



Confidential

# Dunedin City Council

## **DCC Landslide Monitoring Report**

19 June 2026

6-CD109.A9



## DCC Landslide Monitoring Report

Dunedin City Council

WSP  
Dunedin  
197 Rattray Street  
Dunedin 9016  
New Zealand  
+64 3 471 5500  
wsp.com/

| REV | DATE       | DETAILS           |
|-----|------------|-------------------|
| C   | 19/06/2026 | For client review |

|              | NAME              | DATE       | SIGNATURE                                                                             |
|--------------|-------------------|------------|---------------------------------------------------------------------------------------|
| Prepared by: | Ben Winmill       | 17/06/2026 |   |
| Reviewed by: | Latasha Templeton | 17/06/2026 |  |
| Approved by: | Kevin Wood        | 17/06/2026 |   |

This report ('Report') has been prepared by WSP exclusively for Dunedin City Council ('Client') in relation to the landslide monitoring at selected sites in Dunedin (Landslide Monitoring Long-Term SoW DCC Reference 9662). The scope of this Report is to present the survey monitoring results and recommendations for future surveys for the site ('Purpose'). The findings in this Report are based on and subject to the assumptions specified in the Report. WSP accepts no liability whatsoever for any reliance on or use of this Report, in whole or in part, for any use or purpose other than the Purpose or any use or reliance on the Report by any third party.



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# 1 INTRODUCTION

WSP New Zealand Limited (WSP) have been commissioned by Dunedin City Council (DCC) to undertake monitoring of 9 landslide sites around Dunedin. The following locations, provided in no set order, are the 10 landslide sites, which will be referred to as 'the sites' in this report;

- 1 Puketeraki
- 2 Greenacres Street
- 3 Brighton Road
- 4 Howard Street
- 5 Brockville Road
- 6 Cargill Street
- 7 Church Hill Road
- 8 Dickson Street
- 9 Sidey Street
- 10 Motu Street

In previous years, West Abbotsford and Albany Street landslides were included; however, due to project constraints, they were excluded from this years' monitoring round. The purpose of this annual monitoring is to identify trends in the magnitude of movements and to provide recommendations for future monitoring. Please note that these results are based on information gathered during the monitoring rounds and are compared to the year in which monitoring for each site began, which will have an influence on the data reported (i.e. monitoring starting in 2021 compared to 1998).

This report presents a summary of the observed outcomes from the factual survey conducted at various sites in 2025 and 2026, along with recommendations for future monitoring and reporting.

# 2 SURVEY MONITORING

## 2.1 MONITORING HISTORY

Survey monitoring of each site has been undertaken at various intervals since the respective base surveys (i.e., the year in which monitoring began). The surveys are typically carried out on a yearly or biennial basis, the frequency is dependent on the recent rates of movement. Historically, some sites with increased instability have been surveyed on a more frequent basis, particularly following major storm events or increased ground movement.

In previous years, the total number of sites surveyed was 12. Based on priority and criticality, 9 sites were surveyed in 2023, 10 in 2024 and 10 in 2025 survey iterations.

## 2.2 SURVEY EQUIPMENT

All the sites monitored in 2025/2026, utilised Global Navigation Satellite System (GNSS) observations collected using a variety of methods (i.e., a combination of static and post-processed kinematic observations).

## 2.3 SURVEY METHODOLOGY

The quality and redundancy of survey measurements made in the field were improved at selected sites in the 2024 round of landslide monitoring surveys and remain the same for the 2025 round. While WSP continue to seek improvements in both survey field methodologies and office processing procedures, our approach to each site remains as consistent as possible to ensure that the data collected is comparable between years.

The most notable change in 2024 was to the office processing methodology, with the incorporation of GNSS data from the Continuously Operating Reference Station (CORS) GSMG, located in Mosgiel.

Data collected at GSMG increased the number of measurements included in our networks, increasing the redundancy (the number of measurements above the minimum required to compute coordinates) of the network adjustment. The inclusion of GSMG has positively impacted some sites, with improvements in vertical accuracy observed. At most other sites that have incorporated data from GSMG, a negligible impact on survey results has been observed.

## 2.4 SURVEY ACCURACIES

The survey processing in 2024 incorporated GNSS data from the CORS GSMG, as mentioned in Section 2.3. This improvement to the survey methodology for the Brighton Road Landslide and the Church Hill Road Landslide has enabled the inclusion of additional measurements to these survey networks.

The accuracy of 2025 survey remains consistent with 2024 results. The reported survey accuracies at each site for the previous survey as well as the 2025 survey are presented in Table 2-1 below.

Table 2-1: Reported Survey Accuracies for previous surveys and 2025 surveys.

| Site          | 2024              | 2025              |
|---------------|-------------------|-------------------|
| Puketeraki    | H ±15 mm V ±30 mm | H ±15 mm V ±30 mm |
| Greenacres St | H ±10 mm V ±15 mm | H ±10 mm V ±15 mm |
| Brighton Rd   | H ±15 mm V ±20 mm | H ±15 mm V ±20 mm |
| Howard St     | H ±15 mm V ±25 mm | H ±15 mm V ±25 mm |

|                |                             |                             |
|----------------|-----------------------------|-----------------------------|
| Brockville Rd  | H $\pm$ 10 mm V $\pm$ 15 mm | H $\pm$ 10 mm V $\pm$ 15 mm |
| Cargill Street | Not surveyed in 2024        | H $\pm$ 10 mm V $\pm$ 15 mm |
| Church Hill Rd | H $\pm$ 15 mm V $\pm$ 15 mm | H $\pm$ 15 mm V $\pm$ 15 mm |
| Dickson St     | H $\pm$ 15 mm V $\pm$ 25 mm | H $\pm$ 15 mm V $\pm$ 25 mm |
| Sidey St       | H $\pm$ 5 mm V $\pm$ 2 mm   | H $\pm$ 5 mm V $\pm$ 2 mm   |
| Motu St        | H $\pm$ 10 mm V $\pm$ 10 mm | H $\pm$ 10mm V $\pm$ 10 mm  |

### 3 LANDSLIDE TYPES

Providing the landslide types<sup>1</sup> can inform the rate of movement and allude to the plane of weakness, or failure surface(s), between the overlying material that is in motion and the underlying material. The following table outlines the types of landslide movements observed during the survey and their corresponding underlying mapped geological unit. Understanding the relationship between movement types and geology is crucial for assessing the stability of the slope and anticipating future behaviour.

In order to provide a background into interpreting the survey results, a summary of the landslide types have been incorporated in Table 3-1 below. Data has been derived from GNS Geology Webmap portal and Otago Regional Council's Hazard Database<sup>2</sup>.

Table 3-1: Surveyed sites and the respective landslide types and underlying mapped geological unit

| Site name      | Landslide movement type <sup>3</sup> | Mapped geological unit                                                                                              |
|----------------|--------------------------------------|---------------------------------------------------------------------------------------------------------------------|
| Puketeraki     | Complex                              | Otakou Group sandstone and limestone                                                                                |
| Greenacres St  | Earthflow, mass movement             | Dunedin Volcanic Group first main phase extrusives and pyroclastics                                                 |
| Brighton Rd    | Complex                              | Onekara Group sandstone and siltstone                                                                               |
| Howard St      | Complex                              | Dunedin Volcanic Group first and second main phase extrusives                                                       |
| Brockville Rd  | Complex                              | Otakou Group sandstone                                                                                              |
| Cargill St     | Translational slide                  | Dunedin Volcanic Group second main phase extrusives                                                                 |
| Church Hill Rd | Complex, flow                        | Otakou Group sandstone                                                                                              |
| Dickson St     | Complex                              | Dunedin Volcanic Group first main phase extrusives and pyroclastics                                                 |
| Sidey St       | Complex                              | Otakou Group sandstone and Dunedin Volcanic Group first main phase extrusives                                       |
| Motu St        | N/A*                                 | Late Pleistocene ocean beach deposits of Hillgrove Formation and Dunedin Volcanic Group first main phase extrusives |

\*The Motu St landslide is not included in the Otago Regional Council (ORC) Natural Hazards Portal or the GNS Landslide Database.

<sup>1</sup> [Landslide Types Guidance](#)

<sup>2</sup> [Otago Natural Hazards Portal](#)

<sup>3</sup> [Otago Natural Hazards Portal](#)

# 4 MONITORING RESULTS

## 4.1 MONITORING DISPLACEMENTS SINCE PREVIOUS SURVEY

A summary of the maximum and average vertical and horizontal displacements since the previous survey are presented in Table 4-1. Refer to Appendix A for vector displacement plans, Appendix B for factual survey data results and Appendix C for vertical and horizontal movement graphs.

This data highlights the extent of terrain movement, with the maximum vertical displacements and horizontal displacements for each surveyed site. Average displacements are provided to show an overview of general trends.

Notable observations when comparing 2024 survey data to 2025 survey data are:

- A decrease in horizontal movement for Puketeraki
- An increase in vertical movement for Greenacres St, and decrease in horizontal movement
- An increase in horizontal movement for Church Hill Rd
- A decrease in horizontal movement for Howard St

Table 4-1: Displacements since previous survey

| Site name      | Vertical Movement (mm) |     | Horizontal Movement (mm) |     | Date of Latest Survey |
|----------------|------------------------|-----|--------------------------|-----|-----------------------|
|                | Max                    | Ave | Max                      | Ave |                       |
| Puketeraki     | 53                     | 13  | 104                      | 74  | 27/01/2026            |
| Greenacres St  | 17                     | 13  | 13                       | 9   | 22/01/2026            |
| Brighton Rd    | 9                      | 1   | 14                       | 5   | 21/01/2026            |
| Howard St      | 25                     | 11  | 7                        | 3   | 20/01/2026            |
| Brockville Rd  | 3                      | 9   | 14                       | 11  | 13/01/2026            |
| Cargill Street | 6                      | 1   | 9                        | 6   | 28/11/2025            |
| Church Hill Rd | 10                     | 2   | 26                       | 9   | 5/12/2025             |
| Dickson St     | 11                     | 2   | 14                       | 5   | 20/11/2025            |
| Sidey St       | 0                      | 0   | 8                        | 4   | 6/11/2025             |
| Motu St*       | 17                     | 2   | 6                        | 7   | 11/06/2026            |

\*Data from PIN205 was removed for this report due to footpath resurfacing.

## 4.2 MONITORING DISPLACEMENT SINCE BASE SURVEY

Survey monitoring of displacement since the base survey provides an opportunity to compare prior results and identification of long-term slope movement patterns.

It should be noted that some sites (e.g. Puketeraki) have a large dataset over a long period of time, whereas others (e.g. Brockville Rd) have only a select amount of data to compare to base surveys. It is important to take into account both the date range of the collected survey data and the intervals at which the data has been collected when interpreting these results.

A summary of the maximum and average vertical and horizontal displacements since the base survey has been presented below in Table 4-2.

Table 4-2: Displacements Since Base Survey

| Site name      | Vertical Movement (mm) |     | Horizontal Movement (mm) |      | Date of Base Survey          |
|----------------|------------------------|-----|--------------------------|------|------------------------------|
|                | Max                    | Ave | Max                      | Ave  |                              |
| Puketeraki     | 1142                   | 356 | 4424                     | 2536 | 1992                         |
| Greenacres St  | 714                    | 380 | 1731                     | 1167 | July 2015                    |
| Brighton Rd    | 428                    | 70  | 1315                     | 290  | 1998                         |
| Howard St      | 101                    | 39  | 245                      | 82   | 1998                         |
| Brockville Rd  | 67                     | 18  | 20                       | 16   | July 2020                    |
| Cargill Street | 45                     | 20  | 46                       | 33   | December 2000                |
| Church Hill Rd | 263                    | 84  | 625                      | 312  | 1997                         |
| Dickson St     | 50                     | 13  | 59                       | 19   | 1997                         |
| Sidey St       | 12                     | 3   | 11                       | 6    | 1997, Re-established in 2010 |
| Motu St*       | 5                      | 1   | 7                        | 12   | December 2018                |

\*Data from PIN205 was removed for this report due to footpath resurfacing.

# 5 RAINFALL DATA

A summary of the rainfall data since the initial 2020 survey is presented in Figure 5-1 below. The rainfall data was retrieved from the NIWA (National Institute of Water and Atmospheric Research) National Climate Database website<sup>4</sup> using the Musselburgh Station (Agent ID #15752). Mean monthly rainfall was calculated for the Musselburgh Station using data between 1997 to November 2023. A change in licensing for NIWA’s Cliflo meant from December 2023 annual rainfall data was obtained via the ORC’s data portal<sup>5</sup>, using the Station ID Pine Hill.

A major rainfall event occurred in July 2022, as shown in Figure 5-1, with a total of 234 mm recorded that month. In March 2023, the highest monthly rainfall reached 105.8 mm, but there were no significant rainfall events throughout 2023. For 2024, October saw the greatest amount of monthly rainfall, with 198 mm recorded. In July 2025, the highest monthly rainfall for that year was observed, totalling 226.5 mm.

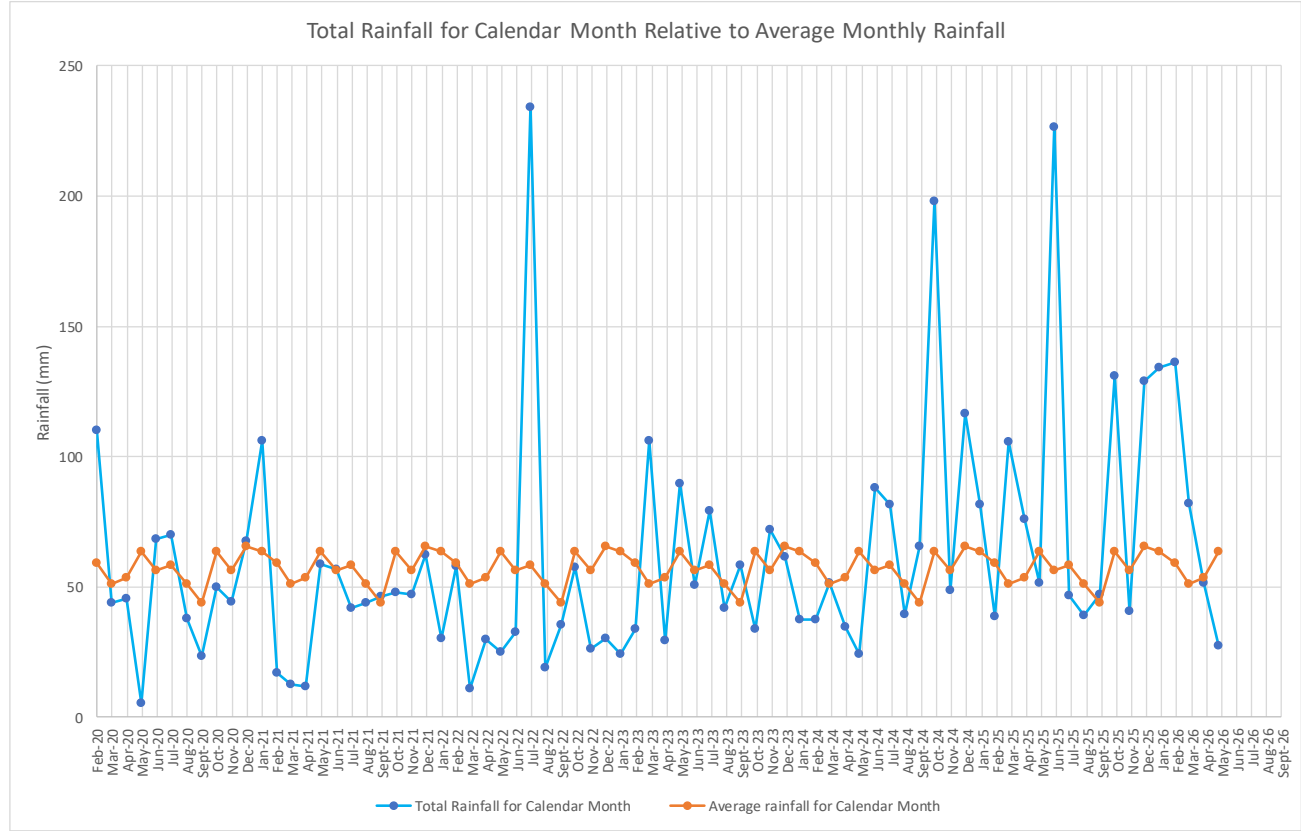


Figure 5-1: Total Rainfall for Calendar Month Relative to Average Monthly Rainfall

<sup>4</sup> <https://cliflo.niwa.co.nz/>

<sup>5</sup> [ORC’s Data portal ID Pine Hill](#)

## 6 RECOMMENDATIONS

Although some of the sites surveyed this year have reported measurements less than survey accuracy, care should be taken when interpreting these results. Landslide movement is difficult to determine without real-time continuous monitoring, and as majority of the landslides surveyed are complex landslides (meaning two or more types of landslide movements at that site).

A summary of each site and its monitoring displacement are summarized in Table 6-1, with recommendations for each site summarized in Table 6-2 below.

Table 6-1: Summary of monitoring displacement for each site

| Site name                | Summary of information                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Puketeraki</b>        | <p>Maximum displacement since base survey: 1142 mm vertical, 4424 mm horizontal. The average rate of horizontal movement has slowed relative to the previous year (293 mm in 2024 compared to 104 mm in 2025/26). The landslide appears to have moved horizontally since the monitoring began. An increase in the average vertical deformations have exceeded the accepted survey accuracy this year.</p> <p>Damage to the road in this area is ongoing with tension cracks appearing in recent seal repairs</p> <p>The consequences include potential damage to the services, roads and utilities in the vicinity of the landslide, should continue to be monitored for damage.</p> |
| <b>Greenacres Street</b> | <p>Maximum horizontal displacement since the previous survey: 13 mm, decrease from the previous report. Vertical deformation of 17 mm slightly more than survey accuracy.</p> <p>The consequences include potential damage to residential dwellings and farmland.</p>                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Brighton Road</b>     | <p>Maximum displacement since base survey: 428 mm vertical, 1315 mm horizontal. Horizontal and vertical movements are less than the accepted survey accuracy since the previous survey.</p> <p>Semi-rural location of the slip, with the consequence of damage to residential dwellings.</p>                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Howard Street</b>     | <p>Maximum displacement since base survey: 101 mm vertical, 245 mm horizontal. Minor vertical movement since the previous survey, with a vertical movement of 25 mm. Average vertical and horizontal movements are both less than the accepted survey accuracy. Continued movement of the landslide towards the harbour since the base survey.</p> <p>The consequences include potential damage to residential dwellings.</p>                                                                                                                                                                                                                                                        |
| <b>Brockville Road</b>   | <p>Maximum displacement since base survey: 67 mm vertical, 20 mm horizontal. Minor vertical movement since the previous survey, with a horizontal movement of 14 mm.</p> <p>The consequences include potential damage to residential dwellings and a school.</p>                                                                                                                                                                                                                                                                                                                                                                                                                     |

|                         |                                                                                                                                                                                                                                                                                                                                                                           |
|-------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Cargill Street</b>   | Displacements since the previous survey in 2021 have been minimal (<10 mm maximum vertical and horizontal).<br>The consequences include potential damage to residential dwellings                                                                                                                                                                                         |
| <b>Church Hill Road</b> | Maximum displacement since base survey: 625 mm horizontal and 263 mm vertical movement. Average vertical and horizontal movements since the previous survey are both less than the accepted survey accuracy.<br>The consequences include potential damage to residential dwellings and a school.                                                                          |
| <b>Dickson Street</b>   | Maximum displacement since base survey: 50 mm vertical and 59 mm horizontal. Minimal/negligible displacements since the previous survey. Positive vertical deformation is being reported which is atypical for landslides.<br>The consequences include potential damage to residential dwellings.                                                                         |
| <b>Sidey Street</b>     | Displacements since the previous survey have been minimal (<10 mm maximum vertical and horizontal).<br>Nail 6 and Nail 7 mark destroyed by the kerb and retaining wall works.<br>The consequences include potential damage to residential dwellings.                                                                                                                      |
| <b>Motu Street</b>      | One survey mark was destroyed, two survey marks were inaccessible this round and two other survey marks were replaced. Minor horizontal movement since previous survey (in 2022), with a maximum vertical movement of 17 mm. Average vertical movements is less than the accepted survey accuracy.<br>The consequences include potential damage to residential dwellings. |

Table 6-2: Recommendations for each site

| Reporting Level | Minimum Criteria                                                                             | Sites <sup>1</sup>                                                                                                                           | Recommendations                                                                                                                                                                                                |
|-----------------|----------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1               | Sites with average displacements greater than the survey accuracy since the previous survey. | <ul style="list-style-type: none"> <li>Puketeraki</li> </ul>                                                                                 | Site walkover, UAV survey, and a site-specific report every 2 years                                                                                                                                            |
| 2               | Sites with maximum displacements greater than the survey accuracy since the base survey      | <ul style="list-style-type: none"> <li>Howard St</li> <li>Greenacres St</li> <li>Church Hill Rd</li> <li>Brockville Rd</li> </ul>            | Site walkover and high-level assessment of observable deformation. A brief description of observations and discussion of the survey network to be presented in a combined report. Continued survey monitoring. |
| 3               | Sites with negligible/no displacements                                                       | <ul style="list-style-type: none"> <li>Dickson St</li> <li>Brighton Rd</li> <li>Cargill Street</li> <li>Sidey St</li> <li>Motu St</li> </ul> | Continued survey monitoring and/or visual monitoring.                                                                                                                                                          |

<sup>1</sup> Presented in descending order of criticality

## 7 LIMITATIONS

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In preparing this Report, WSP has relied upon data, surveys, analyses, designs, plans and other information ('Client Data') provided by or on behalf of the Client. Except as otherwise stated in this Report, WSP has not verified the accuracy or completeness of the Client Data. To the extent that the statements, opinions, facts, information, conclusions and/or recommendations in this Report are based in whole or part on the Client Data, those conclusions are contingent upon the accuracy and completeness of the Client Data. WSP will not be liable for any incorrect conclusions or findings in the Report should any Client Data be incorrect or have been concealed, withheld, misrepresented or otherwise not fully disclosed to WSP.

