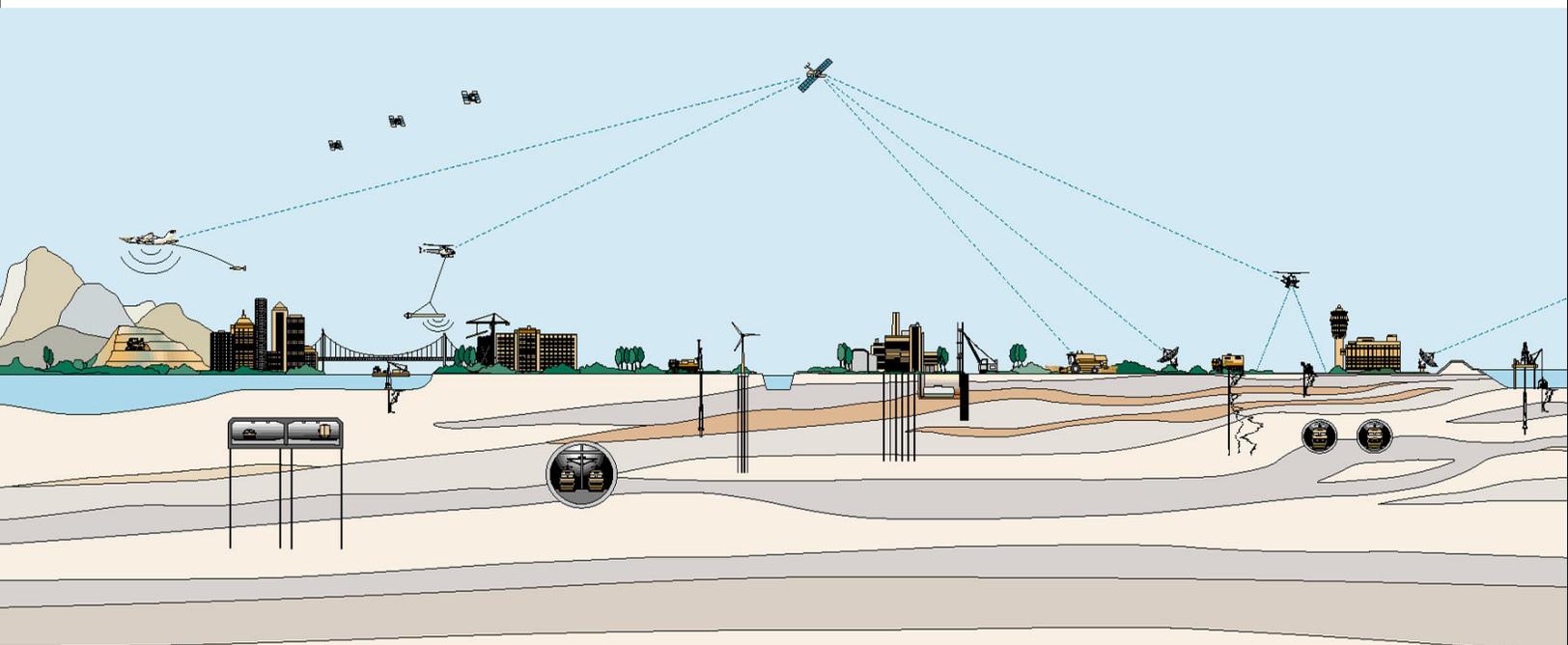

FUGRO CONSULTANTS, INC.



**ANNUAL REPORT
JULY 2014 THROUGH JUNE 2015
MALIBU ROAD LANDSLIDE ASSESSMENT DISTRICT
MALIBU, CALIFORNIA**

Prepared for:
CITY OF MALIBU

November 2015
Fugro Project No. 04.62140604





4820 McGrath Street, Suite 100
Ventura, California 93003-7778
Tel: (805) 650-7000
Fax: (805) 650-7010

November 4, 2015
Project No. 04.2140604

City of Malibu
23825 Stuart Ranch Road
Malibu, California 90265

Attention: Mr. Rob Duboux

Subject: Annual Report, July 2014 through June 2015, Malibu Road Landslide Assessment District

Dear Mr. Duboux,

Fugro is pleased to present this annual report for the Malibu Road Landslide Assessment District. This report summarizes the monitoring and maintenance activities completed during the period of July 2014 through June 2015.

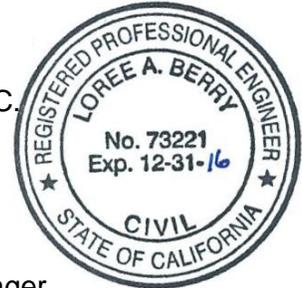
Fugro appreciates the opportunity to be of service to the City of Malibu and the District homeowners. Please contact Chris Dean at (310) 456-2489, x306 or Loree Berry at (805) 289-3830 if you have any questions regarding this report.


Christopher Dean, C.E.G.
Associate Geologist/Program Manager



Sincerely,
FUGRO CONSULTANTS, INC.


Loree A. Berry, P.E.
Senior Engineer/Project Manager




Nicholas Simon
Staff Geologist/Lead Technician

Copies Submitted: (1) Addressee and PDF
(2) City of Malibu - Geotechnical Staff and PDF



CONTENTS

	Page
1.0 INTRODUCTION.....	1
1.1 Authorization.....	1
1.2 Background	1
1.3 Scope of Work	1
1.4 Report Organization.....	2
1.5 Report Availability	2
2.0 MONITORING	2
2.1 Rainfall Data	2
2.2 Groundwater Monitoring	2
2.2.1 Standpipe Piezometers	3
2.2.2 Pneumatic Piezometers	3
2.2.3 Groundwater Level Discussion.....	4
2.3 Dewatering Production	4
2.3.1 Dewatering Well Production	4
2.3.2 Hydrauger Production	5
2.3.3 Total Dewatering Production	5
2.4 Slope Inclinator Measurements.....	5
3.0 DEWATERING FACILITY MAINTENANCE	6
3.1 Facility Maintenance	6
3.2 Capital Improvement Projects	6
3.3 Major Facility repair inventory	6
4.0 SUMMARY AND CONCLUSIONS.....	7
5.0 REFERENCES.....	8

TABLES

	Page
Table 1. Summary of Average Groundwater Elevations by Area	4

PLATES

Site Location Map	1
Assessment District Map.....	2
Rainfall Graph.....	3
Total Discharge - Wells and Hydraugers	4
Groundwater Levels, Dewatering, and Rainfall	5



CONTENTS - CONTINUED

APPENDICES

APPENDIX A GROUNDWATER DATA

Piezometer Information	Plate A-1
Summary of Groundwater Data	Plate A-2
Groundwater Level Information - Malibu Road (West End)	Plate A-3
Groundwater Level Information - Malibu Road (East End)	Plate A-4
Groundwater Level Information - Bayshore Drive.....	Plate A-5

APPENDIX B DEWATERING DATA

Dewatering Well / Hydrauger Information.....	Plate B-1
Dewatering Well Discharge Rate Graph - Malibu Road	Plate B-2a
Dewatering Well Discharge Rate Graph - Bayshore Drive	Plate B-2b
Hydrauger Discharge Rate Graph - Malibu Road (West End).....	Plate B-3a
Hydrauger Discharge Rate Graph -Malibu Road (East End)	Plate B-3b

APPENDIX C SLOPE INCLINOMETER DATA

Summary of Slope Inclinometers.....	Plate C-1
SI-1A – Cumulative and Incremental Displacement (A Direction)	Plate C-2a
SI-1A – Cumulative and Incremental Displacement (B Direction)	Plate C-2b
SI-1A – Displacement vs. Time (A Direction)	Plate C-2c
SI-1A – Displacement vs. Time (B Direction)	Plate C-2d
SI-2A – Cumulative and Incremental Displacement (A Direction)	Plate C-3a
SI-2A – Cumulative and Incremental Displacement (B Direction)	Plate C-3b
SI-2A – Displacement vs. Time (A Direction)	Plate C-3c
SI-2A – Displacement vs. Time (B Direction)	Plate C-3d
SI-4A – Cumulative and Incremental Displacement (A Direction)	Plate C-4a
SI-4A – Cumulative and Incremental Displacement (B Direction)	Plate C-4b
SI-4A – Displacement vs. Time (A Direction)	Plate C-4c
SI-4A – Displacement vs. Time (B Direction)	Plate C-4d
SI-5 – Cumulative and Incremental Displacement (A Direction).....	Plate C-5a
SI-5 – Cumulative and Incremental Displacement (B Direction).....	Plate C-5b
SI-5 – Displacement vs. Time (A Direction).....	Plate C-5c
SI-5 – Displacement vs. Time (B Direction).....	Plate C-5d
SI-6 – Cumulative and Incremental Displacement (A Direction).....	Plate C-6a
SI-6 – Cumulative and Incremental Displacement (B Direction).....	Plate C-6b
SI-6 – Displacement vs. Time (A Direction).....	Plate C-6c
SI-6 – Displacement vs. Time (B Direction).....	Plate C-6d



1.0 INTRODUCTION

1.1 AUTHORIZATION

Fugro performed the work summarized in this report in accordance with our contract with the City of Malibu (City) and consistent with the cost estimate document "Exhibit A - FY 2014-2015 Maintenance Cost Estimate" presented in the Annual Assessment Report (Taussig, 2014).

1.2 BACKGROUND

The Malibu Road Landslide Assessment District (Assessment District) was established in 1981 by the County of Los Angeles (County) following the activation of a landslide on the west end of Malibu Road in 1978 (Plates 1 and 2). The assessment district provides permanent funding to maintain and monitor dewatering facilities with the purpose of stabilizing the landslide to the extent feasible using dewatering methods only. The County administered the assessment district until 1991 when the City incorporated. The Assessment District was reauthorized in May 1998 under Resolution No. 98-036. The City has administered the assessment district, utilizing consultants to maintain and monitor the district facilities.

1.3 SCOPE OF WORK

This annual report summarizes the monitoring and maintenance of the geotechnical instrumentation and dewatering facilities within the Malibu Road Assessment District for the period between July 1, 2014, and June 30, 2015 (hereafter, the "monitoring period").

Routine monitoring data collected during the current monitoring period included the following:

- Review of annual rainfall data from a local rain gauge operated by the County of Los Angeles, Department of Public Works - Water Resources Division;
- Monthly groundwater level measurements from nine standpipes
- Periodic groundwater measurements from nine pneumatic piezometers;
- Monthly dewatering production readings from ten dewatering wells owned by the Assessment District and three wells owned by a private homeowner on Bayshore Drive;
- Monthly dewatering production readings from 23 horizontal drains (hydraugers);
- Quarterly ground deformation measurements from five slope inclinometers; and
- Periodic maintenance of dewatering and monitoring facilities.

The operating condition of the instrumentation and dewatering facilities was checked during each field monitoring/observation visit and by evaluating preliminary data in the office as they were received. Maintenance was performed as-needed based upon the field observations



and preliminary data evaluation, and correspondence from concerned homeowners and tenants.

The scope of services includes monitoring and maintenance of the assessment district facilities. The services provided on an annual basis for the assessment district do not include an engineering evaluation of the stability of the landslide.

1.4 REPORT ORGANIZATION

This report summarizes the monitoring data collected during the current monitoring period and presents conclusions regarding the annual monitoring results. The location of the assessment district is illustrated on Plate 1 - Site Location Map. Locations of the geotechnical instrumentation are shown on Plate 2 - Assessment District Map. Tabulated and graphic summaries of monitoring data are presented in Appendix A through Appendix C as indicated in the Table of Contents.

1.5 REPORT AVAILABILITY

The annual Assessment District reports are available for review at Malibu City Hall. Reports may also be viewed on the City's website at <http://www.malibucity.org>.

2.0 MONITORING

2.1 RAINFALL DATA

Rainfall totals were tabulated based exclusively on recorded values from the Los Angeles County Rainfall Station 1239 located at Big Rock Mesa since 2004 and on an average of three Rainfall Stations referred to as the "Malibu Area" between 1968 and 2004. A graph of historical monthly rainfall and average annual rainfall through September 30, 2015 is shown on Plate 3 - Rainfall Graph.

Rainfall data indicate that approximately 8.70 inches of precipitation fell during the monitoring period from July 1, 2014 through June 30, 2015. The average annual rainfall from 1968 to 2015 in the "Malibu Area" for the monitoring period is approximately 15.6 inches.

Rainfall data are usually analyzed in terms of the annual "rain season" that covers the time period from October 1 through September 30. Rainfall for October 1, 2014, through September 30, 2015, was approximately 10.75 inches. This is approximately 33 percent of the average annual rainfall of 16.0 inches for the "rain seasons" between 1968 and 2015.

2.2 GROUNDWATER MONITORING

The groundwater level data collected during the current monitoring period are summarized in Appendix A. Groundwater levels fluctuate throughout the year and from year to year in response to natural and man-made influences. The primary natural influence is varying precipitation. Man-made influences include:

- Recharge from septic systems;
- Recharge from irrigation;
- Alterations to surface drainage by grading, landscaping, storm drains, and rain gutters;
- Accidental water discharges from leaking utilities (water, irrigation, sewer, storm drain), and swimming pools; and
- Dewatering activities including pumping dewatering wells and hydraugers.

Typically, groundwater levels rise relatively quickly following significant rainfall and gradually lower after the wet season ends. Groundwater levels measured in standpipe piezometers (wells) and pneumatic piezometers are depicted on Plates A-3 through A-5 in Appendix A. Groundwater levels at Malibu Road typically peak around late-March to mid-April and gradually decline through late September to November.

A summary graph of mean high groundwater elevations for Malibu Road is presented on Plate 5 - Groundwater Levels, Dewatering, and Rainfall. Plate 5 also shows the average dewatering output (gpd) and the deviation from the mean annual rainfall. The mean annual rainfall used for the chart was computed using all of the data from 1988 through the present. This graph illustrates that, since 2010-2011, annual rainfall has been generally decreasing. During the same period, the average dewatering output has been decreasing.

2.2.1 Standpipe Piezometers

Eight standpipe piezometers (W-2A, PZ-A, PZ-B, PZ-C, PZ-D, PZ-E, SI-5, and SI-6) were measured regularly over the monitoring period. Standpipe W-3A has not been located and is presumed to be buried under soil creeping down the slope on the North side of Malibu Road. Slope inclinometers/piezometers SI-5 and SI-6 were installed in 1998 along Bayshore Drive. Los Angeles County installed the other piezometers at earlier dates. The locations of the standpipe piezometers are depicted on Plate 2 - Assessment District Map, and groundwater hydrographs are presented in Appendix A.

2.2.2 Pneumatic Piezometers

Inclinometers installed within the assessment district after 1997 were typically outfitted with one or two pneumatic piezometer sensors. Each sensor records groundwater elevations by measuring differential air pressure between the instrument sensor and groundwater surface across a flexible bladder. In consideration of the generally declining groundwater levels, low rainfall, and close proximity of standpipe piezometers to pneumatic piezometers, the pneumatic water levels were monitored only intermittently throughout the monitoring year. All Pnuematic piezometers were assessed for functionality and it was determined that only SI-4 Tip-1, SI 5 Tips 1 and 2, and SI-6 Tip 2 are still functioning. June 2015 data for the functioning pneumatic piezometers is included in the report. The locations of the piezometers are depicted on Plate 2, and hydrographs are presented in Appendix A.



2.2.3 Groundwater Level Discussion

The groundwater data were reviewed by evaluating changes that occurred during the current monitoring period as well as changes in groundwater levels over extended periods. To analyze trends in seasonal groundwater fluctuations, the average (mean) annual and highest annual recorded groundwater elevation for each piezometer was calculated (Plate A-2).

Groundwater levels rose significantly immediately following the record rainfall in the winter of 2004 to 2005 (37.6 inches). Since about mid-2005, groundwater levels in the eastern and western portions of the district under Malibu Road had been slowly rising, while levels in the central portion of the district under Malibu Road had remained the same. Groundwater levels under Bayshore Drive have generally decreased since mid-2005. Over the last monitoring period, groundwater levels under the East and West ends of the Malibu Road section of the assessment district (PZ-D, PZ-E, and PZ-A) have decreased about three feet and the groundwater level in W-2A at the west end has decreased below the bottom of the well. W-3A, at the west end cannot be located and is buried under slump debris. Groundwater levels in standpipe piezometers under the middle section of the assessment district along Malibu Road (PZ-B and PZ-C) are both increasing despite the below average rainfall. The water levels in PZ-C have been increasing since 2013, which may be related to a decreased production in nearby dewatering well W-5. Dewatering well, W-5 has decreased production from an average of 460 gpm in the 2012-2013 monitoring year to 3.0 gpm over the last monitoring year. Similarly, PZ-B is located adjacent to dewatering well W-10. W-10 stopped producing in February 2015. Groundwater levels at SI-5 have decreased significantly following the installation of the replacement dewatering well, W-14, in October 2008.

The average and highest annual groundwater levels are provided on Plate A-2 and summarized in Table 1, below. Both the average and peak groundwater elevations have decreased since the prior year.

Table 1. Summary of Average Groundwater Elevations by Area

Location	Average Groundwater El. 2014-2015	Change from Prior Year Average	Peak Groundwater El. 2014-2015	Change from Prior Year Peak
Malibu Road	5.9	-3.1	6.8	-2.9
Bay Shore Drive	21.0	-1.4	21.7	-1.6

Note: All units are in feet.

2.3 DEWATERING PRODUCTION

2.3.1 Dewatering Well Production

A graph of the production rate for all dewatering wells is presented on Plate 4. Graphs showing production rates of individual wells are provided in Appendix B. Production data for the dewatering wells indicates the following:

- The average total well production rate for this monitoring period was approximately 292 gallons per day (gpd). That represents a decrease of about 35 percent from the previous monitoring period production rate of 452 gpd.

2.3.2 Hydrauger Production

A graph of the production rate for all hydraugers is presented on Plate 4. Graphs of individual production rates for all hydraugers are included in Appendix B. Data for the hydraugers indicates the following:

- The average production rate for all hydraugers over the monitoring period is approximately 194 gpd. This represents a decrease of approximately 57 percent from the average production rate of 449 gpd for the previous monitoring period.

2.3.3 Total Dewatering Production

A combined graph of the total dewatering rate for all dewatering wells and hydraugers is presented on Plate 4. Total dewatering production data for the hydraugers and wells indicates the following:

- The average total dewatering rate during the monitoring period was approximately 486 gpd. This represents a 46 percent decrease in the average rate relative to the 901 gpd average recorded during the previous monitoring period.

2.4 SLOPE INCLINOMETER MEASUREMENTS

Fugro monitored five slope inclinometers on a quarterly basis to check for subsurface ground deformation through June 2015. Slope inclinometer measurement plots are presented in Appendix C for each monitored inclinometer installation. Plots of slope inclinometer measurements (four plots for each monitored slope inclinometer) are presented in Appendix C. The first plot, for each inclinometer, shows the cumulative deflection and incremental deflection for the A-direction and the second plot shows the cumulative deflection and incremental deflection for the B-direction. Those two plots show approximately one curve per year from about 2006 through the current monitoring year. The third and fourth plots show displacement versus time for the same period, but all of the readings are included on those plots.

SI-1A was installed in August 2006 and has a baseline reading from September 2006. SI-2A was installed in September of the 2010-2011 monitoring year with a baseline reading in November 2010. SI-4A was installed in August 2012 as a replacement for SI -4 and has a baseline reading from September 2012.

Interpretation of inclinometer data along Malibu Road shows no clearly defined interpreted movement during the 2014-2015 monitoring year, except for SI-1A, which shows slow, steady movement at about 27 feet. Displacements appear to be less than 0.1 inch per year.

Inclinometers SI-5 and SI-6 are located on Bayshore Drive, upslope and outside the defined limit of the most recent 1998 movement. No significant movement was observed during this monitoring year in SI-5 or SI-6.

3.0 DEWATERING FACILITY MAINTENANCE

3.1 FACILITY MAINTENANCE

The operating status of each dewatering well and hydrauger was checked monthly. When necessary, repair work was scheduled and undertaken (typically within a matter of a few hours to a few days of identifying a problem). Generally, repairs and maintenance consisted of brush clearance around facilities and fixing broken hydraugers and conveyance lines.

3.2 CAPITAL IMPROVEMENT PROJECTS

No capital improvements were performed during the monitoring period.

3.3 MAJOR FACILITY REPAIR INVENTORY

Some maintenance and repair are of such a scope that they would exceed the normal maintenance budget. Those larger tasks are identified below and should be considered a priority when additional funding can be made available.

- Dewatering well W-5 had a sudden drop in production in August 2013. W-5 had been producing above 400 gpd consistently and is currently producing 3 gpd. This well should be evaluated by a well contractor to determine if it is operating with optimum efficiency or if it needs to be repaired, improved, or replaced.
- Dewatering well W-10 has had decreased production and has not produced any water since February 2015. This well should be evaluated by a well contractor to determine if it is operating at optimum efficiency or if it needs to be repaired, improved, or replaced.
- Dewatering Well W-12 has low production, however it cannot be inspected or have the water level directly measured due to a previous temporary repair. The well should be properly repaired by a well contractor and assessed for efficiency.
- The corrugated plastic conveyance lines extending from W-14 and W-12 are decomposed and could leak water back onto the subsurface. They should be replaced.
- All of the hydraugers in the assessment district show decreased production. Although some of the decrease can be attributed to lack of precipitation in the region, the hydraugers and conveyance lines should be maintained with routine flushing. They have not been cleaned/flushed since 2008.
- Standpipe piezometer W-3A and several hydraugers at the west end of the district along Malibu Road have been buried by soil creep and slumping. Those facilities require excavation by a backhoe or other similar equipment to expose them and to

properly inspect their condition. Cages or boxes should be constructed around the exposed facilities to protect them from future soil slumping. Ideally, the cut should be stabilized to prevent the soil creep/slumping from occurring.

