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Bi-Directional O-Cell Test Checklist for Deep Foundations

Bi-directional O-Cell test interactive checklist for foundation teams; commentable and export as PDF/Excel. Verify jacks, gauges, bi-directional loads, and interpretation with clear evidence prompts.

Project:
Date:
Filled by:

Pre-Test Preparation

1	Verify test element dimensions and location against approved drawings using tape, level, and survey; confirm concrete/grout strength meets or exceeds project requirements; attach cylinder/batch reports and element photos as evidence.
2	Confirm O-Cell assembly rated capacity exceeds target maximum test load by $\geq 20\%$; record serial numbers; attach calibration certificates dated within the last 12 months.
3	Review approved method statement and risk assessment; brief crew on exclusion zones, pressure hazards, and emergency stop; collect toolbox talk attendance signatures.
4	Establish barricaded exclusion zone and safe egress; place signage and lighting; upload site layout photo showing pump, beam, and access paths.

Instrumentation and Calibration

5	Calibrate pressure gauges/transducers to $\pm 1\%$ full-scale; zero at ambient conditions; label with range and date; photograph gauge faces at zero.
6	Verify displacement gauges (LVDTs/dials) resolution ≤ 0.01 mm and stroke adequate for expected movement; attach calibration sheets; record baseline readings.
7	Check vibrating-wire strain gauges or sister bars for stable readings; configure data logger channels with correct gauge factors; store a baseline file.
8	Install and level independent reference beam on stable supports clear of the load path; acceptance: beam movement under load < 0.25 mm; record verification readings.

Test Setup and Assembly

9	Inspect O-Cell welds, bearing plates, and grout interfaces visually; no cracks, dents, or misalignment; document with close-up photos and NDT reports if required.
10	Confirm load transfer layers above/below O-Cell are flat and concentric; shim or sand-bed to achieve ≤ 1 mm flatness deviation; photograph plate contact surfaces.
11	Route hydraulic lines with abrasion protection and drip trays; install pressure relief valve; leak test at $1.1 \times$ planned max pressure, 10 min hold, $\leq 1\%$ loss.
12	Install tell-tales/targets for upward and downward movement; ensure plumbness; confirm clear line of sight to gauges; record initial readings to 0.01 mm.

Loading Procedure and Monitoring	
13	Confirm bi-directional loading sequence, step sizes (5–20% increments), and hold durations per approved test plan; obtain engineer sign-off prior to loading.
14	Increase pressure smoothly using pump control; avoid spikes >5% of step target; operators and recorder agree readings each minute during ramps.
15	At each hold, log pressure and displacements at specified intervals; acceptance: creep rate within plan limits (e.g., <0.1 mm/log cycle or per plan).
16	Perform unload/reload cycles as specified; capture residual movement and recovery; note hysteresis; annotate any anomalies and corrective actions.
17	Monitor upward/downward travel; if one side nears stroke limit, cap safely and continue on the other side as planned; record lock-off pressures.

Data Recording and Quality Control	
18	Synchronize data logger time with manual log; ensure sampling rate ≥ 1 Hz during ramps and holds; back up files to cloud and removable media.
19	Cross-check automatic and manual readings; acceptance: within 2% for load and 0.05 mm for displacement; investigate and document discrepancies.
20	Maintain environmental log: air temperature, groundwater level, weather; apply temperature corrections per instrument guidance; store photos of conditions.
21	Capture high-resolution photos each step showing gauge faces, reference beam, and pump pressures; timestamp and label by step number.
22	Invoke hold-point review when cumulative movement or pressure reaches plan triggers; obtain written authorization to proceed; upload signed checkpoint form.

Interpretation and Reporting	
23	Derive upward and downward mobilization curves; quantify unit side shear and base resistance; document neutral plane location and all assumptions clearly.
24	Verify acceptance against project criteria: target steps achieved, creep within limits, stable readings; generate plots with SI units and labeled axes.
25	Compile test report including calibration certificates, raw data, charts, site photos, and signatures; store digitally with QR-secured access; distribute to stakeholders.

Demobilization and Site Restoration	
26	Depressurize system safely; drain, cap, and tag hydraulic lines; remove hardware only after movements stabilize; photograph dismantling sequence.
27	Remove reference beam and barricades; tidy site; leave pile head per plan; complete demobilization checklist and obtain site release sign-off.

Comments:

Filled by:

Signature:

Introduction	How to use this checklist
<p>The bi-directional O-Cell test is a specialized deep foundation load test used to mobilize side shear and base resistance without a massive surface reaction. Also known as the Osterberg Cell or bi-directional pile load test, this procedure evaluates drilled shafts and barrettes by applying simultaneous upward and downward forces from a jack assembly embedded within the test element. This checklist focuses on verifying jacks and hydraulic lines, calibrating pressure and displacement gauges, executing bi-directional loading steps, and interpreting mobilization curves. It excludes top-down static load testing procedures. Following these steps helps avoid gauge drift, reference-beam instability, pressure spikes, and data loss—common issues that compromise test validity and safety. The outcome is reliable, defensible capacity characterization, complete with synchronized manual and logger records, photographs, and calibration certificates. Use this interactive checklist to tick off tasks in real time, add comments for nonconformities, and export deliverables as PDF/Excel with a QR-secured record for sign-off and audit trails.</p>	<p>1. Preparation: Confirm approved plan, O-Cell capacity, and calibration certificates. Gather tools—pressure pump, gauges, LVDTs/dials, reference beam gear, data logger, PPE—and verify site access, power, and exclusion zones. 2. Open the checklist: Create or select the project and test ID. Preload drawings, test plan, and baseline calibration files to enable quick cross-referencing during execution. 3. Use interactive mode: Work step-by-step, ticking tasks as completed. Add comment threads for issues, assign actions, and attach photos, logs, and certificates directly to the relevant checklist item. 4. Evidence management: Timestamp manual readings, synchronize logger clocks, and upload data at key milestones. Tag entries with load step numbers for easy traceability and later charting. 5. Review and export: Resolve open comments, confirm acceptance criteria, and generate charts. Export the full record as PDF/Excel for submittals and internal QA. 6. Sign-off and distribution: Capture digital signatures from responsible parties. Share QR-authenticated links with stakeholders and archive the package for audits and project closeout.</p>