# APPENDIX A - MONITORING DISPLACEMENT VECTOR PLANS

LEGEND

LANDSLIDE - OTAGO REGION (CERTAINTY)

DEFINITE

LIKELY

POSSIBLE

NOT ASSESSED

NO INFORMATION

INDICATIVE LANDSLIDE EXTENTS ARE BASED ON "REVISED LANDSLIDE DATABASE FOR THE COASTAL SECTOR OF THE DUNEDIN CITY DISTRICT" BY BARRELL, D.J.A., SMITH LITTLE, B., GLASSEY, P.J. GNS SCIENCE CONSULTANCY REPORT 2017/41, JULY 2017, SOURCED FROM THE OTAGO REGIONAL COUNCIL (ORC) NATURAL HAZARDS PORTAL.

OTHER

+/- Xmm = CUMULATIVE VERTICAL DISPLACEMENT SINCE THE BASE SURVEY

CUMULATIVE HORIZONTAL DISPLACEMENT SINCE THE BASE SURVEY

SURVEY MARKER

1:2000 @ A1  
1:4000 @ A3

| REVISION | AMENDMENT                        | APPROVED | DATE       |
|----------|----------------------------------|----------|------------|
| A        | 2024 DEFORMATION MONITORING DATA | D.M.     | 10/12/2024 |
| B        | 2025 DEFORMATION MONITORING DATA | D.M      | 04/02/2026 |
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Dunedin Office  
+64 3 471 5500  
Private Bag 1913  
Dunedin 9016  
New Zealand

CIVIL

SCALES  
1:2000 @A1, 1:4000 @A3

ORIGINAL SIZE  
A1

DRAWN  
J.W

APPROVED  
D.M

DRAWING VERIFIED  
B.W

APPROVED DATE  
04/02/2026

CUMULATIVE SURVEY RESULTS 2025

PROJECT  
DUNEDIN CITY COUNCIL  
PUKETERAKI  
LONG TERM LANDSLIDE MONITORING

TITLE  
CUMULATIVE LANDSLIDE DISPLACEMENT  
PUKETERAKI

WSP PROJECT NO. (SUB-PROJECT)  
6-CD109.55

SHEET NO.  
C01

REVISION  
B

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LEGEND

LANDSLIDE - OTAGO REGION (CERTAINTY)

DEFINITE

LIKELY

POSSIBLE

NOT ASSESSED

NO INFORMATION

INDICATIVE LANDSLIDE EXTENTS ARE BASED ON "REVISED LANDSLIDE DATABASE FOR THE COASTAL SECTOR OF THE DUNEDIN CITY DISTRICT" BY BARRELL, D.J.A., SMITH LITTLE, B., GLASSEY, P.J. GNS SCIENCE CONSULTANCY REPORT 2017/41, JULY 2017, SOURCED FROM THE OTAGO REGIONAL COUNCIL (ORC) NATURAL HAZARDS PORTAL.

OTHER

+/- Xmm = CUMULATIVE VERTICAL DISPLACEMENT SINCE THE BASE SURVEY

CUMULATIVE HORIZONTAL DISPLACEMENT SINCE THE BASE SURVEY

SURVEY MARKER

| REVISION | AMENDMENT                        | APPROVED | DATE       |
|----------|----------------------------------|----------|------------|
| A        | 2024 DEFORMATION MONITORING DATA | D.M      | 10/12/2024 |
| B        | 2025 DEFORMATION MONITORING DATA | D.M      | 04/02/2026 |
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Private Bag 1913  
Dunedin 9016  
New Zealand

CIVIL

CUMULATIVE SURVEY RESULTS 2025

SCALES  
1:2000 @A1, 1:4000 @A3

DRAWN  
J.W

DRAWING VERIFIED  
B.W

ORIGINAL SIZE  
A1

APPROVED  
D.M

APPROVED DATE  
04/02/2026

PROJECT  
DUNEDIN CITY COUNCIL  
HOWARD STREET  
LONG-TERM LANDSLIDE MONITORING

TITLE  
CUMULATIVE LANDSLIDE DISPLACEMENTS  
HOWARD STREET

WSP PROJECT NO.  
6-CD109.55

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6-CD109.55

SHEET NO.  
C01

REVISION  
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LEGEND

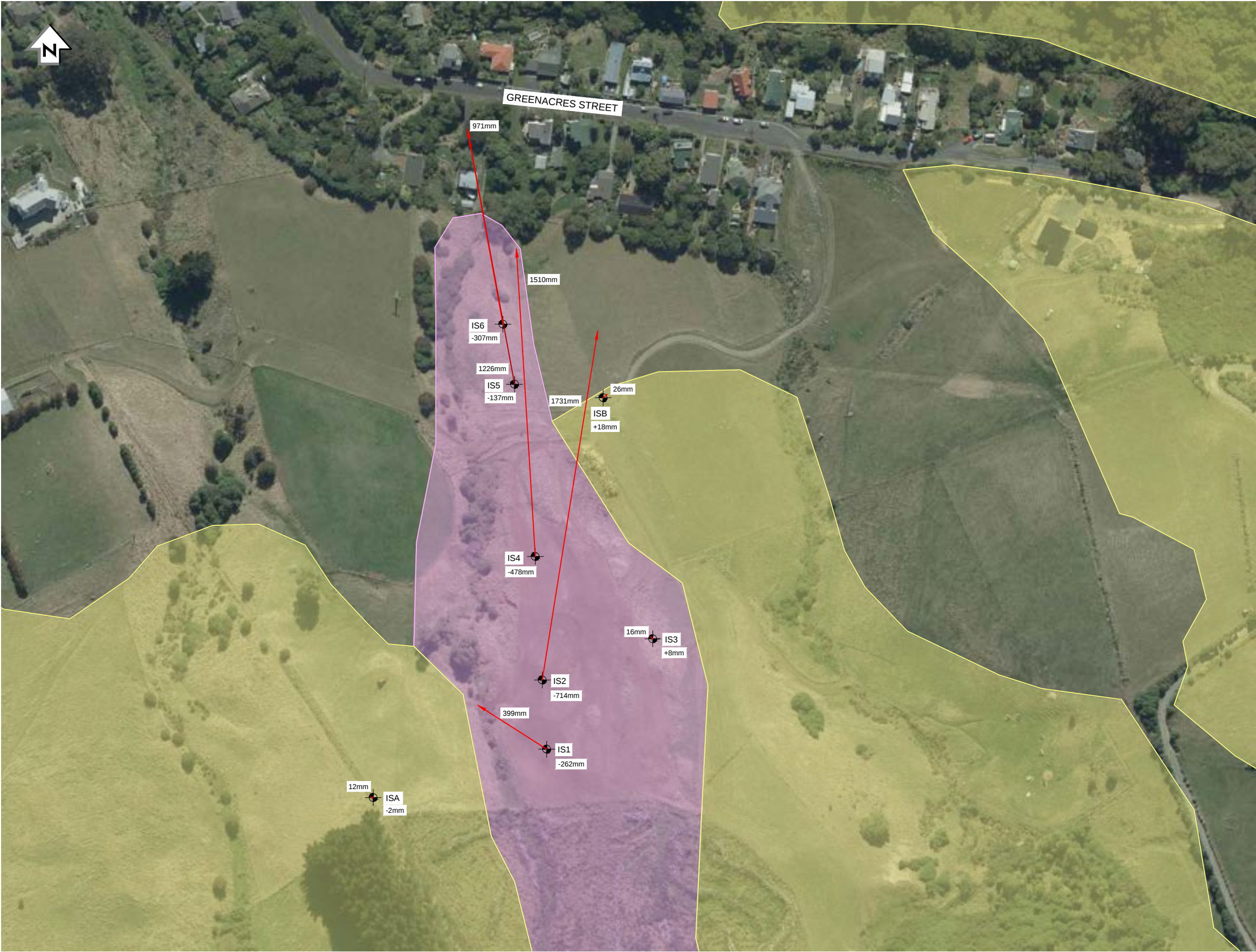
LANDSLIDE - OTAGO REGION (CERTAINTY)

- DEFINITE
- LIKELY
- POSSIBLE
- NOT ASSESSED
- NO INFORMATION

INDICATIVE LANDSLIDE EXTENTS ARE BASED ON "REVISED LANDSLIDE DATABASE FOR THE COASTAL SECTOR OF THE DUNEDIN CITY DISTRICT" BY BARRELL, D.J.A., SMITH LITTLE, B., GLASSEY, P.J. GNS SCIENCE CONSULTANCY REPORT 2017/41, JULY 2017, SOURCED FROM THE OTAGO REGIONAL COUNCIL (ORC) NATURAL HAZARDS PORTAL.

OTHER

- +/- Xmm = CUMULATIVE VERTICAL DISPLACEMENT SINCE THE BASE SURVEY
- CUMULATIVE HORIZONTAL DISPLACEMENT SINCE THE BASE SURVEY
- SURVEY MARKER



1:1000 @ A1  
1:2000 @ A3

| REVISION | AMENDMENT                        | APPROVED | DATE       |
|----------|----------------------------------|----------|------------|
| A        | 2024 DEFORMATION MONITORING DATA | D.M.     | 10/12/2024 |
| B        | 2025 DEFORMATION MONITORING DATA | D.M.     | 04/02/2026 |
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Dunedin 9016  
New Zealand

CIVIL

SCALES  
1:1000 @A1, 1:2000 @A3

ORIGINAL SIZE  
A1

|                         |                             |
|-------------------------|-----------------------------|
| DRAWN<br>J.W            | APPROVED<br>D.M             |
| DRAWING VERIFIED<br>B.W | APPROVED DATE<br>04/02/2026 |

CUMULATIVE SURVEY RESULTS 2025

PROJECT  
DUNEDIN CITY COUNCIL  
GREENACRES STREET  
LONG-TERM LANDSLIDE MONITORING  
TITLE  
CUMULATIVE LANDSLIDE DISPLACEMENTS  
GREENACRES STREET  
WSP PROJECT NO.  
6-CD109.55  
PROJ-ORIG-VOL-LOC-TYPE  
6-CD109.55

SHEET NO.  
C01  
REVISION  
B

LEGEND

LANDSLIDE - OTAGO REGION (CERTAINTY)

DEFINITE

LIKELY

POSSIBLE

NOT ASSESSED

NO INFORMATION

INDICATIVE LANDSLIDE EXTENTS ARE BASED ON "REVISED LANDSLIDE DATABASE FOR THE COASTAL SECTOR OF THE DUNEDIN CITY DISTRICT" BY BARRELL, D.J.A., SMITH LITTLE, B., GLASSEY, P.J. GNS SCIENCE CONSULTANCY REPORT 2017/41, JULY 2017, SOURCED FROM THE OTAGO REGIONAL COUNCIL (ORC) NATURAL HAZARDS PORTAL.

OTHER

+/-

Xmm = CUMULATIVE VERTICAL DISPLACEMENT SINCE THE BASE SURVEY

CUMULATIVE HORIZONTAL DISPLACEMENT SINCE THE BASE SURVEY

SURVEY MARKER



1:1500 @ A1  
1:3000 @ A3

| REVISION | AMENDMENT                        | APPROVED | DATE       |
|----------|----------------------------------|----------|------------|
| A        | 2024 DEFORMATION MONITORING DATA | D.M      | 10/12/2024 |
| B        | 2025 DEFORMATION MONITORING DATA | D.M      | 04/02/2026 |
|          |                                  |          |            |
|          |                                  |          |            |
|          |                                  |          |            |
|          |                                  |          |            |
|          |                                  |          |            |
|          |                                  |          |            |



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Dunedin 9016  
New Zealand

CIVIL

| SCALES                   | ORIGINAL SIZE |
|--------------------------|---------------|
| 1:3000 @ A1, 1:6000 @ A3 | A1            |
| DRAWN                    | APPROVED      |
| J.W                      | D.M           |
| DRAWING VERIFIED         | APPROVED DATE |
| B.W                      | 04/02/2026    |

CUMULATIVE SURVEY RESULTS 2025

|                                                                                       |                                      |                  |               |
|---------------------------------------------------------------------------------------|--------------------------------------|------------------|---------------|
| PROJECT<br>DUNEDIN CITY COUNCIL<br>CHURCH HILL ROAD<br>LONG-TERM LANDSLIDE MONITORING |                                      |                  |               |
| TITLE<br>CUMULATIVE LANDSLIDE DISPLACEMENTS<br>CHURCH HILL ROAD                       |                                      |                  |               |
| WSP PROJECT NO.<br>6-CD109.55                                                         | PROJ-ORIG-VOL-LOC-TYPE<br>6-CD109.55 | SHEET NO.<br>C01 | REVISION<br>B |

LEGEND

LANDSLIDE - OTAGO REGION (CERTAINTY)

DEFINITE

LIKELY

POSSIBLE

NOT ASSESSED

NO INFORMATION

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OTHER

+/- Xmm = CUMULATIVE VERTICAL DISPLACEMENT SINCE THE BASE SURVEY

CUMULATIVE HORIZONTAL DISPLACEMENT SINCE THE BASE SURVEY

SURVEY MARKER

1:1250 @ A1  
1:2500 @ A3

| REVISION | AMENDMENT                        | APPROVED | DATE       |
|----------|----------------------------------|----------|------------|
| A        | 2024 DEFORMATION MONITORING DATA | D.M.     | 10/12/2024 |
| B        | 2025 DEFORMATION MONITORING DATA | D.M      | 04/02/2026 |
|          |                                  |          |            |
|          |                                  |          |            |
|          |                                  |          |            |
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|          |                                  |          |            |
|          |                                  |          |            |

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New Zealand

CIVIL

| SCALES                   | ORIGINAL SIZE |
|--------------------------|---------------|
| 1:1250 @ A1, 1:2500 @ A3 | A1            |
| DRAWN                    | APPROVED      |
| J.W                      | D.M           |
| DRAWING VERIFIED         | APPROVED DATE |
| B.W                      | 04/02/2026    |

CUMULATIVE SURVEY RESULTS 2025

|                        |                                                                          |
|------------------------|--------------------------------------------------------------------------|
| PROJECT                | DUNEDIN CITY COUNCIL<br>DICKSON STREET<br>LONG-TERM LANDSLIDE MONITORING |
| TITLE                  | CUMULATIVE LANDSLIDE DISPLACEMENTS<br>DICKSON STREET                     |
| WSP PROJECT NO.        | 6-CD109.55                                                               |
| PROJ-ORIG-VOL-LOC-TYPE | 6-CD109.55                                                               |
| SHEET NO.              | C01                                                                      |
| REVISION               | B                                                                        |

Original sheet size A1 (841x594) Plot Date 2026-02-04 at 1:36:55 pm \\corp.pbwan.net\ANZ\Projects\NZ\6c16-CD109.55 LTES Long-term Landslide Monitoring\Home\03\_Delivery\Site Plans - DWG\6-CD109.55\_Dickson Street.dwg Layout2

LEGEND

LANDSLIDE - OTAGO REGION (CERTAINTY)

DEFINITE

LIKELY

POSSIBLE

NOT ASSESSED

NO INFORMATION

INDICATIVE LANDSLIDE EXTENTS ARE BASED ON "REVISED LANDSLIDE DATABASE FOR THE COASTAL SECTOR OF THE DUNEDIN CITY DISTRICT" BY BARRELL, D.J.A., SMITH LITTLE, B., GLASSEY, P.J. GNS SCIENCE CONSULTANCY REPORT 2017/41, JULY 2017, SOURCED FROM THE OTAGO REGIONAL COUNCIL (ORC) NATURAL HAZARDS PORTAL.

OTHER

+/- Xmm = CUMULATIVE VERTICAL DISPLACEMENT SINCE THE BASE SURVEY

CUMULATIVE HORIZONTAL DISPLACEMENT SINCE THE BASE SURVEY

SURVEY MARKER

1:1000 @ A1  
1:2000 @ A3

| REVISION | AMENDMENT                        | APPROVED | DATE       |
|----------|----------------------------------|----------|------------|
| A        | 2024 DEFORMATION MONITORING DATA | D.M      | 10/12/2024 |
| B        | 2025 DEFORMATION MONITORING DATA | D.M      | 04/02/2026 |
|          |                                  |          |            |
|          |                                  |          |            |
|          |                                  |          |            |
|          |                                  |          |            |
|          |                                  |          |            |
|          |                                  |          |            |
|          |                                  |          |            |

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New Zealand

CIVIL

SCALES  
1:1000 @A1, 1:2000 @A3

ORIGINAL SIZE  
A1

DRAWN  
J.W

APPROVED  
D.M

DRAWING VERIFIED  
B.W

APPROVED DATE  
04/02/2026

CUMULATIVE SURVEY RESULTS 2025

PROJECT  
DUNEDIN CITY COUNCIL  
BRIGHTON ROAD  
LONG-TERM LANDSLIDE MONITORING

TITLE  
CUMULATIVE LANDSLIDE DISPLACEMENTS  
BRIGHTON ROAD

WSP PROJECT NO.  
6-CD109.55

PROJ-ORIG-VOL-LOC-TYPE  
6-CD109.55

SHEET NO.  
C01

REVISION  
B

Original sheet size A1 (841x594) Plot Date 2026-02-05 at 8:39:48 am \\corp.pbwan.net\ANZ\Projects\NZ\6c\6-CD109.55 LTES Long-term Landslide Monitoring\Home\03\_Delivery\Site Plans - DWG\6-CD109.55\_Brighton.dwg Layout1



NOTES:

CHRIS PLEASE WRITE NOT TO INCLUDE:  
COORDINATE DATUM-  
LEVEL DATUM-  
ORIGIN COORDINATES  
HORIZONTAL AND VERTICAL ACCURACY  
"REFER TO SPREADSHEET FOR SURVEY DATA"

LEGEND

LANDSLIDE - OTAGO REGION (CERTAINTY)

- DEFINITE
- LIKELY
- POSSIBLE
- NOT ASSESSED
- NO INFORMATION

INDICATIVE LANDSLIDE EXTENTS ARE BASED ON "REVISED LANDSLIDE DATABASE FOR THE COASTAL SECTOR OF THE DUNEDIN CITY DISTRICT" BY BARRELL, D.J.A. SMITH LYTTLE, B., GLASSEY, P.J. GNS SCIENCE CONSULTANCY REPORT 2017/41, JULY 2017, SOURCED FROM THE OTAGO REGIONAL COUNCIL (ORC) NATURAL HAZARDS PORTAL.

