

REPORT NUMBER

FF-20260119-001

DATE · 2026-01-19

Foundation Inspection Report

ASCE Level B Evaluation — Elevation Survey & Analysis

NATURE OF THIS REPORT

This report represents the professional inspection opinion of the inspector named herein, prepared in accordance with ASCE Level B evaluation methodology (Texas Section, Version 3, 2022). No calculations of structural load capacity, soils engineering analysis, or construction code-compliance certification are offered. Opinions expressed herein are professional inspection opinions, exempted from liability under Texas DTPA §17.49(c) as professional services.

PREPARED FOR

Homeowner ·

SUBJECT PROPERTY

Single-Family Residence · Built 1978 · 1,850 sq ft

INSPECTOR OF RECORD

, Forensic Foundation Evaluator

PRINCIPAL FINDING

Maximum elevation differential of 1.80 in. observed across 12 measurement points.

Classification: Measured Differential Exceeds 1.5 in. — Critical Measured Range

§ 0 Report Index

This report has been prepared in accordance with the guidelines set forth in the ASCE Texas Section Guidelines for the Evaluation and Repair of Residential Foundations, Version 3, adopted 1 April 2022.

- § 1.0 Inspection Conditions
- § 2.0 Structural Description
- § 3.0 Relative Elevation Survey
- § 3.5 Plan View
- § 3.6 Sub-Slab Plumbing Impact Assessment
- § 4.0 Visual Observations
- § 5.0 Analysis
- § 6.0 Conclusions & Recommendations
- § 7.0 Visit Comparison & Movement Rate
- § 8.0 Limitations & Certification

§ 1.0 Inspection Conditions

1.1 SITE & INSPECTION DATA

Subject Property: [REDACTED], [REDACTED]
Inspected By: [REDACTED], Forensic Foundation Evaluator
Firm: Foundation Forensics LLC
Type of Inspection: ASCE Level B — Relative Elevation Survey & Sub-Slab Plumbing Impact Documentation
Date of Inspection: 2026-01-19
Time of Inspection: 9:00 AM - 11:30 AM
Weather: Clear
Temperature: 58-65
Report Number: FF-20260119-001

1.2 CLIENT INFORMATION

Client Name: [REDACTED]
Role: Homeowner
Phone: [REDACTED]
Email: [REDACTED]

1.3 SCOPE OF WORK

At the request of the client, this firm performed an ASCE Level B relative elevation survey of the residential slab foundation at the subject property, together with a sub-slab plumbing impact analysis of the traced sewer line. The purpose of this engagement is to document measured conditions as of the survey date in a form suitable for review by a licensed Professional Engineer, a public adjuster, or counsel. This firm performs no repair work, renders no engineering opinion as to causation, and does not negotiate insurance claims.

§ 2.0 Structural Description

2.1 BUILDING CHARACTERISTICS

Building Type:	Single-Family Residence
Year Built:	1978
Stories:	1
Living Area:	1,850 sq ft
Construction Type:	Wood Frame
Exterior Cladding:	Brick Veneer
Entry Faces:	South

2.2 FOUNDATION SYSTEM

Foundation Type:	Slab on Grade (Conventional)
Perimeter Beam:	Present
Reinforcement:	Rebar
Previous Work:	No record of previous work

2.3 SITE CONDITIONS

Soil Type:	Expansive Clay
Soil Condition:	Damp
Drainage:	Gutters present, discharge adjacent to foundation at NE corner

Tree Proximity & Vegetation:
Mature pecan tree, approximately 24 in. trunk diameter, located approximately 15 ft from the northeast corner of the structure. Root system likely extends under foundation perimeter.

Homeowner-Reported Symptoms:
Homeowner reports doors in master bedroom and Bedroom 2 have been sticking for approximately 18 months, with progressive worsening. Drywall crack first observed in dining room approximately 12 months ago.

2.3.1 SITE GEOLOGY — PUBLISHED SOIL SURVEY DATA

Soil Map Unit:	Houston Black clay, 1 to 3 percent slopes (map unit HuB, dominant component Houston Black 85%)
Shrink-Swell Potential:	Very High
Plasticity Index (PI):	40–60
Linear Extensibility (LEP %):	9.5
Drainage Class:	Moderately well drained

Blackland Prairie vertisol: deep calcareous clay with pronounced seasonal shrink-swell behavior and characteristic gilgai microrelief. Soils of this series undergo substantial volume change with moisture cycling, and published survey data classifies the shrink-swell potential as very high. This is published regional survey data cited for context; it is not a parcel-specific geotechnical determination.