4.0 SUMMARY AND CONCLUSIONS

The status of the Malibu Road Landslide Assessment District can be summarized as follows:

- The 2014 through 2015 monitoring year rainfall was below average with 8.70 inches of precipitation. Rainfall during the monitoring period was below the historical average of 16.0 inches per year measured from 1968 through 2015.
- Groundwater levels on Bayshore Drive and along Malibu Road with the exception of two locations near the center of the district have declined over the last monitoring year. Average daily dewatering production declined 46 percent from the previous monitoring year. This could be a reflection of the below-average rainfall these past two reporting years.
- Readings from SI-1A showed slow steady movement of less than 0.1 inch per year at a depth of 27 feet.
- Readings for the four remaining slope inclinometers show no clearly defined significant movement during the 2014 to 2015 monitoring year.
- Water conservation is encouraged throughout the Malibu Road area to reduce future groundwater level increases. Control of groundwater levels within the landslide area is critical to maintaining the stability of the landslides. The following are suggested:
 1. Rain Gutters - Installation and Maintenance.
 2. Limit Irrigation.
 3. Use of low-flow toilet and plumbing fixtures.
- Groundwater production from existing dewatering wells and hydraugers should be expected to gradually decline over time as the efficiency of the wells and hydraugers decrease due to mineralization and aging of the facilities. This may contribute to reduced rates of groundwater lowering or localized increases in groundwater levels. Periodic maintenance of the existing facilities and replacement of older, worn-out pumps should improve the efficiency of the dewatering systems throughout the year, especially during and immediately following the rainy months.

5.0 REFERENCES

- Bing Yen and Associates, Inc. (2003), "Annual Observation & Maintenance Report for the Period July 2002 to June 2003, Malibu Road, Malibu, California," dated October.
- _____ (2003), "Annual Observation & Maintenance Report for the Period July 2001 to June 2002, Malibu Road, Malibu, California" dated February.
- _____ (2002), "Annual Observation & Maintenance Report for the Period July 2000 to June 2001, Malibu Road, Malibu, California," dated January.
- _____ (2000), "Annual Observation & Maintenance Report for the Period April 1999 to June 2000, Malibu Road, Malibu, California," dated August.
- _____ (1999), "Annual Observation & Maintenance Report for the Period April 1998 to March 1999, Malibu Road, Malibu, California," dated May.
- _____ (1998), "Annual Observation & Maintenance Report for the Period July 1997 to April 1998, Malibu Road, Malibu, California," dated April.
- _____ (1997), "Annual Observation & Maintenance Report for the Period July 1996 to July 1997, Malibu Road, Malibu, California," dated June.
- _____ (1996), "Annual Observation & Maintenance Report for the Period July 1995 to July 1996, Malibu Road, Malibu, California," dated September.
- _____ (1995), "Annual Observation & Maintenance Report for the Period July 1994 to July 1995, Malibu Road, Malibu, California," dated September.
- _____ (1994), "Annual Observation & Maintenance Report for the Period July 1993 to July 1994, Malibu Road, Malibu, California," dated September.
- _____ (1993), "Semi-Annual Observation & Maintenance Report for the Period January to July 1993, Malibu Road, Malibu, California," dated September.
- _____ (1993), "Semi-Annual Observation & Maintenance Report for the Period July to December 1992, Malibu Road, Malibu, California," dated February.
- _____ (1992), "Second Quarter Observation Report: Instrumentation and Dewatering Facilities at Calle del Barco, Puerco Beach, and Latigo Canyon Landslide Sites," dated July 9.
- _____ (1992), "First Quarter Observation Report: Instrumentation and Dewatering Facilities at Calle Del Barco, Puerco Beach, and Latigo Canyon Landslide Sites," dated April 7.
- _____ (1991), "Monitoring, Instrumentation, and Dewatering Facilities at Calle del Barco, Puerco Beach, Latigo Canyon, and Rambla Pacifico (2 wells) Landslide Sites," dated October 4.



David Taussig & Associates, Inc. (2014), "Annual Assessment District No. 98-3 (Malibu Road) FY 2014-2015," dated June 22.

_____(2013), "Annual Assessment District No. 98-3 (Malibu Road) FY 2013-2014," dated May 28.

_____(2012), "Annual Assessment District No. 98-3 (Malibu Road) FY 2012-13," dated June 11.

_____(2011), "Annual Assessment District No. 98-3 (Malibu Road) FY 2011-12," dated June 27.

_____(2010), "Annual Assessment District No. 98-3 (Malibu Road) FY 2010-11," dated June 14.

_____(2009), "Annual Assessment District No. 98-3 (Malibu Road) FY 2009-10," dated June 8.

_____(2008), "Annual Assessment District No. 98-3 (Malibu Road) FY 2008-09," dated June 23.

_____(2007), "Annual Assessment District No. 98-3 (Malibu Road) FY 2007-08," dated June 25.

_____(2006), "Annual Assessment District No. 98-3 (Malibu Road) FY 2006-07," dated June 8.

_____(2005), "Annual Assessment District No. 98-3 (Malibu Road) FY 2005-06," dated June 13.

Fugro Consultants, Inc. (2015), "Annual Report, July 2013 through June 2014 Malibu Road Landslide Assessment District, Malibu, California," dated April 2015.

_____(2014), "Annual Report, July 2012 through June 2013 Malibu Road Landslide Assessment District, Malibu, California," dated January 2014.

_____(2012), "Annual Report, July 2011 through June 2012 Malibu Road Landslide Assessment District, Malibu, California," dated September 2012.

_____(2011), "Annual Report, July 2010 through June 2011 Malibu Road Landslide Assessment District, Malibu, California," dated August 2011.

_____(2010), "Annual Report, July 2009 through June 2010 Malibu Road Landslide Assessment District, Malibu, California," dated August 2009.

_____(2009), "Annual Report, July 2008 through June 2009 Malibu Road Landslide Assessment District, Malibu, California," dated August 2009.

_____(2008), "Annual Report, July 2007 through June 2008 Malibu Road Landslide Assessment District, Malibu, California," dated October 2008.

_____(2007), "Annual Report, July 2006 through June 2007 Malibu Road Landslide Assessment District, Malibu, California," dated October 2007.

_____(2006), "Annual Report, July 2005 through June 2006 Malibu Road Landslide Assessment District, Malibu, California," dated August 2006.

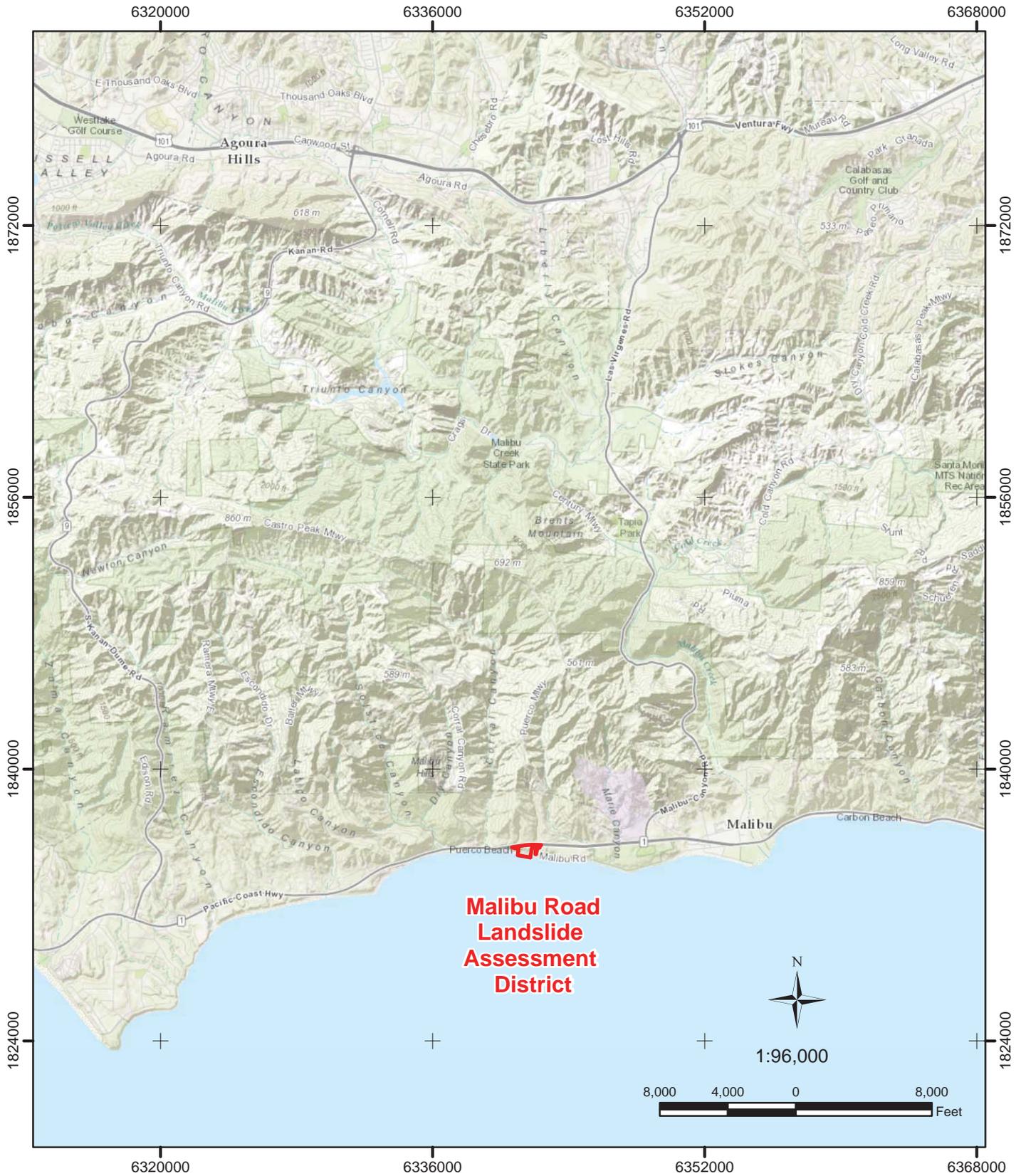


_____(2005), "Annual Report, July 2004 through June 2005 Malibu Road Landslide Assessment District, Malibu, California," dated October 2005.

_____(2004), "Annual Report, July 2003 through June 2004 Malibu Road Landslide Assessment District, Malibu, California," dated November 2004.

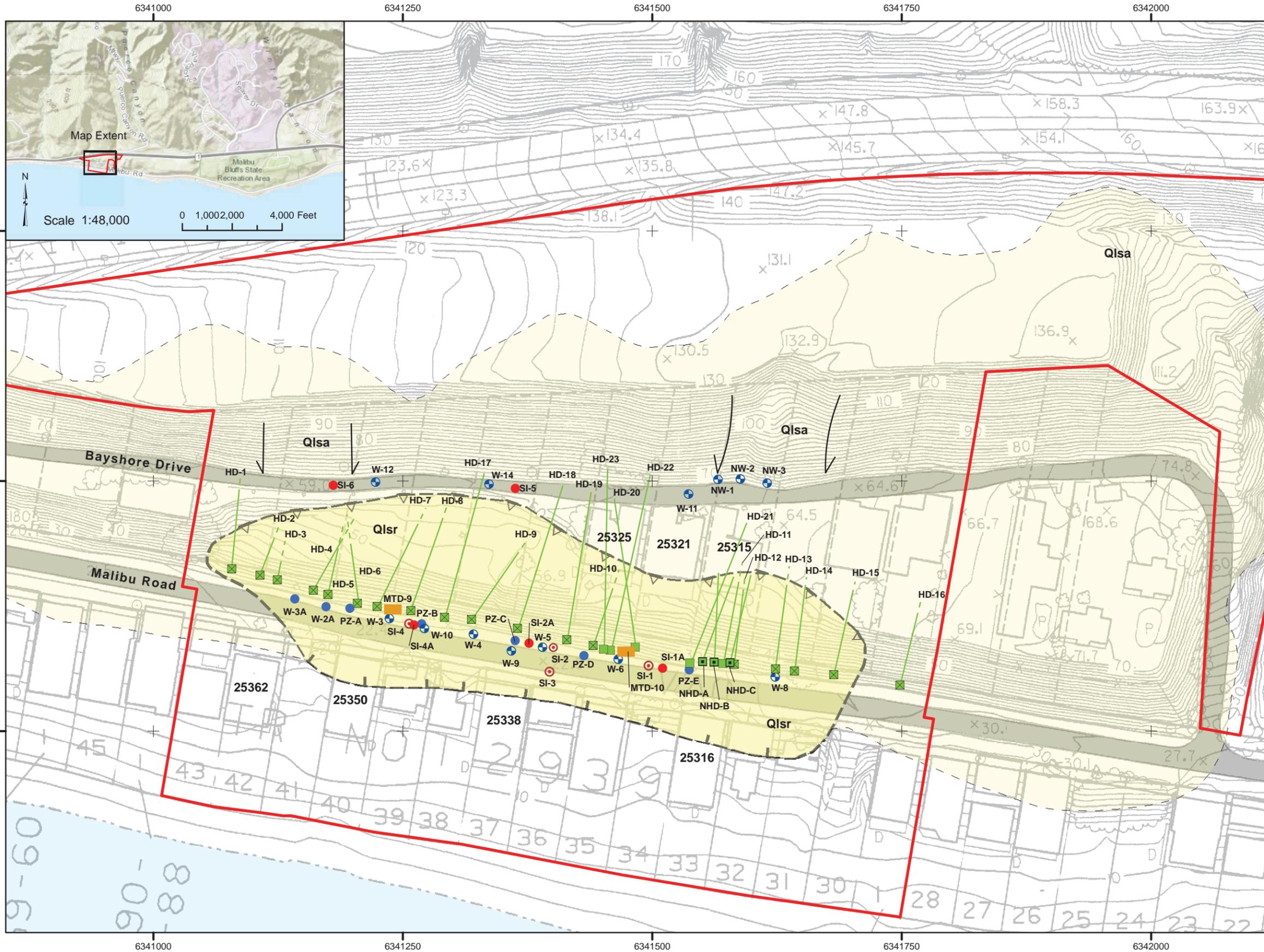
Leighton and Associates, Inc. (1979), "Final Report, Geotechnical Investigation of Landslide Conditions Affecting Puerco West Area, Malibu, California," dated September 4.

PLATES

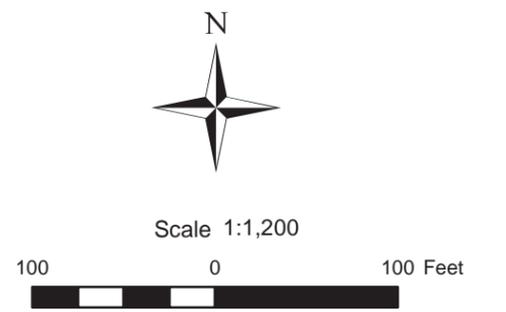


SITE LOCATION MAP
 Malibu Road Landslide Assessment District
 Malibu, California

N:\Projects\04_2014\04_6214_0604_Malibu_Rd\Outputs\2015_2_23_Annual_Report\mxd\Plate01_SiteLocation.mxd, 2/23/2015, wcupples

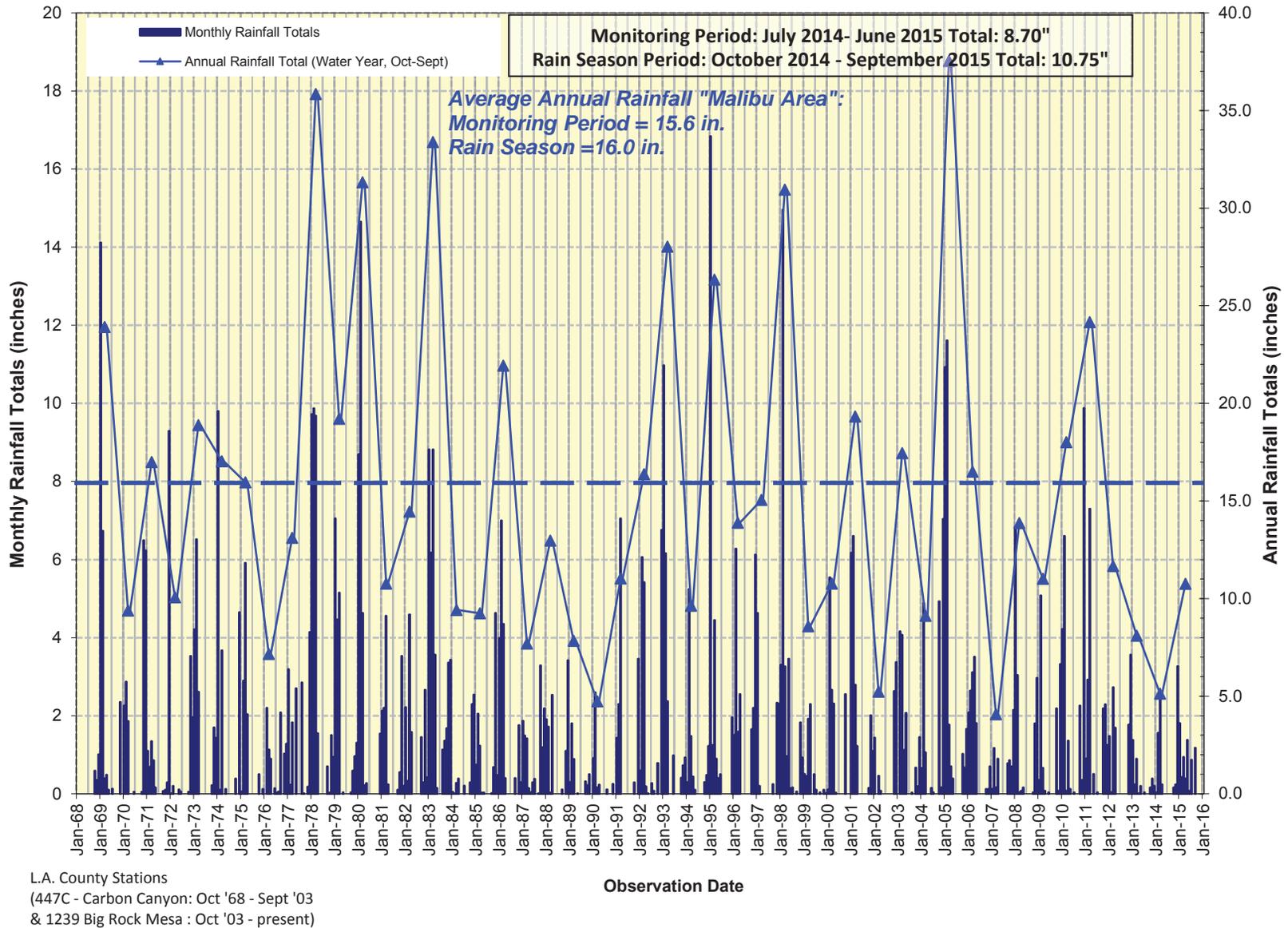


- LEGEND**
- Dewatering Well
 - Slope Inclinometer
 - Destroyed Slope Inclinometer
 - Standpipe Piezometer
 - Storm Drain Outfall
 - Producing Hydrauger (solid line showing unobstructed pipe)
 - Private Hydrauger
 - Nonproducing Hydrauger
 - +
 Coordinate Grid: California State Plane, Zone 5, NAD 83, Feet
 - Assessment District No. 98-3 Boundary
 - Qlsr Recent Landslide of 1978 (Boundary from Leighton, 1979)
 - Qlsa Ancient Landslide (Boundary from Leighton, 1979)



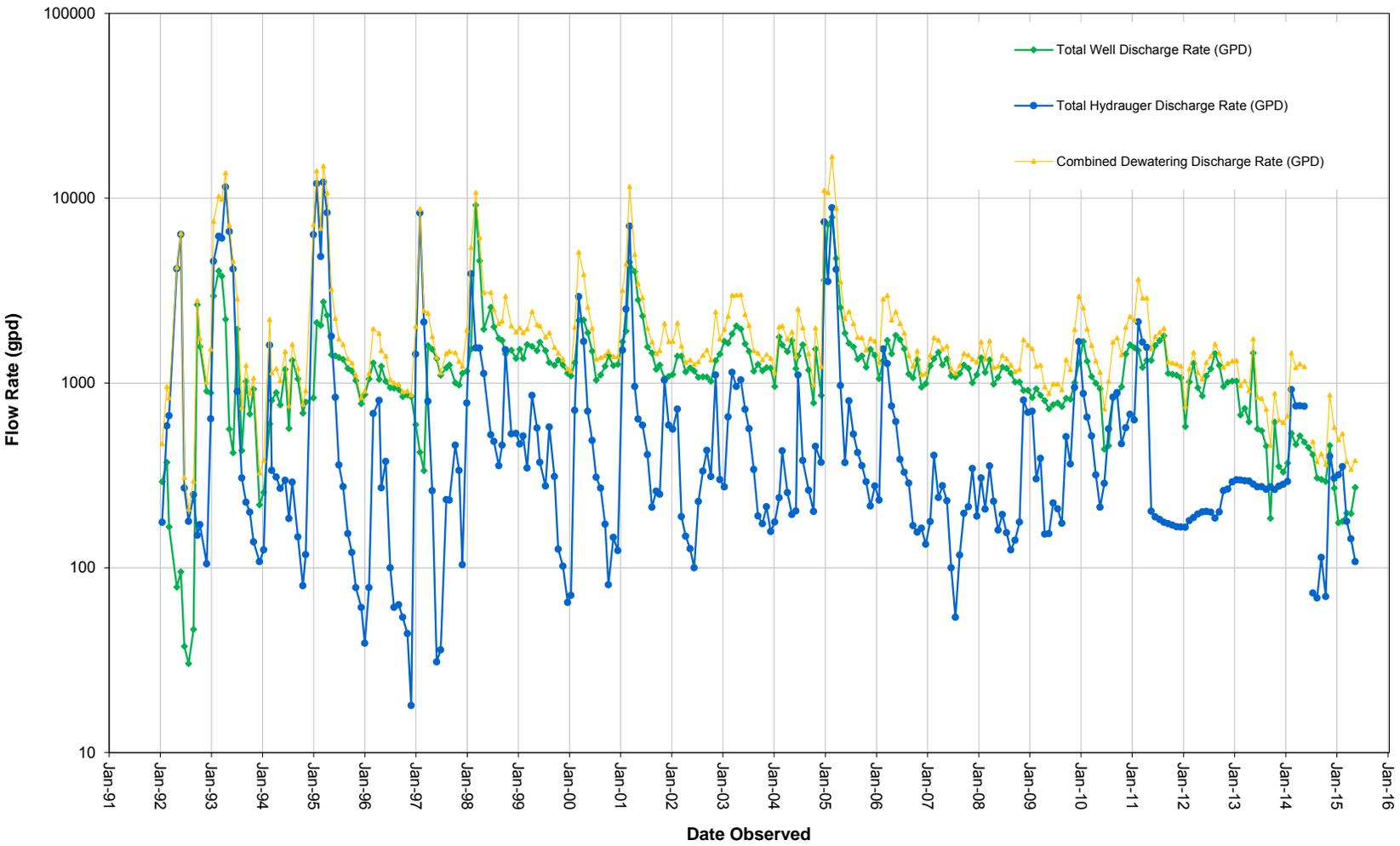
ASSESSMENT DISTRICT MAP
 Malibu Road Landslide Assessment District
 Malibu, California