OTHER

- Xmm = CUMMULATIVE VERTICAL DISPLACEMENT
- CUMMULATIVE HORIZONTAL DISPLACEMENT
- SURVEY MARKER

1:100 @ A1  
1:200 @ A3

| REVISION | AMENDMENT                   | APPROVED | DATE      |
|----------|-----------------------------|----------|-----------|
| A        | 2025 DEFORMATION MONITORING | D.M      | 4/02/2026 |
| A        |                             |          |           |
|          |                             |          |           |
|          |                             |          |           |
|          |                             |          |           |
|          |                             |          |           |
|          |                             |          |           |
|          |                             |          |           |



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New Zealand

CIVIL

SCALES  
1:250 @ A1, 1:500 @ A3  
ORIGINAL SIZE  
A1

DRAWN  
J.W  
APPROVED  
D.M

DRAWING VERIFIED  
B.W  
APPROVED DATE  
04/02/2026

CUMULATIVE SURVEY RESULTS 2025

|                                                                   |                                                 |                               |                                      |                  |               |
|-------------------------------------------------------------------|-------------------------------------------------|-------------------------------|--------------------------------------|------------------|---------------|
| PROJECT<br>DUNEDIN CITY COUNCIL<br>LONG TERM LANDSLIDE MONITORING | TITLE<br>LANDSLIDE MONITORING<br>CARGILL STREET | WSP PROJECT NO.<br>6-CD109.55 | PROJ-ORIG-VOL-LOC-TYPE<br>6-CD109.55 | SHEET NO.<br>C01 | REVISION<br>A |
|-------------------------------------------------------------------|-------------------------------------------------|-------------------------------|--------------------------------------|------------------|---------------|

LEGEND

LANDSLIDE - OTAGO REGION (CERTAINTY)

DEFINITE

LIKELY

POSSIBLE

NOT ASSESSED

NO INFORMATION

INDICATIVE LANDSLIDE EXTENTS ARE BASED ON "REVISED LANDSLIDE DATABASE FOR THE COASTAL SECTOR OF THE DUNEDIN CITY DISTRICT" BY BARRELL, D.J.A., SMITH LITTLE, B., GLASSEY, P.J. GNS SCIENCE CONSULTANCY REPORT 2017/41, JULY 2017, SOURCED FROM THE OTAGO REGIONAL COUNCIL (ORC) NATURAL HAZARDS PORTAL.

OTHER

+/- Xmm = CUMULATIVE VERTICAL DISPLACEMENT SINCE THE BASE SURVEY

CUMULATIVE HORIZONTAL DISPLACEMENT SINCE THE BASE SURVEY

SURVEY MARKER

1:1250 @ A1  
1:2500 @ A3

| REVISION | AMENDMENT                        | APPROVED | DATE       |
|----------|----------------------------------|----------|------------|
| A        | 2024 DEFORMATION MONITORING DATA | D.M      | 10/12/2024 |
| B        | 2025 DEFORMATION MONITORING DATA | D.M      | 04/02/2026 |
|          |                                  |          |            |
|          |                                  |          |            |
|          |                                  |          |            |
|          |                                  |          |            |
|          |                                  |          |            |
|          |                                  |          |            |

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CIVIL

| SCALES                   |                 |               | ORIGINAL SIZE |
|--------------------------|-----------------|---------------|---------------|
| 1:1250 @ A1, 1:2500 @ A3 |                 |               | A1            |
| DRAWN                    | SURVEYED        | APPROVED      |               |
| J.W                      |                 | D.M           |               |
| DRAWING VERIFIED         | DESIGN VERIFIED | APPROVED DATE |               |
| B.M                      |                 | 04/02/2026    |               |

CUMULATIVE SURVEY RESULTS 2025

|                                                                                      |                                      |                  |               |
|--------------------------------------------------------------------------------------|--------------------------------------|------------------|---------------|
| PROJECT<br>DUNEDIN CITY COUNCIL<br>BROCKVILLE ROAD<br>LONG TERM LANDSLIDE MONITORING |                                      |                  |               |
| TITLE<br>CUMULATIVE LANDSLIDE DISPLACEMENTS<br>BROCKVILLE ROAD                       |                                      |                  |               |
| WSP PROJECT NO.<br>6-CD109.55                                                        | PROJ-ORIG-VOL-LOC-TYPE<br>6-CD109.55 | SHEET NO.<br>C01 | REVISION<br>B |

Original sheet size A1 (841x594) Plot Date 2026-02-05 at 10:58:34 am \\corp.pbwan.net\ANZ\Projects\NZ\6c\6-CD109.55 LTES Long-term Landslide Monitoring\Home\03\_Delivery\Site Plans - DWG\6-CD109.55\_Brockville.dwg Layout2

LEGEND

LANDSLIDE - OTAGO REGION (CERTAINTY)

DEFINITE

LIKELY

POSSIBLE

NOT ASSESSED

NO INFORMATION

INDICATIVE LANDSLIDE EXTENTS ARE BASED ON "REVISED LANDSLIDE DATABASE FOR THE COASTAL SECTOR OF THE DUNEDIN CITY DISTRICT" BY BARRELL, D.J.A., SMITH LITTLE, B., GLASSEY, P.J. GNS SCIENCE CONSULTANCY REPORT 2017/41, JULY 2017, SOURCED FROM THE OTAGO REGIONAL COUNCIL (ORC) NATURAL HAZARDS PORTAL.

OTHER

+/- Xmm = CUMULATIVE VERTICAL DISPLACEMENT SINCE THE BASE SURVEY

CUMULATIVE HORIZONTAL DISPLACEMENT SINCE THE BASE SURVEY

SURVEY MARKER

| REVISION | AMENDMENT                        | APPROVED | DATE       |
|----------|----------------------------------|----------|------------|
| A        | 2024 DEFORMATION MONITORING DATA | D.M      | 10/12/2024 |
| B        | UPDATED ORIENTATION              | D.M.     | 04/02/2025 |
| C        | 2025 DEFORMATION MONITORING DATA | D.M      | 04/02/2026 |
|          |                                  |          |            |
|          |                                  |          |            |
|          |                                  |          |            |
|          |                                  |          |            |

 **DUNEDIN** CITY COUNCIL

kaunihera  
a-rohe o  
ōtepoti

 **wsp**

Dunedin Office  
+64 3 471 5500

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Dunedin 9016  
New Zealand

SCALES  
1:250 @A1, 1:500 @A3

ORIGINAL SIZE  
**A1**

DRAWN  
J.W

APPROVED  
D.M

DRAWING VERIFIED  
B.W

APPROVED DATE  
04.02.2026

PROJECT  
**DUNEDIN CITY COUNCIL  
SIDEY STREET  
LONG TERM LANDSLIDE MONITORING**

TITLE  
**CUMULATIVE LANDSLIDE DISPLACEMENTS  
SIDEY STREET**

WSP PROJECT NO.  
6-CD109.55

PROJ-ORIG-VOL-LOC-TYPE  
6-CD109.55

SHEET NO.  
C01

REVISION  
C

CIVIL

CUMULATIVE SURVEY RESULTS 2025

Original sheet size A1 (841x594) Plot Date 2026-02-04 at 1:38:30 pm \\corp.pbwan.net\ANZ\Projects\NZ\6c\6-CD109.55 LTES Long-term Landslide Monitoring\Home\03\_Delivery\Site Plans - DWG\6-CD109.55\_Sidey.dwg Layout2

LEGEND

LANDSLIDE - OTAGO REGION (CERTAINTY)

DEFINITE

LIKELY

POSSIBLE

NOT ASSESSED

NO INFORMATION

INDICATIVE LANDSLIDE EXTENTS ARE BASED ON "REVISED LANDSLIDE DATABASE FOR THE COASTAL SECTOR OF THE DUNEDIN CITY DISTRICT" BY BARRELL, D.J.A., SMITH LITTLE, B., GLASSEY, P.J. GNS SCIENCE CONSULTANCY REPORT 2017/41, JULY 2017, SOURCED FROM THE OTAGO REGIONAL COUNCIL (ORC) NATURAL HAZARDS PORTAL.

OTHER

+/- Xmm = CUMULATIVE VERTICAL DISPLACEMENT SINCE THE BASE SURVEY

CUMULATIVE HORIZONTAL DISPLACEMENT SINCE THE BASE SURVEY (1:1000 SCALE)

SURVEY MARKER

| REVISION | AMENDMENT                                    | APPROVED | DATE       |
|----------|----------------------------------------------|----------|------------|
| A        | 2025 (JUNE 2026) DEFORMATION MONITORING DATA | DM       | 15/06/2026 |
|          |                                              |          |            |
|          |                                              |          |            |
|          |                                              |          |            |
|          |                                              |          |            |
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|          |                                              |          |            |
|          |                                              |          |            |

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Dunedin 9016  
New Zealand

SURVEY

| SCALES           |                 |               | ORIGINAL SIZE |
|------------------|-----------------|---------------|---------------|
| N.T.S            |                 |               | A1            |
| DRAWN            | SURVEYED        | APPROVED      |               |
| D.M              | D.M             | B.W           |               |
| DRAWING VERIFIED | DESIGN VERIFIED | APPROVED DATE |               |
|                  |                 | 15/06/2026    |               |

2025 (JUNE 2026) SURVEY RESULTS

|                                                                                  |                                      |                  |               |
|----------------------------------------------------------------------------------|--------------------------------------|------------------|---------------|
| PROJECT<br>DUNEDIN CITY COUNCIL<br>MOTU STREET<br>LONG TERM LANDSLIDE MONITORING |                                      |                  |               |
| TITLE<br>CUMULATIVE LANDSLIDE DISPLACEMENTS<br>MOTU STREET                       |                                      |                  |               |
| WSP PROJECT NO.<br>6-CD109.55                                                    | PROJ-ORIG-VOL-LOC-TYPE<br>6-CD109.55 | SHEET NO.<br>C01 | REVISION<br>A |

Original sheet size A1 (841x594) Plot Date 2026-06-15 at 3:16:59 pm \\corp.pbwan.net\ANZ\Projects\NZ\6c\6-CD109.55 LTES Long-term Landslide Monitoring\Home\03\_Delivery\Site Plans - DWG\6-CD109.55\_Motu street.dwg Layout2 (2)

# APPENDIX B - FACTUAL SURVEY DATA



| Howard Street Survey Data<br>Dated: 20/01/2026 |            |            |         |          |                                     |        |         |       |        |                              |        |       |       |        |
|------------------------------------------------|------------|------------|---------|----------|-------------------------------------|--------|---------|-------|--------|------------------------------|--------|-------|-------|--------|
| Additional survey data                         |            |            |         |          | Present to previous<br>(14/11/2024) |        |         |       |        | Present to Control<br>(1998) |        |       |       |        |
| Point Number                                   | Northing   | Easting    | Height  | Code     | dN                                  | dE     | Azim.   | Dist  | dRL    | dN                           | dE     | Azim. | Dist  | dRL    |
| A23K                                           | 698553.383 | 323584.283 | 8.399   | I NO 3   | -0.006                              | 0.002  | 162     | 0.006 | -0.015 | 0.000                        | 0.003  | 90    | 0.003 | -0.005 |
| DUND                                           | 697311.104 | 324412.321 | 386.734 | DUND     | 0.000                               | 0.000  | FIXED   |       | 0.000  | 0.000                        | 0.000  | FIXED |       | 0      |
| GSMG                                           | 696777.062 | 305232.723 | 29.595  | GSMG     |                                     |        |         |       |        |                              |        |       |       |        |
| IS 101                                         | 699022.349 | 324432.492 | 6.956   | IS 101   | 0.000                               | 0.000  | #DIV/0! | 0.000 | -0.012 | 0.001                        | -0.002 | 297   | 0.002 | -0.007 |
| N 102                                          | 699035.008 | 324463.929 | 7.047   | Nail 102 | 0.000                               | 0.001  | 90      | 0.001 | -0.015 | -0.004                       | 0.001  | 166   | 0.004 | -0.003 |
| IS 106                                         | 700292.683 | 324573.461 | 7.511   | IS 106   | -0.002                              | 0.002  | 135     | 0.003 | -0.013 | -0.007                       | 0.006  | 139   | 0.009 | -0.003 |
| IS 2C                                          | 698764.929 | 324482.857 | 24.848  | IS 2C    | -0.001                              | 0.000  | 180     | 0.001 | -0.016 | -0.001                       | 0.000  | 180   | 0.001 | -0.016 |
| IS4                                            | 698161.928 | 323756.590 | 88.183  | ISIV     | -0.002                              | -0.004 | 243     | 0.004 | -0.011 | 0.002                        | -0.001 | 333   | 0.002 | 0.058  |
| IS7A                                           | 698021.225 | 324014.464 | 168.578 | IS7A     | -0.004                              | 0.000  | 180     | 0.004 | -0.014 | 0.025                        | -0.008 | 342   | 0.026 | 0.101  |
| IT8B                                           | 698363.323 | 324109.619 | 97.316  | IT8B     | 0.000                               | -0.007 | 270     | 0.007 | -0.017 | 0.062                        | -0.216 | 286   | 0.225 | 0.008  |
| IS9                                            | 698265.259 | 323937.588 | 87.552  | IS9      | -0.002                              | -0.003 | 236     | 0.004 | -0.024 | 0.109                        | -0.115 | 313   | 0.158 | 0.026  |
| IS12                                           | 698564.106 | 323849.766 | 21.220  | IS12     | 0.000                               | 0.000  | #DIV/0! | 0.000 | -0.013 | -0.002                       | 0.005  | 112   | 0.005 | 0.030  |
| IS14                                           | 698385.076 | 323947.436 | 60.577  | IS14     | 0.001                               | 0.001  | 45      | 0.001 | -0.022 | 0.230                        | -0.085 | 340   | 0.245 | 0.008  |
| IS18                                           | 698489.752 | 323898.092 | 35.411  | IS18     | 0.000                               | 0.002  | 90      | 0.002 | -0.014 | 0.027                        | 0.005  | 10    | 0.027 | 0.054  |
| IS 51                                          | 698396.341 | 323856.057 | 43.553  | IS51     | 0.004                               | 0.005  | 51      | 0.006 | -0.011 | 0.021                        | -0.019 | 317   | 0.029 | 0.047  |
| IS 52                                          | 698388.201 | 323779.255 | 41.051  | IS52     | 0.001                               | -0.002 | 297     | 0.002 | -0.025 | 0.021                        | -0.003 | 350   | 0.021 | 0.059  |
| IS 53                                          | 698544.471 | 323694.700 | 8.696   | IS53     | 0.004                               | -0.002 | 333     | 0.004 | -0.014 | 0.054                        | -0.006 | 353   | 0.055 | 0.032  |
| IS 54                                          | 698497.791 | 323955.623 | 33.112  | IS54     | 0.005                               | 0.002  | 22      | 0.005 | -0.013 | 0.009                        | -0.002 | 346   | 0.009 | -0.009 |
| IS 55                                          | 698629.994 | 323833.209 | 11.457  | IS55     | -0.001                              | 0.000  | 180     | 0.001 | -0.012 | 0.007                        | -0.020 | 289   | 0.021 | 0.050  |
| IS 60                                          |            |            |         | IS60     |                                     |        |         |       |        |                              |        |       |       |        |



Church Hill Road Survey Data

Dated:5/12/2025

| Additional survey data |            |            |         | Present to previous<br>(30/09/2024) |        |         |       | Present to Control (Data derived from Base Survey)<br>(June 1997) |        |        |         |       |        |
|------------------------|------------|------------|---------|-------------------------------------|--------|---------|-------|-------------------------------------------------------------------|--------|--------|---------|-------|--------|
| Point Number           | Northing   | Easting    | Height  | dN                                  | dE     | Bearing | Dist  | dRL                                                               | dN     | dE     | Bearing | Dist  | dRL    |
| Trig A2                | 694110.908 | 311761.546 | 189.282 | 0.000                               | 0.000  | -       | 0.000 | 0.000                                                             | -0.002 | -0.006 | 252     | 0.006 | -0.005 |
| SS WEIR ST (BD5U)      | 694507.270 | 310627.825 | 21.324  | -0.004                              | -0.002 | 207     | 0.004 | 0.005                                                             | 0.003  | -0.001 | 342     | 0.003 | 0.012  |
| IS 1                   | 695294.190 | 311497.215 | 20.613  | 0.000                               | 0.000  | -       | 0.000 | 0.000                                                             | 0.000  | 0.000  | -       | -     | 0.000  |
| IS 2                   | 694566.570 | 310599.975 | 15.818  | 0.000                               | 0.000  | -       | 0.000 | 0.000                                                             | 0.000  | 0.000  | -       | -     | -0.003 |
| Mark 05                | 694943.907 | 311300.290 | 47.497  | 0.006                               | -0.004 | 326     | 0.007 | -0.004                                                            | 0.561  | -0.202 | 340     | 0.596 | -0.035 |
| Mark 06                | 694803.877 | 311350.066 | 64.517  | 0.023                               | -0.012 | 332     | 0.026 | -0.009                                                            | 0.595  | -0.192 | 342     | 0.625 | -0.082 |
| Mark 07                | 694861.524 | 311393.688 | 60.855  | 0.010                               | -0.006 | 329     | 0.012 | -0.010                                                            | 0.416  | -0.194 | 335     | 0.459 | -0.263 |
| Mark 11                | 694900.045 | 311520.723 | 56.440  | 0.008                               | -0.005 | 328     | 0.009 | 0.000                                                             | 0.030  | 0.007  | 13      | 0.031 | 0.043  |
| Mark 12                | 694606.305 | 311682.493 | 125.693 | -0.001                              | -0.001 | 225     | 0.001 | 0.008                                                             | 0.013  | -0.007 | 332     | 0.015 | 0.022  |
| Mark 13                | 694510.860 | 311716.818 | 144.911 | 0.006                               | -0.014 | 293     | 0.015 | 0.012                                                             | 0.046  | -0.002 | 358     | 0.046 | 0.021  |
| Mark 14                | 694678.089 | 311502.615 | 105.620 | 0.003                               | -0.007 | 293     | 0.008 | -0.006                                                            | 0.114  | -0.032 | 344     | 0.118 | 0.006  |
| Mark 15                | 695013.377 | 311491.009 | 40.878  | 0.000                               | -0.004 | 270     | 0.004 | -0.004                                                            | -0.007 | -0.005 | 216     | 0.009 | -0.026 |
| Mark 16                | 694986.960 | 311417.024 | 38.769  | 0.003                               | -0.003 | 315     | 0.004 | -0.008                                                            | -0.003 | -0.005 | 239     | 0.006 | -0.021 |

