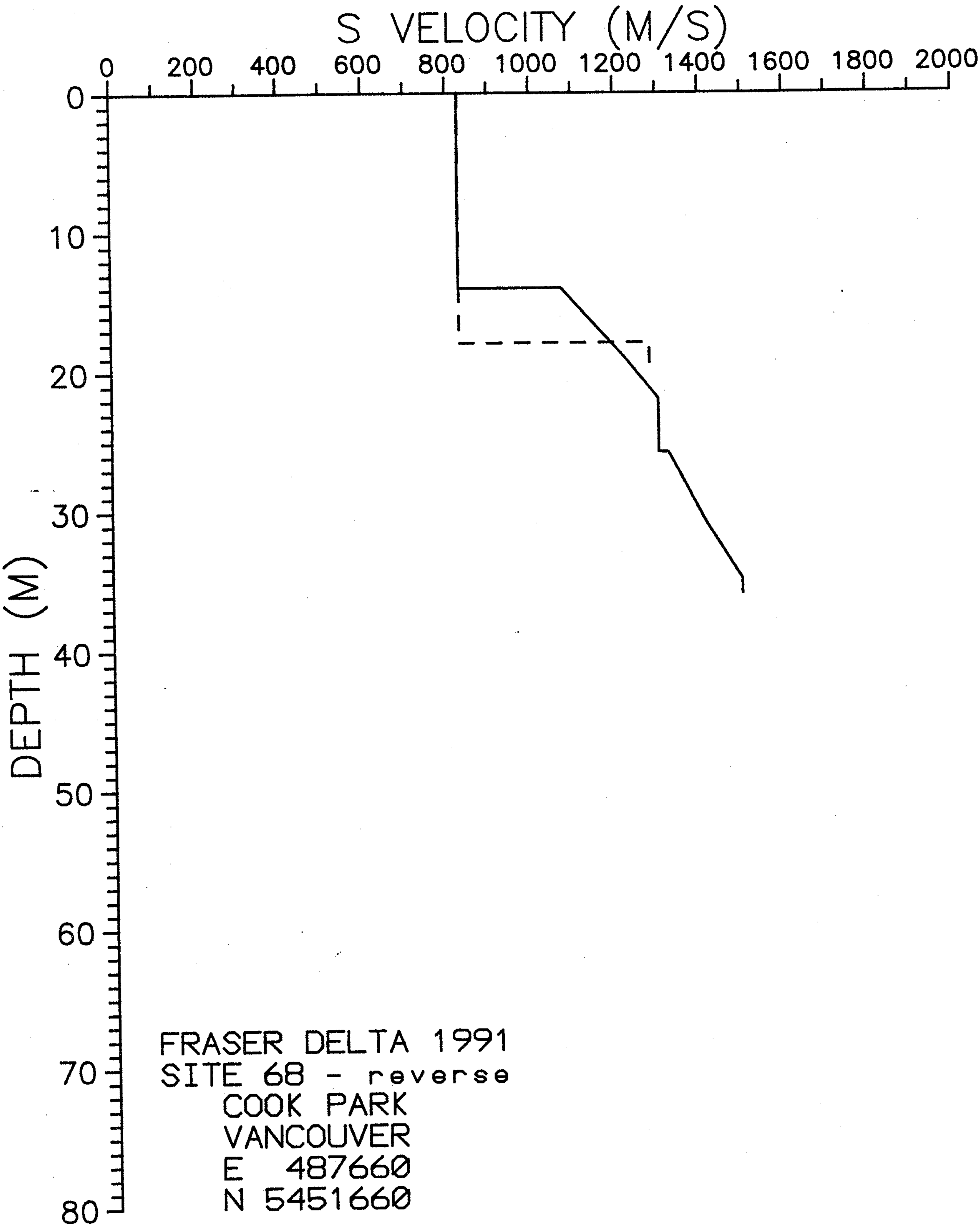

S VELOCITY (M/S)
0
200
400
600
800
1000
1200
DEPTH (M)
0
10
20
30
40
50
60
70
80
FRASER DELTA 1991
SITE 66 - reverse
MOBERLY PARK
VANCOUVER
E 493850
N 5451150