N:\Projects\04_2014\04_6214_0604_Malibu_Rd\Outputs\2015_2_23_Annual_Report\mxd\Plate02-Instrumentation_MR.mxd_2/23/2015_wcupples

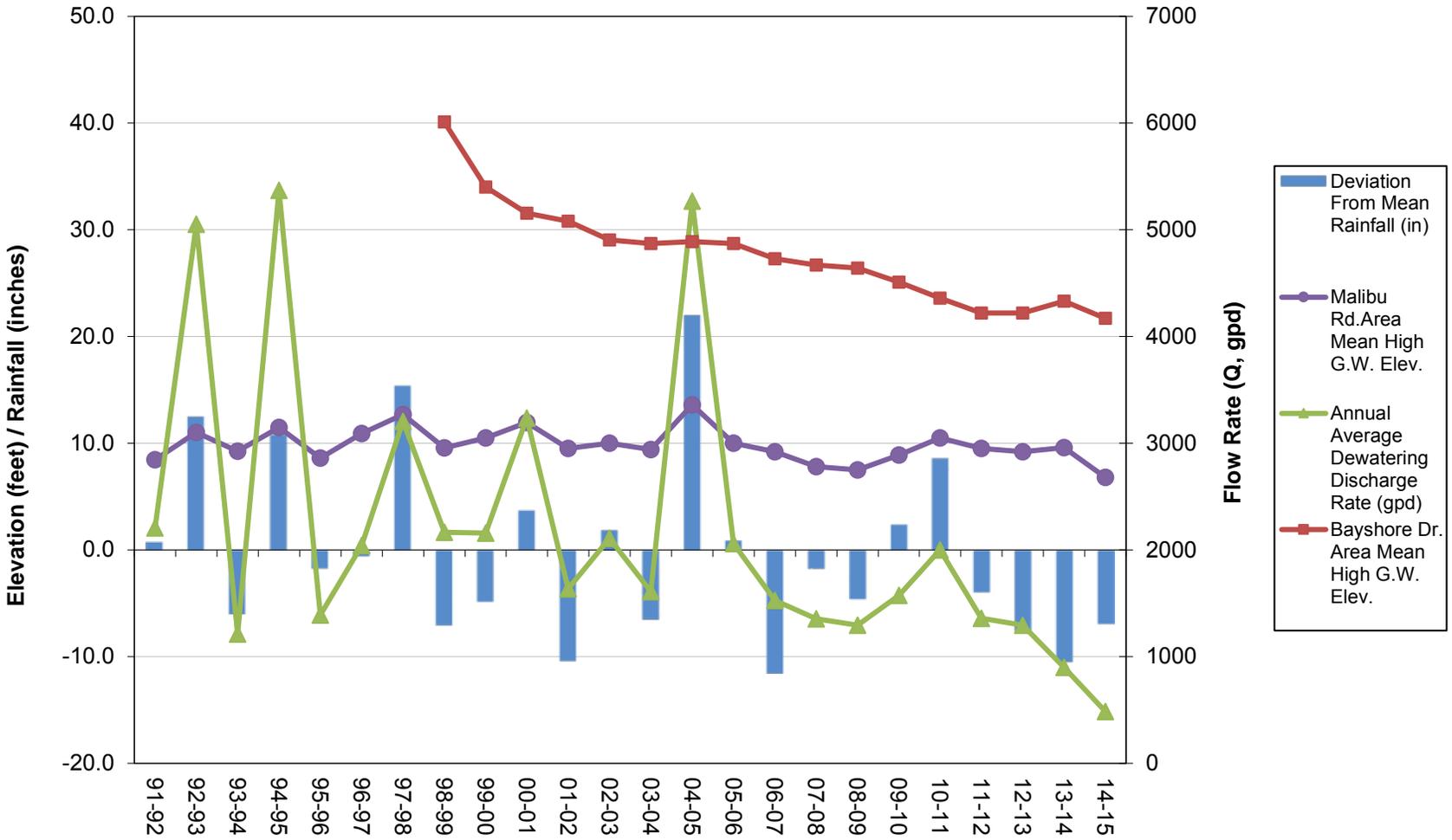


RAINFALL GRAPH
 Malibu Road Landslide Assessment District
 Malibu, California





TOTAL DISCHARGE - WELLS AND HYDRAUGERS
Malibu Road Landslide Assessment District
Malibu, California



* Graph shows the mean value of the highest groundwater elevations recorded for each standpipe piezometer during the monitoring year.

GROUNDWATER LEVELS, DEWATERING AND RAINFALL

Malibu Road Landslide Assessment District
 Malibu, California



**APPENDIX A
GROUNDWATER DATA**



MALIBU ROAD LAD - Standpipe Piezometer Information					
Standpipe ID	Previous Reference Elevation (8/91)	Updated Reference Elevation (4/00)	Casing Depth (ft)	Perforation Interval	Installed By
W-2A	22.6	20.6	9.0	Unknown	LA COUNTY
W-3A	22.0	20.5	32.5	Unknown	LA COUNTY
PZ-A	20.0	19.8	17.2	Unknown	LA COUNTY
PZ-B	20.0	19.1	27.9	Unknown	LA COUNTY
PZ-C	20.0	19.4	29.7	Unknown	LA COUNTY
PZ-D	20.0	19.2	24.7	Unknown	LA COUNTY
PZ-E	20.0	21.4	15.8	Unknown	LA COUNTY
SI-5 ⁺	59.0	59.3	78.0	-19.0 to -14.0	BYA
SI-6 ⁺⁺	57.0	58.0	78.0	-21.0 to -16.0	BYA

Note: + Formerly designated as MR-5
 ++ Formerly designated as MR-6

MALIBU ROAD LAD - Pneumatic Piezometer Information					
Well Identification	Previous Reference Elevation (8/91)	Updated Reference Elevation (4/00)	Tip Depth (ft.)	Tip El. (ft)	Installed By
SI-1*	20.0	20.1	34.6	-14.6	BYA
SI-2*	20.0	19.7	65.1	-45.1	BYA
SI-3*	20.0	20.3	49.8	-29.8	BYA
SI-4	22.0	18.9	43.9	-21.9	BYA
SI-5 Tip 1	59.0	59.3	60	-1	BYA
SI-5 Tip 2	59.0	59.3	40	19	BYA
SI-6 Tip 1*	57.0	58.0	60	-3	BYA
SI-6 Tip 2	57.0	58.0	40	17	BYA
SI-1A	20.0	20.0	50	-30	FUGRO

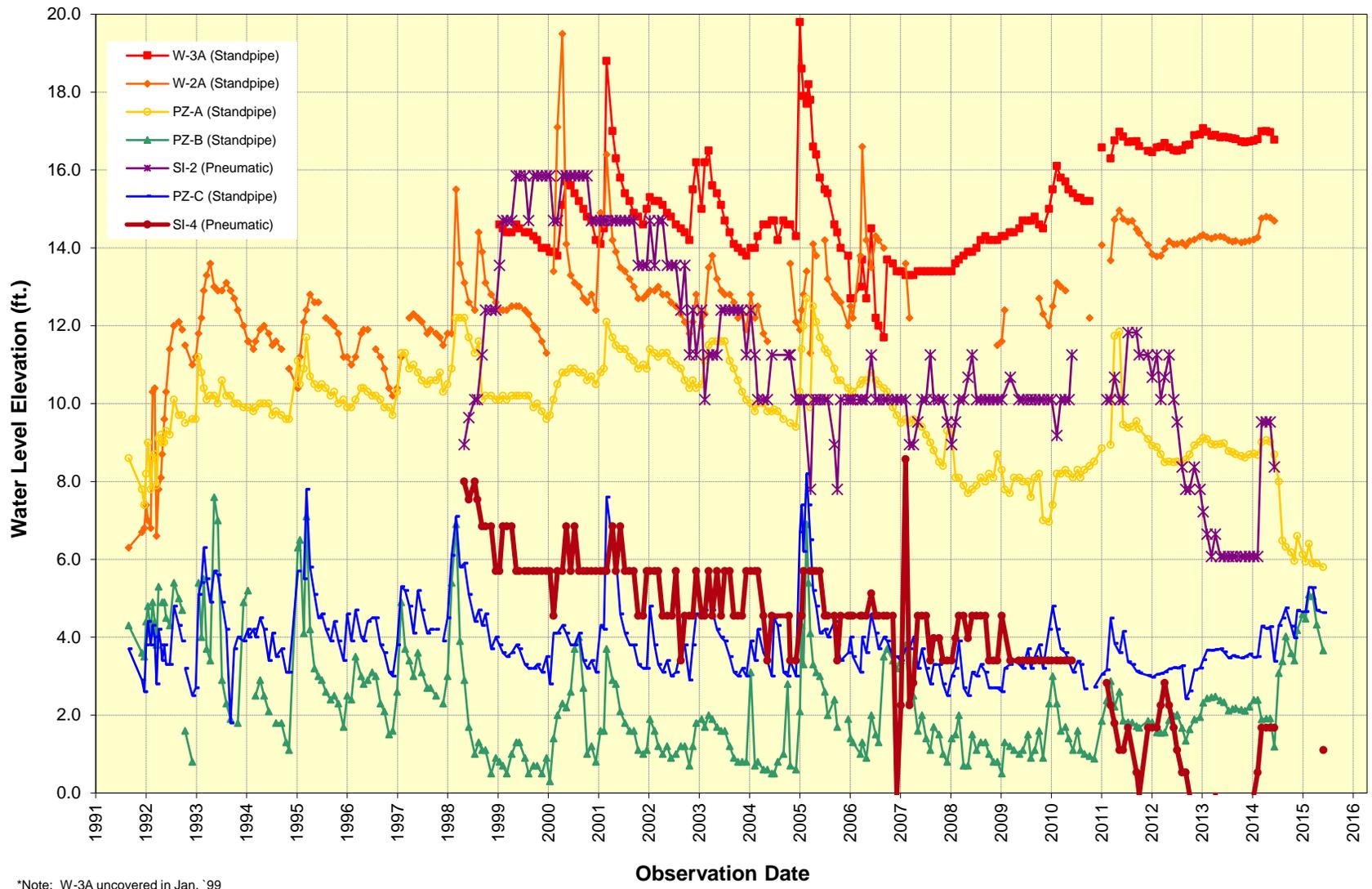
Note: SI-1 thru SI-4 were previously designated MR98-1 thru MR98-4
 SI-5 and SI-6 were previously designated MR-5 and MR-6
 * Piezometer not functioning

PIEZOMETER INFORMATION
 Malibu Road Landslide Assessment District
 Malibu, California

MALIBU ROAD LANDSLIDE ASSESSMENT DISTRICT - SUMMARY OF GROUNDWATER DATA																														
Standpipe / Piezometer I.D.		91-92	92-93	93-94	94-95	95-96	96-97	97-98	98-99	99-00	00-01	01-02	02-03	03-04	04-05	05-06	06-07	07-08	08-09	09-10	10-11	11-12	12-13	13-14	14-15	Mean '91 - '15	Stand Dev.	14-15 vs. 97-98	14-15 vs. mean	
MALIBU ROAD - Standpipe Piezometers																														
W-2A	Mean El.	8.3	12.3	12.1	11.8	11.7	11.2	12.4	12.8	13.5	13.7	12.9	12.6	12.3	12.8	13.4	13.7	--	--	--	14.1	14.2	14.2	14.4	DRY	1.4				
	Highest El.	11.4	13.6	13.1	12.8	12.2	12.3	15.5	14.4	19.5	16.4	13.4	13.8	12.8	14.1	16.6	14.3	--	--	--	15.0	14.7	14.3	14.8	DRY	1.8				
W-3A	Mean El.								14.5	14.4	15.5	15.0	15.3	14.3	16.4	13.9	13.1	13.6	14.3	15.2	16.1	16.6	16.8	16.8	UTL	1.2				
	Highest El.								14.6	15.7	18.8	15.4	16.5	14.7	19.8	15.5	13.7	13.9	14.7	16.1	17.0	16.7	17.1	17.0	UTL	1.7				
PZ-A	Mean El.	8.6	10.1	10.0	10.4	10.2	10.5	11.1	10.4	10.2	11.1	11.2	11.0	10.3	10.8	10.7	9.9	8.5	8.1	7.9	9.2	9.0	8.9	8.8	6.3	9.7	1.2	-4.8	-3.4	
	Highest El.	9.3	11.2	10.6	11.7	10.5	11.3	12.2	11.6	10.9	12.1	11.4	11.6	11.6	12.7	11.4	10.6	9.3	8.7	8.3	11.9	9.6	9.1	9.1	8.0	10.6	1.4	-4.2	-2.6	
PZ-B	Mean El.	4.4	4.5	2.9	3.7	2.6	2.9	3.4	1.0	1.3	2.3	1.3	1.5	1.0	2.8	1.7	2.7	1.3	1.0	1.6	1.8	1.7	2.1	2.1	4.1	2.3	1.1	0.7	1.8	
	Highest El.	5.3	7.6	5.2	7.1	3.5	4.9	6.9	1.3	2.6	4.0	1.9	2.0	3.1	6.9	2.6	3.8	2.0	1.3	3.0	2.9	2.0	2.5	2.4	5.1	3.7	1.9	-1.8	1.4	
PZ-C	Mean El.	3.6	4.6	3.9	4.7	4.2	4.2	5.1	4.0	3.6	4.5	3.6	4.1	3.4	5.2	3.9	3.7	3.0	3.0	3.7	3.4	3.1	3.3	3.7	4.6	3.9	0.6	-0.4	0.7	
	Highest El.	4.4	6.3	4.9	7.8	4.7	5.3	7.1	4.7	4.3	7.6	4.8	5.1	4.2	8.2	4.6	4.1	3.9	3.4	4.8	4.5	3.4	3.7	4.3	5.3	5.1	1.4	-1.8	0.2	
PZ-D	Mean El.	4.4	6.9	5.1	7.6	5.0	5.9	7.8	4.7	4.0	4.8	4.2	4.3	4.1	7.0	4.7	4.2	4.0	4.4	5.1	5.2	5.3	5.8	5.9	5.0	5.2	1.1	-2.8	-0.2	
	Highest El.	5.8	11.4	6.7	13.1	5.8	15.2	18.1	5.9	4.9	8.4	5.3	5.3	4.6	15.3	5.6	4.7	4.9	4.9	6.4	7.1	5.9	6.1	8.0	5.8	7.7	3.9	-12.3	-1.9	
PZ-E	Mean El.	13.0	14.3	13.9	14.5	14.2	14.6	15.2	12.8	12.7	13.3	12.5	14.1	13.8	15.6	12.1	10.5	10.4	10.4	11.6	13.5	11.9	11.2	11.8	9.6	12.8	1.6	-5.6	-3.2	
	Highest El.	14.5	16.0	15.0	16.3	14.9	16.5	16.3	14.4	15.6	16.2	14.3	15.6	14.9	17.9	14.0	13.1	12.8	11.8	14.5	15.4	14.1	11.4	11.8	9.6	14.5	1.9	-6.7	-4.9	
Area Average	Mean El.	7.0	8.8	8.0	8.8	8.0	8.2	9.2	8.6	8.5	9.3	8.7	9.0	8.5	10.1	8.6	8.2	6.8	6.9	7.5	9.0	8.8	8.9	9.0	5.9	8.3	0.9	-3.2	-2.4	
	Highest El.	8.5	11.0	9.3	11.5	8.6	10.9	12.7	9.6	10.5	11.9	9.5	10.0	9.4	13.6	10.0	9.2	7.8	7.5	8.9	10.5	9.5	9.2	9.6	6.8	9.8	1.6	-5.9	-0.2	
Change vs. Prior	Mean El.	1.7	-0.8	0.8	-0.8	0.3	0.9	-0.6	-0.1	0.8	-0.6	0.3	-0.5	-1.0	-0.4	0.2	-1.2	-0.4	-0.6	-1.9	-1.5	-0.9	0.1	0.1	-3.1					
	Highest El.	2.6	-1.8	2.2	-2.9	2.3	1.8	-3.1	0.9	1.4	-2.4	0.5	-0.6	4.1	-3.5	-0.9	-1.4	-0.3	1.4	1.7	-1.0	-0.3	0.5	-2.9						
Bayshore Drive - Standpipe Piezometers																														
SI-5	Mean El.								35.5	32.2	30.7	30.1	29.3	29.0	28.6	28.2	27.8	27.3	26.3	22.6	18.8	16.5	16.4	18.0	17.2	25.6	6.1		-8.3	
	Highest El.								37.8	33.4	31.2	30.4	29.7	29.2	29.0	28.4	28.0	27.5	27.0	24.3	20.5	17.6	17.2	19.4	18.3	26.4	6.0		-8.1	
SI-6	Mean El.								38.8	32.6	31.2	29.9	27.9	27.7	27.2	27.9	26.0	25.7	25.4	25.3	26.1	26.4	26.7	26.8	24.8	28.0	3.5		-3.2	
	Highest El.								42.4	34.6	31.9	31.2	28.4	28.2	28.8	29.0	26.5	25.9	25.7	25.8	26.7	26.8	27.1	27.2	25.1	28.9	4.3		-3.8	
Area Average	Mean El.								37.2	32.4	31.0	30.0	28.6	28.3	27.9	28.0	26.9	26.5	25.8	23.9	22.4	21.5	21.6	22.4	21.0	26.8	4.4		-5.8	
	Highest El.								40.1	34.0	31.5	30.8	29.1	28.7	28.9	28.7	27.3	26.7	26.4	25.1	23.6	22.2	22.2	23.3	21.7	27.7	4.8		-5.9	
Change vs. Prior	Mean El.								-4.7	-1.5	-1.0	-1.3	-0.3	-0.4	0.2	-1.2	-0.4	-0.6	-1.9	-1.5	-0.9	0.1	0.8	-1.4						
	Highest El.								-6.1	-2.5	-0.7	-1.8	-0.4	0.2	-0.2	-1.5	-0.6	-0.3	-1.3	-1.5	-1.4	0.0	1.1	-1.6						
MALIBU ROAD - Pneumatic Piezometers																														
SI-1	Mean El.																													
	Highest El.																													
SI-1A	Mean El.																5.8	6.9	6.5	6.9										
	Highest El.																7.5	6.9	6.9	6.9										
SI-2	Mean El.						9.3	13.2	15.6	15.1	14.1	11.9	11.5	10.1	9.9	10.1	10.2	10.1	10.2	10.1	10.2	11.0	7.4	7.1		11.0	2.4			
	Highest El.						9.6	15.9	15.9	15.9	14.7	13.6	12.4	11.3	11.3	10.7	11.3	10.7	11.3	10.7	11.8	9.5	9.5			12.1	2.3			
SI-3	Mean El.																													
	Highest El.																													
SI-4	Mean El.						7.77	6.6	5.7	6.0	5.2	4.8	5.0	4.9	4.5	4.0	4.0	3.9	3.4	1.8	1.6	-0.3	0.3		4.1	2.2				
	Highest El.						8.0	8.0	6.9	6.9	5.7	5.7	5.7	5.7	5.1	3.6	4.6	4.6	3.4	2.8	2.8	1.1	1.7		5.1	2.2				
Bayshore Drive - Pneumatic Piezometers																														
SI-5 Tip 1	Mean El.								34.2	34.7	36.3	34.2	33.9	32.7	37.6	33.6	31.8	31.7	26.9	25.1	22.9	21.7	18.9	19.0		30.4	5.8			
	Highest El.								34.8	39.4	45.1	35.9	37.1	35.9	44.0	34.8	33.6	34.8	30.1	26.7	24.4	22.6	20.9	20.9		33.3	7.2			
SI-5 Tip 2	Mean El.								35.4	36.1	39.1	35.8	36.5	34.0	39.5	33.7	29.8	29.2	26.0	25.2	26.8	26.3	24.3	25.1		31.9	5.3			
	Highest El.								37.5	42.1	51.3	37.5	40.9	37.5	49.0	37.5	35.1	40.9	27.1	26.5	27.7	28.8	24.8	26.5		36.3	8.1			
SI-6 Tip 1	Mean El.								42.4												25.7	25.9	23.8	24.6		29.5	8.7			
	Highest El.								44.1													26.8	27.4	24.0	26.3		30.6	9.2		
SI-6 Tip 2	Mean El.								44.5	44.6	46.0	44.4	43.0	42.0	43.8	41.0	39.5	39.0	39.0	41.4	40.0	37.7	34.9	35.9		41.4	3.1			
	Highest El.								45.7	48.0	51.5	45.7	45.7	43.4	49.1	42.2	42.2	42.8	39.9	42.8	41.6	39.3	35.9	38.2		43.7	4.0			

PIEZOMETER INFORMATION
Malibu Road Landslide Assessment District
Malibu, California