Source: USDA NRCS SSURGO via Soil Data Access, retrieved 2026-01-19 (demonstration data — verify against Web Soil Survey for any actual engagement)
Published survey data is cited for context only and does not constitute a geotechnical investigation or an engineering opinion. Parcel-specific subsurface conditions require site-specific geotechnical study by qualified professionals.

§ 3.0 Relative Elevation Survey

3.1 INSTRUMENTATION

Instrument: ZipLevel PRO-2000
Serial Number: ZL-2024-4817
Calibration Date: 2026-01-15
Accuracy: +/- 0.05 in.
Unit: inch
Reference Mode: highest

3.2 MEASUREMENT DATA

CODE	LOCATION	READING	DELTA	STATUS
M-01	Living Room Center	100.00	+0.00	WITHIN TOLERANCE
M-02	Living Room SW Corner	99.85	-0.15	WITHIN TOLERANCE
M-03	Kitchen Center	99.70	-0.30	WITHIN TOLERANCE
M-04	Kitchen Island	99.55	-0.45	WITHIN TOLERANCE
M-05	Dining Room	99.40	-0.60	MONITOR
M-06	Master Bed Entry	99.20	-0.80	MONITOR
M-07	Master Bath	98.95	-1.05	REVIEW
M-08	Hallway Mid	98.75	-1.25	REVIEW
M-09	Bedroom 2 Center	98.50	-1.50	CRITICAL
M-10	Bedroom 2 NE Corner	98.20	-1.80	CRITICAL
M-11	Garage Entry	99.80	-0.20	WITHIN TOLERANCE
M-12	Front Entry Foyer	99.95	-0.05	WITHIN TOLERANCE

§ 3.6 Sub-Slab Plumbing Impact Assessment

Analysis of the sub-slab sewer line based on differential foundation settlement interpolated from the measurement points. Per IPC Table 704.1 / IRC Table P3005.3, minimum slope for residential sanitary drainage piping is 1/4 in./ft (2.083% grade) for 2-1/2" or smaller pipe, and 1/8 in./ft (1.042% grade) for 3" through 6" pipe.

3.6.1 SYSTEM PARAMETERS

Pipe Diameter: 4"
Pipe Material: Cast iron (lead caulked)
Original Slope: 2.08%
Installation Year: 1978

3.6.2 SEGMENT ANALYSIS

SEG	FROM -> TO	RUN	ORIG	CURR	STATUS	JOINT-STRESS INDEX
S1	Bedroom 2 NE -> Master Bath	17.4ft	2.08%	+1.72%	COMPLIANT	VERY HIGH (71)
S2	Master Bath -> Dining	18.7ft	2.08%	+1.88%	COMPLIANT	HIGH (60)
S3	Dining -> Living Rm	15.7ft	2.08%	+1.77%	COMPLIANT	VERY HIGH (67)
S4	Living Rm -> Exit to Main	20.5ft	2.08%	+2.10%	COMPLIANT	LOW (12)

3.6.3 FINDINGS

Moderate finding: 0 sub-code segment(s); peak computed joint-stress index 71 (relative scale, see § 3.6 methodology). A CCTV scope by a licensed plumber would document the current pipe condition; remedial scoping is reserved to others.

3.6.4 VISUAL EXHIBITS

Exhibit A — Sewer routing overlaid on the floor plan. Segment color indicates slope status relative to IPC Table 704.1 minimum; labels show computed current slope per segment.