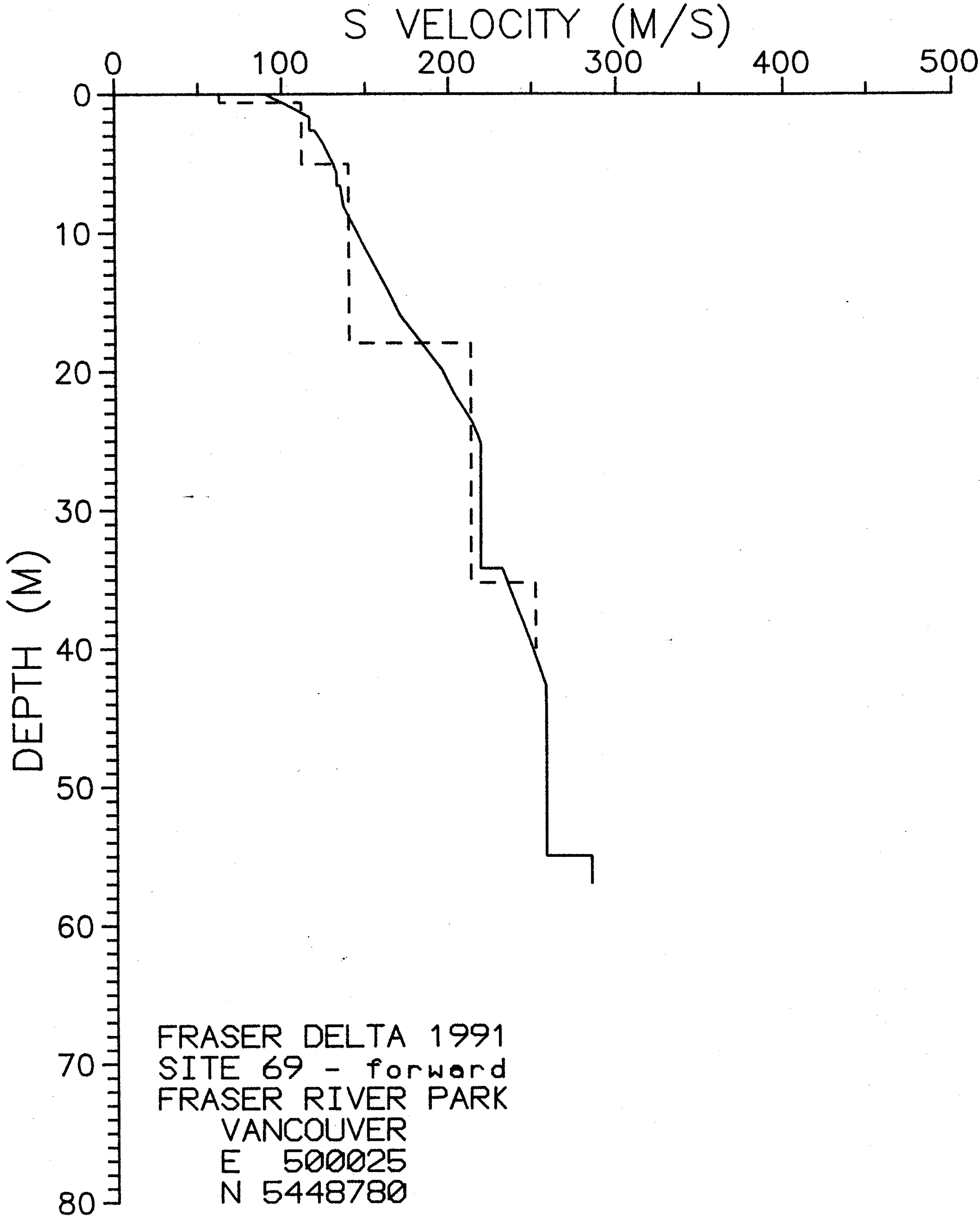

S VELOCITY (M/S)
0
200
400
600
800
1000
1200
0
10
20
30
40
50
60
70
80
DEPTH (M)
FRASER DELTA 1991
SITE 66 - forward
MOBERLY PARK
VANCOUVER
E 493850
N 5451150