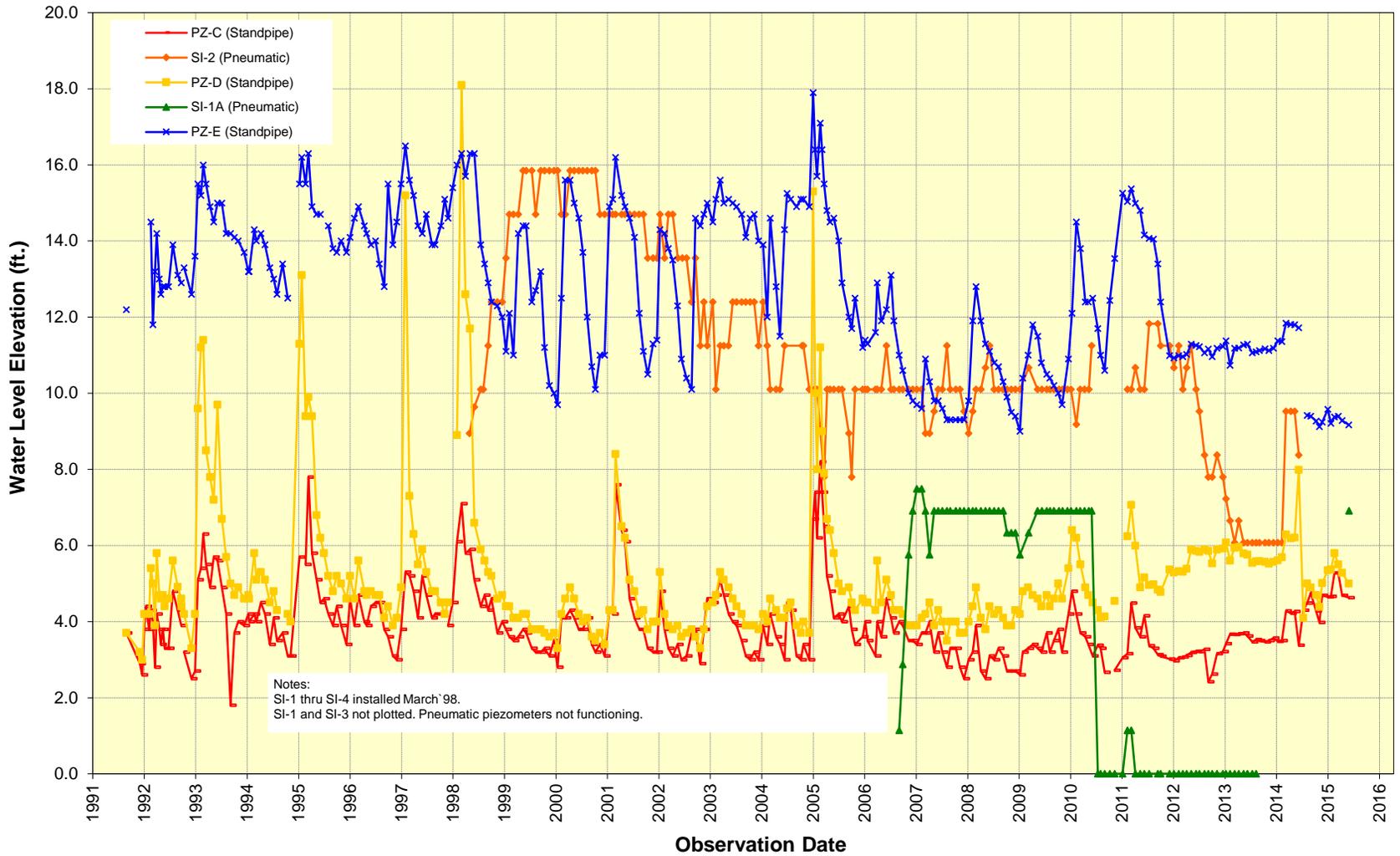




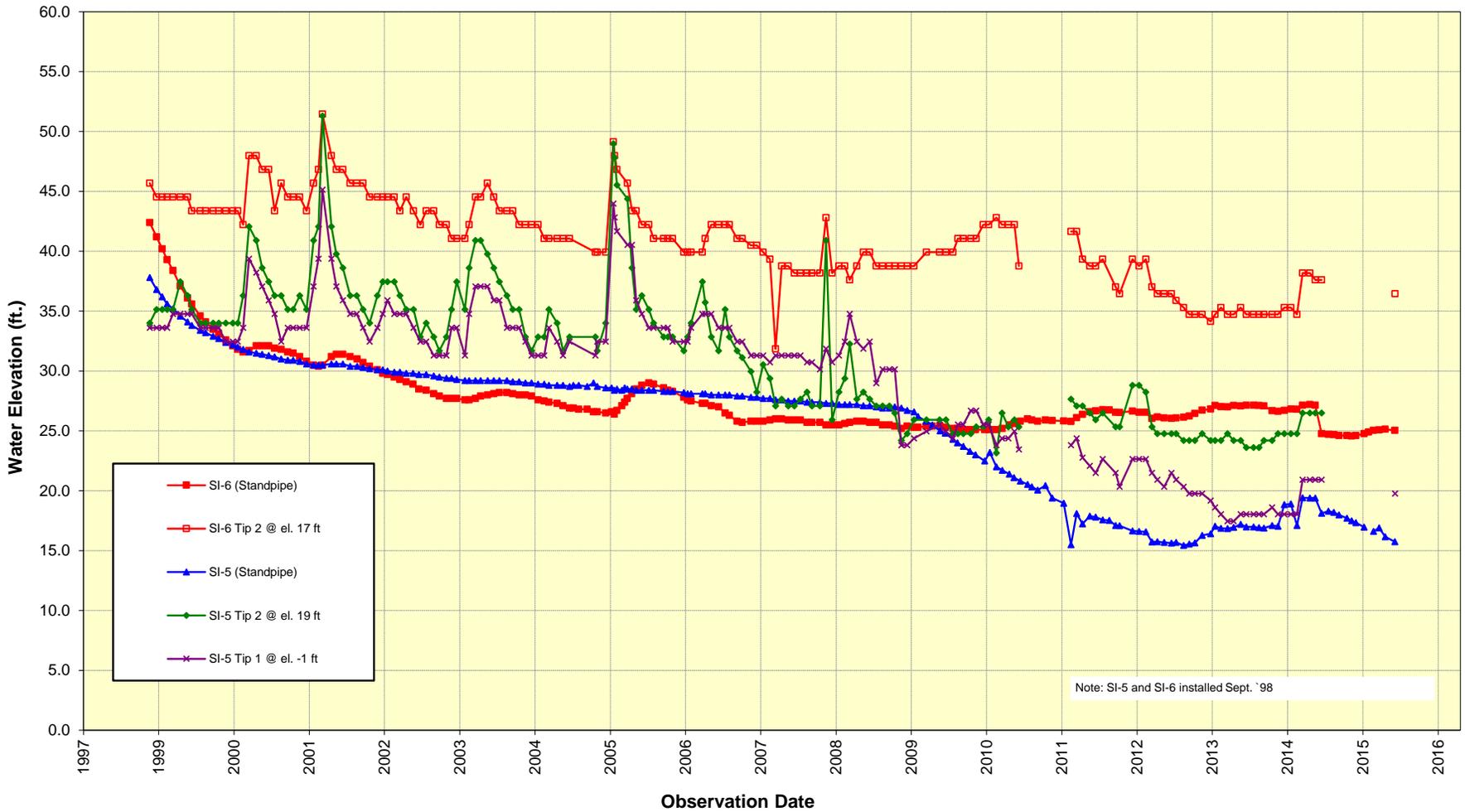
*Note: W-3A uncovered in Jan. '99

GROUNDWATER HYDROGRAPH
 Malibu Road (West End)
 Malibu Road Landslide Assessment District
 Malibu, California





GROUNDWATER HYDROGRAPH
Malibu Road (East End)
Malibu Road Landslide Assessment District
Malibu, California



GROUNDWATER HYDROGRAPH
 Bayshore Drive
 Malibu Road Landslide Assessment District
 Malibu, California

**APPENDIX B
DEWATERING DATA**



MALIBU ROAD LAD - Dewatering Well Information

Well ID	Vault Elevation (ft.)	Bottom Elevation (ft.)	Pump Elevation (ft.)	Pump Size (hp)	2014-2015 Mean Pumping Rate (gpd)	% of Total Well Production	Installed By
W-3	19.5	-4.0	Unknown	1/2	105	36%	LA Co.
W-4	20.0	-9.0	Unknown	1/2	6	2%	LA Co.
W-5	19.0	-9.5	Unknown	1/2	3	1%	LA Co.
W-6	20.0	-4.5	Unknown	1/2	29	10%	LA Co.
W-8	27.5	11.0	Unknown	1/2	3	1%	LA Co.
W-9	20.0	-40.0	-35.0	1/3	15	5%	LA Co.
W-10	19.0	-40.0	-35.0	1/3	35	12%	LA Co.
W-11	61.0	1.0	13.0	1/3	44	15%	BYA
W-12	58.0	-2.0	8.0	1/3	7	2%	BYA
W-14	60.0	-20.0	Unknown	1/3	29	10%	Fugro
NW-1	Unknown	Unknown	Unknown	Unknown	3	1%	Homeowner
NW-2	Unknown	Unknown	Unknown	Unknown	10	3%	Homeowner
NW-3	Unknown	Unknown	Unknown	Unknown	4	1%	Homeowner

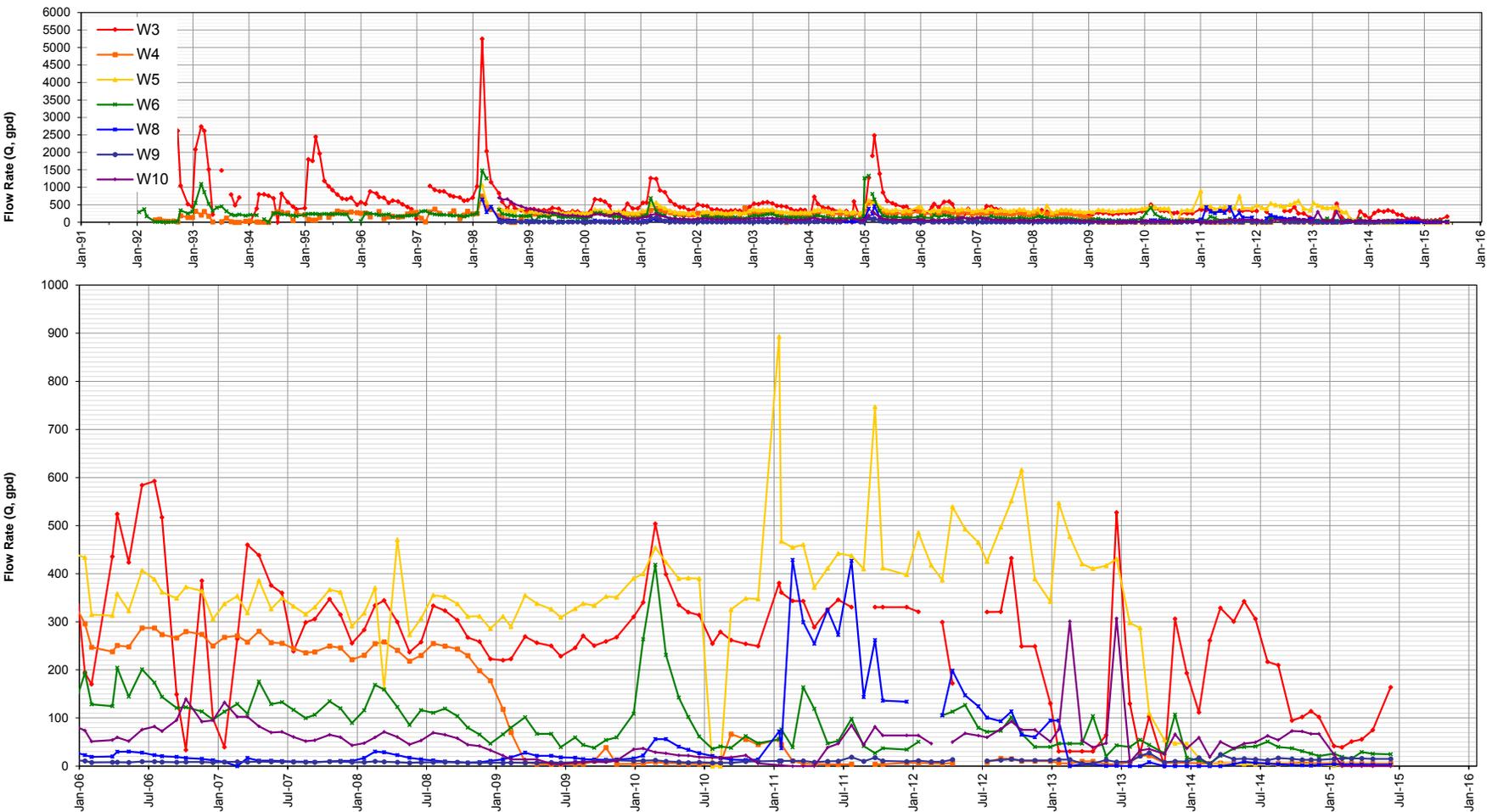
MALIBU ROAD LAD- Hydrauger Information

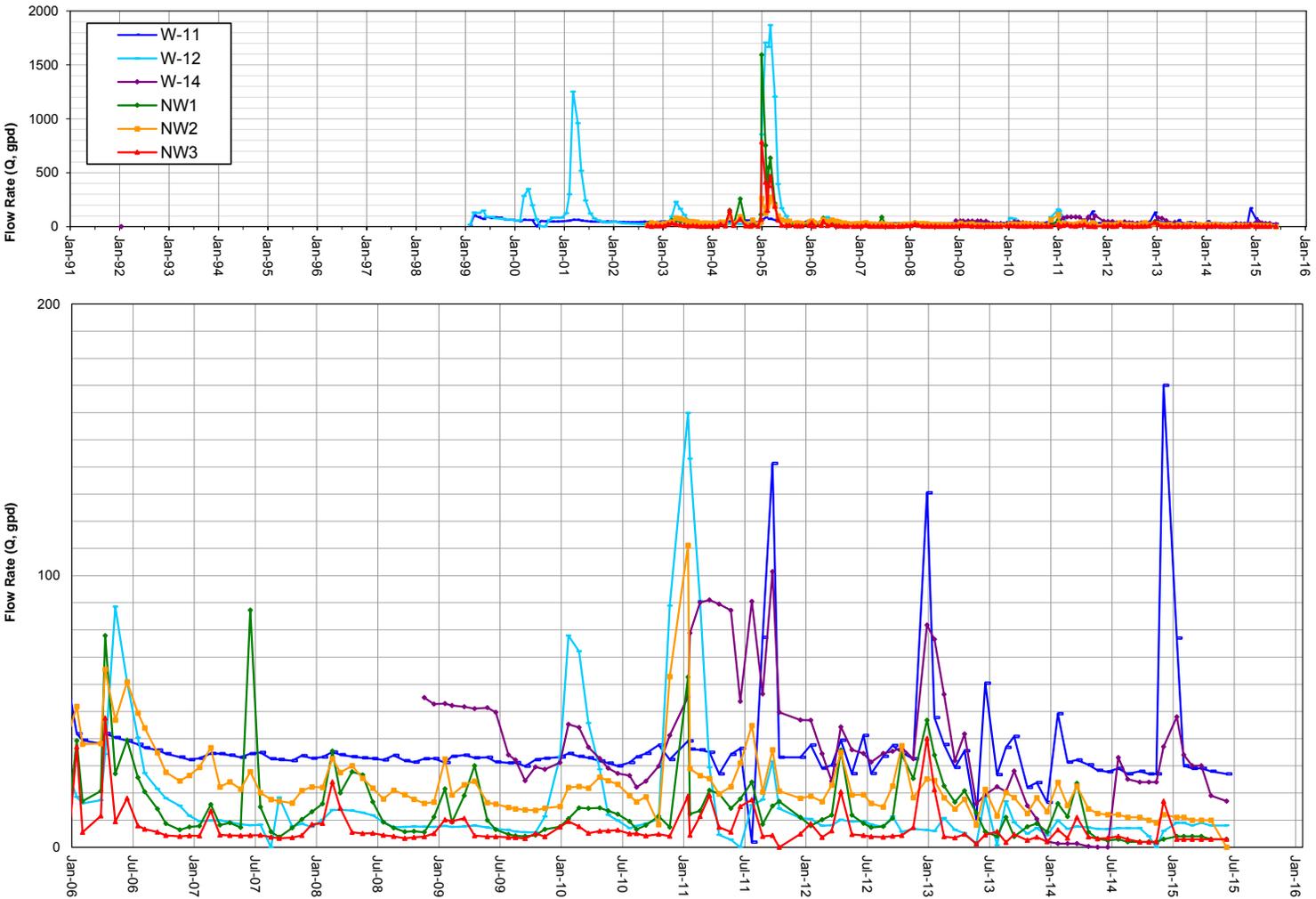
Hydrauger ID	Installed Length (ft.)	Bearing	Functional Length* (ft)	2014-2015 Mean Flow Rate (gpd)	% of Total Production	Installed By
HD-1	Unknown	N05E	74	0	0%	LA County
HD-2	Unknown	N21E	34	0	0%	LA County
HD-3	Unknown	N06E	13	0	0%	LA County
HD-4	Unknown	N29E	53	0	0%	LA County
HD-5	Unknown	N13E	41	0	0%	LA County
HD-6	Unknown	N08W	55	0	0%	LA County
HD-7	Unknown	N26E	87	0	0%	LA County
HD-8	Unknown	N19E	92	7	4%	LA County
HD-9	Unknown	N34E	76	0	0%	LA County
HD-10	Unknown	N19E	55	0	0%	LA County
HD-11	Unknown	N11E	78	0	0%	LA County
HD-12	Unknown	N08E	70	0	0%	LA County
HD-13	Unknown	N09E	79	0	0%	LA County
HD-14	Unknown	N08E	80	0	0%	LA County
HD-15	Unknown	N14E	82	0	0%	LA County
HD-16	Unknown	N15E	69	0	0%	LA County
HD-17	150	N15E	150	0	0%	BYA
HD-18	150	N18E	150	59	30%	BYA
HD-19	150	N10E	150	30	15%	BYA
HD-20	150	N09W	150	34	18%	BYA
HD-21	150	N22E	150	21	11%	BYA
HD-22	180	N13E	180	34	18%	Fugro West
HD-23	160	N01E	160	9	5%	Fugro West

Note: * Measured on 4/1/98 (except HD-22 and HD-23 installed 1/22/05)

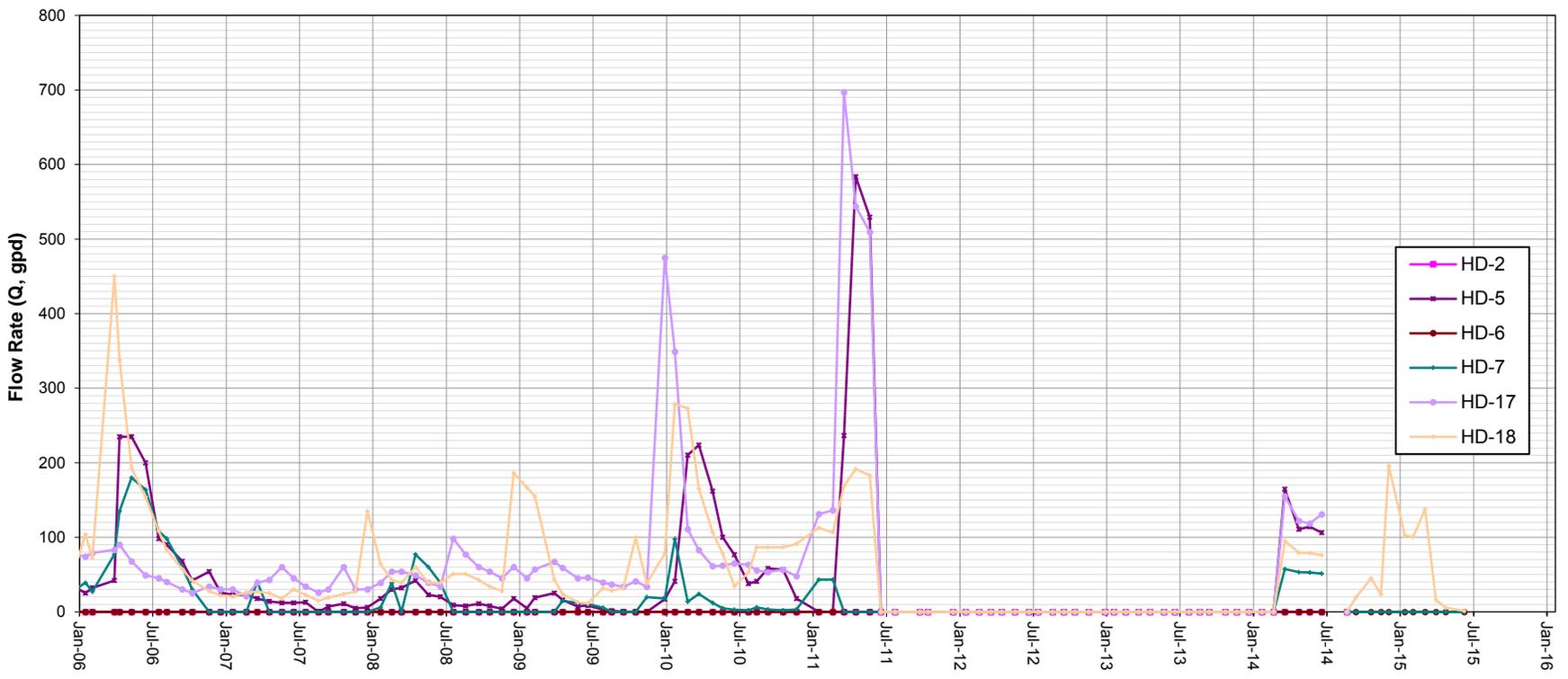
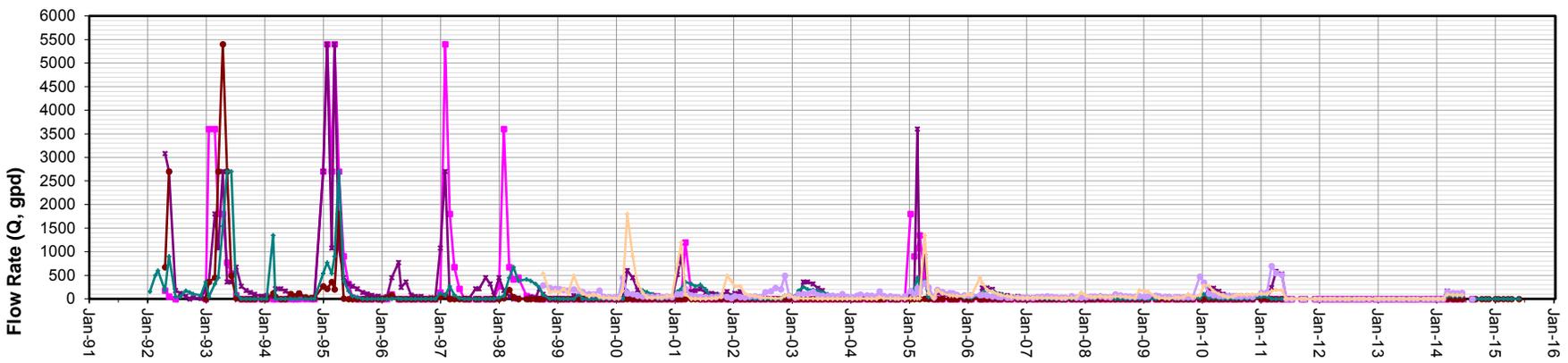
DEWATERING WELL/HYDRAUGER INFORMATION