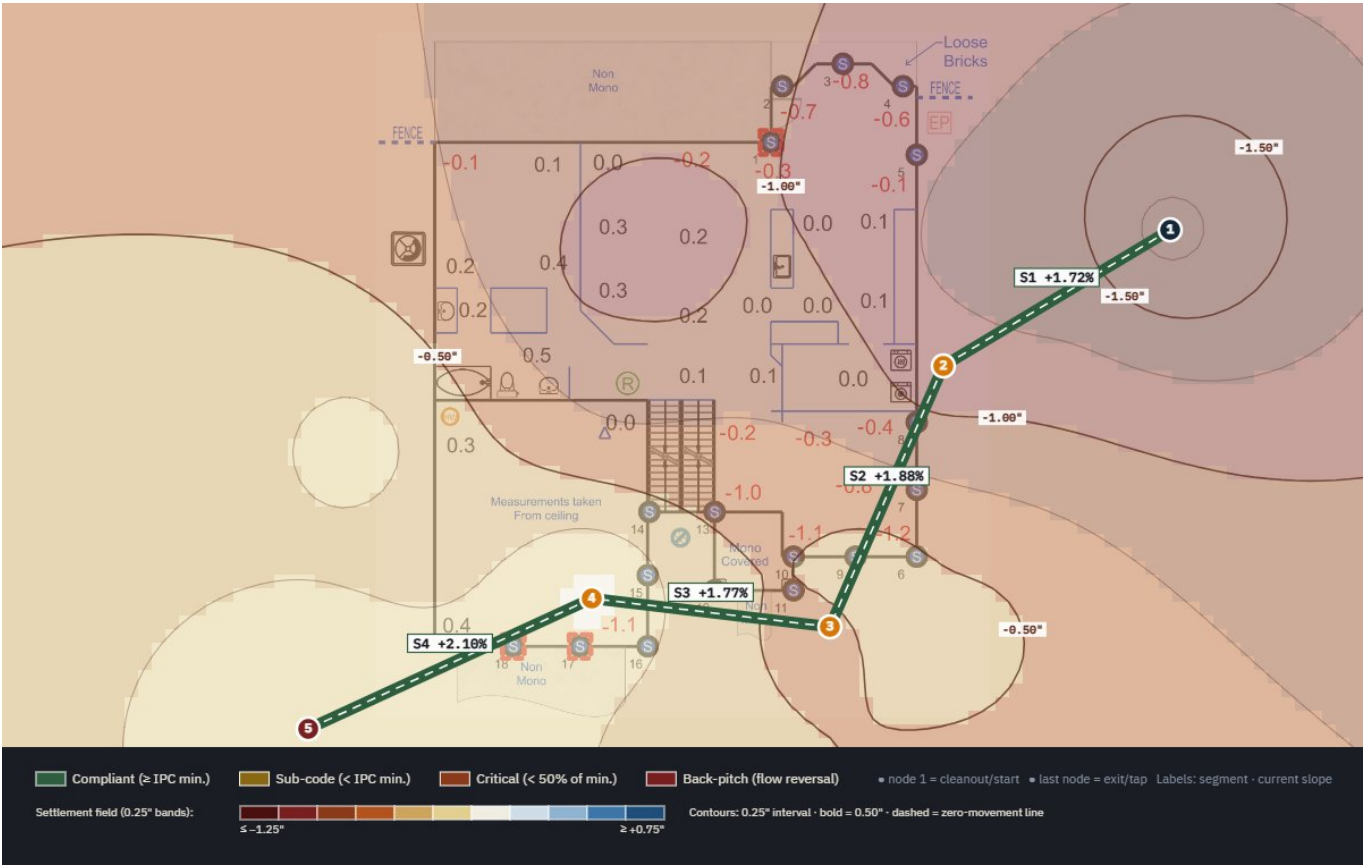
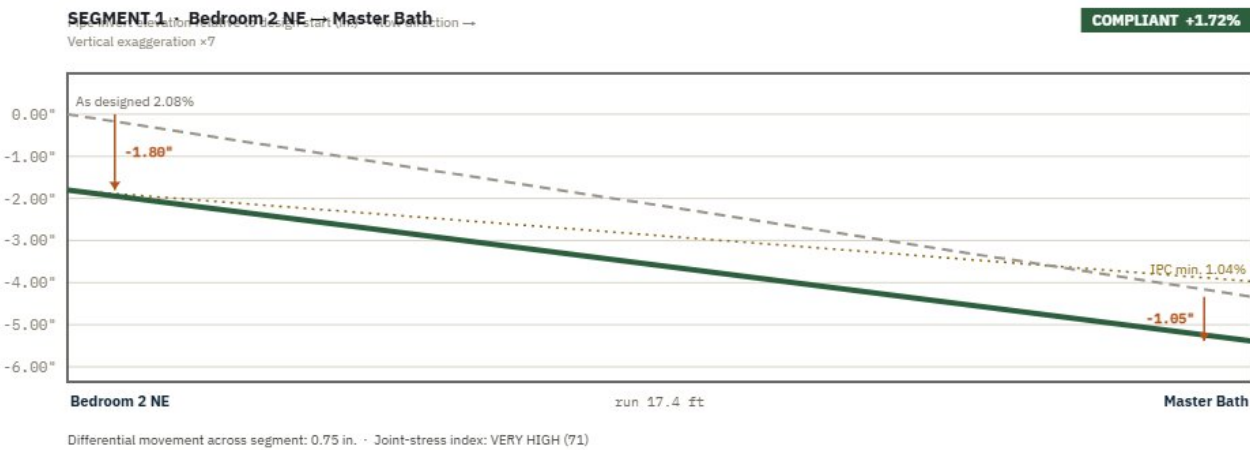
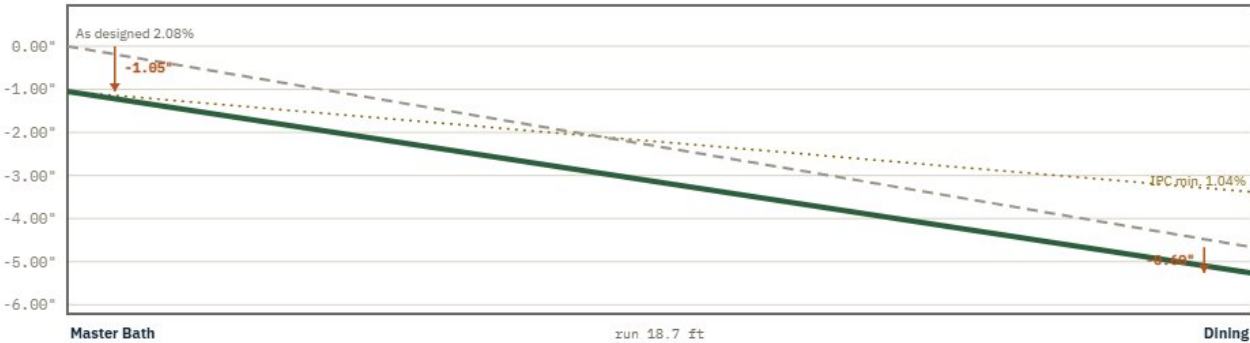