| Cargill Street Survey Data<br>Dated: 28/11/2025 |         |        |                                     |        |                                  |        |
|-------------------------------------------------|---------|--------|-------------------------------------|--------|----------------------------------|--------|
| Additional survey data                          |         |        | Present to previous<br>(21/06/2021) |        | Present to control<br>(Dec-2000) |        |
| POINT                                           | Height  | Offset | dΔ Z                                | Offset | dΔ Z                             | Offset |
| PIN 0a                                          | 131.018 | 0.013  | -0.002                              | 0.000  | -0.001                           | 0.005  |
| PIN 1a                                          | 132.570 | 0.013  | 0.001                               | -0.001 | -0.003                           | 0.015  |
| PIN 2a                                          | 132.994 | -0.001 | -0.002                              | -0.004 | -0.023                           | -0.003 |
| PIN 3a                                          | 133.388 | 0.001  | 0.001                               | -0.003 | -0.022                           | -0.003 |
| PIN 4b                                          | 133.879 | -0.101 | -0.001                              | -0.005 | -0.045                           | -0.036 |
| PIN 5a                                          | 134.545 | -0.016 | 0.001                               | -0.006 | -0.033                           | -0.046 |
| PIN 6a                                          | 135.422 | -0.020 | 0.002                               | -0.009 | -0.037                           | -0.041 |
| PIN 7c                                          | 136.507 | -0.004 | 0.002                               | -0.005 | -0.003                           | -0.045 |
| PIN 8a                                          | 137.498 | 0.000  | 0.003                               | -0.003 | -0.003                           | 0.005  |
| PIN 9a                                          | 138.480 | 0.001  | 0.004                               | -0.004 | -0.014                           | -0.002 |
| PIN 10a                                         | 139.210 | -0.002 | 0.000                               | -0.005 | -0.022                           | -0.001 |
| PIN 11a                                         | 140.078 | -0.004 | -0.006                              | -0.004 | -0.034                           | -0.006 |
| PIN 12a                                         | 141.031 | -0.006 | 0.001                               | -0.006 | -0.014                           | -0.009 |
| PIN 13a                                         | 141.907 | 0.003  | 0.002                               | -0.003 | -0.011                           | -0.002 |



| Puketeraki Street Survey<br>Data Dated: 27/01/2026 |                |            |         |                                         |        |         |       |        |                              |        |         |       |        |
|----------------------------------------------------|----------------|------------|---------|-----------------------------------------|--------|---------|-------|--------|------------------------------|--------|---------|-------|--------|
| Additional survey data                             |                |            |         | Present to Previous<br>(9/12/2024)      |        |         |       |        | Present to Control<br>(1992) |        |         |       |        |
| Pin #                                              | Northing       | Easting    | Height  | dN                                      | dE     | Bearing | Dist  | dRL    | dN                           | dE     | Bearing | Dist  | dRL    |
| 103 - Iron Tube                                    | 823271.257     | 428653.834 | 35.140  | 0.004                                   | -0.005 | 309     | 0.006 | 0.001  | 0.004                        | -0.005 |         | 0.006 | 0.001  |
| 105 - Iron Spike                                   | 823234.582     | 428647.595 | 36.271  | 0.004                                   | -0.005 | 309     | 0.006 | -0.010 | 0.000                        | 0.007  | 94.086  | 0.007 | 0.011  |
| 106 - Iron Spike                                   | 823236.387     | 428641.765 | 36.828  |                                         |        | FIXED   |       |        |                              |        |         |       |        |
| 150 - EW5H                                         | 824788.527     | 428718.023 | 17.561  | 0.002                                   | 0.006  | 72      | 0.006 | -0.013 | 0.002                        | 0.011  | 79.695  | 0.011 | -0.031 |
| 151 - EW5J                                         | 824154.783     | 429113.636 | 15.282  |                                         |        |         |       |        |                              |        |         |       |        |
| 201 - Iron Spike                                   | 824938.246     | 428913.031 | 10.241  | -0.003                                  | 0.003  | 135     | 0.004 | -0.017 | -0.004                       | 0.005  | 128.660 | 0.006 | -0.027 |
| DUND                                               | 797475.895     | 424425.425 | 387.016 | 0.001                                   | -0.003 | 288     | 0.003 | -0.002 |                              |        |         |       |        |
| OULD                                               |                |            |         | Data no longer available for processing |        |         |       |        |                              |        |         |       |        |
| SUTT                                               | 825243.801     | 388833.687 | 417.524 | -0.002                                  | -0.001 | 207     | 0.002 | -0.031 |                              |        |         |       |        |
| 111a - Iron Spike                                  | 822439.458     | 428318.207 | 156.417 | 0.006                                   | 0.080  | 86      | 0.080 | -0.025 | 0.040                        | 0.431  | 84.698  | 0.433 | -0.069 |
| 2                                                  |                |            |         | Not accessible                          |        |         |       |        |                              |        |         |       |        |
| 3                                                  | 822503.885     | 428677.184 | 112.411 | -0.014                                  | 0.092  | 99      | 0.093 | -0.039 | -0.532                       | 3.682  | 98.225  | 3.720 | -1.069 |
| 5                                                  | 822355.672     | 428249.286 | 184.245 | 0.007                                   | 0.068  | 84      | 0.068 | -0.033 | 0.411                        | 2.753  | 81.509  | 2.784 | -0.440 |
| 10a                                                | 822700.199     | 428292.658 | 111.341 | 0.035                                   | 0.090  | 69      | 0.097 | -0.028 | 0.317                        | 0.869  | 69.959  | 0.925 | -0.114 |
| 11                                                 | 822754.913     | 428502.530 | 86.447  | 0.011                                   | 0.033  | 72      | 0.035 | -0.017 | 0.598                        | 2.699  | 77.504  | 2.764 | -0.135 |
| 12                                                 | 822637.156     | 428604.063 | 66.385  | 0.023                                   | 0.094  | 76      | 0.097 | -0.018 | 0.902                        | 3.571  | 75.828  | 3.683 | -0.274 |
| 13                                                 | 822655.116     | 428462.460 | 86.334  | 0.011                                   | 0.103  | 84      | 0.104 | -0.022 | 0.331                        | 4.412  | 85.707  | 4.424 | -0.221 |
| 16                                                 | 822501.917     | 428356.257 | 131.005 | 0.005                                   | 0.080  | 86      | 0.080 | -0.053 | 0.438                        | 3.515  | 82.893  | 3.543 | -1.142 |
| 18                                                 | 822760.099     | 428606.775 | 69.496  | 0.018                                   | 0.012  | 34      | 0.022 | -0.025 | 0.163                        | 0.304  | 61.800  | 0.345 | -0.044 |
| 19                                                 | 822778.706     | 428451.486 | 88.231  | 0.022                                   | 0.060  | 70      | 0.064 | 0.013  | 0.787                        | 2.619  | 73.267  | 2.735 | -0.057 |
| 20                                                 | Not accessible |            |         |                                         |        |         |       |        |                              |        |         |       |        |



| Brighton Street Survey Data<br>Dated: 21/01/2026 |                                               |            |         |                                     |        |       |       |        |                               |        |       |       |        |
|--------------------------------------------------|-----------------------------------------------|------------|---------|-------------------------------------|--------|-------|-------|--------|-------------------------------|--------|-------|-------|--------|
| Additional survey data                           |                                               |            |         | Present to Previous<br>(11/10/2024) |        |       |       |        | Present to Original<br>(1998) |        |       |       |        |
| Mark                                             | mN                                            | mE         | Height  | dN                                  | dE     | Azim. | Dist  | dRL    | dN                            | dE     | Azim. | Dist  | dRL    |
| M2                                               | 791646.856                                    | 405758.435 | 18.356  | -0.012                              | -0.007 | 210   | 0.014 | -0.008 | -0.365                        | -0.016 | 183   | 0.365 | -0.036 |
| M3                                               | 791699.349                                    | 405741.423 | 42.963  | 0.001                               | -0.002 | 297   | 0.002 | -0.005 | -0.597                        | 0.094  | 171   | 0.622 | 0.032  |
| M4                                               | 791698.059                                    | 405771.738 | 41.369  | -0.001                              | 0.003  | 108   | 0.003 | -0.001 | -0.950                        | 0.270  | 164   | 1.017 | -0.248 |
| M5                                               | 791702.206                                    | 405806.518 | 38.444  | -0.006                              | -0.003 | 207   | 0.007 | 0.005  | -1.222                        | 0.606  | 154   | 1.315 | -0.428 |
| M6                                               | 791722.519                                    | 405763.652 | 46.389  | 0.000                               | -0.002 | 270   | 0.002 | 0.005  | -0.805                        | 0.252  | 163   | 0.754 | -0.338 |
| M7                                               | 791767.570                                    | 405767.376 | 62.418  | 0.007                               | -0.007 | 315   | 0.010 | 0.000  | -0.023                        | -0.008 | 199   | 0.024 | 0.008  |
| M8                                               | 791516.990                                    | 405763.218 | 14.846  | -0.003                              | 0.002  | 146   | 0.004 | -0.004 | -0.018                        | 0.020  | 132   | 0.027 | -0.023 |
| ISI - (FIXED)                                    | 791550.227                                    | 405748.121 | 13.675  | 0.000                               | 0.000  | -     | 0.000 | 0.000  | 0.000                         | 0.000  | -     | 0.000 | 0.000  |
| ISII                                             | 791540.489                                    | 405693.775 | 13.754  | -0.001                              | 0.001  | 135   | 0.001 | 0.002  | -0.007                        | 0.030  | 103   | 0.031 | 0.007  |
| ISIII                                            | 791542.175                                    | 405779.198 | 13.538  | 0.001                               | 0.005  | 79    | 0.005 | 0.001  | -0.023                        | 0.003  | 173   | 0.023 | -0.016 |
| ISA                                              | 791697.996                                    | 406326.031 | 14.907  |                                     |        |       |       |        |                               |        |       |       |        |
| ISB                                              | 791667.100                                    | 405627.621 | 26.534  | 0.000                               | 0.002  | 90    | 0.002 | -0.006 | 0.010                         | 0.041  | 76    | 0.042 | -0.008 |
| ISC                                              | 791825.953                                    | 405811.468 | 73.063  | 0.000                               | -0.012 | 270   | 0.012 | -0.004 | -0.029                        | 0.075  | 111   | 0.080 | -0.003 |
| OUSD                                             | NO LONGER INCLUDED DUE TO DATA UNAVAILABILITY |            |         |                                     |        |       |       |        |                               |        |       |       |        |
| BD5W                                             | 793063.312                                    | 409229.765 | 20.351  | -0.003                              | 0.000  | 180   | 0.003 | 0.002  | -0.006                        | 0.002  | 162   | 0.006 | 0.026  |
| DUND                                             | 797474.883                                    | 424425.990 | 389.860 | -0.003                              | 0.010  | 107   | 0.010 | -0.009 | -0.017                        | 0.011  | 147   | 0.020 | -0.014 |
| GSMC                                             | 796940.978                                    | 405246.579 | 32.708  | 0.000                               | 0.000  | 0     | 0.000 | 0.000  | 0.000                         | 0.000  | 0     | 0.000 | 0.000  |



| Brockville Street Survey Data<br>Dated: 13/01/2026 |                                                        |            |         |                                     |       |            |         |        |                                    |       |            |         |        |
|----------------------------------------------------|--------------------------------------------------------|------------|---------|-------------------------------------|-------|------------|---------|--------|------------------------------------|-------|------------|---------|--------|
| Survey data                                        |                                                        |            |         | Present to previous<br>(16/09/2024) |       |            |         |        | Present to original<br>(July-2020) |       |            |         |        |
| Point id                                           | Easting                                                | Northing   | Height  | E                                   | N     | Horizontal | Bearing | Height | E                                  | N     | Horizontal | Bearing | Height |
| OUSD                                               | Data not available                                     |            |         |                                     |       |            |         |        |                                    |       |            |         |        |
| IS Frasers G.                                      | 413294.389                                             | 799712.158 | 283.441 | 0.000                               | 0.000 | 0.000      | -       | 0.000  | 0.000                              | 0.000 | 0.000      | -       | 0.000  |
| IS Dalziel Rd                                      | 413509.317                                             | 800234.218 | 291.874 | 0.000                               | 0.003 | 0.003      | 0       | -0.012 | -0.003                             | 0.009 | 0.009      | 342     | 0.002  |
| IS Reservoir                                       | 412926.747                                             | 799127.947 | 308.737 | 0.006                               | 0.009 | 0.011      | 34      | -0.018 | 0.002                              | 0.008 | 0.008      | 14      | -0.023 |
| F36D                                               | 798307.963                                             | 414508.973 | 114.144 | 0.002                               | 0.007 | 0.007      | 16      | -0.001 | 0.002                              | 0.007 | 0.007      | 16      | -0.001 |
| GSMG                                               | 796941.958                                             | 405245.957 | 29.753  |                                     |       |            |         |        |                                    |       |            |         |        |
| MIS1                                               | 414105.539                                             | 799322.154 | 235.920 | -0.001                              | 0.012 | 0.012      | 90      | 0.003  | -0.008                             | 0.017 | 0.019      | 90      | 0.006  |
| MIS2                                               | 414314.922                                             | 799430.222 | 199.030 | 0.006                               | 0.010 | 0.012      | 31      | -0.007 | 0.004                              | 0.009 | 0.010      | 24      | -0.013 |
| MIS3                                               | 414532.867                                             | 799551.179 | 174.718 | 0.005                               | 0.008 | 0.009      | 32      | -0.008 | 0.000                              | 0.021 | 0.021      | 0       | -0.010 |
| MIS4                                               | 414692.795                                             | 799541.136 | 167.033 | 0.005                               | 0.012 | 0.013      | 23      | -0.006 | 0.001                              | 0.024 | 0.024      | 2       | -0.014 |
| MIS5                                               | 414731.221                                             | 799443.722 | 157.162 | 0.004                               | 0.007 | 0.008      | 30      | -0.007 | 0.004                              | 0.009 | 0.010      | 24      | -0.019 |
| MIS6                                               | INACCESSIBLE DUE TO PRIVATE PROPERTY VEGETATION GROWTH |            |         |                                     |       |            |         |        |                                    |       |            |         |        |
| MIS7                                               | 414606.569                                             | 799276.221 | 162.001 | 0.014                               | 0.003 | 0.014      | 78      | -0.009 | 0.015                              | 0.009 | 0.017      | 59      | -0.010 |
| MIS8                                               | 414448.587                                             | 799218.940 | 174.547 | 0.004                               | 0.007 | 0.008      | 30      | -0.026 | -0.004                             | 0.014 | 0.015      | 344     | -0.067 |



| Greenacres Street Survey Data<br>Dated: 22/01/2026 |                                                  |            |           |              |                                            |        |         |       |        |                                    |       |         |       |        |
|----------------------------------------------------|--------------------------------------------------|------------|-----------|--------------|--------------------------------------------|--------|---------|-------|--------|------------------------------------|-------|---------|-------|--------|
| Survey Data                                        |                                                  |            |           |              | Present to Previous Survey<br>(08/11/2024) |        |         |       |        | Present to Original<br>(July-2015) |       |         |       |        |
| Point ID                                           | Easting                                          | Northing   | Elevation | Feature Code | mE                                         | mN     | Bearing | Dist  | mZ     | mE                                 | mN    | Bearing | Dist  | mZ     |
| DUND                                               | 424425.439                                       | 797475.867 | 386.925   | Base Station |                                            |        |         |       |        |                                    |       |         |       |        |
| IS1                                                | 424790.697                                       | 798547.615 | 94.342    | IS1          | -0.006                                     | 0.008  | 323.130 | 0.010 | -0.016 | -0.336                             | 0.215 | 302.614 | 0.399 | -0.262 |
| IS2                                                | 424789.191                                       | 798583.053 | 86.421    | IS2          | -0.003                                     | 0.013  | 347.005 | 0.013 | -0.017 | 0.272                              | 1.710 | 9.038   | 1.731 | -0.714 |
| IS3                                                | 424843.099                                       | 798601.567 | 80.951    | IS3          | -0.008                                     | -0.007 | 228.814 | 0.011 | -0.003 | -0.012                             | 0.010 | 309.806 | 0.016 | 0.008  |
| IS4                                                | 424785.352                                       | 798643.414 | 72.439    | IS4          | -0.005                                     | 0.002  | 291.801 | 0.005 | -0.011 | -0.093                             | 1.507 | 356.469 | 1.510 | -0.478 |
| IS5                                                | Not observed in 2026 – Vegetation obscuring mark |            |           |              |                                            |        |         |       |        |                                    |       |         |       |        |
| IS6                                                | 424769.42                                        | 798756.717 | 49.651    | IS6          | -0.007                                     | 0.005  | 305.538 | 0.009 | -0.008 | -0.173                             | 0.955 | 349.732 | 0.971 | -0.307 |
| ISA                                                | 424705.907                                       | 798523.722 | 100.972   | ISA          | -0.003                                     | -0.008 | 200.556 | 0.009 | -0.006 | -0.012                             | 0.002 | 279.462 | 0.012 | -0.002 |
| ISB                                                | 424818.754                                       | 798719.7   | 59.37     | ISB          | 0.001                                      | -0.007 | 171.870 | 0.007 | -0.004 | 0.020                              | 0.017 | 49.635  | 0.026 | 0.018  |
| X75                                                | X75 considered unreliable                        |            |           |              |                                            |        |         |       |        |                                    |       |         |       |        |



| Dickson Street Survey Data<br>Dated: 20/11/2025 |                                                |            |          |          |                                     |        |       |       |        |                              |        |       |       |        |
|-------------------------------------------------|------------------------------------------------|------------|----------|----------|-------------------------------------|--------|-------|-------|--------|------------------------------|--------|-------|-------|--------|
| Additional Survey Data                          |                                                |            |          |          | Present to Previous<br>(11/11/2024) |        |       |       |        | Present to Control<br>(1997) |        |       |       |        |
| Point Number                                    | Northing                                       | Easting    | Height   | Code     | dN                                  | dE     | Azim. | Dist  | dRL    | dN                           | dE     | Azim. | Dist  | dRL    |
|                                                 | NZGD49                                         | NZGD49     | Intl1924 |          |                                     |        |       |       |        |                              |        |       |       |        |
| 106 and AFF3                                    | NOT OBSERVED - UNRELIABLE, SUBJECT TO MOVEMENT |            |          |          |                                     |        |       |       |        |                              |        |       |       |        |
| A23K                                            | 698553.386                                     | 323584.280 | 8.398    | I NO 3   | 0.000                               | 0.006  | -     | 0.006 | 0.002  | 0.003                        | 0.006  | 63    | 0.007 | -0.004 |
| DUND                                            | 697311.104                                     | 324412.321 | 386.734  | DUND     | 0.000                               | 0.000  | -     | 0.000 | 0.000  | 0.000                        | 0.000  | -     | 0.000 | 0.000  |
| GSMG                                            | 696777.055                                     | 305232.723 | 29.574   | GSMG     |                                     |        |       |       |        | 0.000                        | 0.000  | -     | 0.000 | 0.000  |
| 101                                             | 699022.349                                     | 324432.490 | 6.955    | IS101    | 0.000                               | 0.000  | -     | 0.000 | 0.006  | 0.001                        | -0.004 | 284   | 0.004 | 0.003  |
| 102                                             | 699035.016                                     | 324463.927 | 7.052    | NAIL 102 | -0.007                              | 0.002  | 164   | 0.007 | 0.000  | -0.003                       | 0.001  | 162   | 0.003 | 0.002  |
| 1                                               | DESTROYED BY FLOOD REMEDIATION WORK            |            |          |          |                                     |        |       |       |        |                              |        |       |       |        |
| 2C                                              | 698764.928                                     | 324482.858 | 24.849   | IS 2C    | -0.004                              | 0.004  | 135   | 0.006 | -0.005 | -0.004                       | 0.004  | 135   | 0.006 | -0.005 |
| 5                                               | INACCESSIBLE IN 2025                           |            |          |          |                                     |        |       |       |        |                              |        |       |       |        |
| 6                                               | 699121.110                                     | 324811.364 | 79.072   | ISVI     | 0.001                               | -0.001 | 315   | 0.001 | 0.011  | -0.041                       | -0.043 | 226   | 0.059 | 0.040  |
| 8                                               | 699034.428                                     | 324842.043 | 75.678   | ISVIII   | -0.005                              | 0.004  | 141   | 0.006 | 0.001  | -0.032                       | -0.031 | 224   | 0.045 | 0.041  |
| 9B                                              | 699013.495                                     | 324570.348 | 20.990   | ISIXB    | -0.006                              | -0.003 | 207   | 0.007 | 0.004  | 0.005                        | 0.001  | 11    | 0.005 | 0.021  |
| 21                                              | 699121.889                                     | 324588.098 | 24.979   | ISXXI    | 0.000                               | -0.001 | 270   | 0.001 | 0.002  | -0.008                       | -0.010 | 232   | 0.013 | 0.004  |
| 22                                              | 698870.899                                     | 324795.959 | 52.164   | ISXXII   | 0.001                               | 0.003  | 72    | 0.003 | 0.007  | -0.014                       | -0.001 | 185   | 0.014 | 0.050  |
| 31                                              | INACCESSIBLE IN 2025                           |            |          |          |                                     |        |       |       |        |                              |        |       |       |        |
| 32                                              | 698981.977                                     | 324681.416 | 28.272   | ISXXXII  | 0.002                               | -0.001 | 333   | 0.002 | -0.001 | 0.004                        | 0.001  | 14    | 0.004 | -0.004 |
| 33                                              | 698954.320                                     | 324793.353 | 49.583   | ISXXXIII | -0.003                              | 0.002  | 146   | 0.004 | 0.005  | 0.021                        | 0.009  | 23    | 0.023 | 0.008  |
| 34                                              | 699016.241                                     | 324787.809 | 48.636   | ISXXXIV  | -0.009                              | 0.011  | 129   | 0.014 | -0.003 | -0.010                       | 0.013  | 128   | 0.016 | -0.010 |
| 35                                              | 699067.820                                     | 324791.791 | 66.729   | ISXXXV   | -0.006                              | 0.001  | 171   | 0.006 | -0.003 | 0.002                        | 0.006  | 72    | 0.006 | -0.011 |