Malibu Road Landslide Assessment District
 Malibu, California

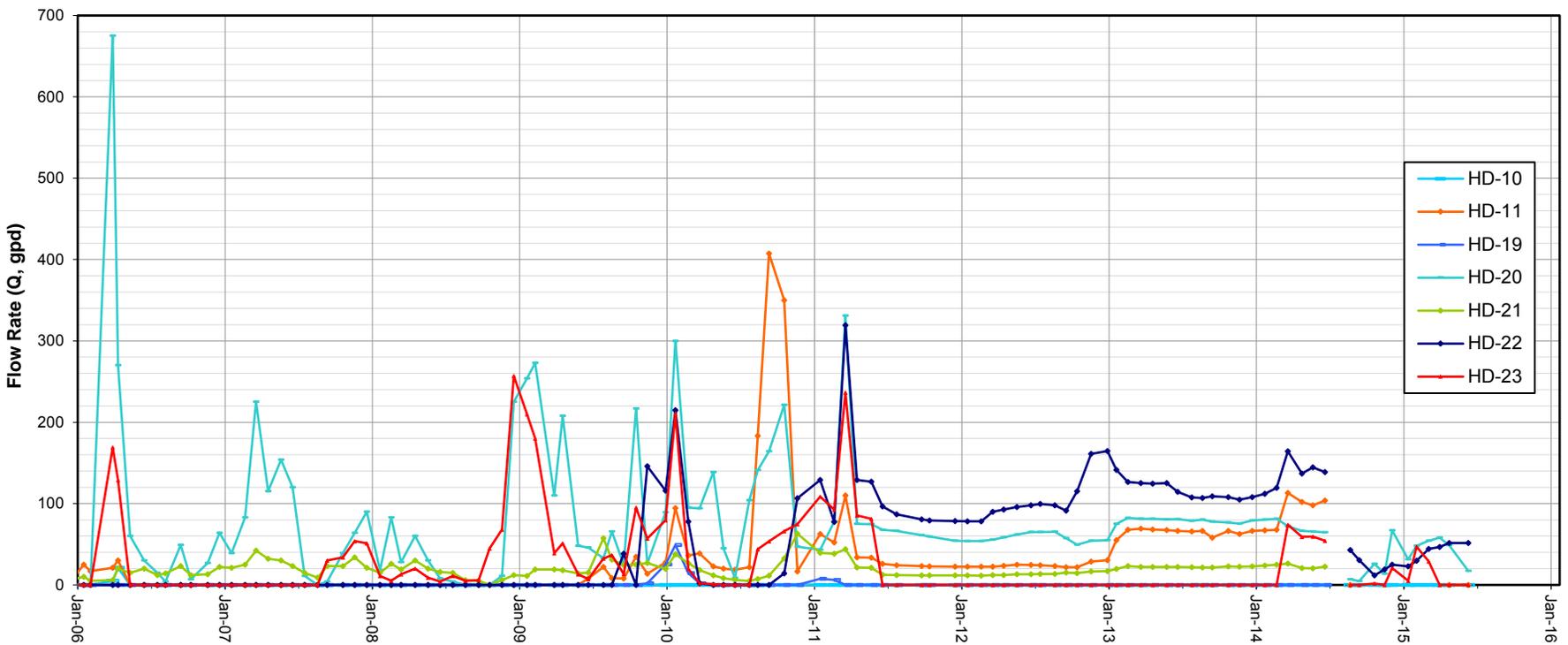
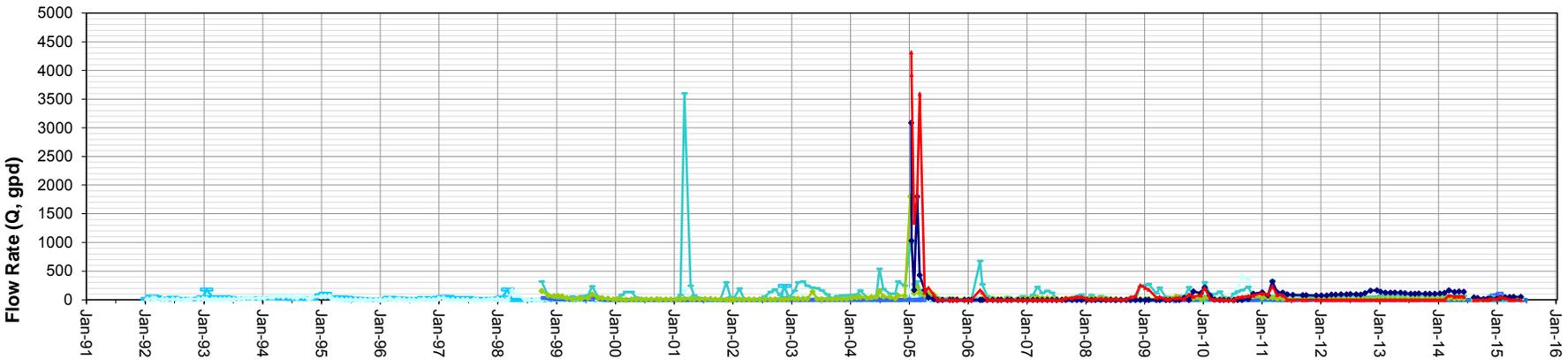




DEWATERING WELL DISCHARGE RATE GRAPH
Bayshore Drive
Malibu Road Landslide Assessment District
Malibu, California



HYDRAUGER DISCHARGE RATE GRAPH
Malibu Road (West End)
Malibu Road Landslide Assessment District
Malibu, California



HYDRAUGER DISCHARGE RATE GRAPH
Malibu Road (East End)
Malibu Road Landslide Assessment District
Malibu, California

APPENDIX C
SLOPE INCLINOMETER DATA



MALIBU ROAD LAD - Slope Incliner Interpretation Summary

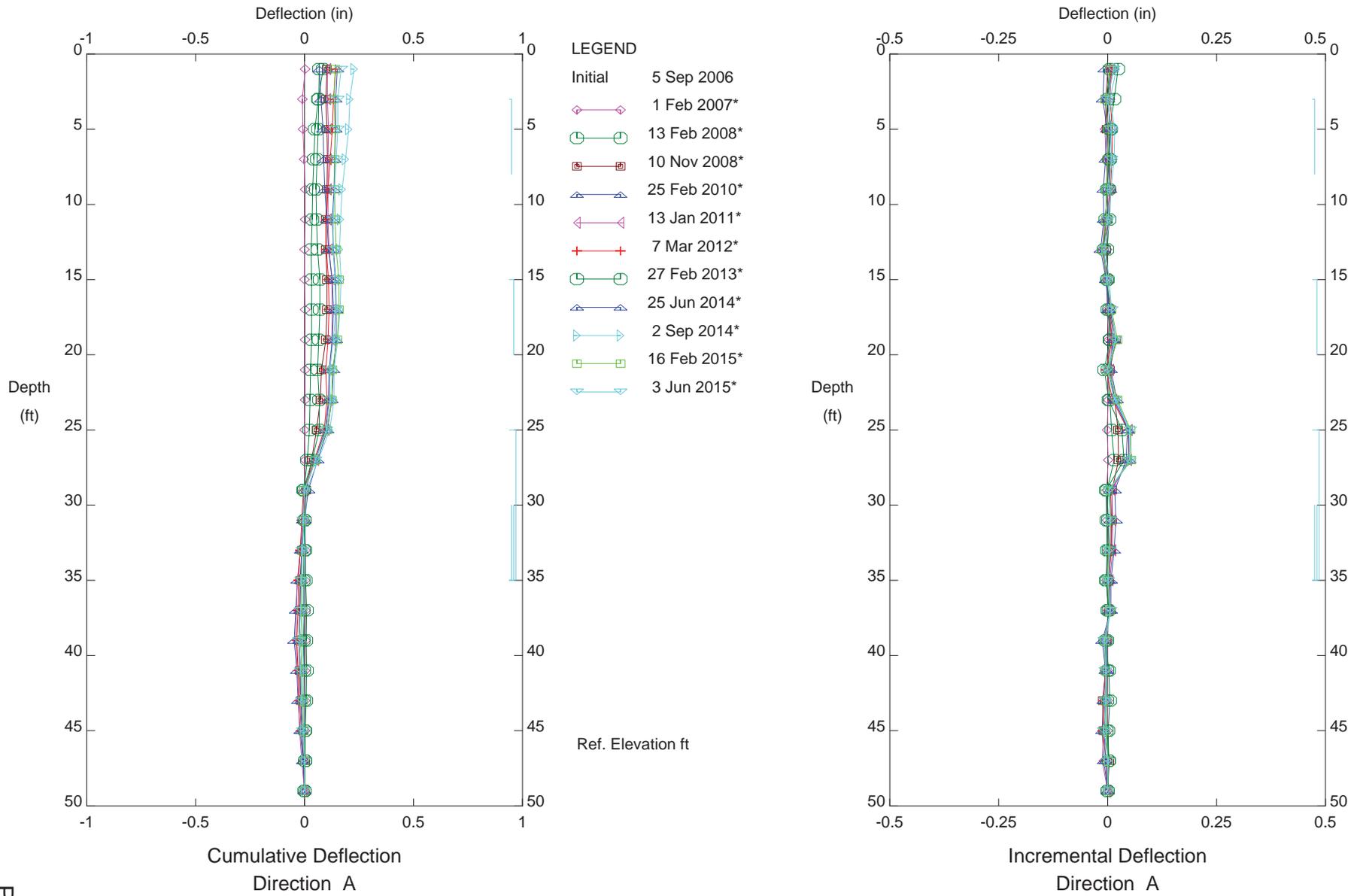
	SI-1 (MR98-1)	SI-1A	SI-2 (MR98-2)	SI-2A	SI-3 (MR98-3)	SI-4 (MR98-4)	SI-4A	SI-5	SI-6
Installation Details									
Previous Ref.Elev.(8/91)	20.0	20.0	20.0	20.0	20.0	22.0	N/A	59.0	57.0
Updated Ref.Elev.(4/00)	20.1	20.0	19.7	19.7	20.3	18.9	18.9	59.3	58.0
Depth (ft.)	34	50	64	64	49	43	50	78	78
Install Date	Apr-98	Aug-08	Apr-98	Apr-98	Apr-98	Apr-98	Aug-12	Apr-98	Apr-98
A+ Axis orientation (deg)	184	197	201	200	190	204	204	176	186
Casing	RST	SI	RST	RST	RST	RST	SI	SI	SI
Installer	BYA	FWI	BYA	BYA	BYA	BYA	Fugro	BYA	BYA
Interpreted Rupture Depth (ft)	30-32	23-30	28-32	28-32	35-38	32-34	32-34	unknown	unknown
Status	D	F	D	F	D	D	F	F	F
Reading Interval	Quarterly	Quarterly	Quarterly	Quarterly	Quarterly	Quarterly	Quarterly	Quarterly	Quarterly
Interpretation Movement (inches)									
2014-2015	NR	<0.1	NR	--	NR	NR	--	--	--
2013-2014	NR	0.1	NR	--	NR	NR	--	--	--
2012-2013	NR	<0.1	NR	<0.1	NR	NR	--	0.1	0.1
2011-2012	NR	<0.1	NR	--	NR	--	NR	--	<0.1
2010-2011	NR	<0.1	NR	--	NR	0.6	NR	--	<0.1
2009-2010	NR	<0.1	NR	--	NR	--	NR	--	<0.1
2008-2009	NR	<0.1	<0.1 (4)	NR	NR	--	NR	--	<0.1
2007-2008	NR	<0.1	--	NR	NR	--	NR	--	<0.1
2006-2007	NR	NR	--	NR	NR	--	NR	--	0.1
2004-2005	0.5 (3)	NR	0.4	NR	>1(3)	0.4 to 0.5	NR	~ 0.2 *	--
2003-2004 (1)	--	NR	--	NR	--	--	NR	--	--
2002-2003	~ 0.2 *	NR	~ 0.1 *	NR	--	--	NR	--	--
2001-2002	--	NR	--	NR	--	--	NR	--	--
2000-2001	0.5	NR	0.4	NR	0.3	0.6	NR	--	--
1999-2000	--	NR	--	NR	--	--	NR	--	--
1998-1999	3.1	NR	1.5	NR	4.1	1.3 (2)	NR	--	--

NOTES:

- D Destroyed
- F Functioning
- NI No information
- (1) Readings only through March 2004
- (2) Readings are through 2000, although majority of movement occurred in 1998
- (3) Inclinerometer sheared off in January, 2005.
- (4) Inclinerometer sheared off winter of 2009.
- NR No reading
- No clearly defined interpreted movement.
- ~ 0.1 * Indicated displacement is less than reliable instrument accuracy. Interpreted movement is theoretical.

SUMMARY OF SLOPE INCLINOMETERS
 Malibu Road Landslide Assessment District
 Malibu, California

Fugro Consultants, Inc. - Ventura, CA

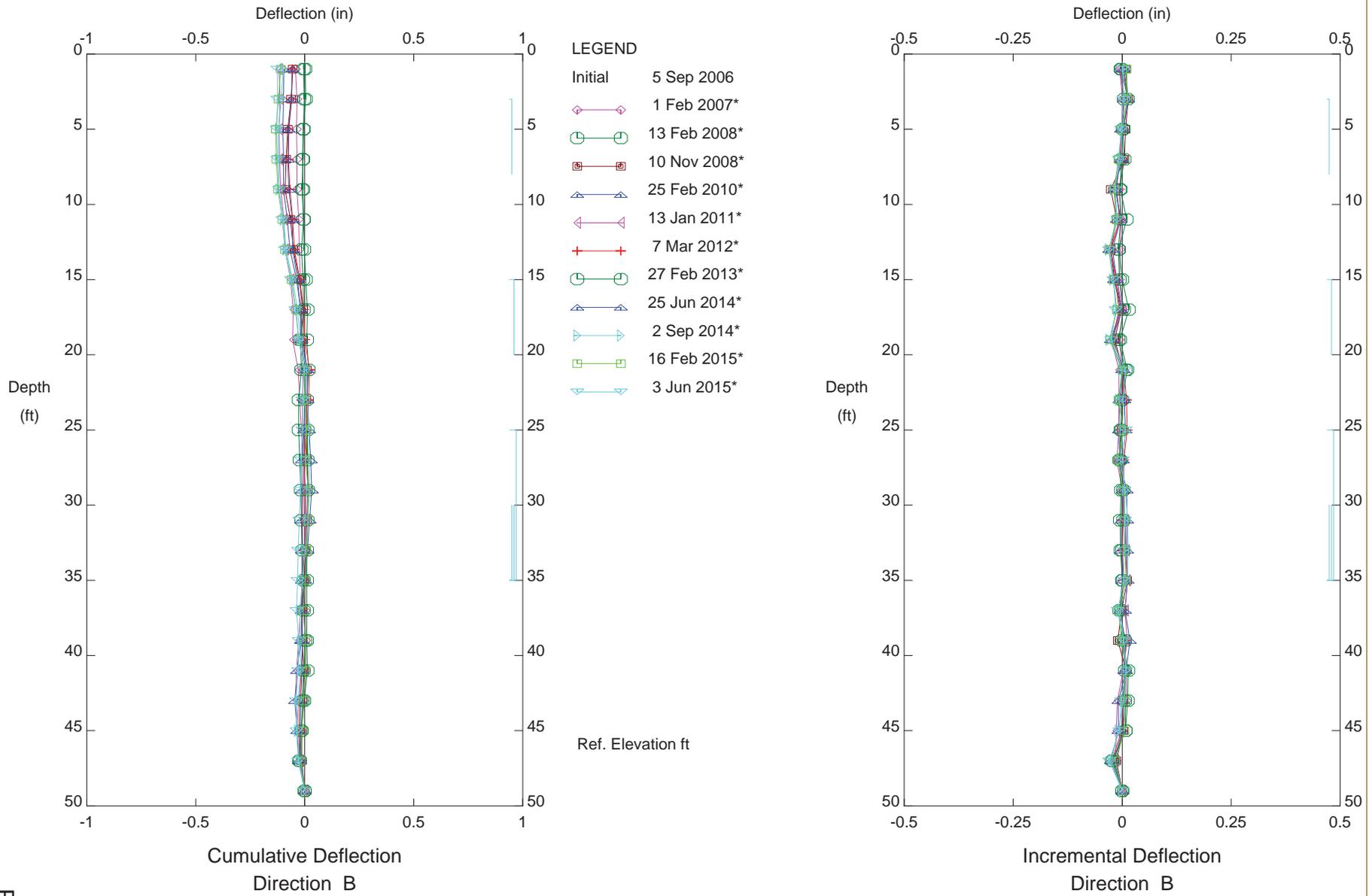


Assessment District 98-3, Inclinometer SI-1A
 City of Malibu

Sets marked * include zero shift and/or rotation corrections.



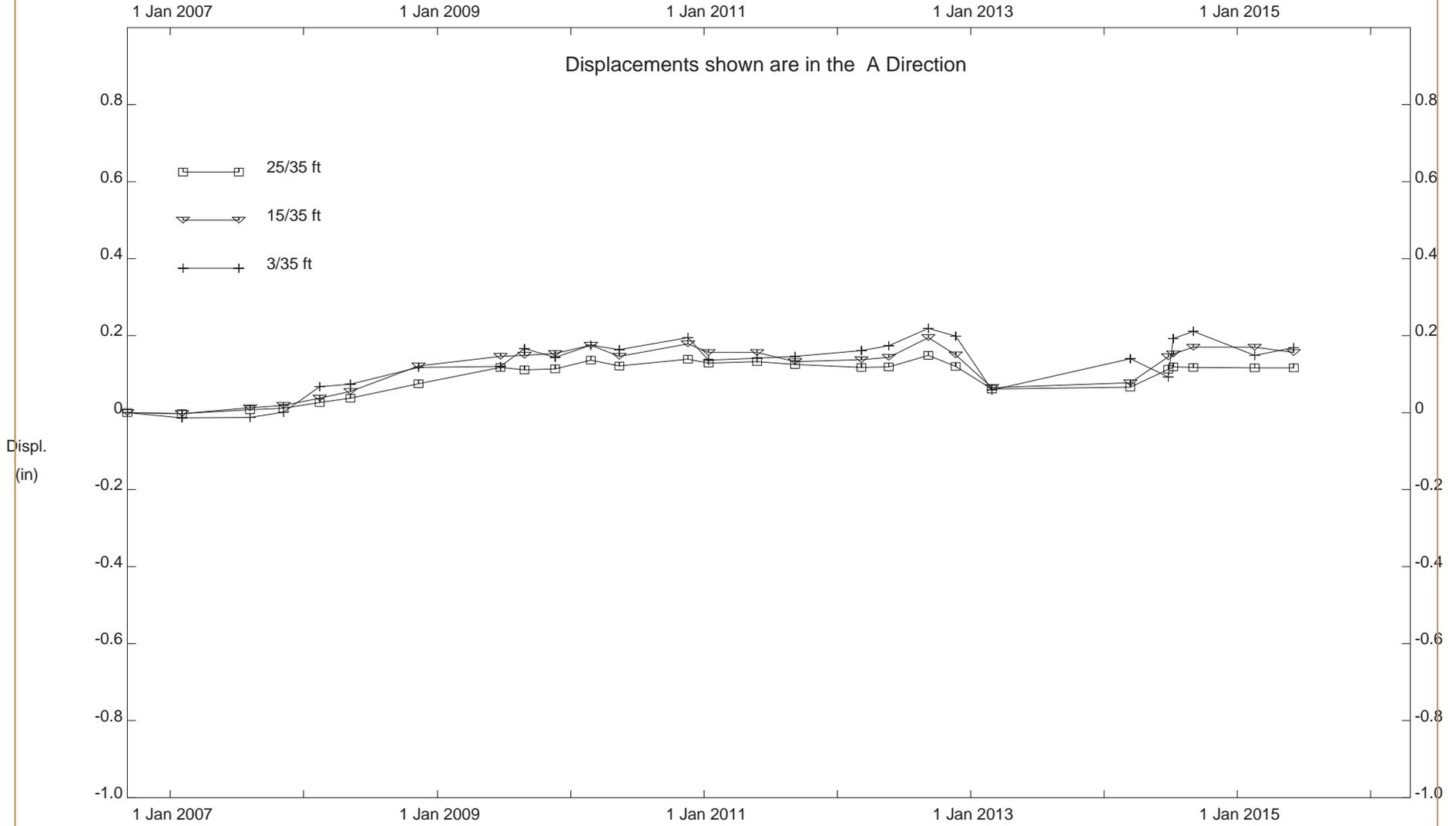
Fugro Consultants, Inc. - Ventura, CA



Assessment District 98-3, Inclinometer SI-1A
 City of Malibu

Sets marked * include zero shift and/or rotation corrections.