Exhibit B — Side-view slope profiles. Dashed gray line: as-designed slope. Solid colored line: current slope computed from measured settlement at each end (orange arrows). Dotted line: IPC minimum-slope reference. Vertical scale is exaggerated for readability; exaggeration factor noted on each profile.



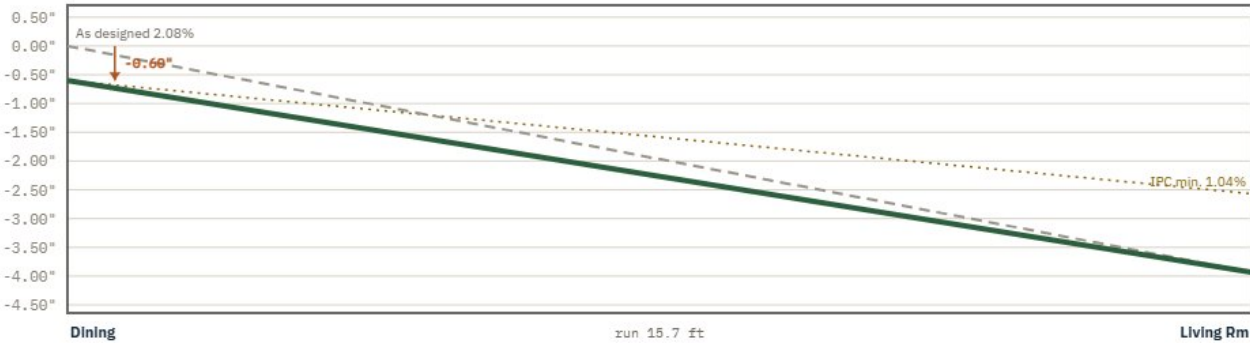
SEGMENT 2 Master Bath → Dining
Vertical exaggeration x8