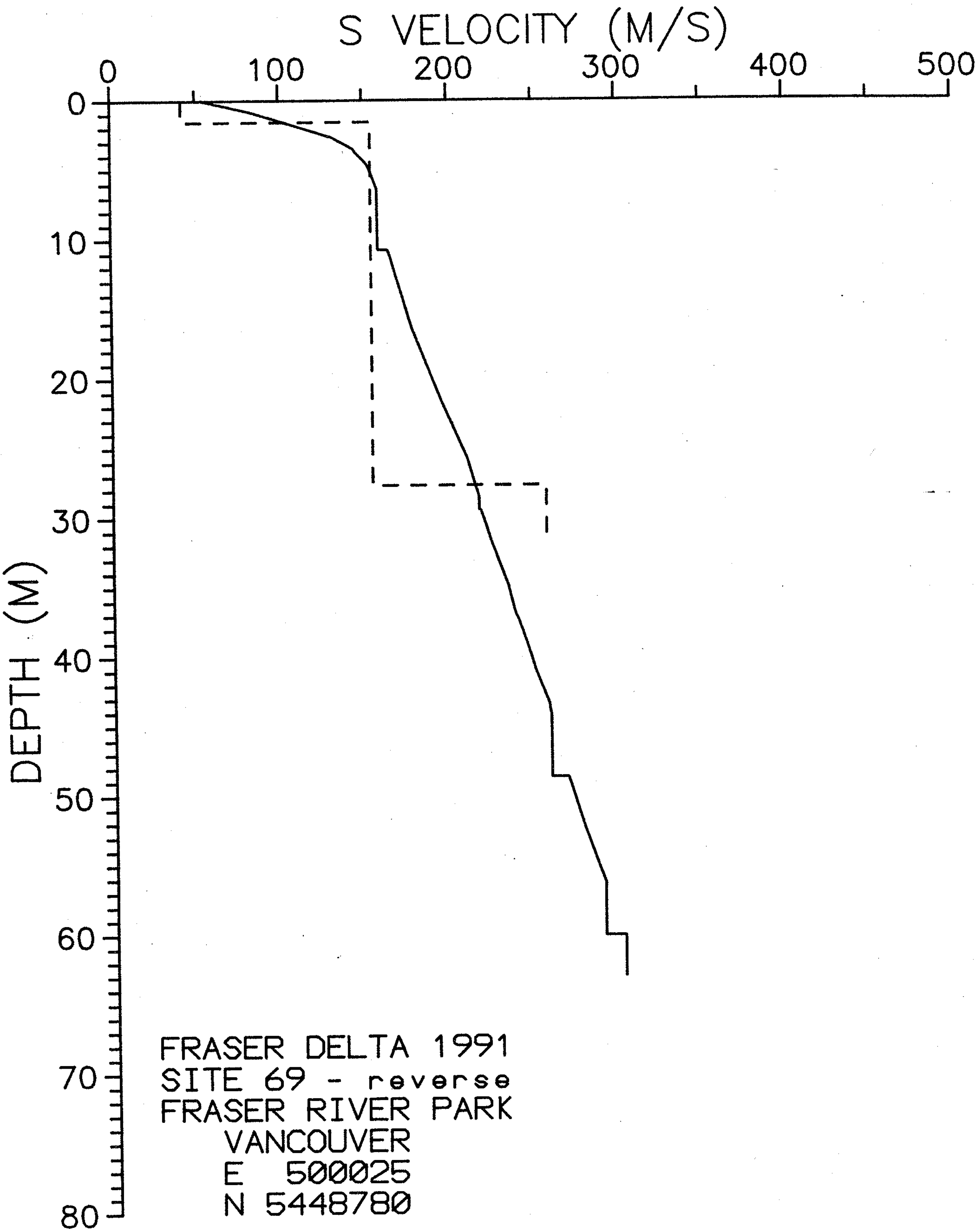

S VELOCITY (M/S)
0 200 400 600 800 1000 1200 1400 1600 1800 2000
DEPTH (M)
0 10 20 30 40 50 60 70 80
FRASER DELTA 1991
SITE 67 - forward
BOBOLIN PARK
VANCOUVER
E 495900
N 5451240