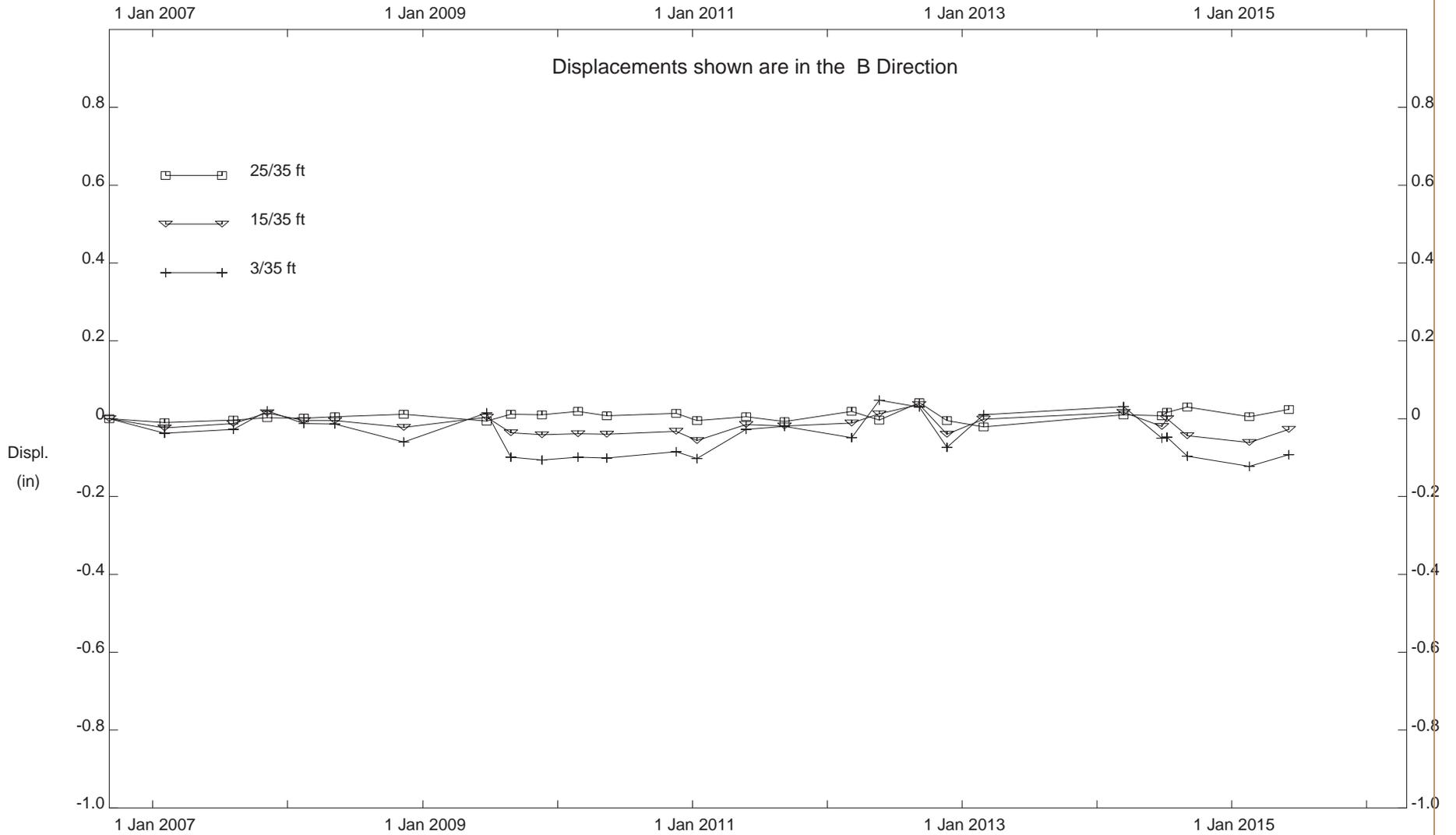


Displ.
(in)

Assessment District 98-3, Inclinator SI-1A

City of Malibu

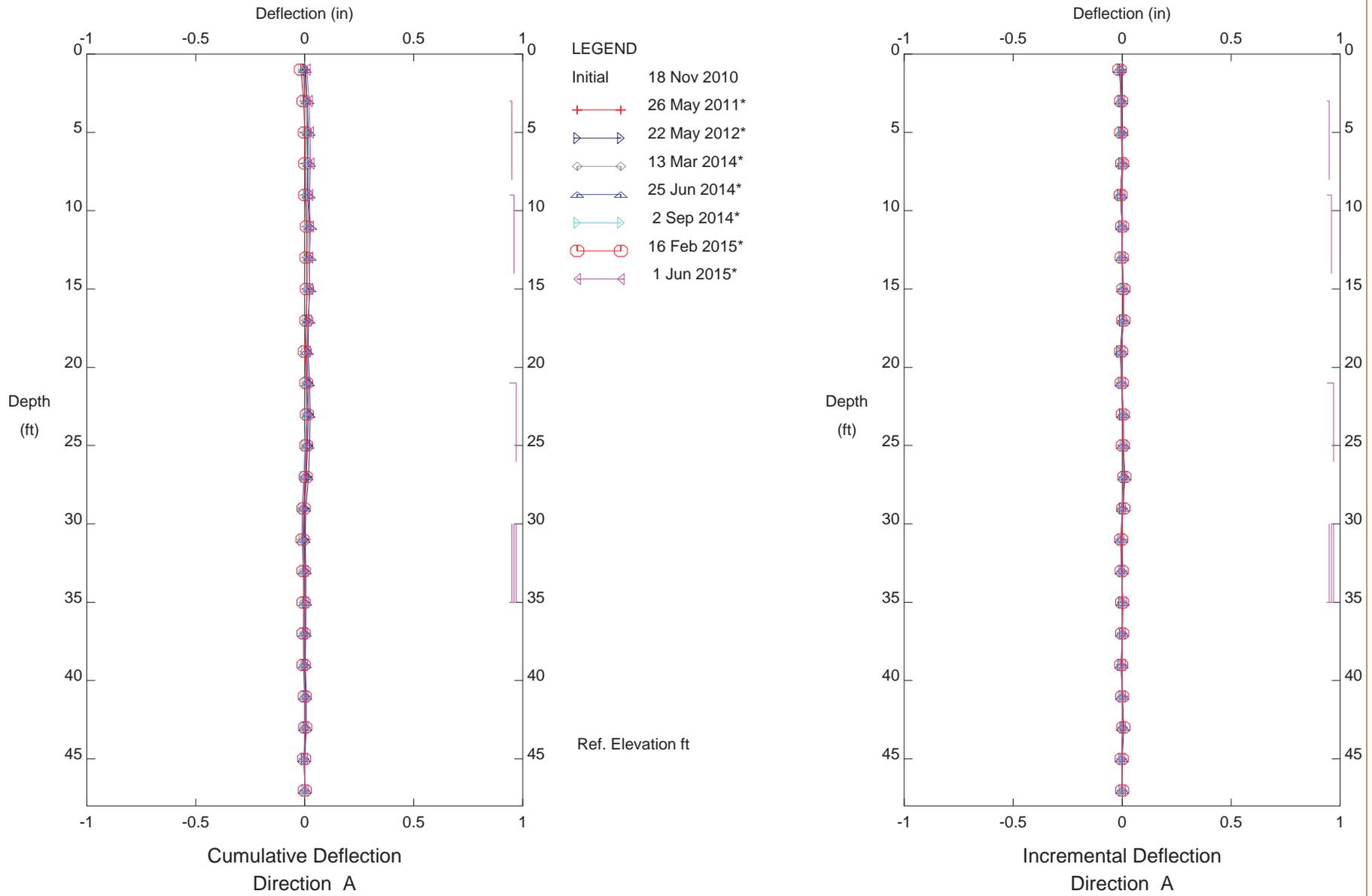




Assessment District 98-3, Inclinator SI-1A

City of Malibu

Fugro Consultants, Inc. - Ventura, CA

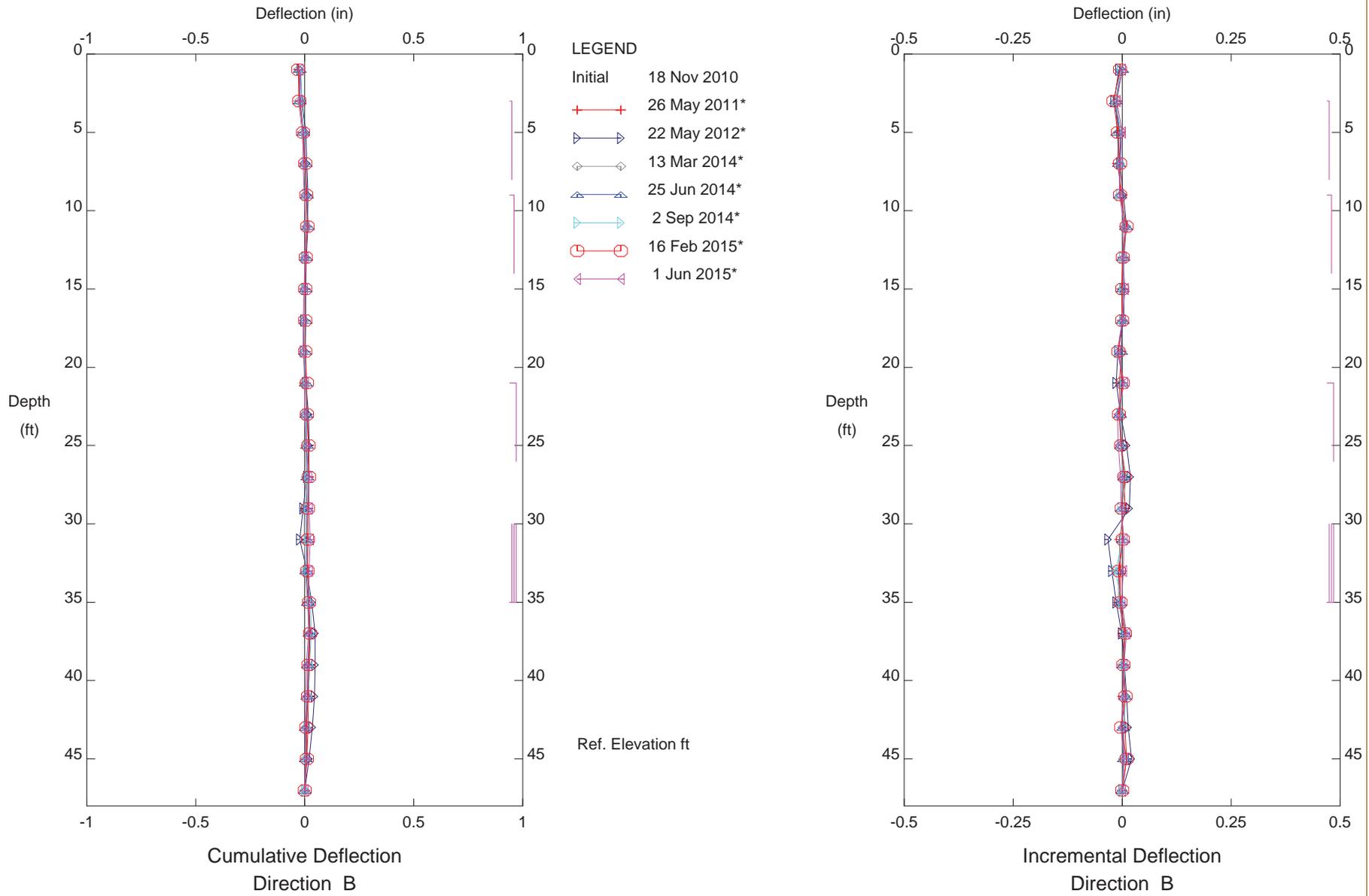


Assessment District 98-3, Inclinometer SI-2A
 City of Malibu

Sets marked * include zero shift and/or rotation corrections.



Fugro Consultants, Inc. - Ventura, CA

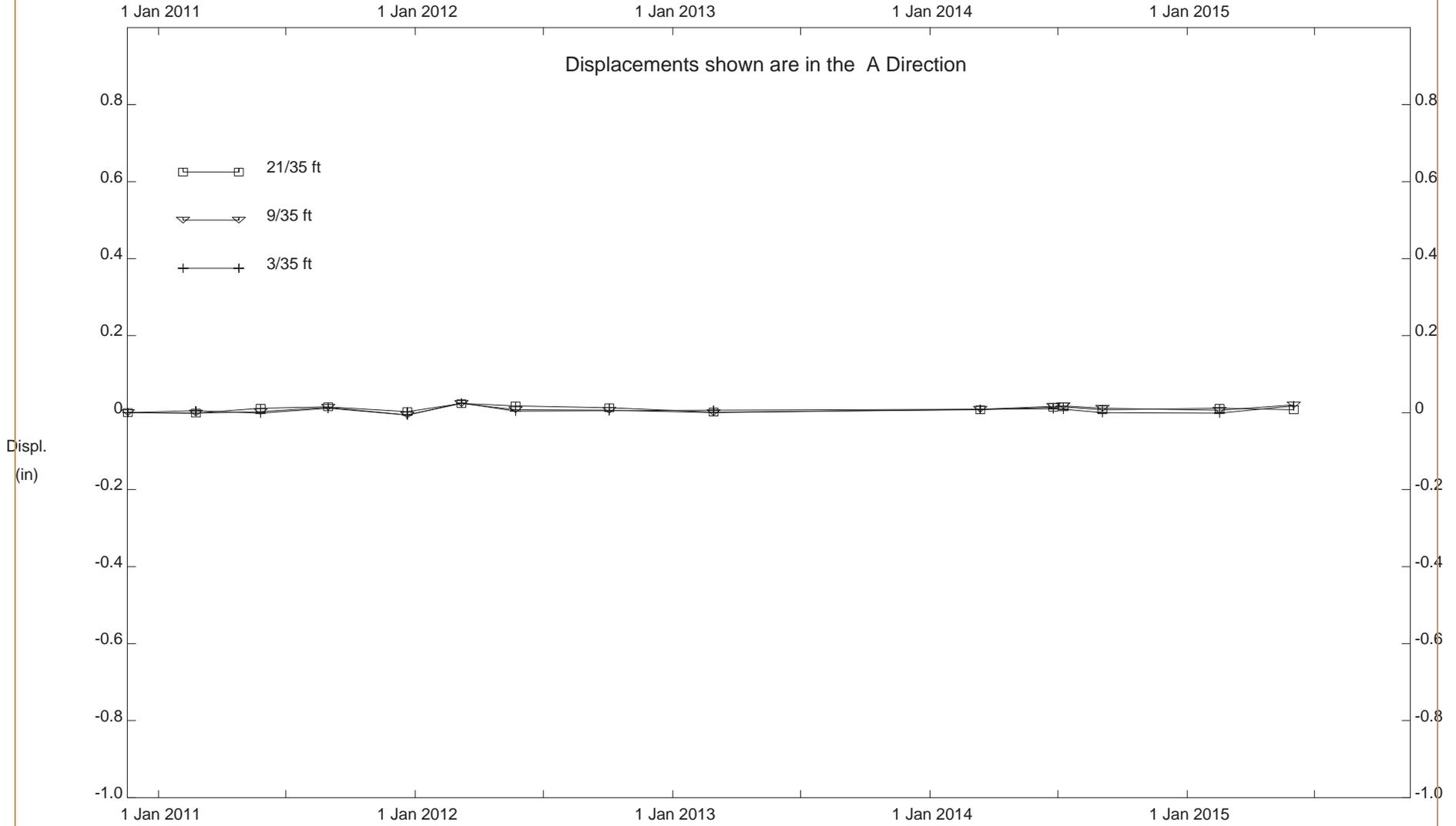


Assessment District 98-3, Inclinometer SI-2A
 City of Malibu

Sets marked * include zero shift and/or rotation corrections.



Fugro Consultants, Inc. - Ventura, CA



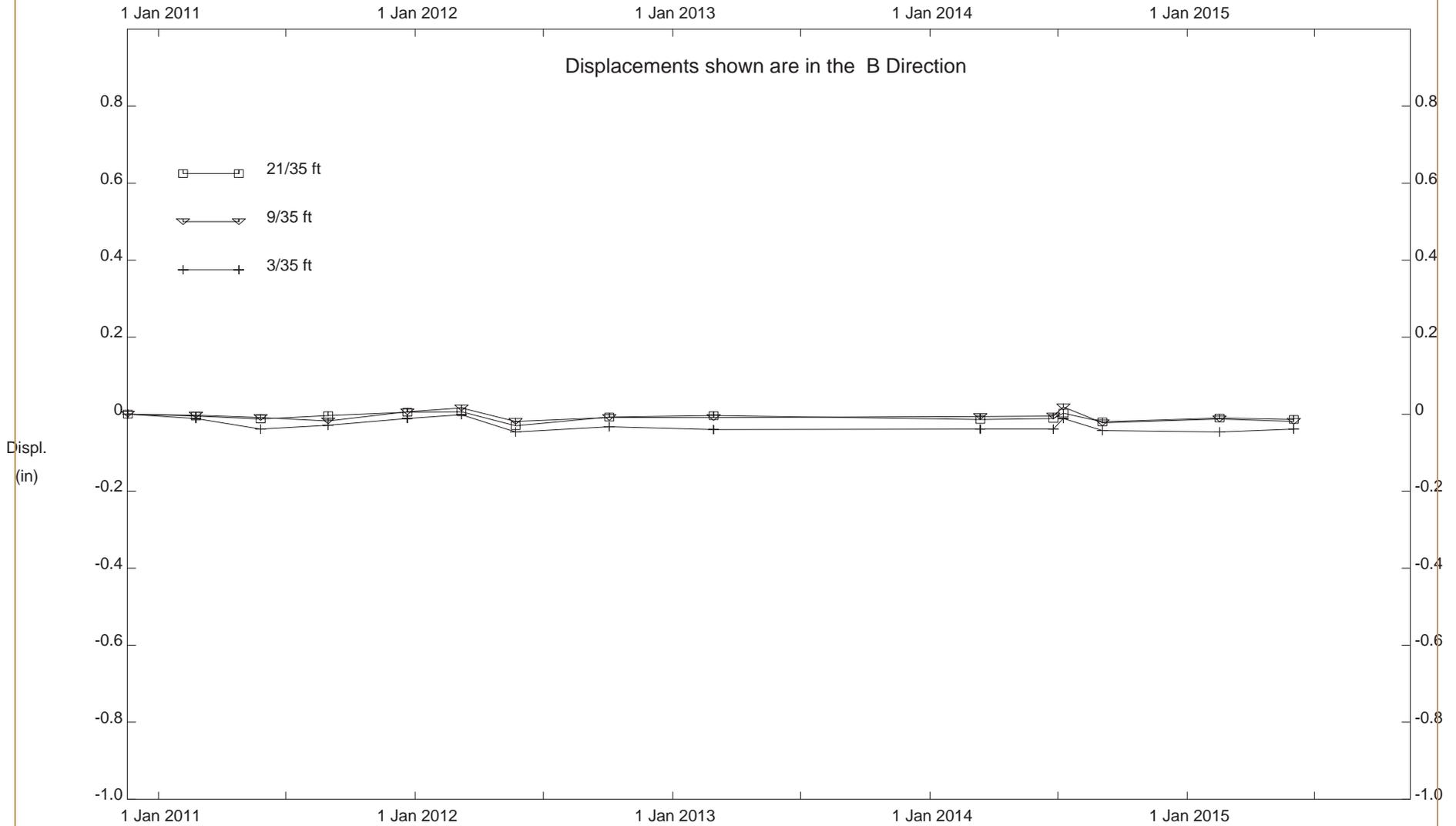
Displ.
(in)