COMPLIANT +1.88%



SEGMENT 3 Dining → Living Rm
Vertical exaggeration x9

COMPLIANT +1.77%



SEGMENT 4 Living Rm → Exit to Main
Vertical exaggeration x9

COMPLIANT +2.10%

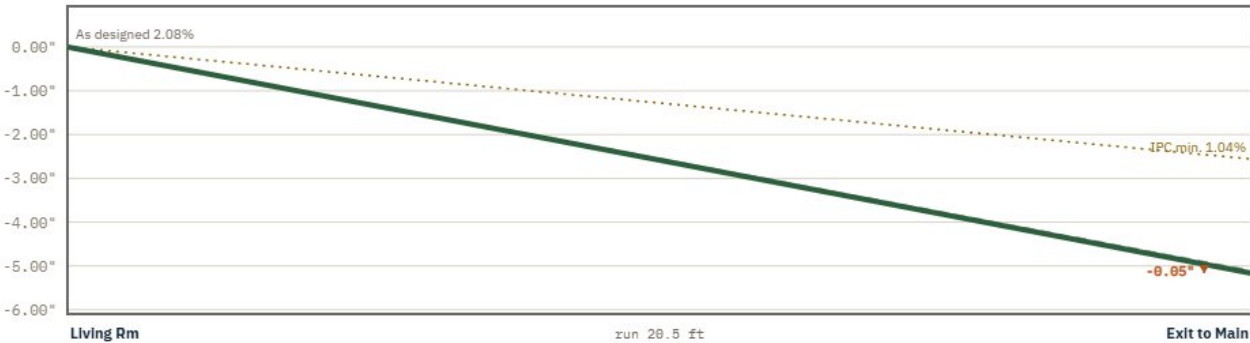


Exhibit C — Joint separation mechanism. Schematic of a bell-and-spigot drain joint before and after differential settlement, with this property's worst-segment values (material joint tolerance vs. measured movement, and the resulting joint-stress index).

HOW DIFFERENTIAL SETTLEMENT OPENS PIPE JOINTS

Sanitary drain lines are assembled from rigid pipe sections joined by bell-and-spigot connections. When one end of a run settles relative to the other, the joint rotates and the seal opens.

AS INSTALLED

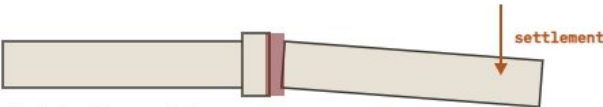
Joint aligned — gasket compressed uniformly, watertight.



THIS PROPERTY — WORST SEGMENT (1)	
Material:	Cast iron (lead caulked)
Joint tolerance:	0.25 in.
Measured move:	0.75 in.
Joint-stress index:	71 (VERY HIGH)

AFTER DIFFERENTIAL SETTLEMENT

Joint rotated / drawn open — gasket unloaded on one side; leak path forms at the invert.



Schematic — not to scale. Joint-stress index per §3.6 methodology; a screening value, not a statistical probability. Field confirmation by hydrostatic/CCTV testing.

§ 4.0 Visual Observations

4.1 INTERIOR OBSERVATIONS

I-01 Dining Room, north wall above window

Diagonal sheetrock crack running from upper-right corner of north window to ceiling, approximately 1/16 in. wide and 18 in. long.

I-02 Master Bedroom, east side of door frame

Vertical sheetrock crack at door frame, approximately 1/16 in. wide, 24 in. long. Door observed to stick in frame.

I-03 Bedroom 2, center of floor

Visible floor slope toward northeast corner. Ball-roll test confirms consistent slope to the NE.

4.2 EXTERIOR OBSERVATIONS

E-01 Northeast exterior corner

Approximately 1 in. brick separation at the NE corner of the structure.

E-02 East exterior wall, midspan

Vertical mortar crack extending full height of wall, approximately 1/8 in. wide.

4.3 DRAINAGE OBSERVATIONS

D-01 Northeast downspout

Gutter downspout discharges directly adjacent to foundation.

§ 5.0 Analysis

5.1 SUMMARY METRICS

Measurement Points:	12
Elevation Range:	1.80 in. (includes tilt)
Deflection:	0.36 in. deviation at M-03 from the 18.7 ft chord M-05 to M-07
Deflection Ratio:	L/618
Overall Tilt:	0.31% (best-fit plane)

The deflection ratio is computed as ASCE Texas Section "Guidelines for the Evaluation and Repair of Residential Foundations," Version 3 (adopted 1 April 2022), Section 5.4 defines it: the maximum deviation of a third point from a straight line between two points, divided by the distance L between those two points. Every pair of plan-located points was searched as a candidate chord and the governing (worst) triple is reported above; an intermediate point was accepted as lying on a chord when it fell within 10 percent of the chord length of it in plan, which is this tool's search convention and not a figure from the guidelines. Section 5.5 offers L/360, the IRC allowable live-load deflection for a structural floor member, as an analogy in which the whole foundation is treated as a single member and differential soil movement as live load, and states that below that figure a foundation is unlikely to be materially deflected unless visible indications show otherwise. The guidelines set out no tier scale below L/360 and no numeric damage classification table. Tilt is reported separately above because it is rigid-body rotation, not bending. Separately, and corresponding to no figure in the guidelines, the departure of the measured field from a least-squares plane through all plan-located points is 0.59 in. between M-01 and M-12; that figure indicates whether the field is bowed or essentially planar and is this tool's own metric.

5.2 CLASSIFICATION OF MEASURED CONDITION

The 0.5 in., 1.0 in. and 1.5 in. bands used below are this firm's screening convention for organising a measured differential, adopted for consistency between reports. The ASCE Texas Section guidelines contain no numeric severity or damage classification table, and no part of the banding below should be read as a criterion drawn from them. The bands sort a measurement; they do not establish distress, and they assert nothing about cause.

