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Low-Strain Integrity Testing (PIT/SE) Checklist & Guide

Low-strain integrity testing (PIT/SE) checklist for setup, signal quality, defect screening, and acceptance—interactive, commentable, and export as PDF/Excel.

Project:	
Date:	
Filled by:	

Pre-Test Setup	
1	Confirm the current test plan, pile list, and any special instructions.
2	Inspect pile head; chip to sound concrete, remove laitance, and create a clean, flat area; unevenness ≤ 2 mm; capture close-up photos.
3	Mark test positions: ≥ 2 positions for small piles; four at 0°, 90°, 180°, 270° for ≥ 600 mm diameter; photo evidence of markings.
4	Estimate wave speed and toe time from design data; set time window ≥ 2.5× predicted two-way travel; record calculation and screenshot device window.

Equipment Verification	
5	Verify PIT device calibration certificate (valid ≤ 12 months), firmware version, and serial number; attach certificate and device photo.
6	Check accelerometer/receiver and cables for damage; continuity within manufacturer limits; document resistance reading and photos of connectors.
7	Set sampling rate ≥ 20 kHz with anti-aliasing filter enabled; record filter settings; capture configuration screenshot.
8	Prepare hammer 0.5–1.0 kg with undamaged rubber tip; replace if wear > 2 mm; photograph hammer and tip condition.

Test Execution and Signal Quality	
9	Mount or hold sensor firmly with coupling gel/tape; confirm baseline noise within ±0.02 m/s²; take setup photo and baseline screenshot.
10	Perform trial blows to tune gain so peak velocity 0.2–0.8 m/s without clipping; screenshot peak values and gain settings.
11	Record 6–10 consistent impacts per position; standard deviation of peak amplitude ≤ 15%; save stacked trace with GPS time.
12	Confirm time window covers beyond predicted toe arrival by ≥ 50%; verify no saturation; capture full-trace screenshot.
13	If SNR < 6 dB, improve coupling, adjust tip hardness, shield from wind, or reposition; re-test and document achieved SNR or reason.

Defect Screening and Analysis	
14	Compare measured toe echo time with predicted; acceptance for known length: within ±10%; annotate deviations and save overlays.
15	Screen for early reflections before 0.7× predicted toe time; if amplitude > 25% of toe, flag potential necking/voids; add annotated screenshot.
16	Assess damping and waveform shape for bulges/soft toes; correlate across filters; record interpretation notes and filtered trace images.
17	Check repeatability across circumferential positions; confirm features recur in ≥ 2 positions; note any position-specific anomalies.

Acceptance and Documentation	
18	Classify each pile: Accept, Accept with remarks, Inconclusive, or Suspect; record basis and references to trace images.
19	For inconclusive or suspect results, recommend additional investigation beyond low-strain PIT/SE per approved project specifications and authority requirements.
20	Apply file naming: project-pileID-date-position; back up to two locations; verify checksum match; attach directory screenshot.
21	Compile report: test plan, settings, wave speed assumptions, locations, annotated plots, results table; obtain reviewer signature and date.

Safety and Controls	
22	Establish 1 m exclusion zone; brief team on hammer use; record toolbox talk with attendee signatures.
23	Verify safe access and edge protection on pile caps/platforms; no unprotected edges within 2 m; capture access photos.
24	Coordinate with site to pause nearby impact/vibration sources within 20 m during testing; log hold points and times.

Comments:

Filled by:

Signature:

Introduction	How to use this checklist
Low-strain integrity testing (PIT/SE) verifies pile continuity and length using low-energy impact waves to evaluate cast-in-place and driven piles. Also known as pile integrity test, sonic echo test, or pulse echo test, this checklist focuses on test setup, signal quality, defect screening, and acceptance, while explicitly excluding CSL and TIP methods. You will configure equipment, prepare pile heads, select appropriate time windows from estimated wave speed, and execute consistent impacts to achieve reliable, repeatable traces. Guidance covers SNR improvement, stacking, filtering, and interpretation cues for toe echo timing, early reflections, and damping behavior. Acceptance outcomes are clearly classified with documentary evidence, file naming standards, and sign-off procedures. Use this interactive checklist to reduce rework, catch hidden defects early, and deliver traceable records that meet approved project specifications and authority requirements. Start in interactive mode to tick items, add comments, and export your record as PDF/Excel with a secure QR code.	1. Preparation: gather PIT device, accelerometer, cables, 0.5–1.0 kg hammer with rubber tip, coupling gel/tape, PPE, cleaning tools, and a tablet/phone for the interactive checklist. 2. Review the test plan, pile IDs, drawings, and any constraints. Estimate wave speed and initial time window from design data or previous calibration piles. 3. Open the interactive checklist, start a new session, and select the project and pile ID. Enable GPS timestamp and camera permissions for evidence capture. 4. Tick items as you prepare the head and equipment. Add comments on site conditions, instrument settings, and planned circumferential positions. 5. During testing, attach photos and screenshots of traces directly to the relevant checklist items. Flag anomalies for later review. 6. After each pile, review classification (Accept, Accept with remarks, Inconclusive, Suspect). Request internal review in-app if needed. 7. Export the completed record as PDF/Excel, including images and metadata. Share the file link and QR code with stakeholders. 8. Sign-off: obtain digital signatures, archive to the project drive with standardized naming, and verify backup integrity.