Sidey Street Survey Data

Dated: 06/11/2025

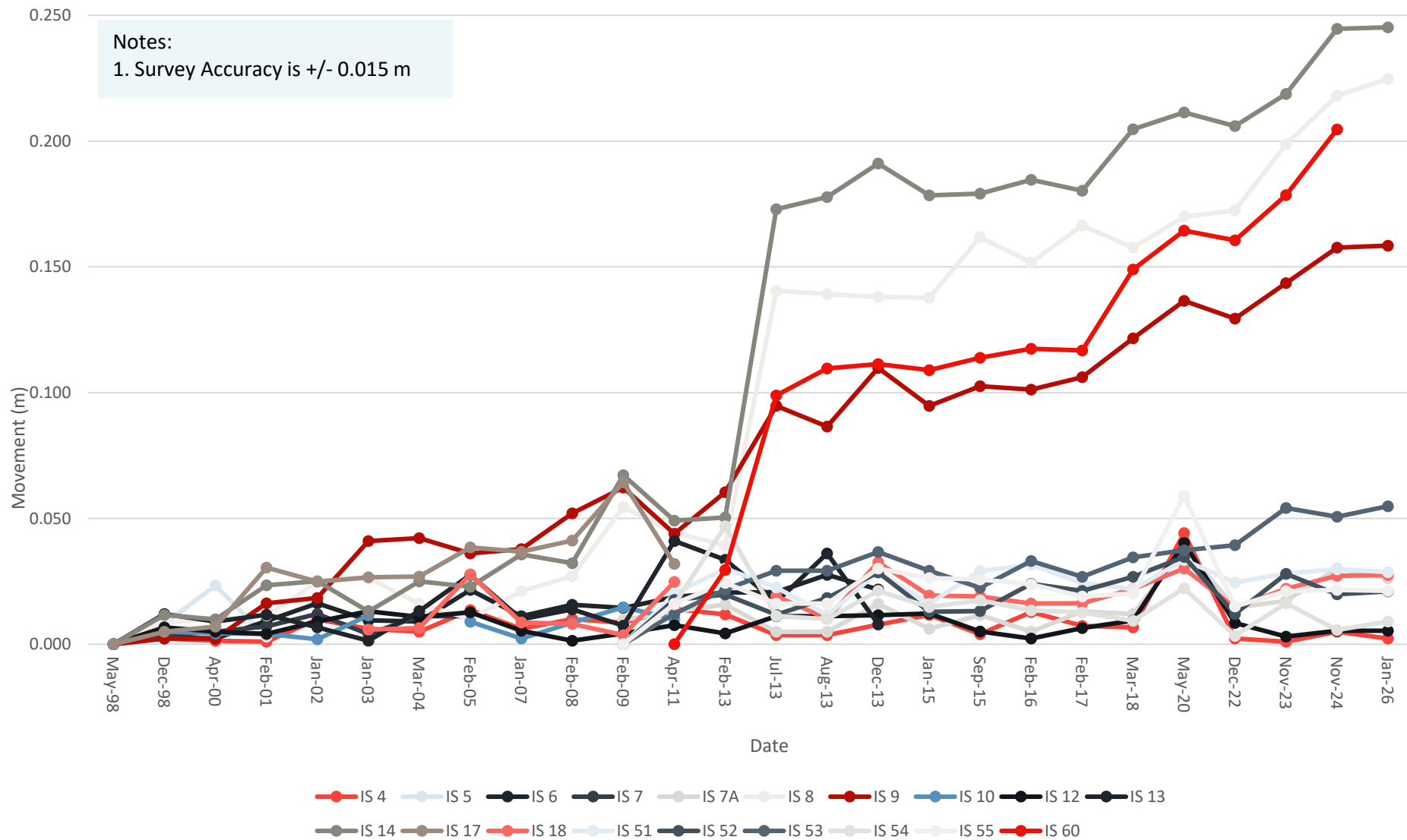
| Additional survey data |                |          |        | Present to previous<br>(02/12/2022) |        |         |       |        | Present to Control<br>(1997, 2010) |        |         |       |        |
|------------------------|----------------|----------|--------|-------------------------------------|--------|---------|-------|--------|------------------------------------|--------|---------|-------|--------|
| Point Number           | Northing       | Easting  | Height | dN                                  | dE     | Azim.   | Dist  | dRL    | dN                                 | dE     | Azim.   | Dist  | dRL    |
| NL2                    | mark destroyed |          |        |                                     |        |         |       |        |                                    |        |         |       |        |
| NL2b                   | 8000.112       | 4900.147 | 89.576 | 0.013                               | -0.001 | 357     | 0.013 | -0.001 | 0.013                              | -0.001 | 357     | 0.013 | -0.001 |
| NL3                    | 7991.974       | 4985.424 | 94.757 | 0.000                               | 0.000  | #DIV/0! | 0.000 | 0.000  | 0.000                              | 0.000  | -       | 0.000 | 0.000  |
| NL4                    | 7990.874       | 4997.839 | 95.519 | 0.000                               | 0.003  | 92      | 0.003 | 0.000  | -0.007                             | -0.002 | 194.982 | 0.007 | 0.003  |
| NL5                    | 7988.077       | 5019.006 | 96.993 | 0.001                               | 0.007  | 84      | 0.007 | 0.001  | 0.001                              | 0.007  | -       | 0.007 | 0.008  |
| Pin 15                 |                |          | 89.165 |                                     |        |         |       | -0.001 |                                    |        |         |       |        |
| RT 16                  | 8000.973       | 4925.558 | 93.720 | 0.013                               | 0.005  | 21      | 0.014 | 0.003  |                                    |        |         |       |        |
| NL6                    |                |          |        |                                     |        |         |       |        |                                    |        |         |       |        |
| NL1                    |                |          |        |                                     |        |         |       |        |                                    |        |         |       |        |
| NL7                    |                |          |        |                                     |        |         |       |        |                                    |        |         |       |        |
| NL8                    | 7995.637       | 5020.210 | 96.870 | -0.001                              | 0.007  | 98      | 0.007 | 0.000  | 0.009                              | 0.006  | 32.347  | 0.011 | -0.012 |
| NL9                    | 7996.817       | 5011.117 | 96.286 | -0.001                              | 0.007  | 101     | 0.008 | 0.000  | 0.004                              | 0.006  | 60.642  | 0.007 | -0.001 |
| NL10                   | 7997.750       | 5004.182 | 95.710 | -0.003                              | 0.005  | 122     | 0.006 | 0.000  | -0.003                             | 0.005  | -       | 0.006 | -0.001 |
| NL11                   | 7998.657       | 4997.312 | 95.433 | 0.002                               | 0.000  | 4       | 0.002 | 0.000  | -0.001                             | 0.002  | 103.392 | 0.002 | 0.000  |
| NL12                   | 7999.519       | 4990.366 | 95.054 | 0.003                               | 0.001  | 19      | 0.003 | 0.000  | 0.003                              | 0.001  | -       | 0.003 | -0.002 |
| NL13                   | 8000.144       | 4983.464 | 94.666 | 0.003                               | 0.001  | 22      | 0.003 | 0.000  | 0.006                              | 0.002  | 20.225  | 0.006 | -0.001 |
| NL14                   | 8000.702       | 4975.722 | 94.229 | 0.002                               | 0.002  | 45      | 0.003 | 0.000  | 0.007                              | 0.004  | 29.745  | 0.008 | -0.001 |



| Motu Street Survey Data<br>Dated: 11/06/2026 |                           |            |        |                                     |        |       |       |        |                                       |        |       |       |        |
|----------------------------------------------|---------------------------|------------|--------|-------------------------------------|--------|-------|-------|--------|---------------------------------------|--------|-------|-------|--------|
| Additional survey data                       |                           |            |        | Present to previous<br>(14/12/2022) |        |       |       |        | Present to Control<br>(December 2018) |        |       |       |        |
| Point Number                                 | Northing                  | Easting    | Height | dN                                  | dE     | Azim. | Dist  | dRL    | dN                                    | dE     | Azim. | Dist  | dRL    |
| MIS2                                         | 794839.612                | 415651.255 | 21.032 | 0.004                               | -0.008 | 311   | 0.009 | 0.004  | -0.002                                | 0.001  | 153   | 0.002 | 0.000  |
| MIS9                                         | 794855.076                | 415649.076 | 26.141 | -0.008                              | -0.006 | 220   | 0.008 | 0.017  | -0.037                                | 0.028  | 140   | 0.045 | 0.006  |
| MIS14                                        | 794886.967                | 415700.233 | 21.453 | 0.001                               | -0.011 | 288   | 0.009 | 0.000  | -0.008                                | -0.004 | 198   | 0.006 | -0.003 |
| MIS16A                                       | INACCESSIBLE              |            |        |                                     |        |       |       |        |                                       |        |       |       |        |
| MIS17                                        | MARK DESTROYED            |            |        |                                     |        |       |       |        |                                       |        |       |       |        |
| MIS19A                                       | UNABLE TO ACCESS PROPERTY |            |        |                                     |        |       |       |        |                                       |        |       |       |        |
| PIN 201                                      | REPLACED WITH NAIL 21     |            |        |                                     |        |       |       |        |                                       |        |       |       |        |
| PIN 202                                      | 794836.543                | 415696.081 | 15.611 | -0.004                              | -0.004 | 236   | 0.004 | 0.002  | -0.007                                | -0.004 | 211   | 0.006 | -0.001 |
| PIN 203                                      | REPLACED WITH NAIL 24     |            |        |                                     |        |       |       |        |                                       |        |       |       |        |
| PIN 204                                      | 794879.708                | 415751.407 | 14.835 | 0.002                               | -0.003 | 326   | 0.004 | -0.002 | -0.007                                | -0.004 | 207   | 0.007 | 0.000  |
| PIN 205                                      | 794874.901                | 415611.984 | 35.481 | 0.008                               | 0.000  | 0     | 0.008 | -0.014 | 0.010                                 | 0.004  | 22    | 0.011 | -0.010 |
| PIN 206                                      | 794891.598                | 415664.879 | 30.808 | 0.000                               | -0.007 | 279   | 0.006 | -0.010 | -0.001                                | -0.004 | 256   | 0.003 | -0.005 |

# APPENDIX C - VERTICAL AND HORIZONTAL CUMULATIVE MOVEMENT GRAPHS

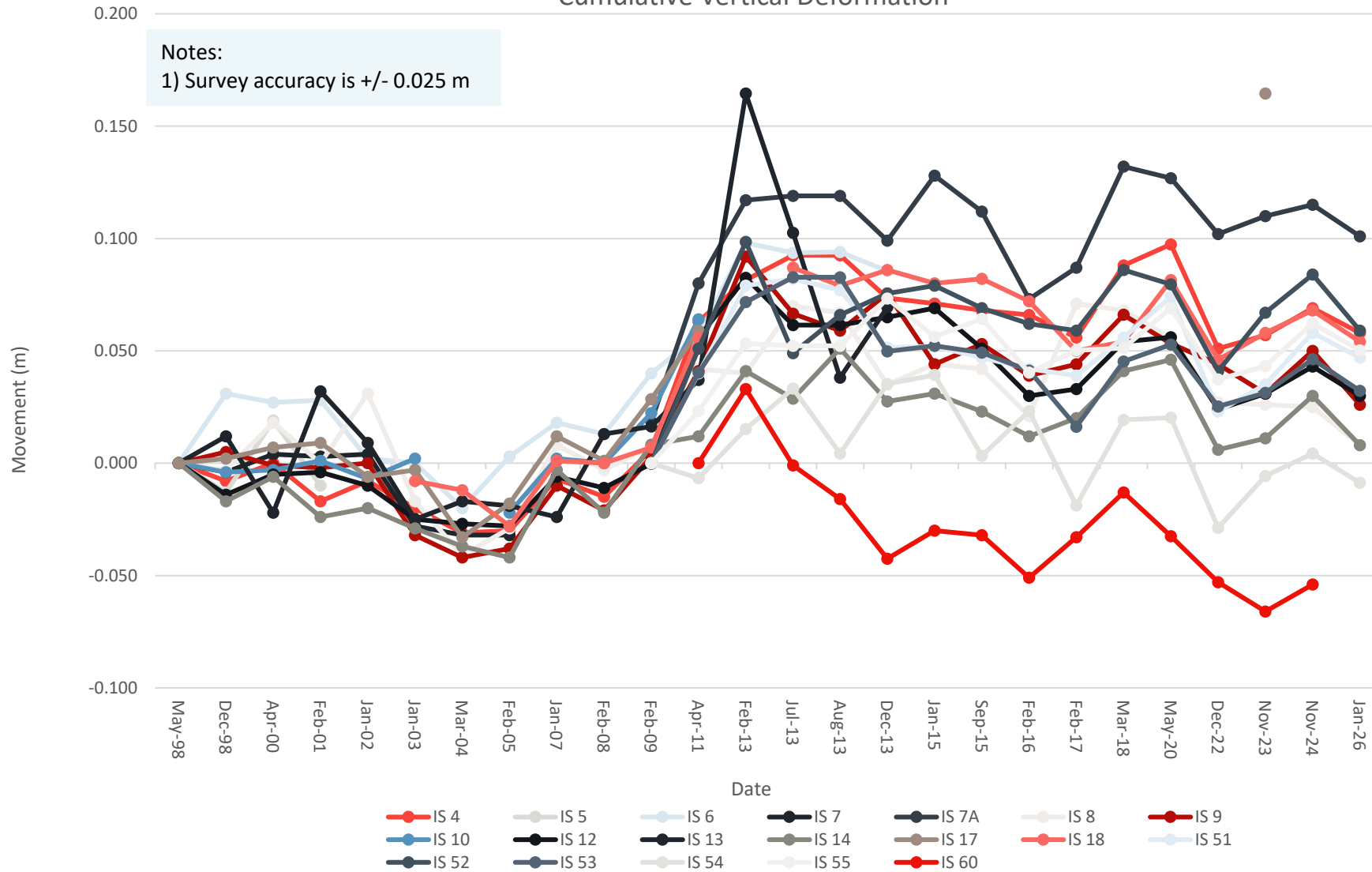
## Howard Street Landslide Monitoring 1998 - Present Cumulative Horizontal Deformation



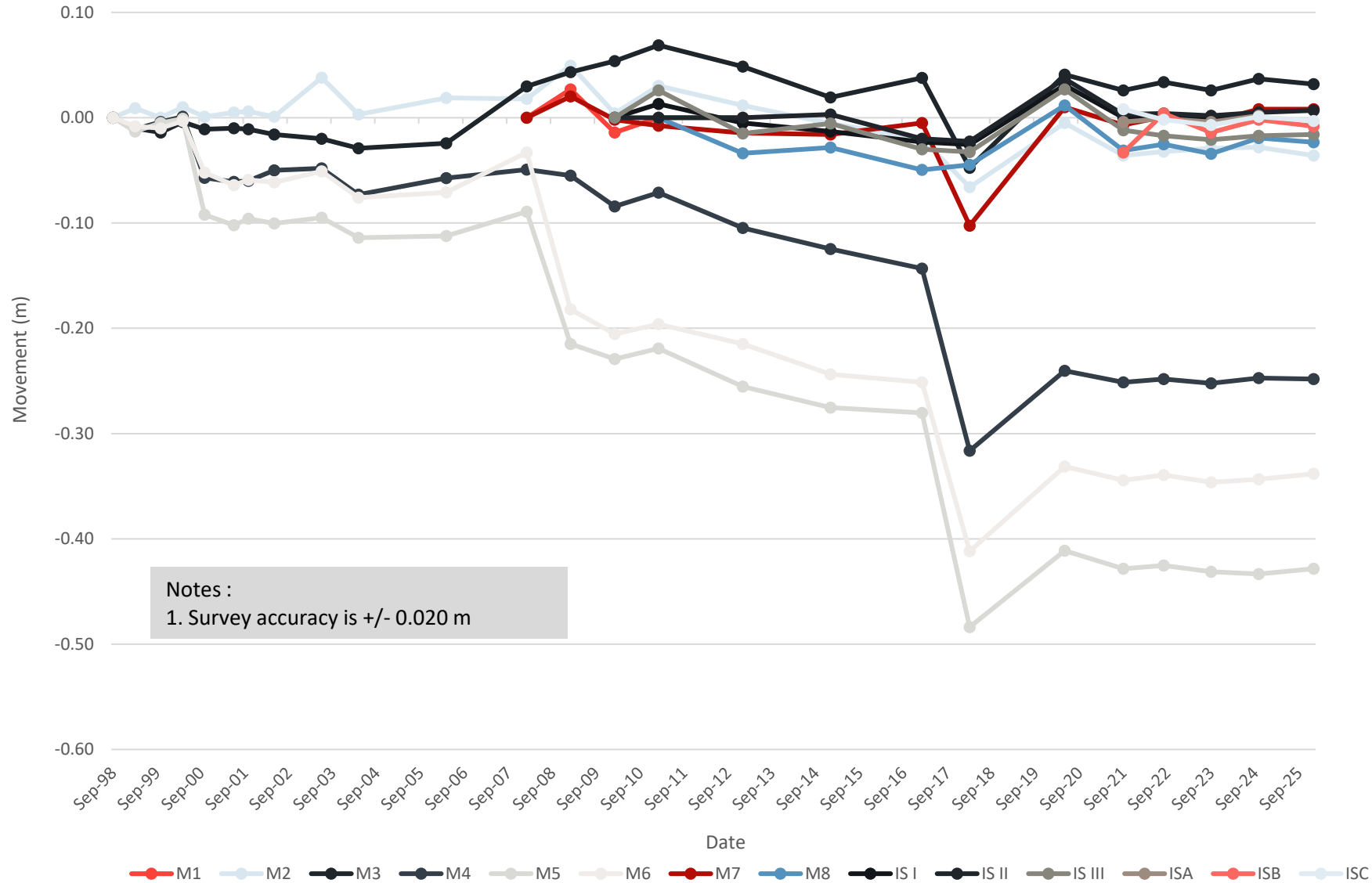
## Howard Street Landslide Monitoring 1998 - Present Cumulative Vertical Deformation