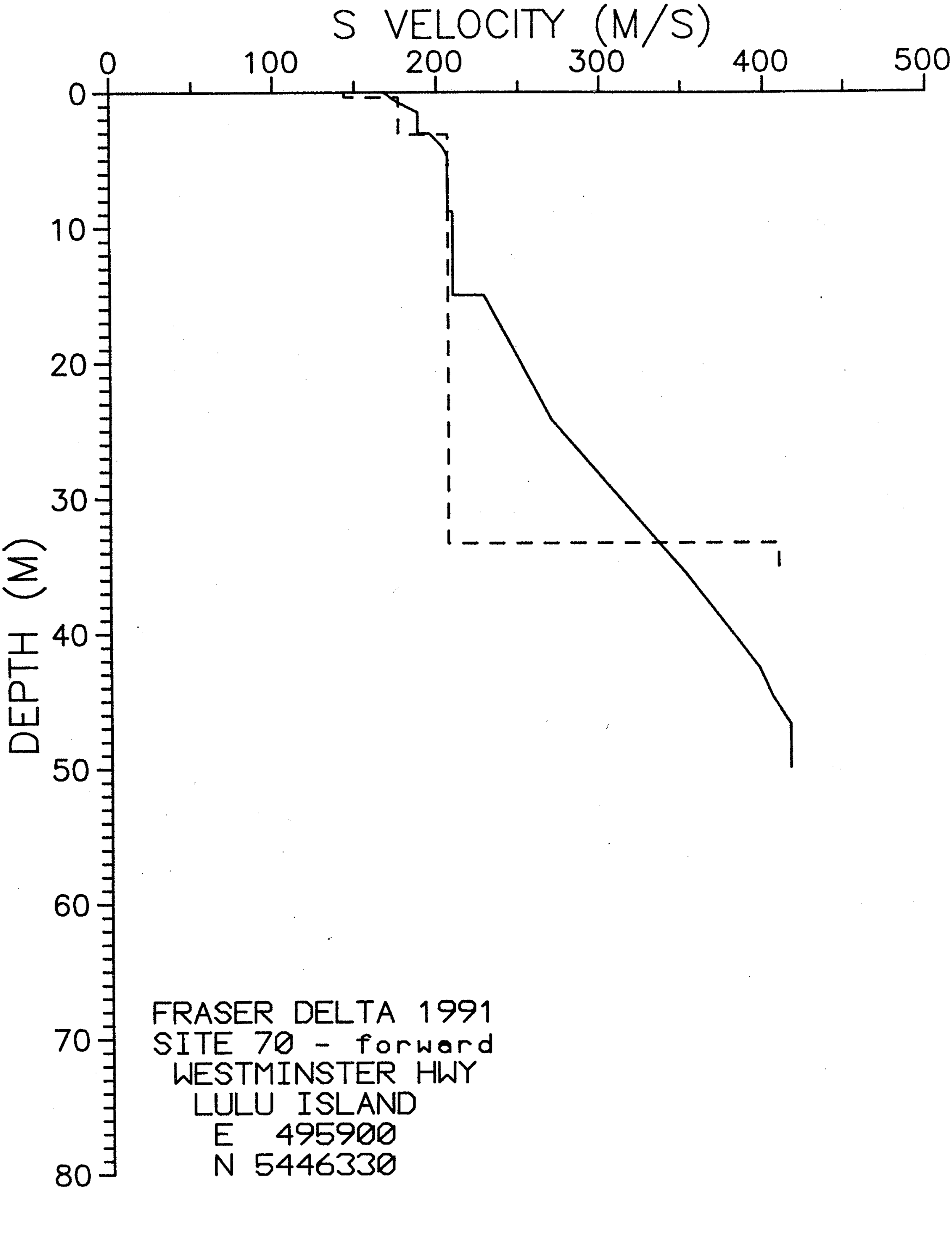

S VELOCITY (M/S)
0 200 400 600 800 1000 1200 1400 1600 1800 2000
DEPTH (M)
0 10 20 30 40 50 60 70 80
FRASER DELTA 1991
SITE 67 - reverse
BOBOLIN PARK
VANCOUVER
E 495900
N 5451240