Assessment District 98-3, Inclinator SI-2A

City of Malibu



Fugro Consultants, Inc. - Ventura, CA

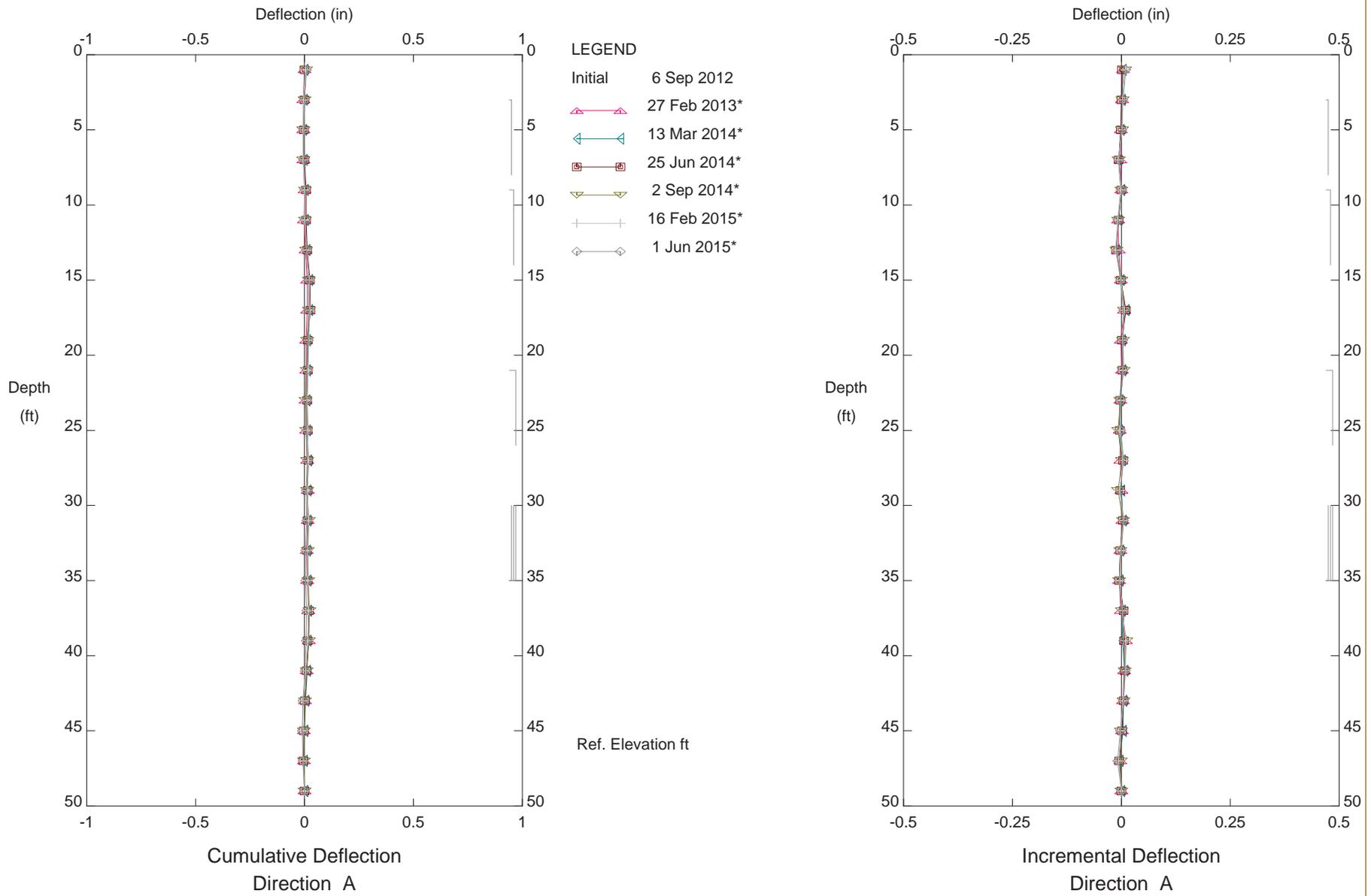


Assessment District 98-3, Inclinator SI-2A

City of Malibu



Fugro Consultants, Inc. - Ventura, CA

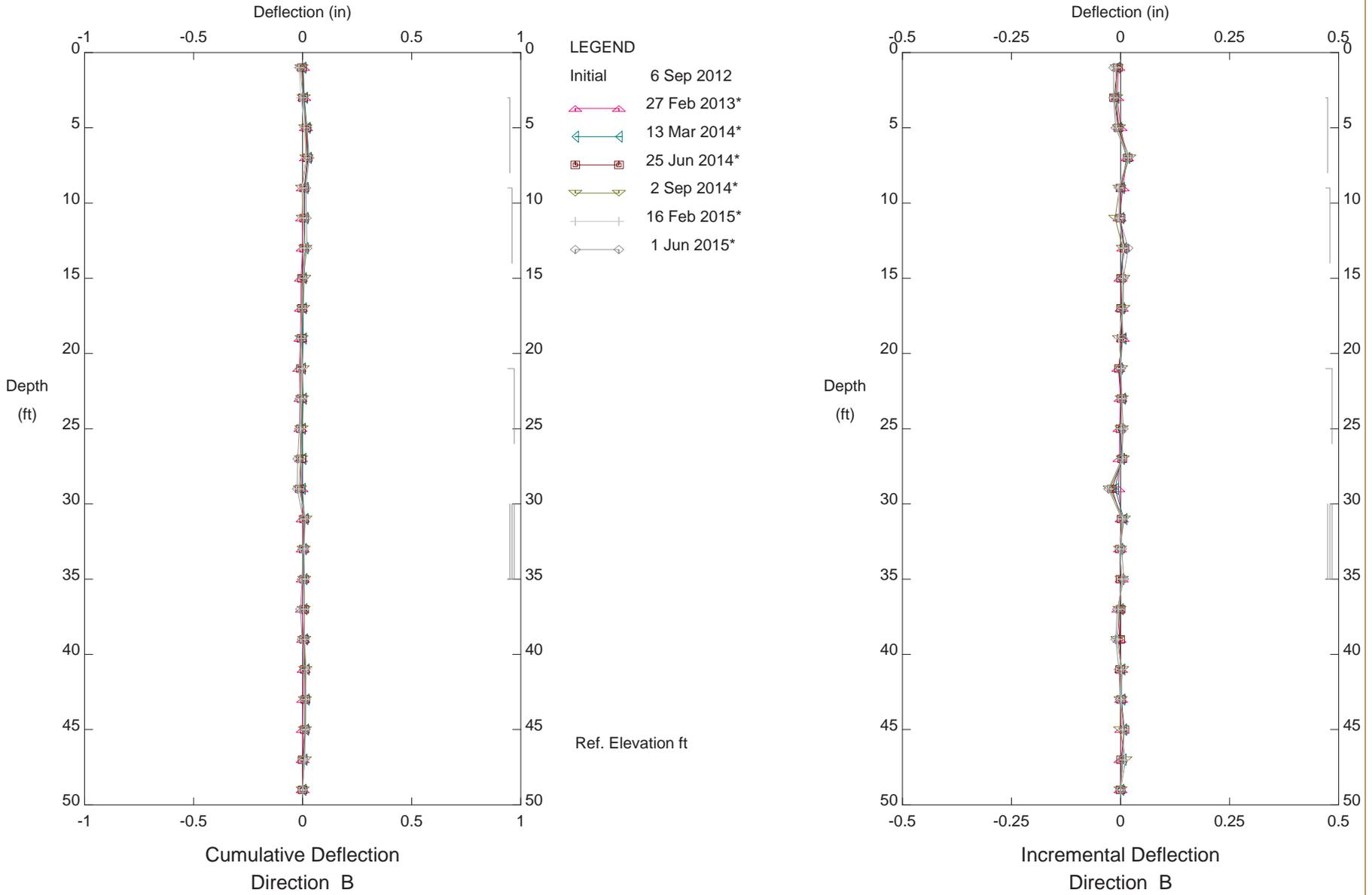


Assessment District 98-3, Inclinometer SI-4A
 City of Malibu

Sets marked * include zero shift and/or rotation corrections.



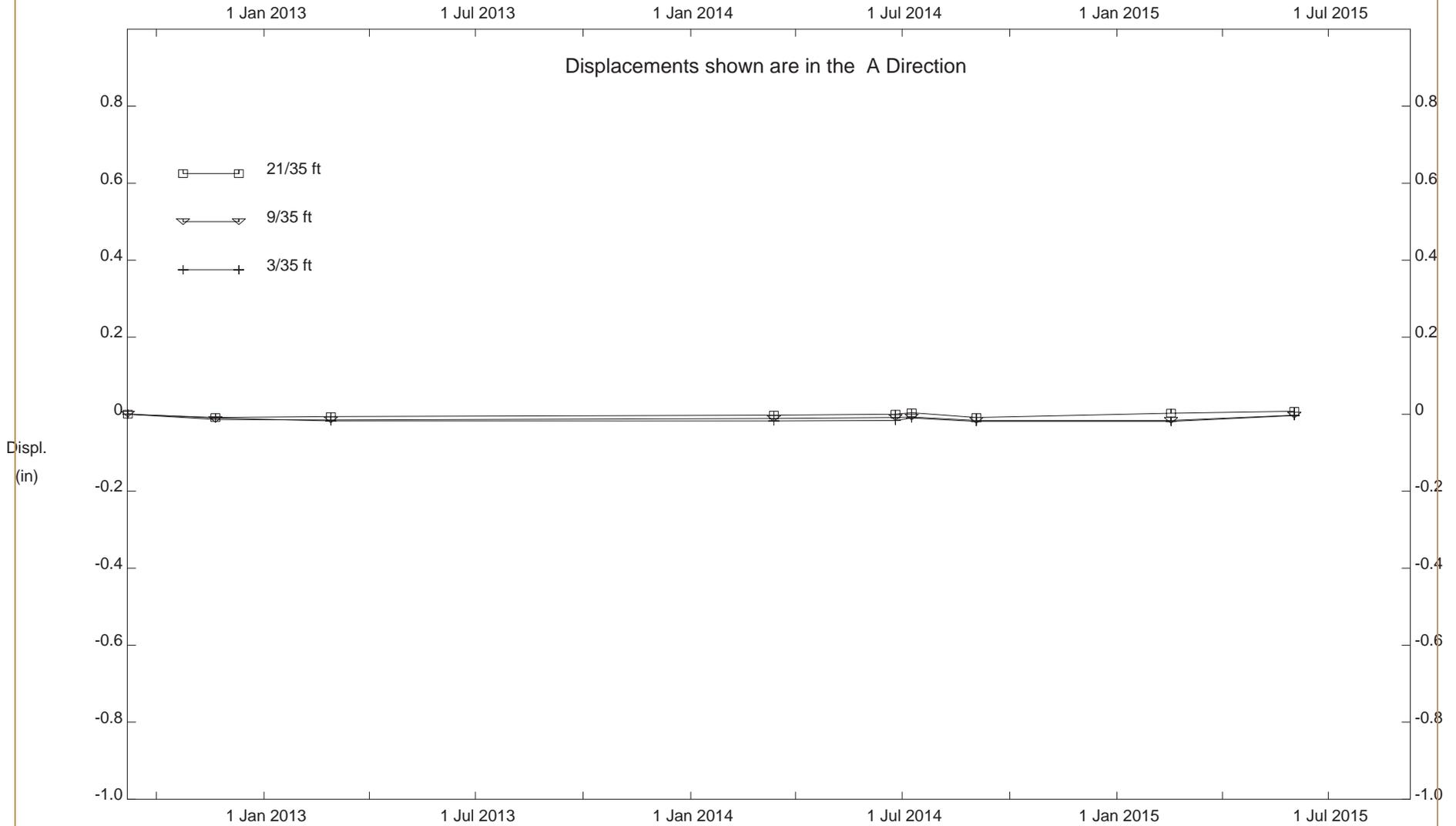
Fugro Consultants, Inc. - Ventura, CA



Assessment District 98-3, Inclinometer SI-4A
 City of Malibu

Sets marked * include zero shift and/or rotation corrections.

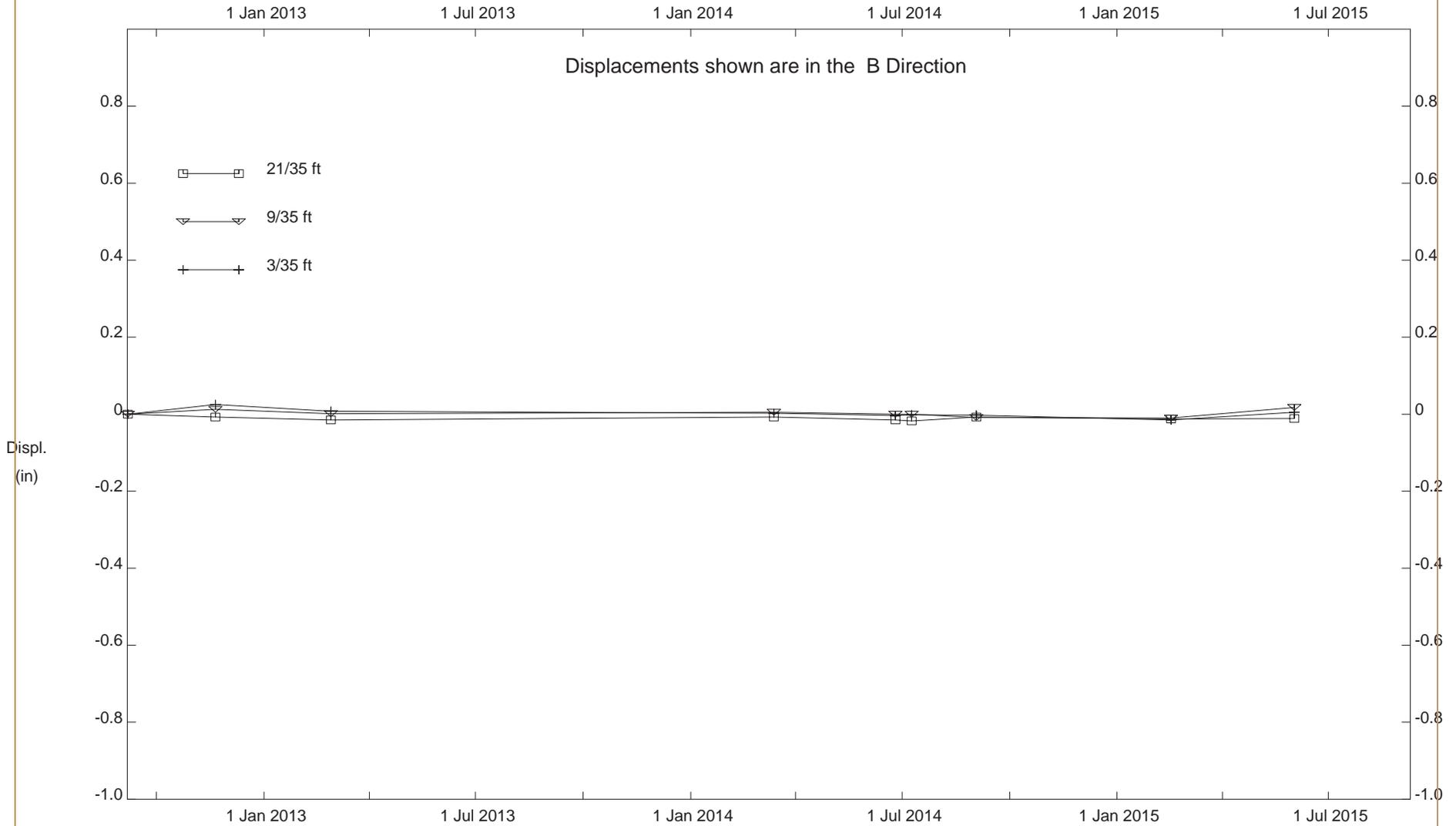




Displ.
(in)

Assessment District 98-3, Inclinator SI-4A

City of Malibu



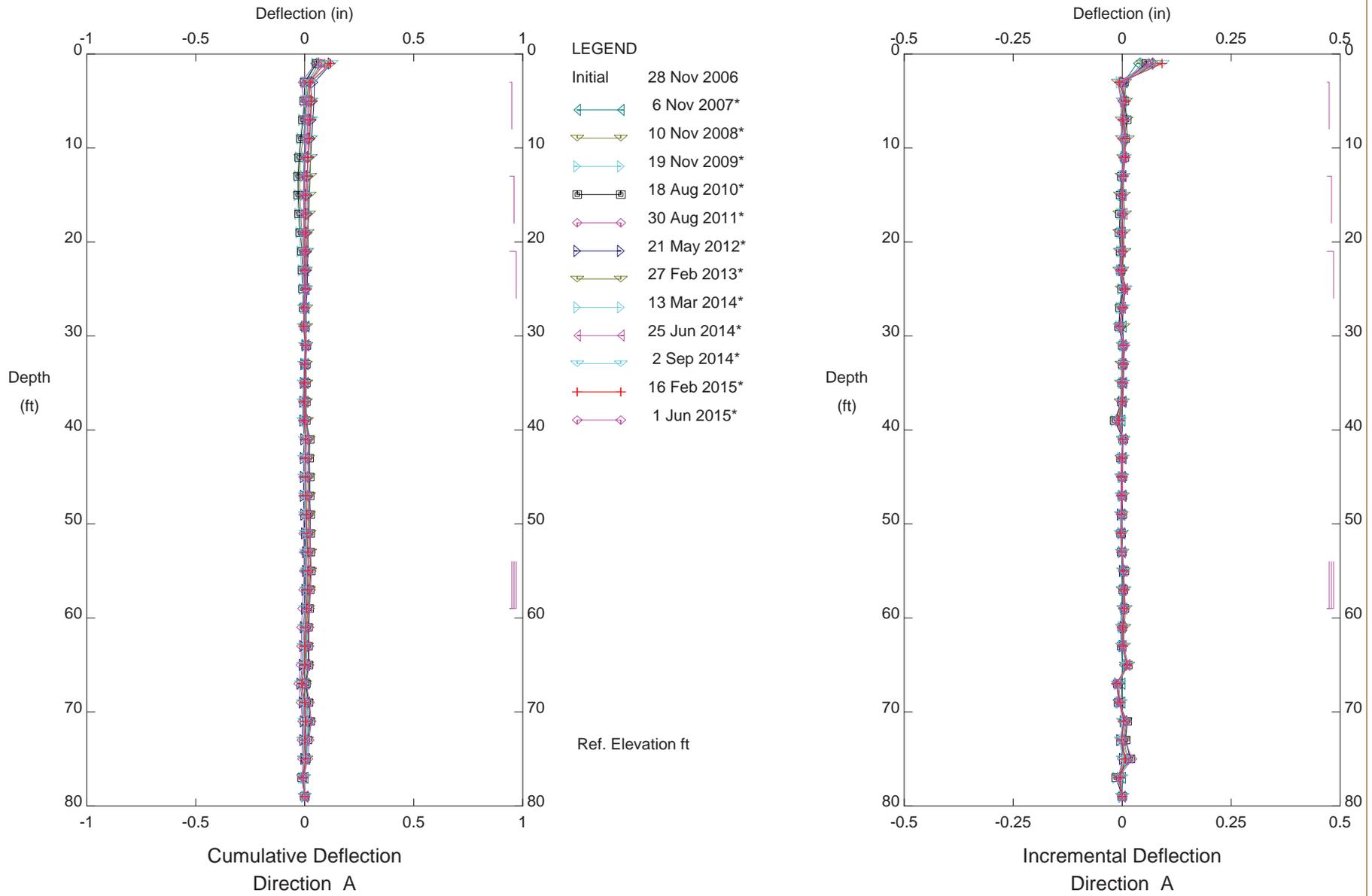
Displ.
(in)

Assessment District 98-3, Inclinator SI-4A

City of Malibu



Fugro Consultants, Inc. - Ventura, CA

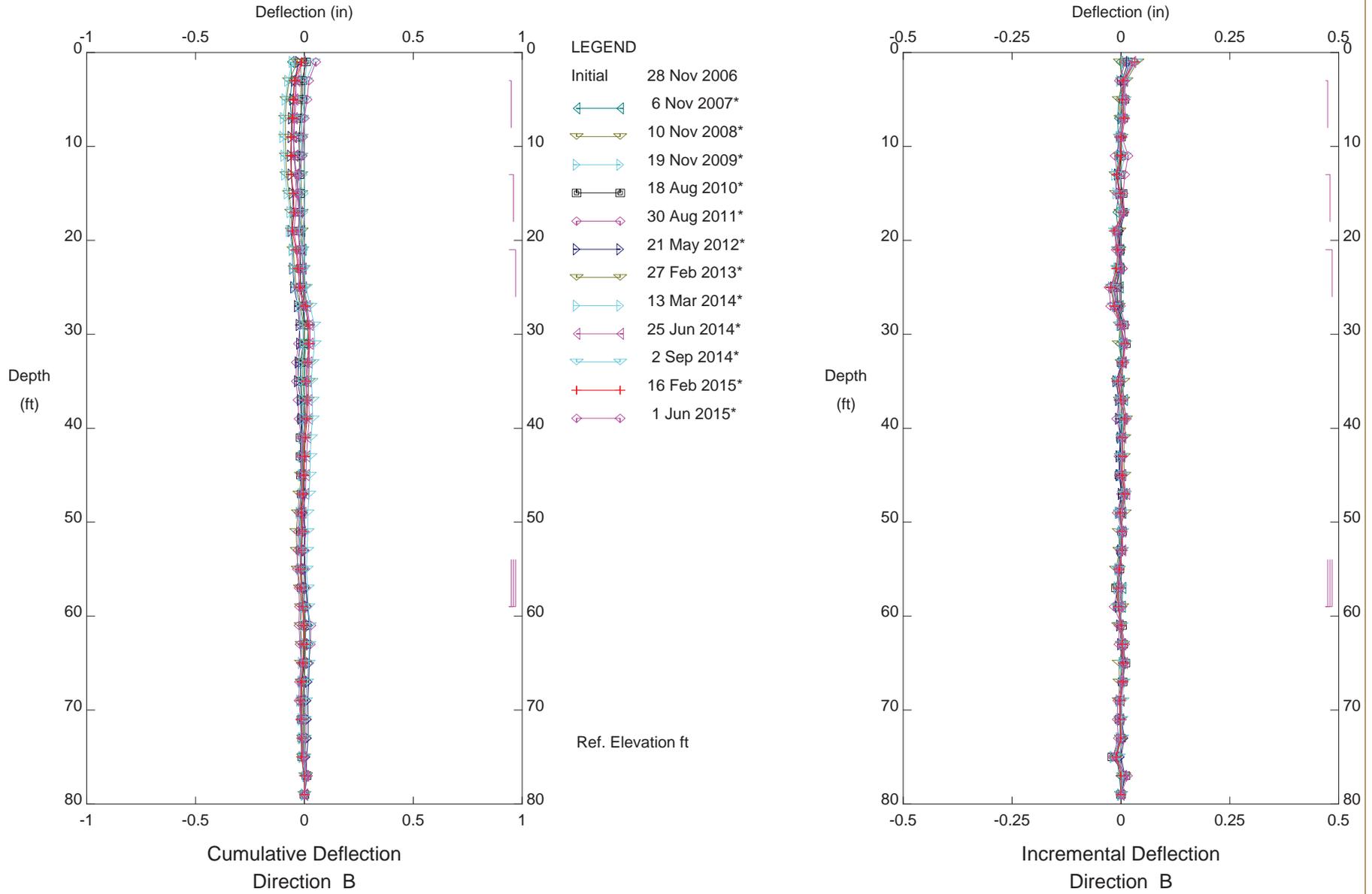


Assessment District 98-3, Inclinometer SI-5
 City of Malibu

Sets marked * include zero shift and/or rotation corrections.