**Notes:**

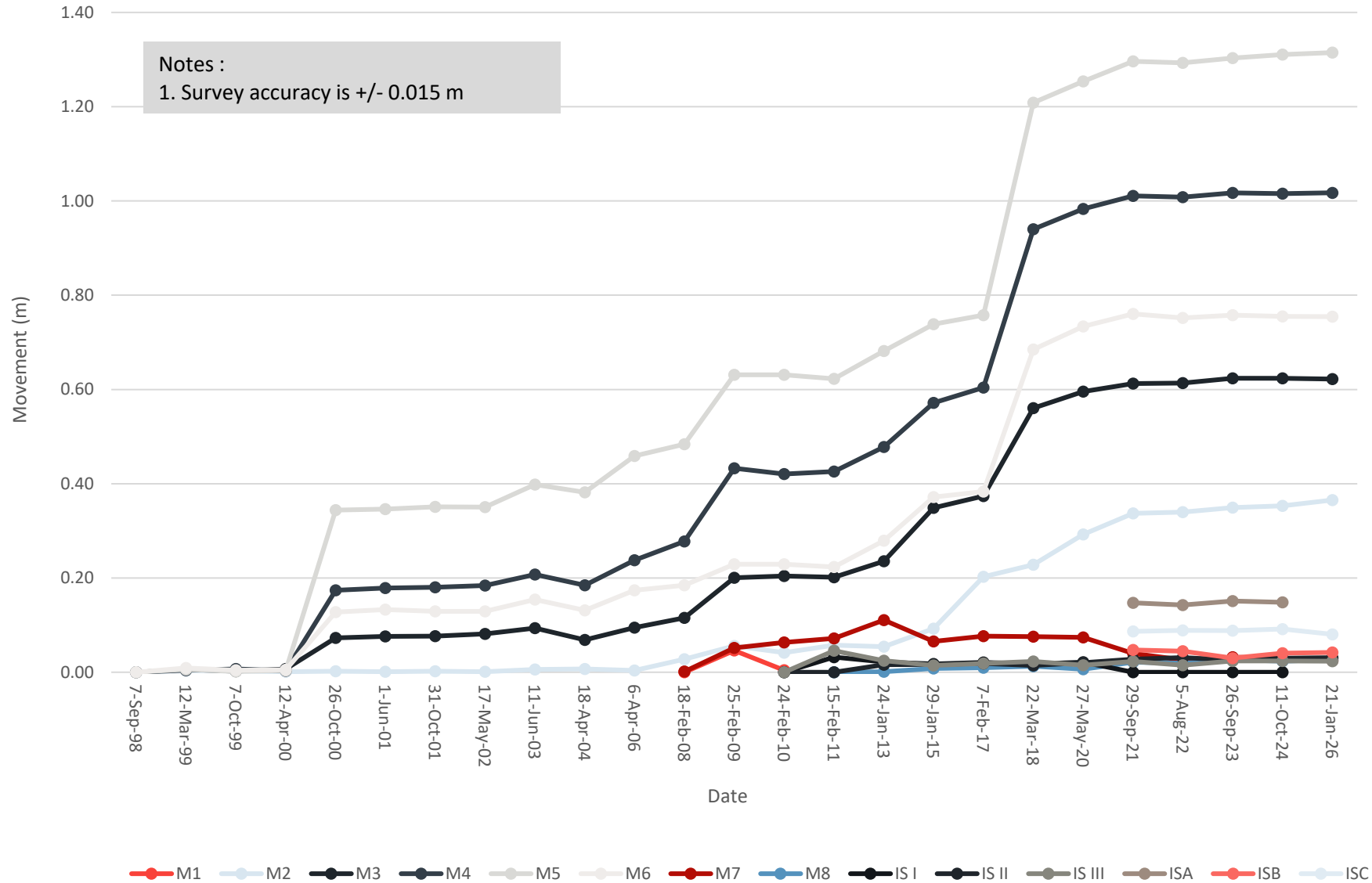
1) Survey accuracy is +/- 0.025 m



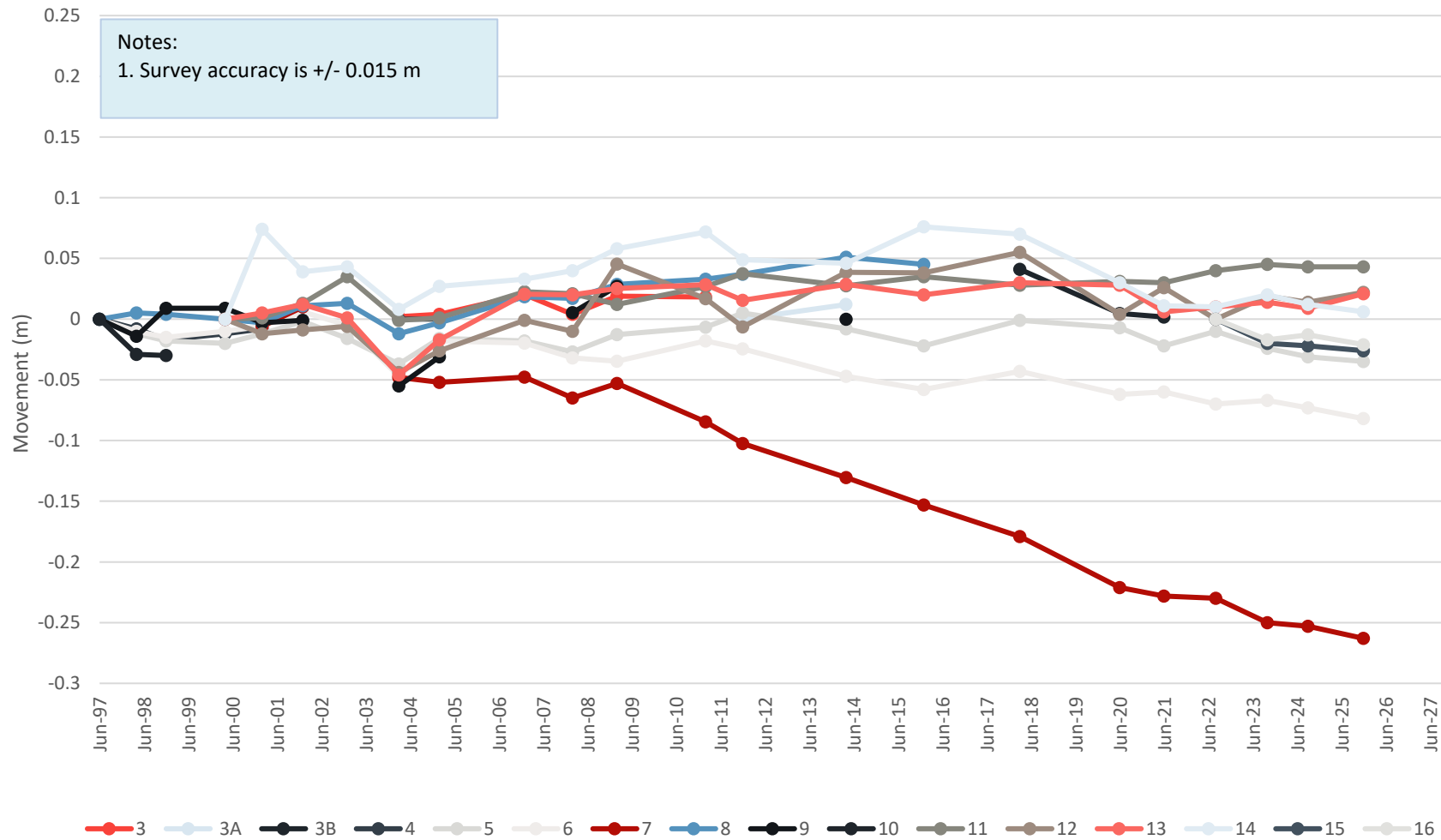
## Brighton Road Landslide Monitoring 2025 Cumulative Vertical Movement