Measured Differential Exceeds 1.5 in. — Critical Range

The maximum measured elevation differential is 1.80 in., exceeding the 1.5 in. threshold. Differentials of this magnitude are associated with significant interior and exterior distress; observed conditions are documented in § 4.0. These findings warrant prompt review by a licensed Professional Engineer for causation determination and remedial scoping. Where § 3.6 indicates elevated joint stress in the sub-slab sewer line, verification testing by a licensed plumber prior to any remedial work both preserves the evidentiary record and establishes whether an active leak is a contributing factor.

§ 6.0 Conclusions & Recommendations

6.1 MOVEMENT FINDING

Relative elevation measurements across 12 points establish a maximum differential of 1.62 in., with the low region concentrated at the northeast quadrant. Interior and exterior distress consistent with differential movement is documented in § 4.0. Segment analysis of the traced sewer line (§ 3.6) computes two segments below IPC Table 704.1 minimum slope under the measured settlement, with the worst segment computing to negative slope. These are measured and computed findings; determination of cause is reserved to a licensed Professional Engineer.

6.2 CONTRIBUTING FACTORS

Conditions documented at the site that are recognized in published literature as associated with differential foundation movement, listed without assignment of causal weight: (1) Houston Black clay — very high shrink-swell potential per published USDA NRCS survey data (§ 2.3.1); (2) mature pecan tree approximately 12 ft from the northeast corner, within the commonly cited zone of influence; (3) roof drainage discharging adjacent to the foundation at the northeast corner; (4) computed sub-slab sewer slope deficiency in the same quadrant as the measured low region, pending field verification. Apportionment among these factors requires engineering analysis not performed by this firm.

6.3 TESTING RECOMMENDATIONS

Field verification that would resolve the open questions in this report, to be performed by appropriately licensed parties: hydrostatic pressure test and CCTV inspection of the sub-slab sewer line by a licensed plumber; comparative re-survey at a defined interval to establish whether movement is active and at what rate (§ 7.0); soil moisture sampling at the perimeter if a licensed engineer determines it material to causation analysis.

6.4 STRUCTURAL RECOMMENDATIONS

No remedial scope is offered. Specification of corrective work is an engineering judgment reserved to a licensed Professional Engineer under Texas Occupations Code Chapter 1001, and this firm performs no repair work. The measured elevation data, plan-view settlement field, and plumbing segment computations in this report, together with the raw-data export, are prepared to support that engineering review.

6.5 DRAINAGE & MOISTURE MANAGEMENT

Site drainage conditions as observed are documented in § 2.3 and § 4.0 for the record. This firm does not specify corrective drainage work.

§ 7.0 Visit Comparison & Movement Rate

7.1 VISITS COMPARED

Baseline: Initial Evaluation — 2026-01-19 (initial). Current: Monitoring Visit (6-Month) — 2026-07-18 (monitoring). Interval: 180 days (5.9 months). Measurement points matched by label: 12.

7.2 DATUM BASIS

A relative elevation survey is referenced to a datum selected at each visit and carries no absolute benchmark. Each visit is therefore reduced to deviations from its own reference point (reference mode: highest) before the two are compared, so that the arbitrary datum of each visit cancels and only the change in shape of the elevation field survives. Between these two visits the reference reading itself moved +0.00 in.; that shift is a change of datum, not movement of the structure, and has been removed from every figure in this section.

7.3 MOVEMENT RATE SUMMARY

INTERVAL	MAX DELTA SHAPE	PEAK RATE	MEAN RATE
180 d	0.68 in.	0.115	0.051
5.9 months	M-10	in / month	in / month

Peak joint-stress index (§ 3.6): 71 at baseline, 71 at the current visit — a change of +0 index points. The index is a comparative screening value used to prioritize field verification; it is not a statistical probability and does not establish that a leak exists.

INTERPRETATION
Elevated rate of change. The measured condition is not static. Contributing factors commonly investigated at this rate include sub-slab plumbing discharge, drainage failure, tree root activity, and recent grading change; establishing which, if any, applies is a causation determination reserved to a licensed Professional Engineer. Where this visit follows remediation, the data does not support a stabilized condition.