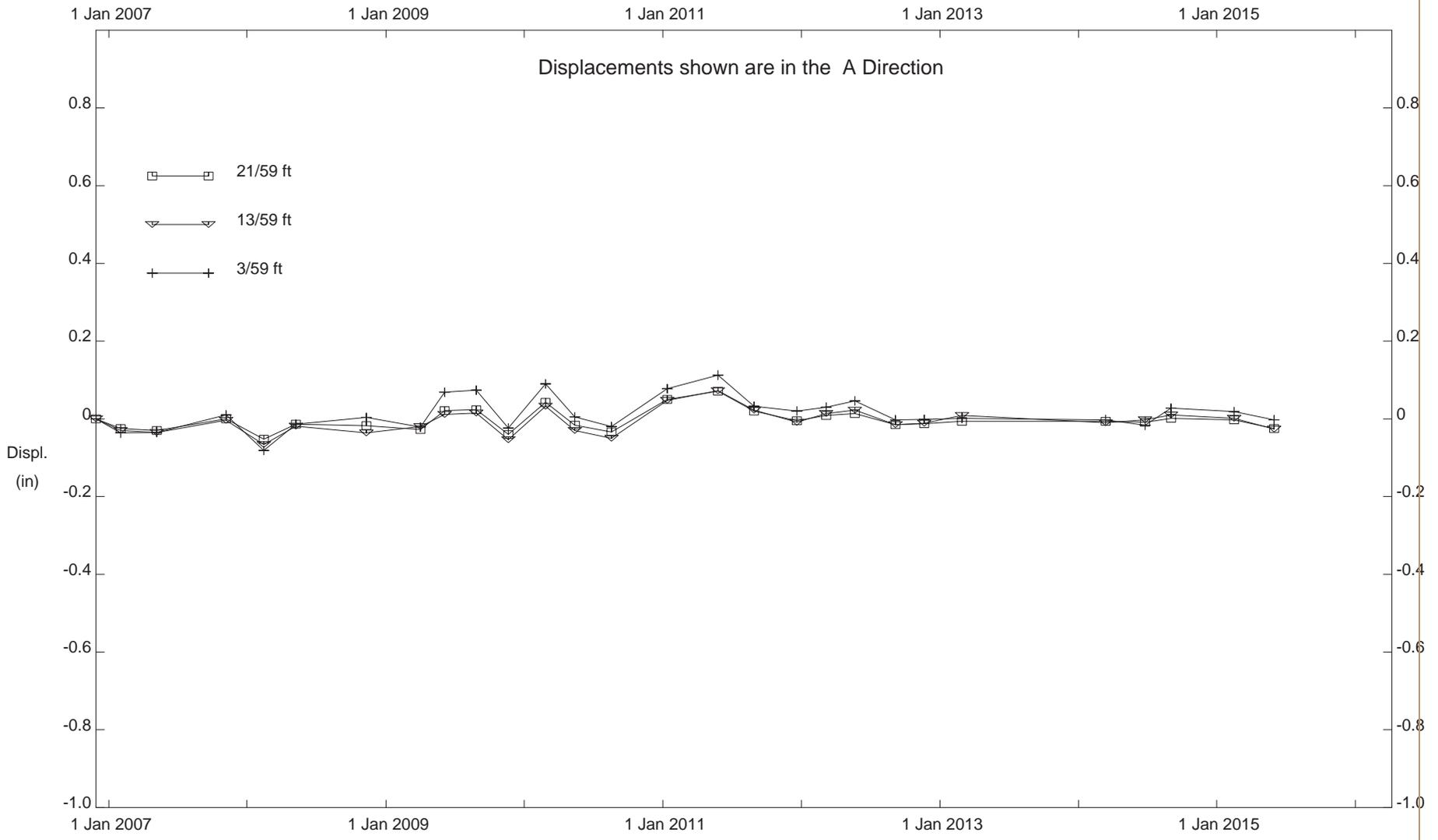
Fugro Consultants, Inc. - Ventura, CA



Assessment District 98-3, Inclinometer SI-5
 City of Malibu

Sets marked * include zero shift and/or rotation corrections.

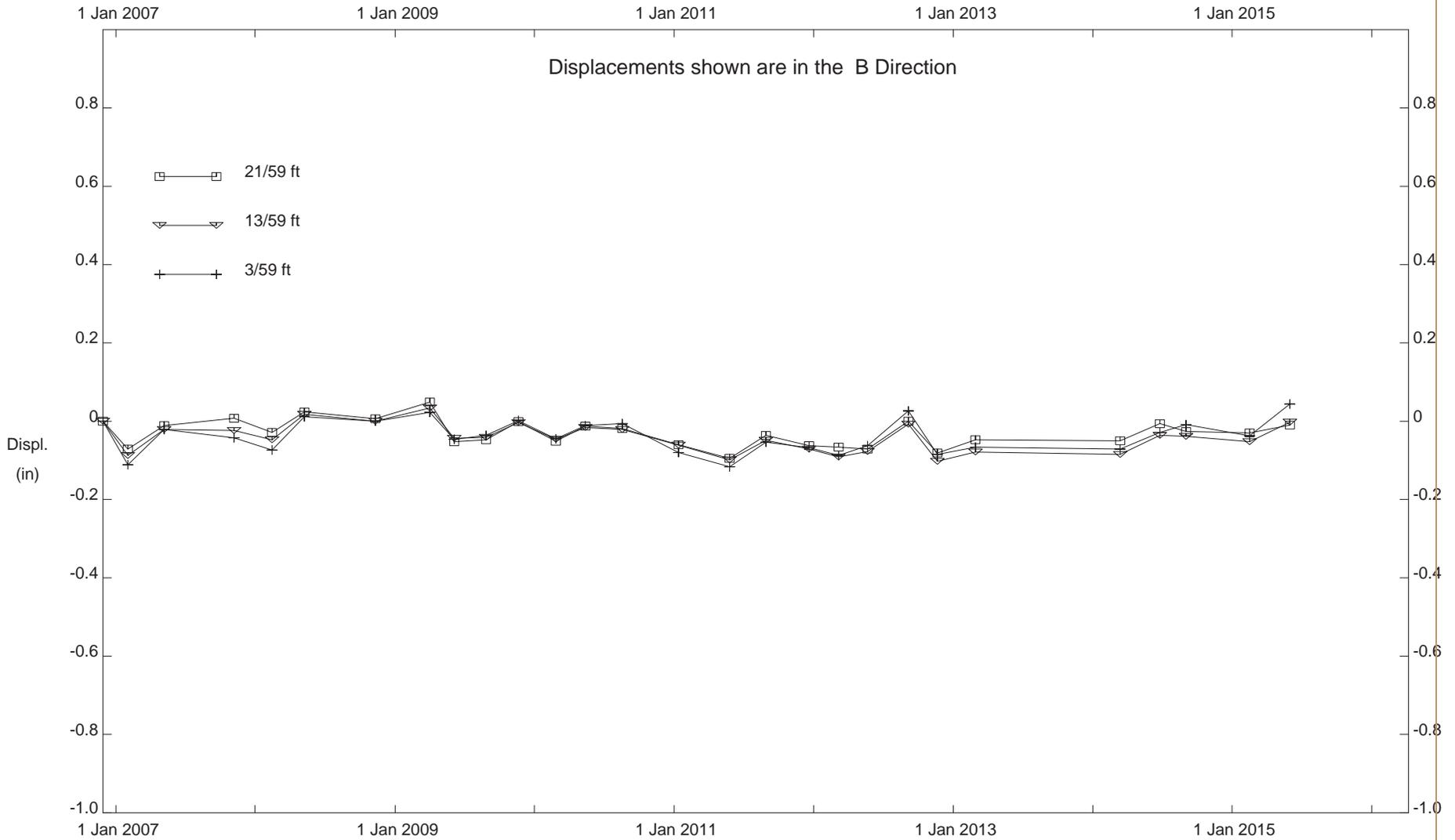




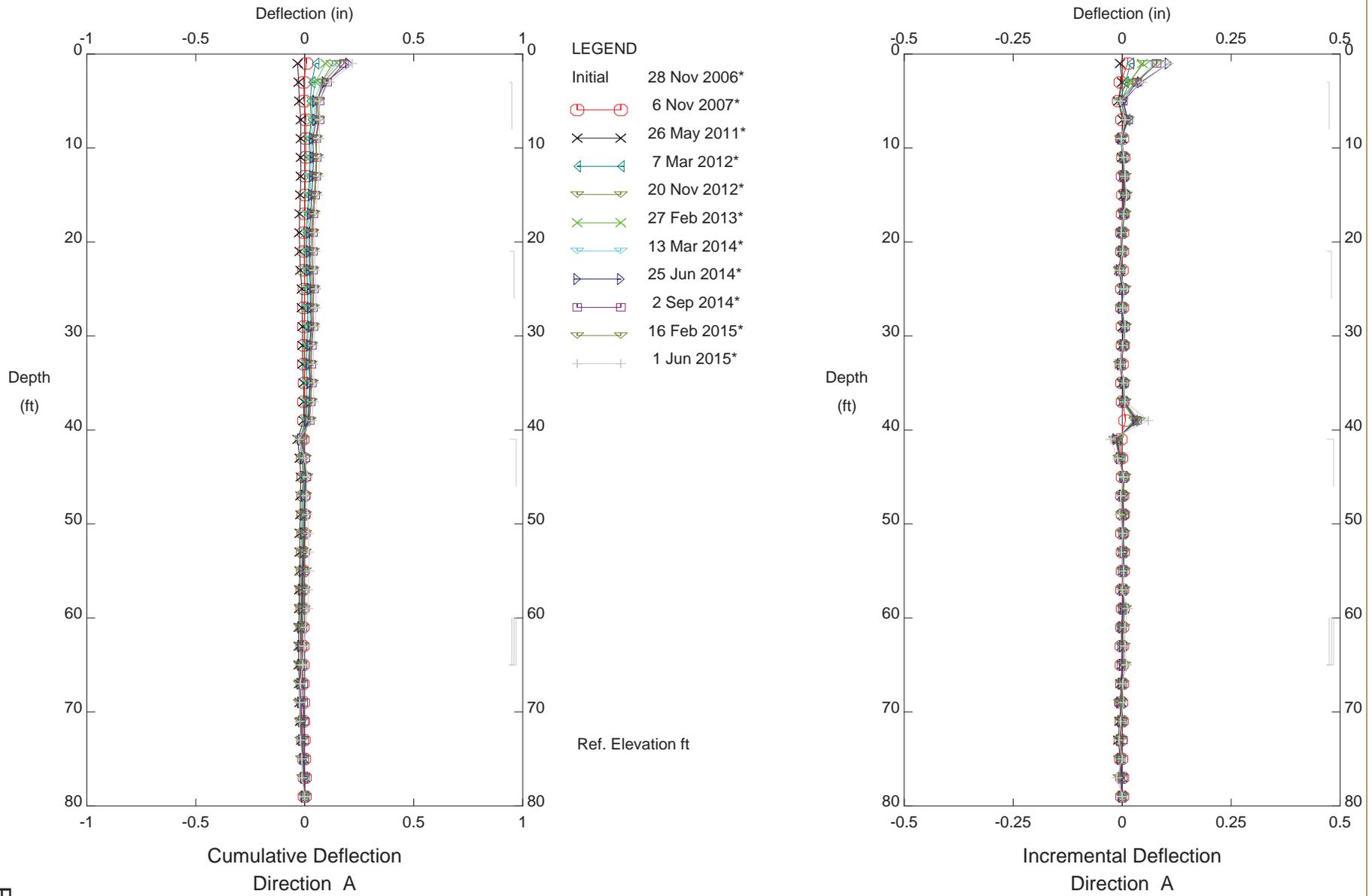
Assessment District 98-3, Inclinator SI-5

City of Malibu





Fugro Consultants, Inc. - Ventura, CA

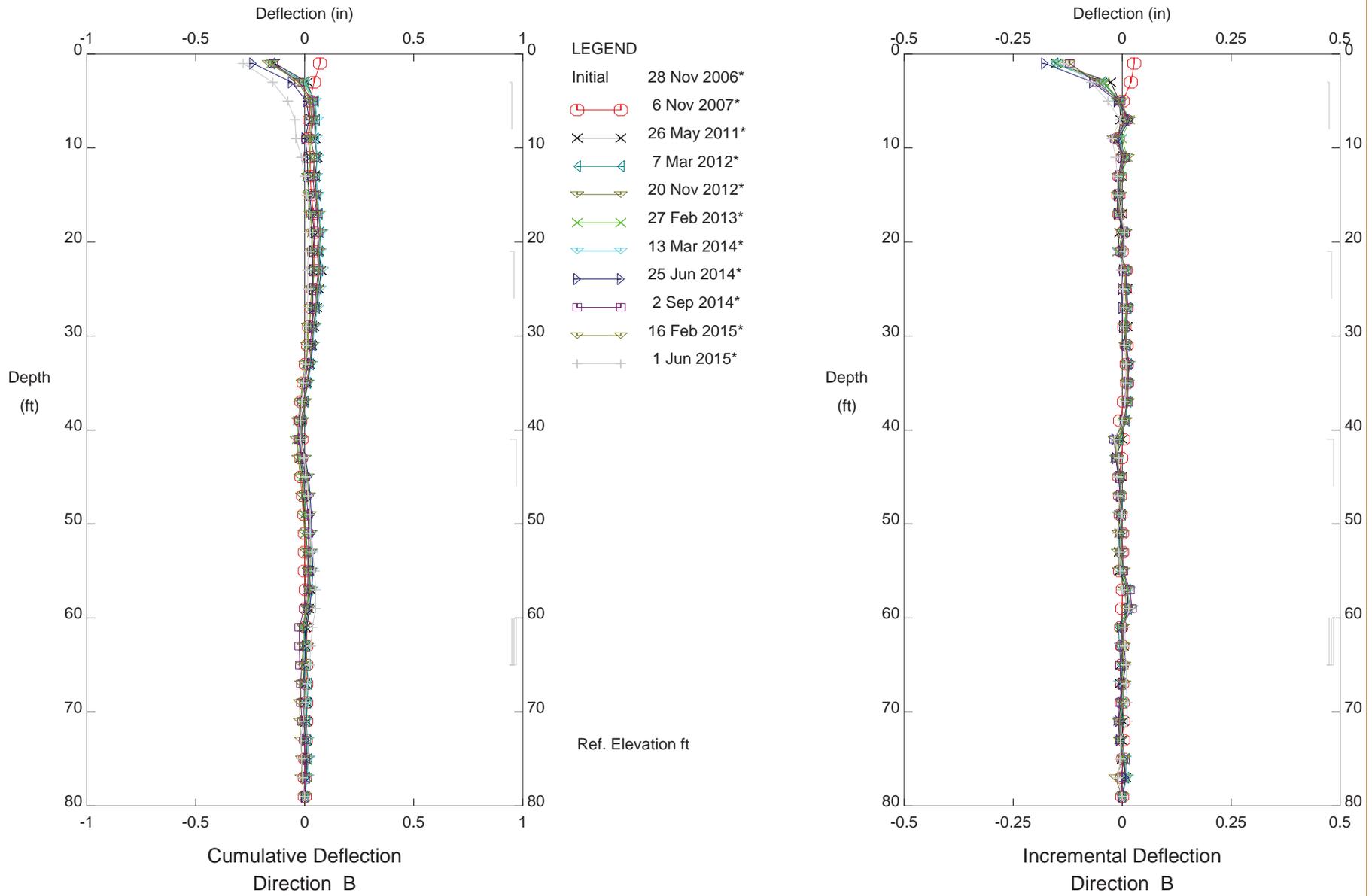


Assessment District 98-3, Inclinometer SI-6
 City of Malibu

Sets marked * include zero shift and/or rotation corrections.



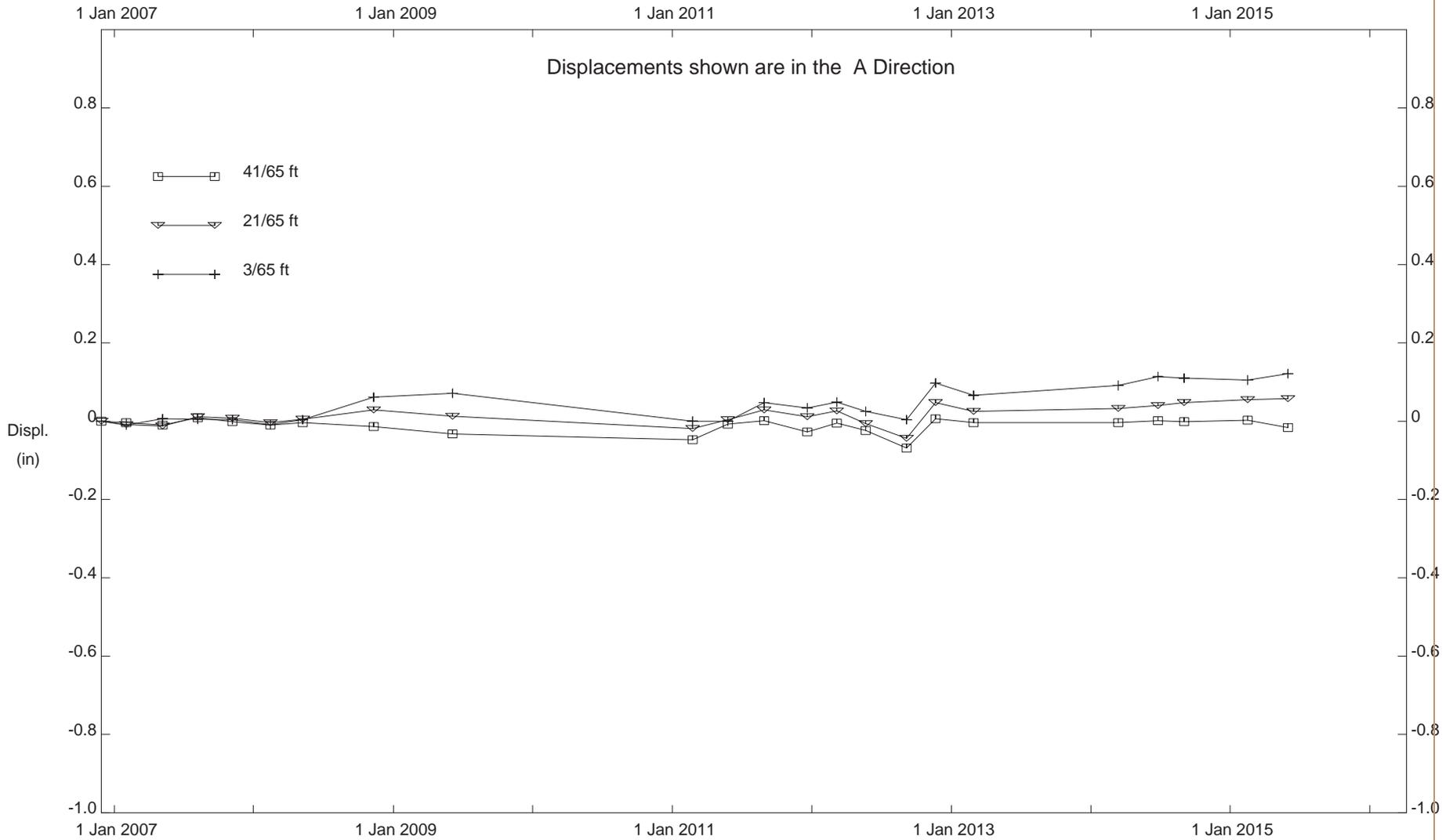
Fugro Consultants, Inc. - Ventura, CA



Assessment District 98-3, Inclinator SI-6
 City of Malibu

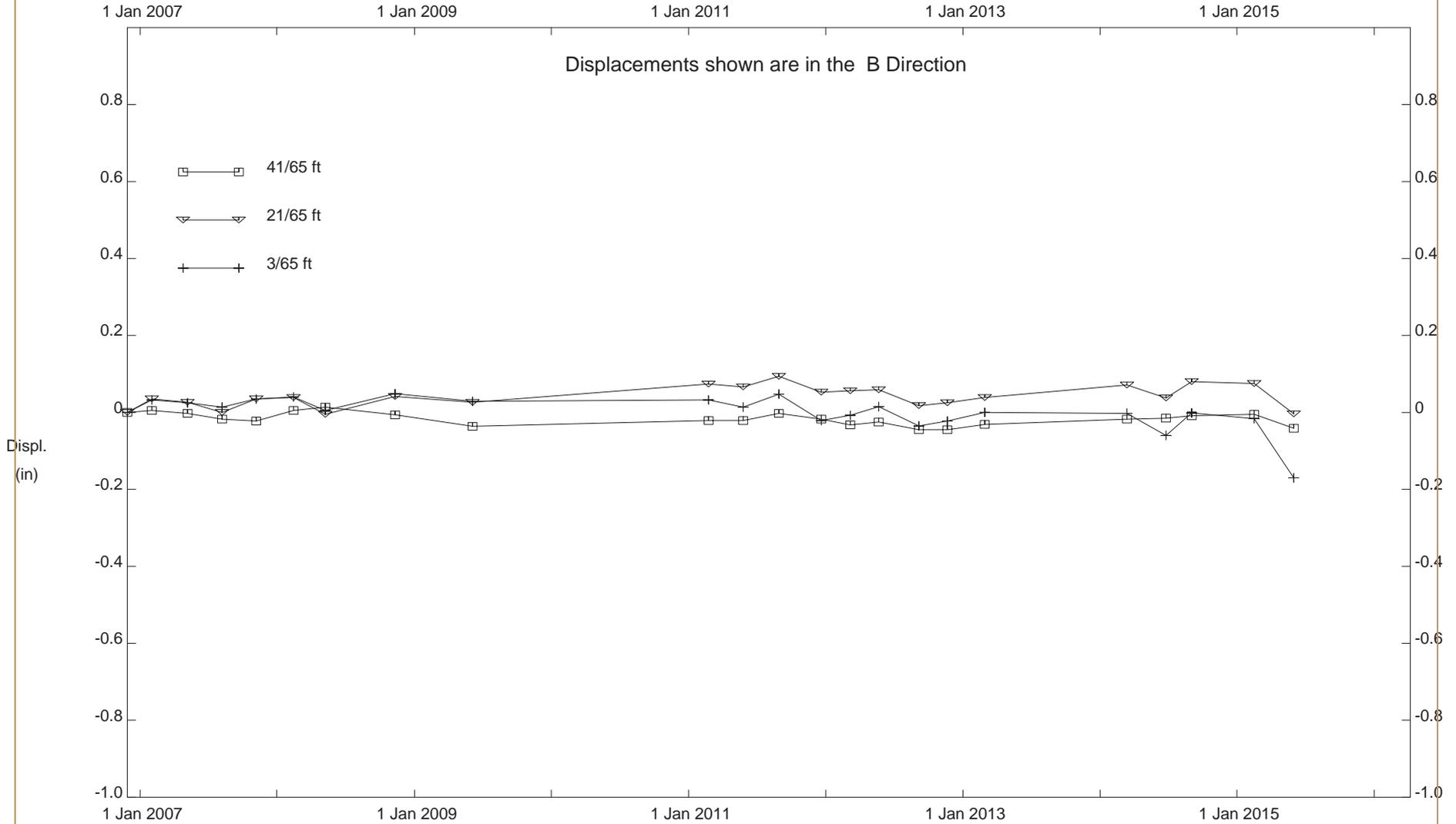
Sets marked * include zero shift and/or rotation corrections.





Assessment District 98-3, Inclinator SI-6

City of Malibu



Displ.
(in)

Assessment District 98-3, Inclinator SI-6

City of Malibu

