

PROPERTY INVESTIGATION · CATEGORY II

Ground Movement Investigation Report

1 St Peters Street, St Albans, AL1 3LF — satellite-measured vertical displacement over 2019-01-09 to 2023-12-26 (n = 230 observations).



CLIENT	COORDINATES	OBSERVATION PERIOD	DATA CONFIDENCE	PREPARED BY
On request	51.7523°N -0.3382°W	2019-01-09 to 2023-12-26 230 epochs	High 63 PS pts · LiCSAR n/a	AllStrata Ltd. Geospatial Analytics

DETERMINATION



RISK INDEX

47/100
MODERATE RISK

Satellite monitoring shows this property has experienced an average vertical downward movement of 3.9 mm/year between 2019 and 2023. The property is founded on Lambeth Group, a clay formation susceptible to seasonal volume changes.

The property is founded on Lambeth Group (Clay, sand and gravel), dating from the Paleocene.

§ 01 Summary of Measurements

OBSERVED QUANTITIES

RISK INDEX 47/100 Composite — velocity and seasonal amplitude.	MEAN VELOCITY -3.9 mm/yr Linear vertical trend over observation window.	SEASONAL AMPLITUDE 1.4 mm Peak-to-trough within the annual cycle.
ACCELERATION +1.08 mm/yr ² Second-order trend; change in velocity per year.	TOTAL DISPLACEMENT -6.4 mm Cumulative displacement across the series.	OBSERVATION WINDOW 230 epochs 2019-01-09 to 2023-12-26

§ 02 Subject Property

SCHEDULE OF PARTICULARS

ADDRESS	1 St Peters Street, St Albans, AL1 3LF
GEOGRAPHIC COORDINATES	51.75235°N, -0.33817°W (WGS 84)
REPORT REFERENCE	EX0-2026-85053
DATA SOURCES	63 EGMS persistent scatterers within 30 m

03 Spatial Distribution of Movement

FIGURE 3.1



FIGURE 3.1 — VERTICAL VELOCITY WITHIN 500 M OF SUBJECT PROPERTY

EGMS PS · LICRSAR RASTER (LOCAL-RELATIVE)

Satellite radar data measures average ground movement across a ~100m area centred on the subject property. For clay shrink-swell subsidence, which typically affects entire streets and neighbourhoods uniformly, this spatial resolution provides reliable evidence of ground movement trends at the property location.