7.4 PER-POINT ELEVATION DELTA

POINT	BASELINE	CURRENT	DELTA RAW	DELTA REL. DATUM	RATE (IN/MO)
M-01	100.00	100.00	+0.00	+0.00	+0.000
M-02	99.85	99.73	-0.12	-0.12	-0.020
M-03	99.70	99.51	-0.19	-0.19	-0.032
M-04	99.55	99.34	-0.21	-0.21	-0.036
M-05	99.40	99.12	-0.28	-0.28	-0.047
M-06	99.20	98.83	-0.37	-0.37	-0.063
M-07	98.95	98.53	-0.42	-0.42	-0.071
M-08	98.75	98.24	-0.51	-0.51	-0.086
M-09	98.50	97.89	-0.61	-0.61	-0.103
M-10	98.20	97.52	-0.68	-0.68	-0.115
M-11	99.80	99.66	-0.14	-0.14	-0.024
M-12	99.95	99.84	-0.11	-0.11	-0.019

Points are matched by label across visits. Delta raw is the arithmetic difference of the two readings and carries any change of survey datum; Delta rel. datum removes the reference shift stated in § 7.2 and is the value every rate above is computed from. Points introduced at the current visit have no baseline and are excluded from rate calculations.

§ 8.0 Limitations & Certification

8.1 LIMITATIONS

This report reflects conditions observed and measured at the subject property on the date of inspection and does not predict future performance. The survey is non-destructive; no excavation, coring, or subsurface investigation was performed and no concealed conditions were inspected. Sub-slab sewer routing was traced from accessible cleanouts and fixture locations and is approximate; actual routing may differ. Plumbing segment analysis is a geometric computation based on measured surface settlement and assumed original slope, and is not a substitute for field testing by a licensed plumber. Published soil survey data is cited for regional context and is not a parcel-specific geotechnical determination. No opinion is expressed as to causation, structural adequacy, code compliance, or the appropriate scope of corrective work; those determinations are reserved to a licensed Professional Engineer.

8.2 SIGNATURE



[REDACTED]
ator

Foundation Forensics LLC

Date: 2026-01-19

PART II

Property Owner Summary

*A plain-language overview of inspection findings
and recommended next steps.*

Prepared for: [REDACTED]

Prepared by: Foundation Forensics LLC

Foundation Inspection Summary Report

PROPERTY ADDRESS

[REDACTED] [REDACTED]

PROPERTY OWNER

[REDACTED]

Inspected: 2026-01-19

YOUR FOUNDATION STATUS

CRITICAL MEASURED RANGE

Maximum measured differential: 1.80 inches

AT A GLANCE

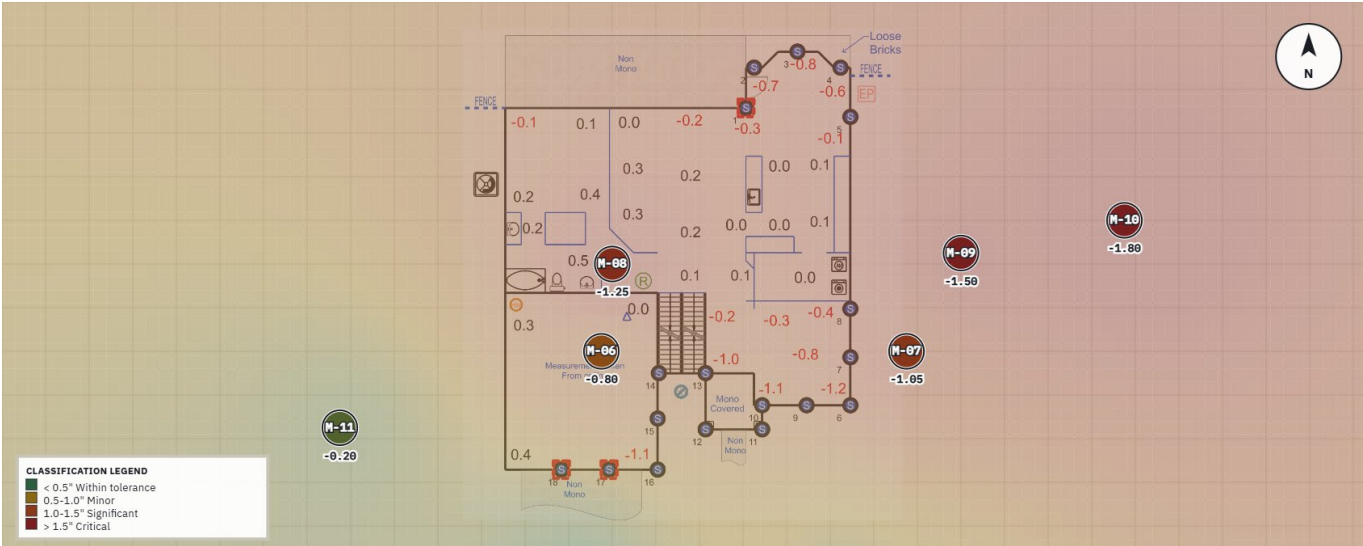
POINTS MEASURED 12 <i>across the property</i>	OVERALL CONDITION CRITICAL <i>tier classification</i>	JOINT-STRESS INDEX 71 <i>peak segment, relative scale</i>
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BOTTOM LINE