# Brighton Road Landslide Monitoring 2025 Cumulative Horizontal Movement

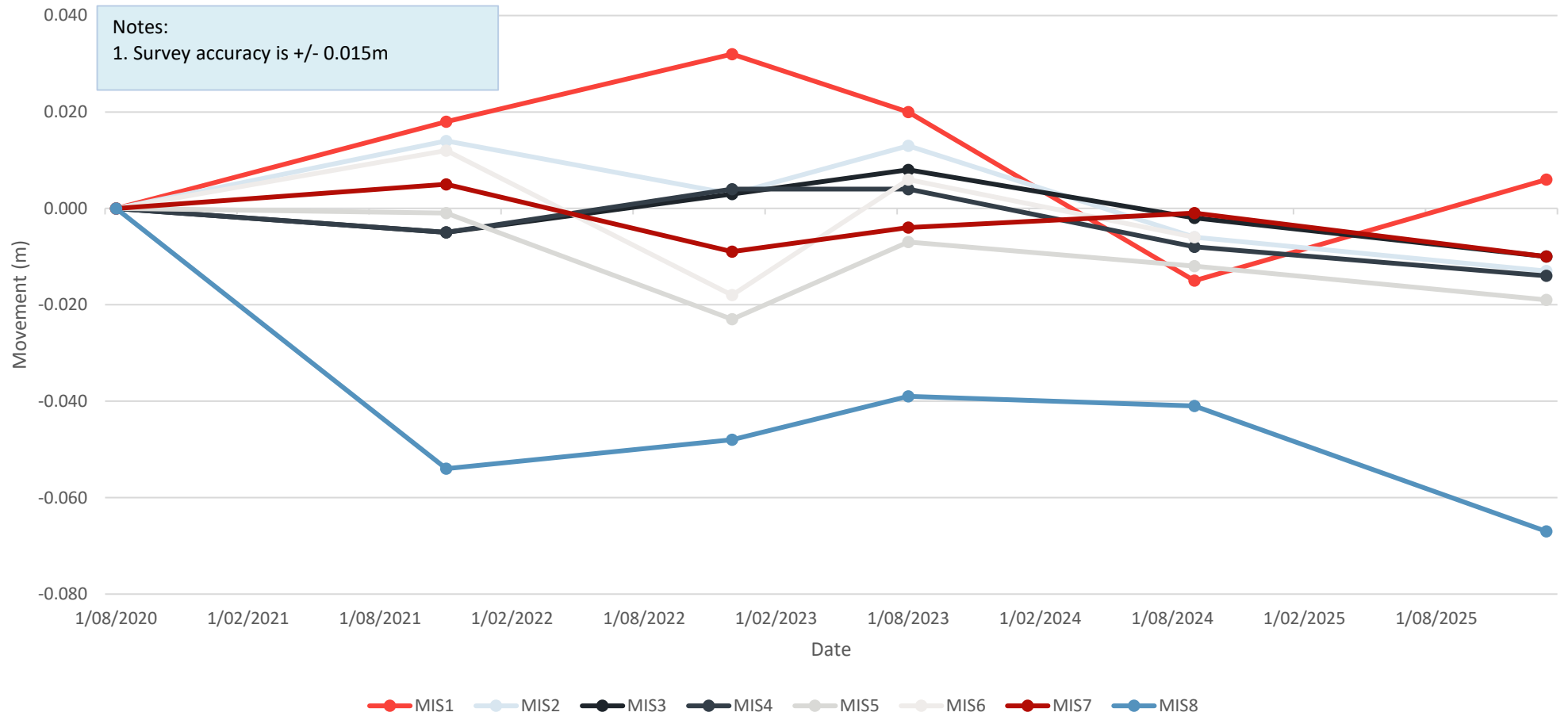


## Church Hill Road Landslide Monitoring Vertical Deformation - June 1997 to present



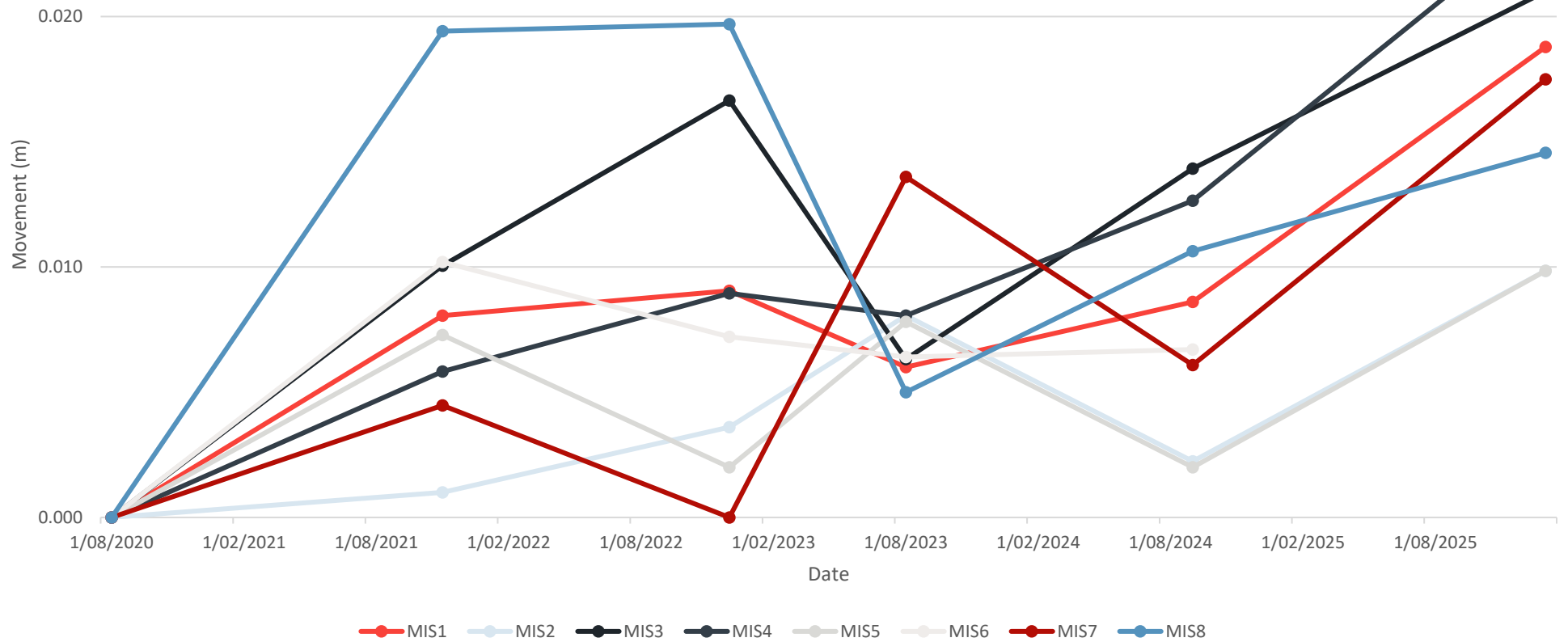


## Brockville Landslide Monitoring Cumulative Vertical Deformation - 2020 to present

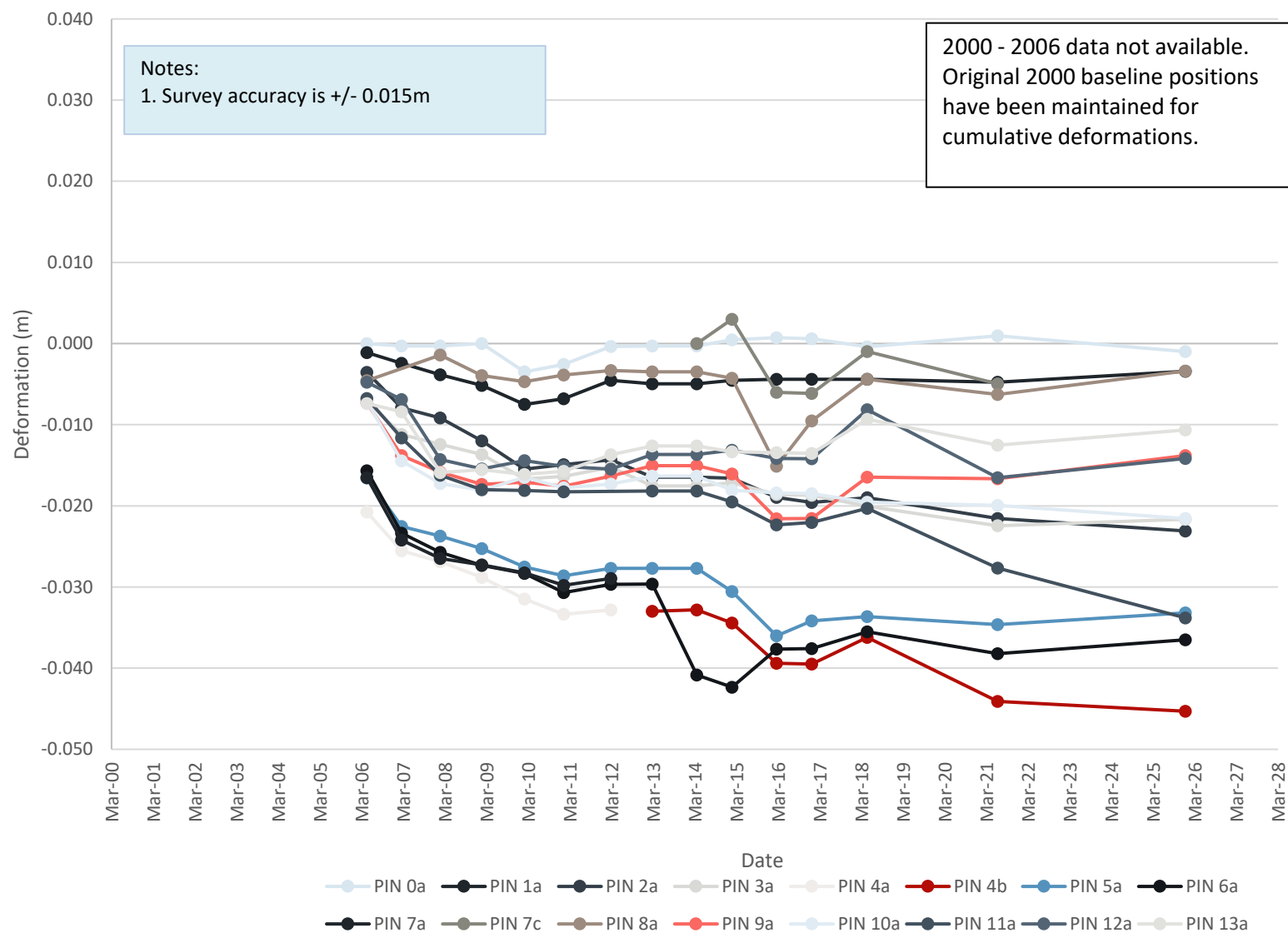


## Brockville Landslide Monitoring Cumulative Horizontal Deformation - 2020 to present

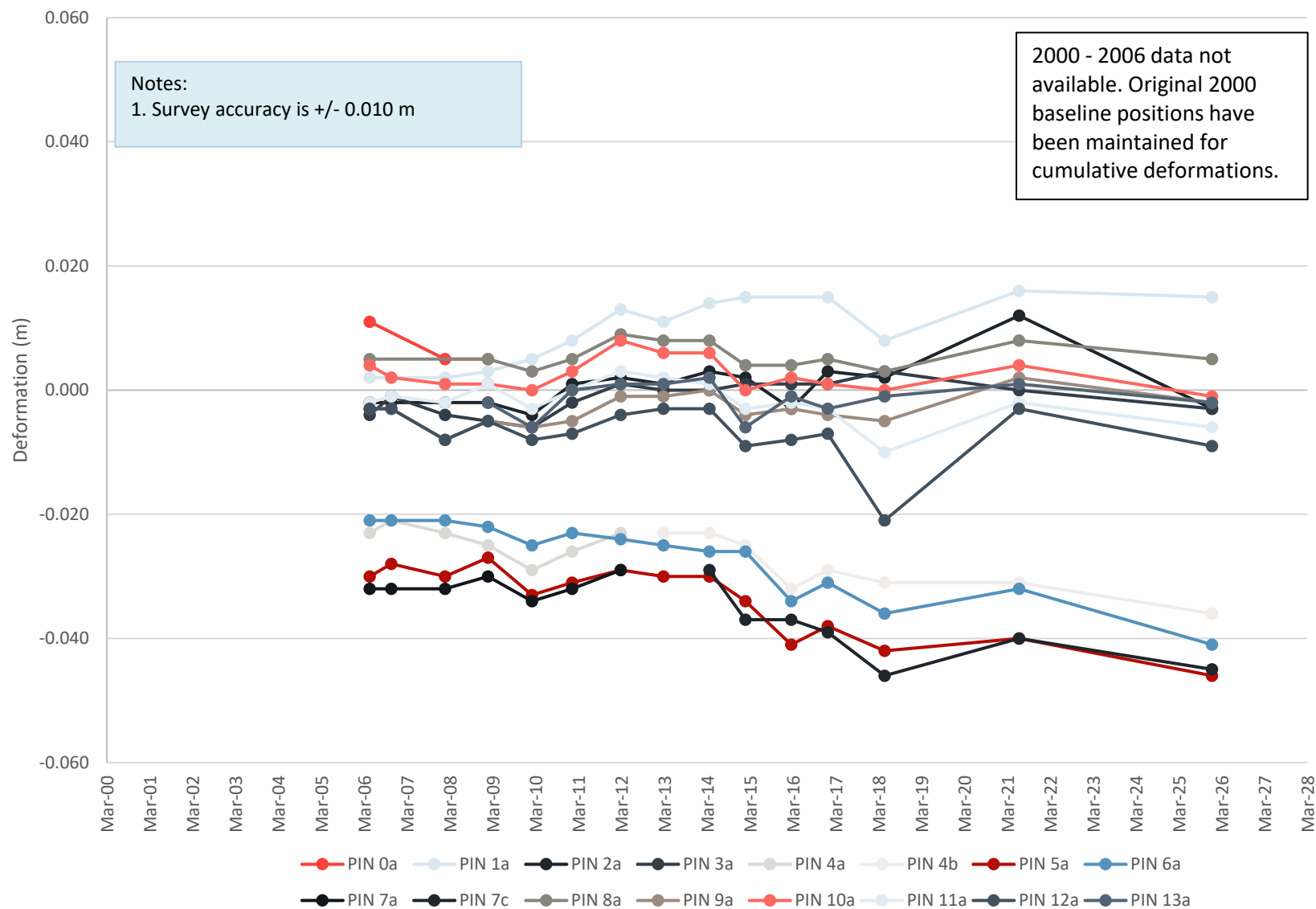
Notes:  
1. Survey accuracy is +/- 0.010m



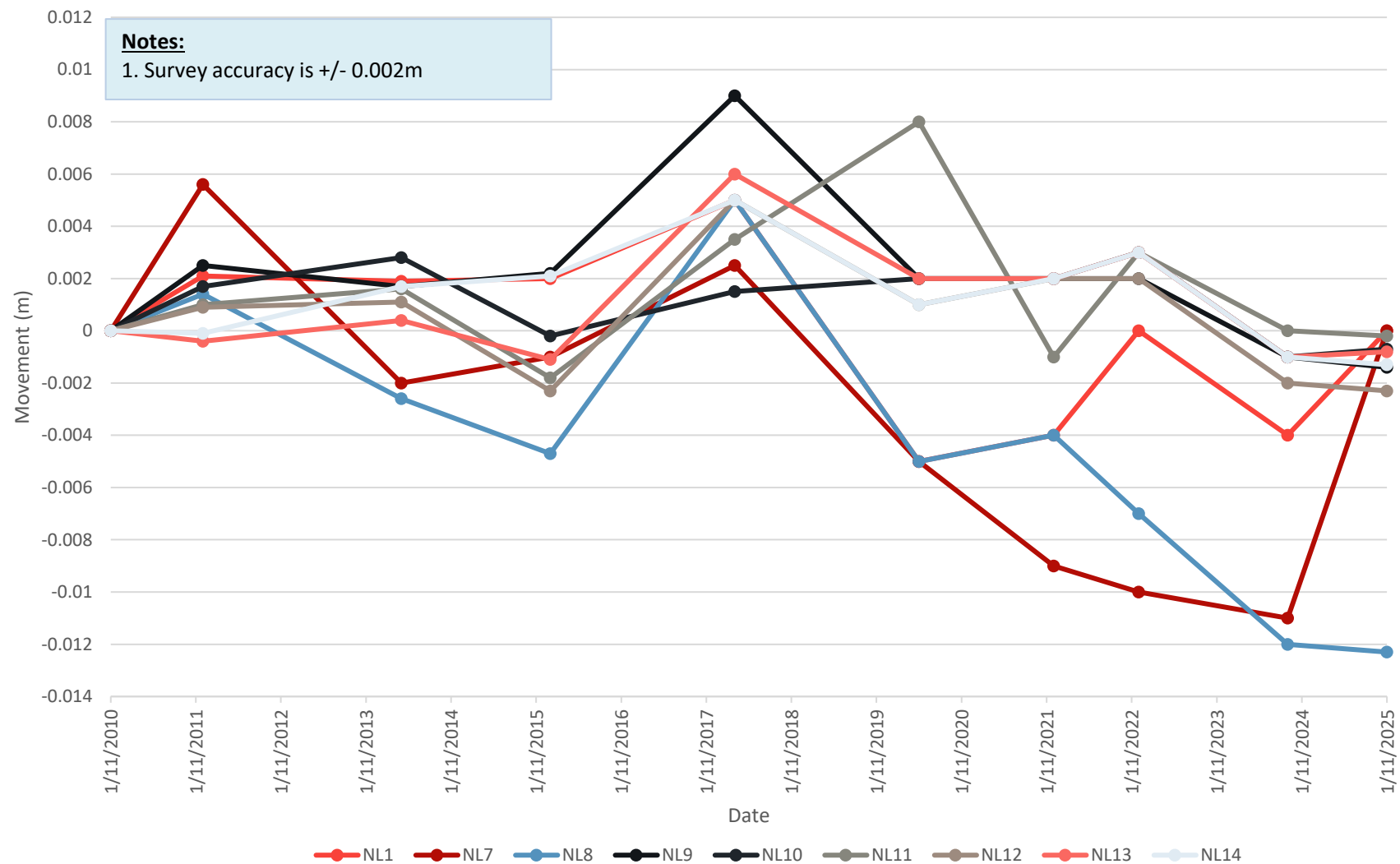
Cargill St Landslide Monitoring  
Chart 2 : Vertical Deformation - February 2000 to present



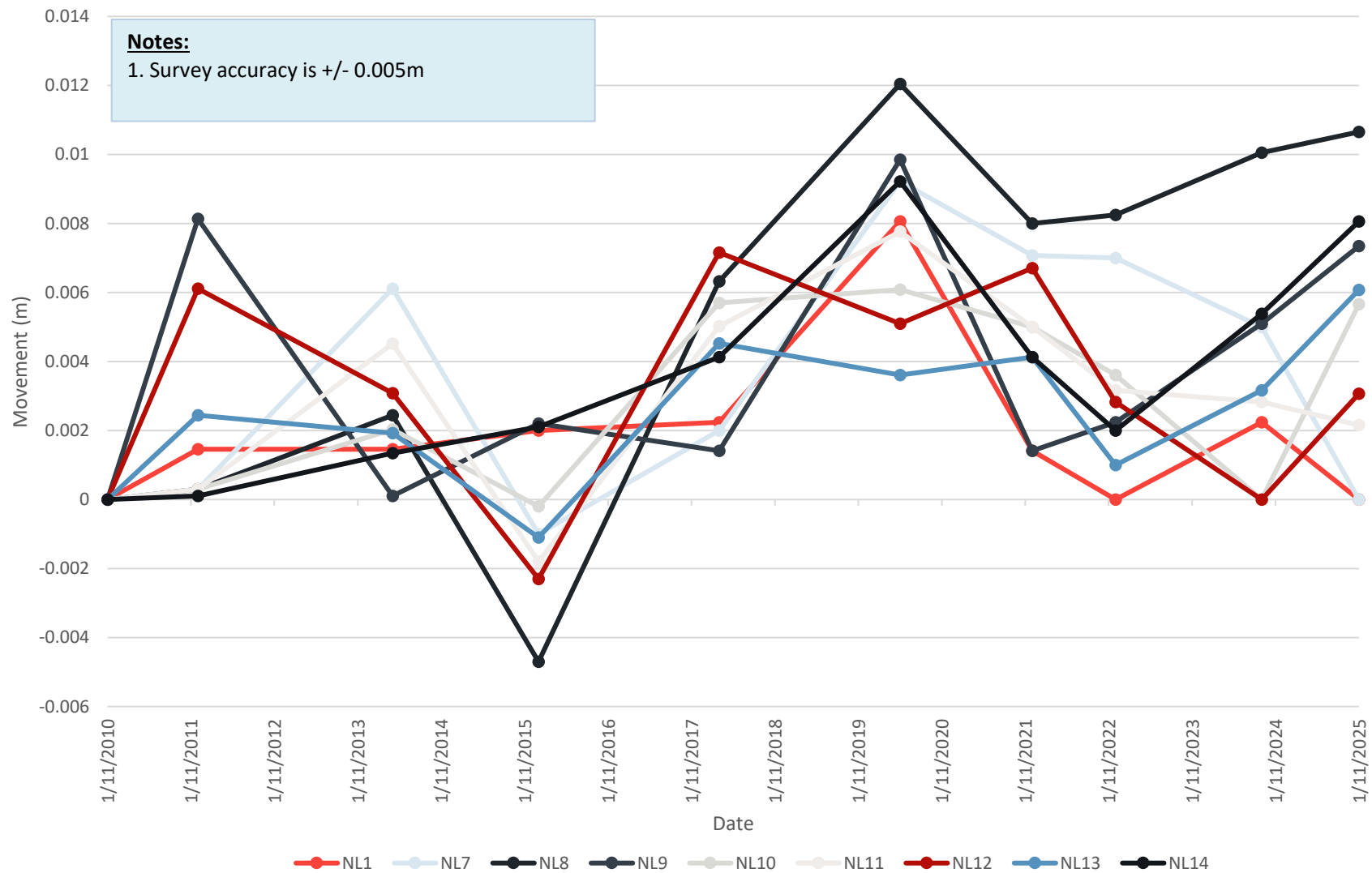
Cargill St Landslide Monitoring  
Chart 1 : Horizontal Deformation - February 2000 to present



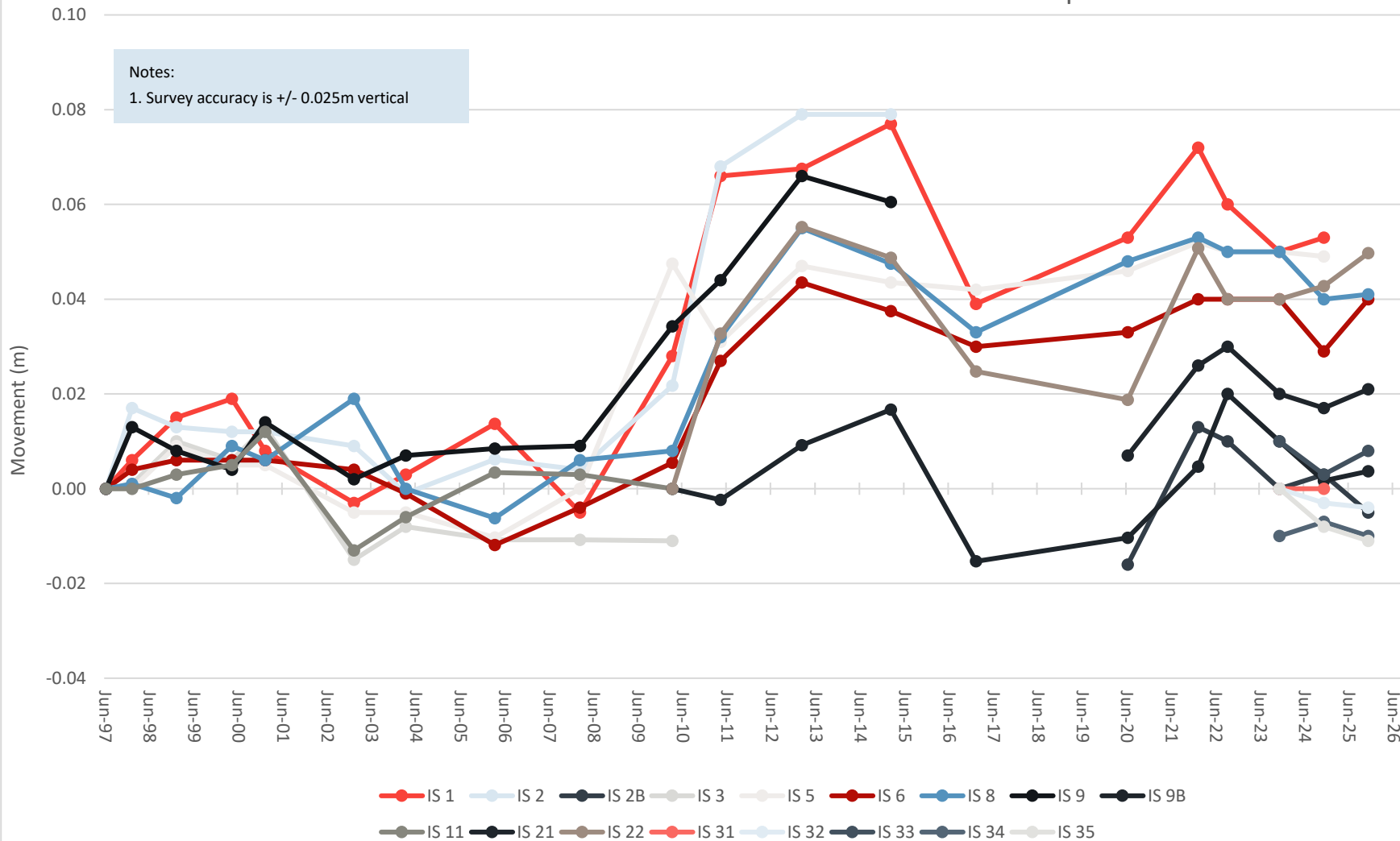
Sidey Street Landslide Monitoring  
Chart 1: Vertical Deformation - November 2010 to present



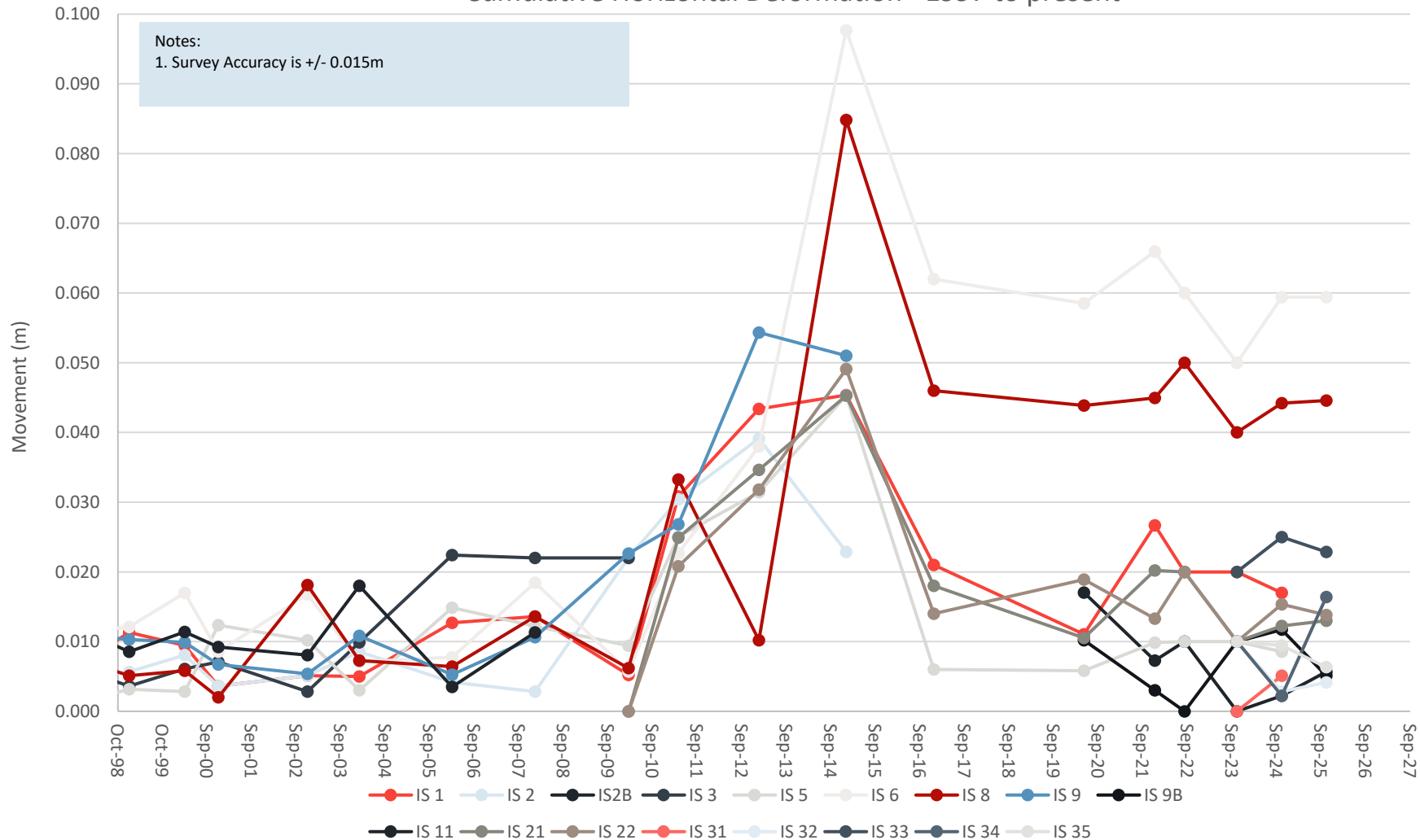
Sidey Street Landslide Monitoring  
Chart 2: Horizontal Deformation - November 2010 to present