04 Displacement Time Series

FIGURE 4.1

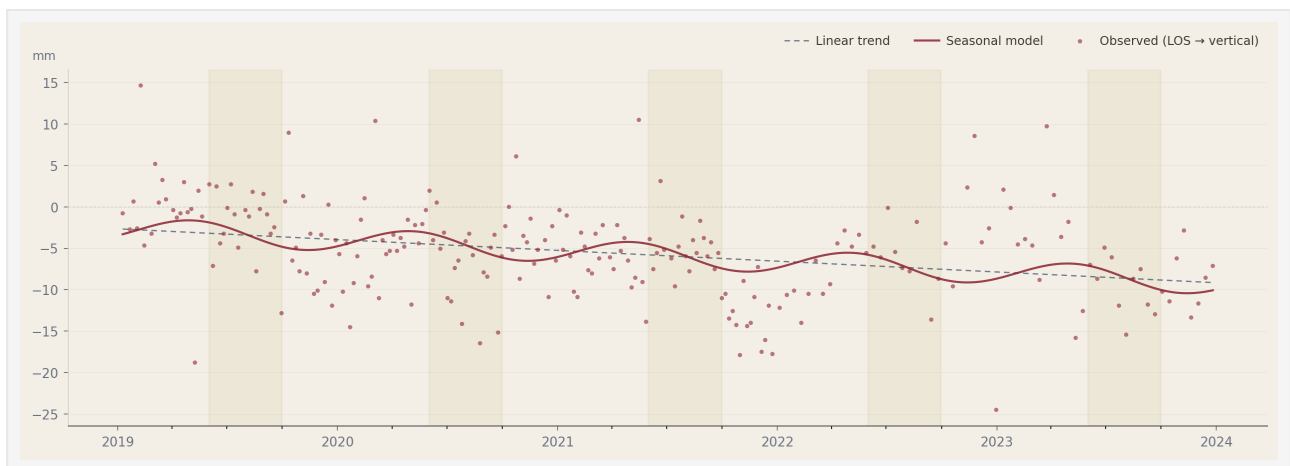


FIGURE 4.1 — CUMULATIVE VERTICAL DISPLACEMENT · 2019-01-09 TO 2023-12-26

N = 230 · SENTINEL-1 C-BAND

The displacement time series combines EGMS Calibrated persistent scatterers (2019–2023) into a single vertical record, calibrated to remove reference-pixel bias during the 2019–2023 overlap. Note: Reduced data density between Dec 2021 and Dec 2024 due to Sentinel-1B failure.

§05 Geological Context

BRITISH GEOLOGICAL SURVEY

BEDROCK GEOLOGY	Lambeth Group (BGS 1:50,000)
SUPERFICIAL DEPOSITS	Satwell Gravel Member
GEOSURE SHRINK-SWELL	<div>LOWHIGH</div>

The property is founded on Lambeth Group (Clay, sand and gravel), dating from the Paleocene.

§06 Data Sources & Cross-Validation

DUAL-SOURCE RECORD

EGMS CALIBRATED · 2019–2023	63 building-level measurement points within 30 m. EGMS-only velocity: -1.81 mm/yr .
LICSAR + LICSBAS · 2015–2024	No LiCSAR data at this location.
UNIFIED TIME SERIES	230 observations from 2019-01-09 to 2023-12-26. Vertical velocity -3.89 mm/yr ; seasonal amplitude 1.4 mm .

§07 Confidence & Limitations

SCOPE OF REPORT

CONFIDENCE RATING

High

4 / 5 · Insufficient · Low · Medium · **High** · Very High

26 ascending + 37 descending EGMS points. Nearest: 4m Measurement accuracy is approximately ±4–5 mm per acquisition, ±1 mm/yr on the velocity estimate, and ±1 mm on the seasonal amplitude.

WHAT THIS REPORT ESTABLISHES	WHAT THIS REPORT DOES NOT ESTABLISH
Whether the ground at and about the subject has been displacing, in what direction and magnitude, with what seasonal signature, and with what statistical confidence. These are measured quantities derived from satellite radar interferometry, not modelled estimates.	Whether structural damage has occurred, the precise causative mechanism, or the condition of the foundations. A site inspection by a suitably qualified surveyor remains necessary and is supported, rather than supplanted, by the evidence contained herein.

§08 Methodology & Data Sources

TECHNICAL APPENDIX

Ground displacement was derived via Interferometric Synthetic Aperture Radar (InSAR) analysis of European Space Agency Sentinel-1 acquisitions spanning 2019-01-09 to 2023-12-26. Two independent data sources were combined: (i) European Ground Motion Service (EGMS) Calibrated L2b persistent and distributed scatterer measurements (2019–2023) at building-level resolution, and (ii) LiCSAR interferograms from COMET/University of Leeds processed with LiCSBAS NSBAS inversion (2015–2024) at ~100 m resolution. Line-of-sight displacement values were resolved to the vertical component using per-point/per-pixel viewing geometry (E, N, U unit vectors) and ascending-plus-descending decomposition. LiCSAR was calibrated to EGMS by linear regression during the 2019–2023 overlap period to remove per-track reference-pixel bias. A seasonal-plus-quadratic-trend model was fitted to the resulting time series to quantify annual shrink–swell amplitude, linear velocity, and acceleration.

Geological context is sourced from the British Geological Survey 1:50,000 digital map and GeoSure shrink-swell dataset, via the BGS WMS. Coordinates are referenced to the WGS 84 datum. Frame IDs: 154D_03661_253146 (desc), 030A_03517_515153 (asc).

AUTHORISED FOR ISSUE	REPORT REFERENCE	SUBJECT PROPERTY
AllStrata	EXO-2026-85053	1 St Peters Street, St Albans, AL1 3LF
AllStrata Analytics	DATE OF ISSUE	CONTACT
Geospatial Ground Movement Intelligence	18 April 2026	contact@allstrata.com

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