We measured a maximum height difference of 1.80 inches — above the level commonly cited as a threshold in residential practice. Movement of this size is associated with structural cracking and stress on sub-slab plumbing. Our role is to document what we measured; deciding what work is needed is the job of a licensed engineer, and we have prepared this report so that an engineer, your insurer, or your attorney can review the underlying data directly.

What We Found

Our inspector recorded relative elevation measurements at 12 points across the foundation slab. The map below shows where each measurement was taken and the relative settlement at each location. Color-coded markers indicate severity: lower (settled) areas appear in red, baseline areas in green.



Why This Matters

Foundation movement does not stay confined to the slab. Over time, even modest differential settlement transmits stress upward through the framing, walls, doors, plumbing, and roof, causing cosmetic and structural damage that compounds with continued movement.

VISIBLE SIGNS

- Cracks in interior drywall or exterior brick
- Doors that stick or no longer latch
- Windows difficult to open or close
- Gaps between trim, baseboards, or crown molding
- Sloping or uneven floors
- Cracked tile or separating grout lines
- Visible gaps at the base of columns or piers

HIDDEN RISKS

- Sub-slab plumbing leaks (sewer joint separation)
- Soil washout accelerating further settlement
- Compromised load paths in load-bearing walls
- Roof framing distortion and leak propagation
- Insurance coverage limitations if undocumented
- Property value decline at time of resale
- Continued movement (rate increases with time)

PLUMBING IMPACT — NOTE FOR YOUR INSURER

Our analysis computes a peak joint-stress index of 71 along the sub-slab sewer line — an indication that this line warrants field verification, not a finding that a leak exists. Texas homeowner policies commonly address foundation damage caused by sudden and accidental water discharge, and such conditions are generally documented before remedial work begins, since that work can remove the evidence. A hydrostatic pressure test and CCTV inspection performed by a licensed plumber would establish whether an active leak is present. Coverage determinations are matters between you and your insurer; this firm provides technical documentation only and does not negotiate claims.

What To Do Next

1**Have a licensed engineer review this report**

Determining the cause of the movement and specifying what work is required are engineering judgments reserved to a licensed Professional Engineer. This report and its raw measurement data are prepared for that review.

2**Document the plumbing condition before any work begins**

A hydrostatic test and CCTV inspection by a licensed plumber establish whether a sub-slab leak is present. Once remedial work starts, that evidence is difficult or impossible to recover.

3**Notify your insurer and ask about the claim process**

Texas homeowner policies commonly address sudden and accidental water discharge. Coverage questions are between you, your insurer, and — if you choose to engage one — a licensed public adjuster or attorney. This firm does not negotiate claims.

4**Preserve the condition record**

Date-stamped photographs of cracks, doors, and tile separations, kept alongside this report, document the condition as it stands today.

5**Keep this report as your baseline**

A second survey compared against this one is what establishes whether movement is active and at what rate — often the single most useful piece of evidence in a claim or engineering review.

About This Report

OUR METHODOLOGY

This inspection followed ASCE Texas Section "Guidelines for the Evaluation and Repair of Residential Foundations," Version 3 (adopted 1 April 2022), Level B methodology. A relative elevation survey was performed using a precision instrument across the slab, and the resulting elevation field was analyzed for differential settlement, deflection ratio, and tilt. Where a sub-slab plumbing line was traced, segment-by-segment slope analysis was performed against IPC Table 704.1 / IRC P3005.3 minimums, with a relative joint-stress index derived from differential settlement, pipe material joint tolerance, and installation era. The index is a comparative screening value used to prioritize field verification; it is not a statistical probability and does not establish that a leak exists. Field testing by a licensed plumber is the controlling evidence.

INSPECTOR

[REDACTED]
Forensic Foundation Evaluator
Foundation Forensics LLC
San Antonio, TX (demo data)
[REDACTED]

NATURE OF THIS REPORT

This summary represents the professional inspection opinion of the inspector named above. Findings reflect conditions present at the date and time of inspection. No structural load calculations or code-compliance certification are offered. Where sealed engineering documents are required for remediation, the remediation contractor is responsible for retaining such documents. (Texas DTPA §17.49(c).)