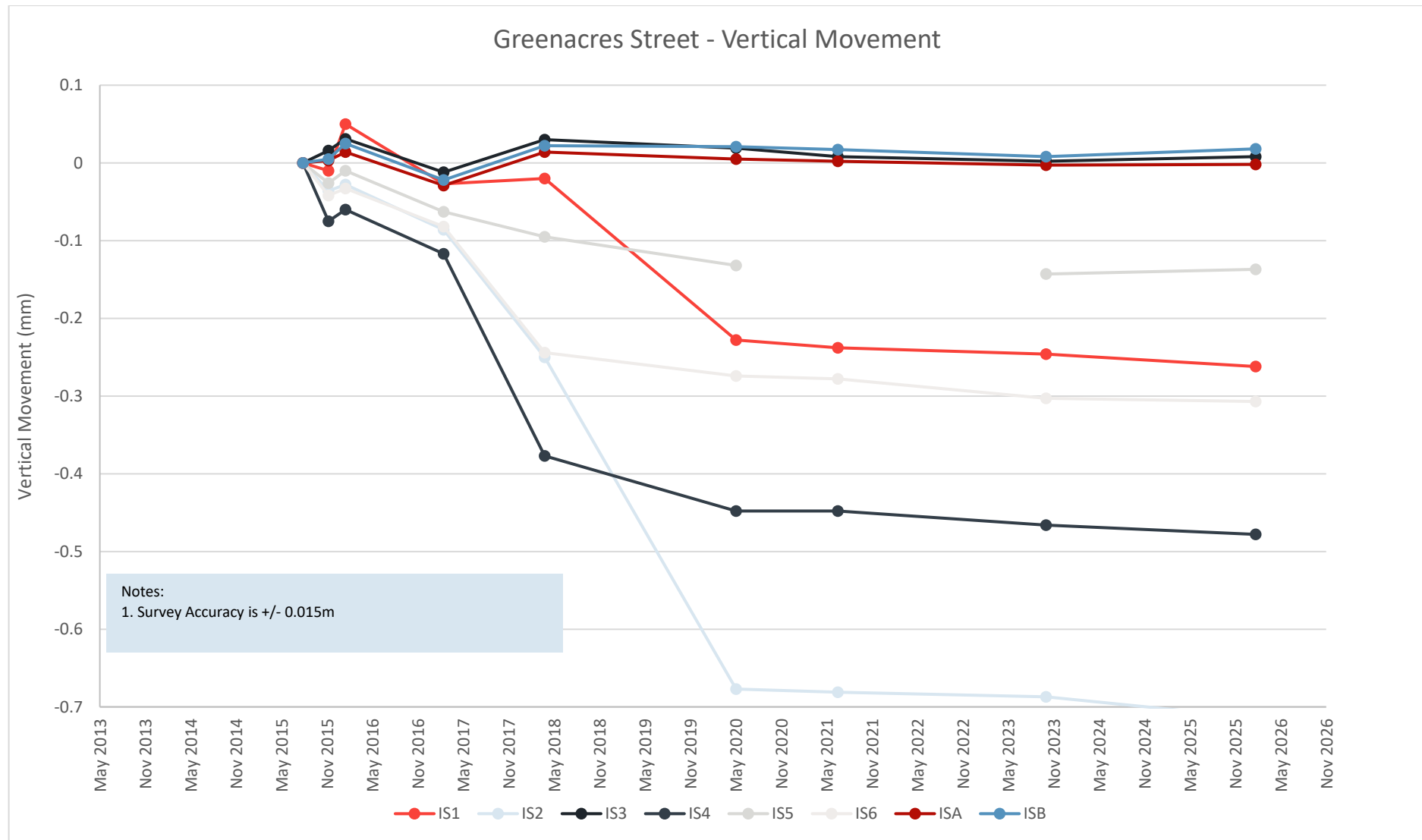


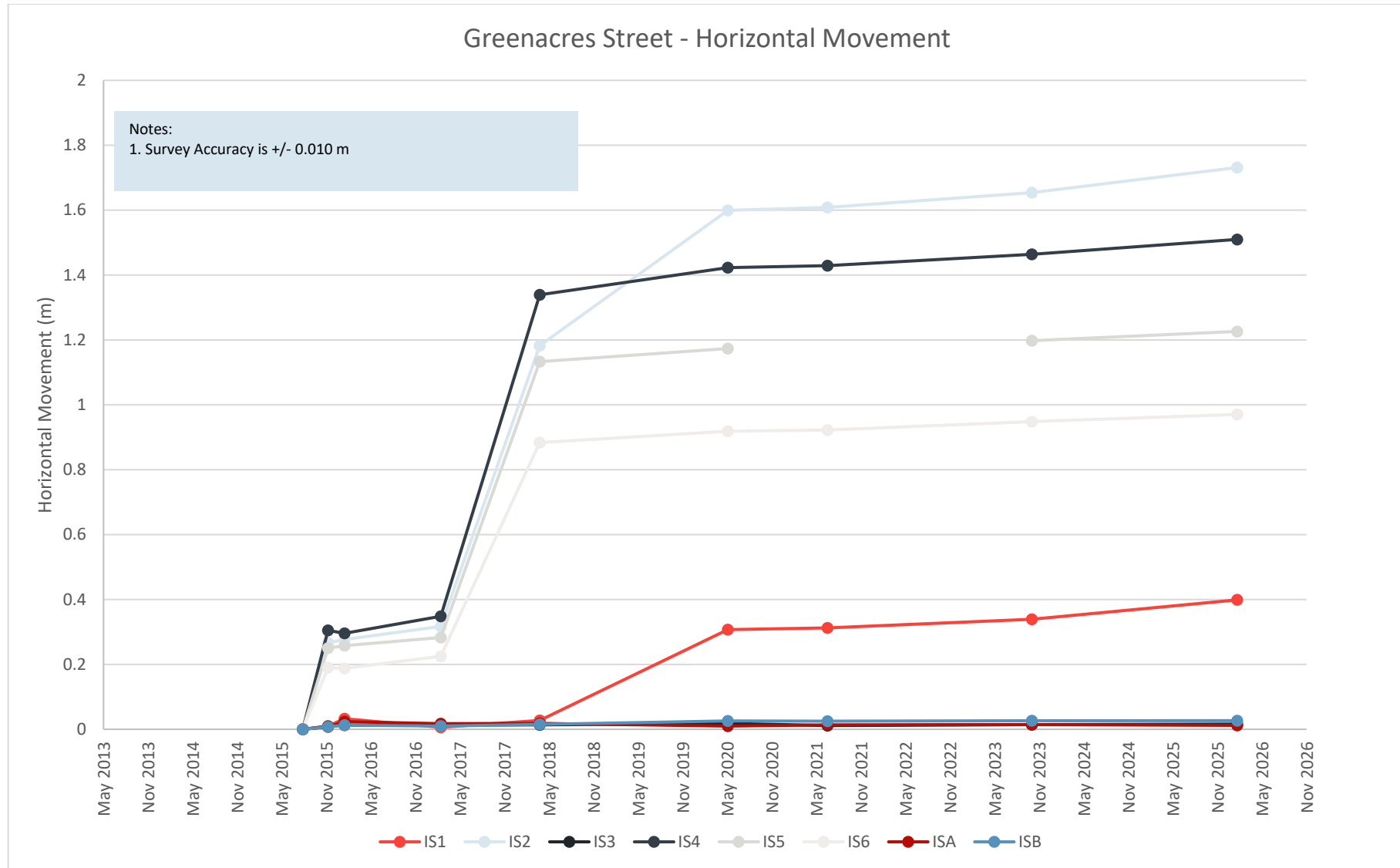
## Dickson Street Landslide Monitoring Cumulative Vertical Deformation - 1997 to present



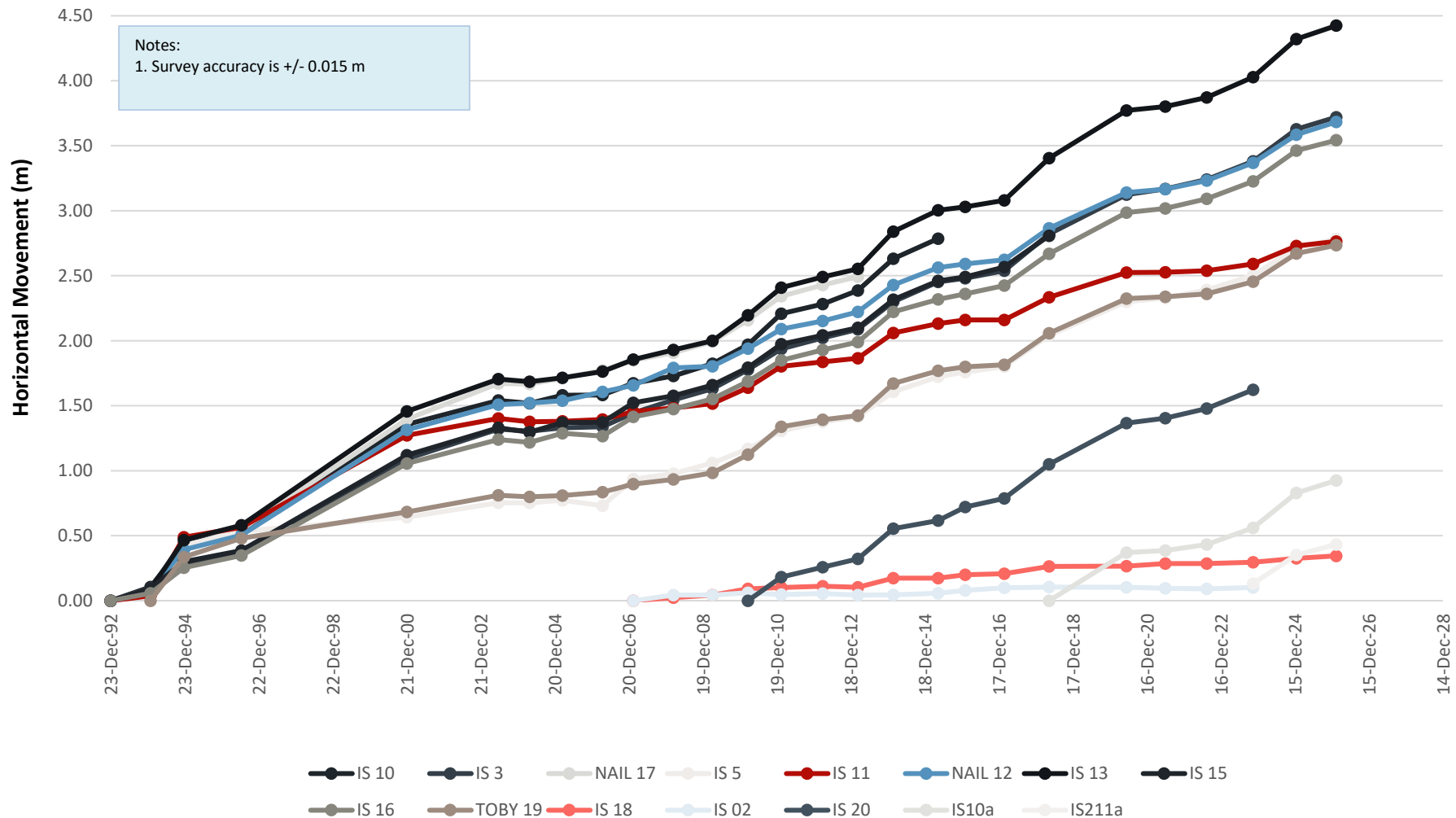
# Dickson Street Landslide Monitoring Cumulative Horizontal Deformation - 1997 to present



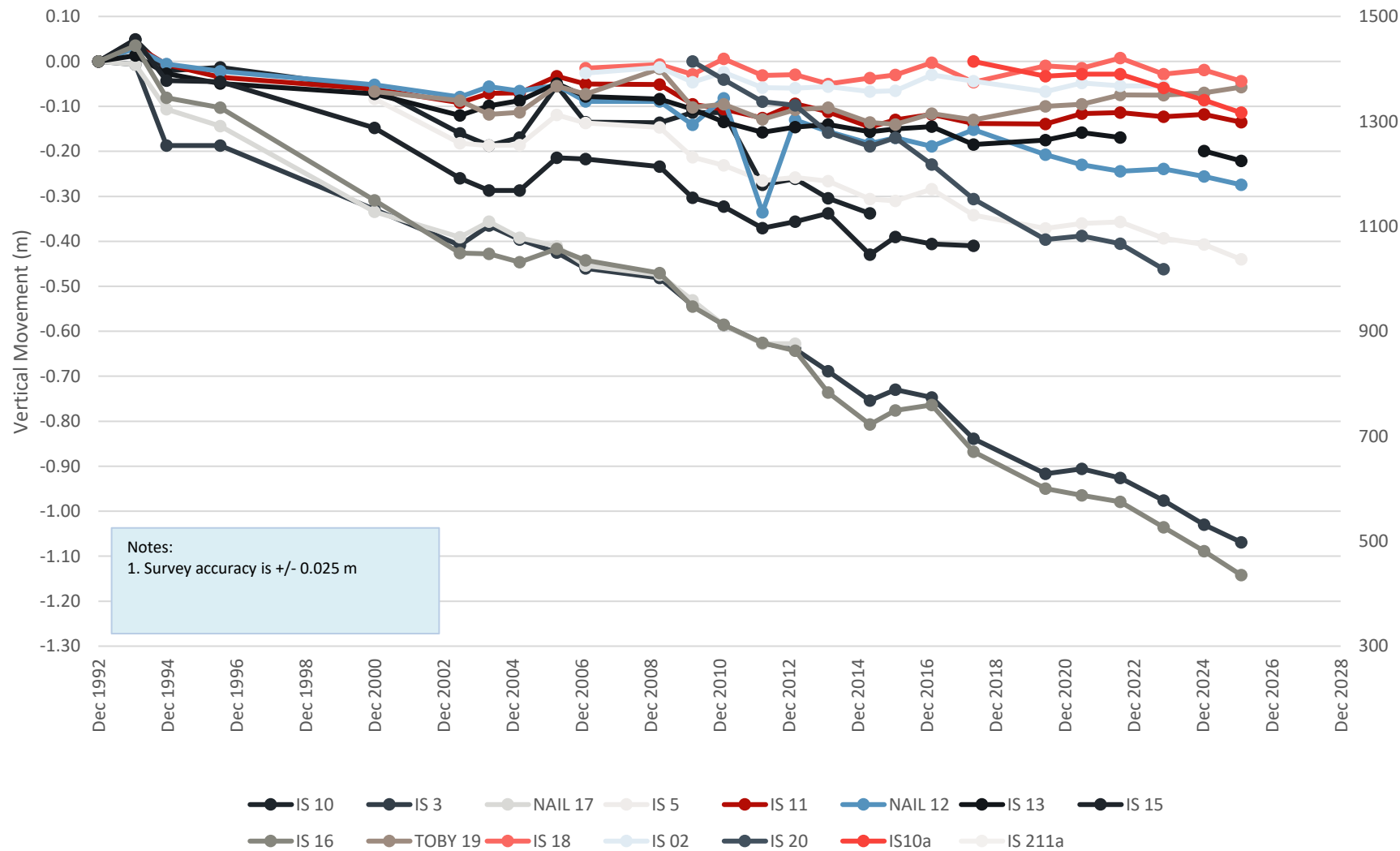




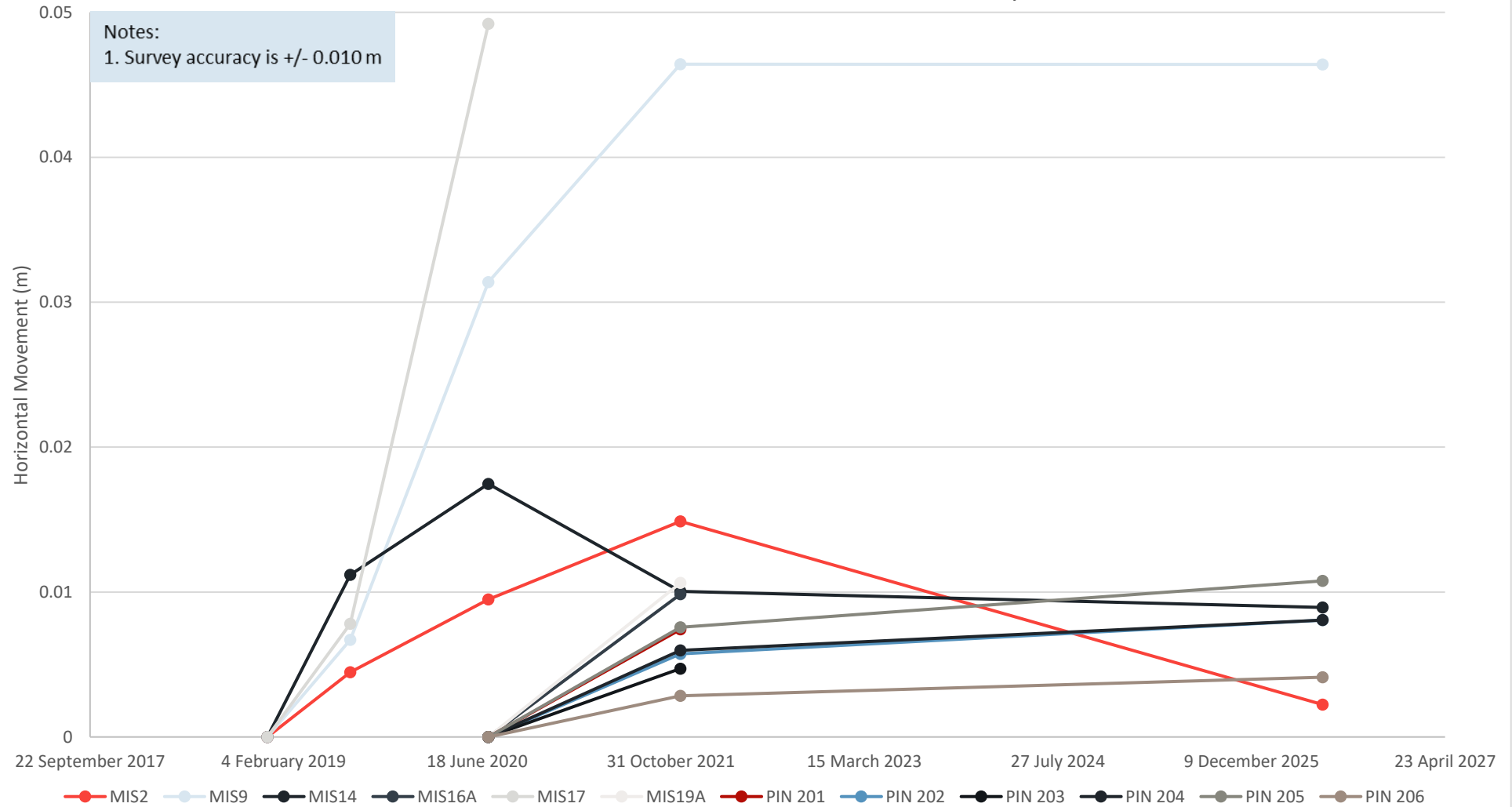
Puketeraki Landslide Monitoring  
Chart 1: Horizontal Deformation - December 1992 to present



Puketeraki Landslide Monitoring  
Chart 2: Vertical Deformation - December 1992 to present



Motu Street Landslide Monitoring  
Chart 1: Horizontal Deformation - December 2018 to present



Motu Street Landslide Monitoring  
Chart 2: Vertical Deformation - December 2018 to present