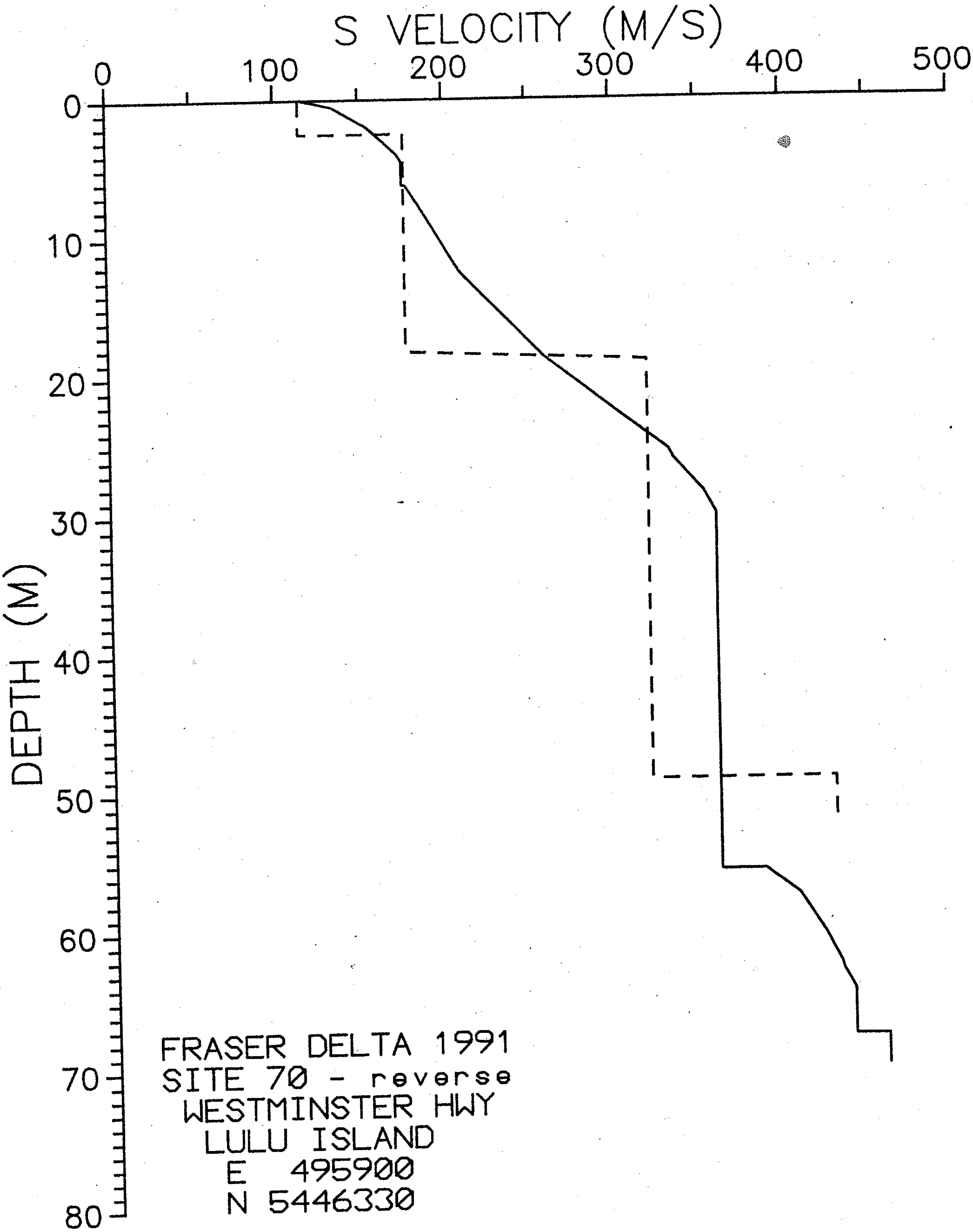

S VELOCITY (M/S)
0 200 400 600 800 1000 1200 1400 1600 1800 2000
0 10 20 30 40 50 60 70 80
DEPTH (M)
FRASER DELTA 1991
SITE 68 - forward
COOK PARK
VANCOUVER
E 487660
N 5451660


S VELOCITY (M/S)
0 200 400 600 800 1000 1200 1400 1600 1800 2000
0 10 20 30 40 50 60 70 80
DEPTH (M)
FRASER DELTA 1991
SITE 68 - reverse
COOK PARK
VANCOUVER
E 487660
N 5451660


S VELOCITY (M/S)
0
100
200
300
400
500
0
10
20
30
40
50
60
70
80
DEPTH (M)
FRASER DELTA 1991
SITE 69 - forward
FRASER RIVER PARK
VANCOUVER
E 500025
N 5448780


S VELOCITY (M/S)
0
100
200
300
400
500
DEPTH (M)
0
10
20
30
40
50
60
70
80
FRASER DELTA 1991
SITE 69 - reverse
FRASER RIVER PARK
VANCOUVER
E 500025
N 5448780


S VELOCITY (M/S)
0
100
200
300
400
500
0
10
20
30
40
50
60
70
80
DEPTH (M)
FRASER DELTA 1991
SITE 70 - forward
WESTMINSTER HWY
LULU ISLAND
E 495900
N 5446330


S VELOCITY (M/S)
0
100
200
300
400
500
DEPTH (M)
0
10
20
30
40
50
60
70
80
FRASER DELTA 1991
SITE 70 - reverse
WESTMINSTER HWY
LULU ISLAND
E 495900
N 5446330