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# Verify Reaction Systems: capacity, stability, instrumentation

Verify Reaction Systems with an interactive checklist that is commentable and export as PDF/Excel. Confirm capacity, stability, and instrumentation before load tests with traceable evidence.

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| Project:   |
| Date:      |
| Filled by: |
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| Design Capacity Verification |  |
|------------------------------|--|
| 1                            | Review approved drawings and reaction scheme; confirm required maximum jack force and reaction capacity match design.  |
| 2                            | Recalculate total kentledge mass or reaction pile/anchor capacity versus maximum expected jack force using a spreadsheet; upload calculation sheet demonstrating compliance per approved project specifications.           |
| 3                            | Check reaction beam bending, shear, and bearing stresses using section properties; verify fastener grades and spacing; acceptance: calculated demands $\leq$ capacities; evidence: annotated calc sheet and beam ID photo. |
| 4                            | Verify jack capacity, stroke, and rated pressure exceed design requirements; evidence: manufacturer nameplate photo and data sheet confirming rating with margin per approved project specifications.                      |

| Stability and Geometry Checks |   |
|-------------------------------|---|
| 5                             | Confirm bearing pressure under kentledge grillage or cribbing $\leq$ allowable from the geotechnical report; evidence: area calculation and allowable bearing note, signed.       |
| 6                             | Measure levelness of grillage/reaction beam using a digital level; tolerance: $\pm 3$ mm/m; record readings and upload level screenshots/photos.                                  |
| 7                             | Verify alignment of jack centerline to test point; tolerance: within $\pm 3$ mm in plan; method: tape/laser; evidence: marked layout photo and measurement notes.                 |
| 8                             | Check eccentricity of reaction load path; tolerance: resultant within 5 mm of reaction frame centroidal line; evidence: sketch with dimensions and sign-off.                      |
| 9                             | Inspect lateral bracing, tie-downs, and anti-uplift measures installed as designed; acceptance: all connections tight, lock nuts engaged; evidence: photos of each bracing point. |

| Kentledge Stack and Supports |   |
|------------------------------|---|
| 10                           | Count and identify all blocks; verify mass per block from certificates; acceptance: cumulative mass within $\pm 2\%$ of required; evidence: tally sheet and stack photo with IDs visible. |
| 11                           | Check stacking pattern (staggered joints, interlocks, no rocking); overhang $\leq 50$ mm; method: tape check; evidence: side-profile photos with dimensions.                              |
| 12                           | Verify grillage/cribbing dimensions and timber/steel grade; bearing stress $\leq$ allowable; evidence: material tags, grade certificates, and calc snippet.                               |
| 13                           | Confirm anti-topple restraints (chains/straps/stops) installed per design; acceptance: tensioners locked and tagged; evidence: photo of each restraint with tag numbers.                  |

| Reaction Piles/Anchors |   |
|------------------------|---|
| 14                     | Review installation logs for reaction piles/anchors (depth, diameter, tendon/strand data, grout volumes); acceptance: meets approved design; evidence: signed log extracts.                         |
| 15                     | Verify grout/concrete strength test results meet required value before use; method: lab report; evidence: test certificates showing date, age, and strength.  |
| 16                     | Inspect head hardware (plates, nuts, couplers); torque nuts to manufacturer/approved spec using a calibrated wrench; acceptance: torque within $\pm 10\%$ ; evidence: torque log and wrench serial. |
| 17                     | Check pile/anchor alignment and inclination; tolerance: within design $\pm 1^\circ$ ; method: inclinometer/plumbline; evidence: readings and head photos.   |

| Reaction Beams and Frames |  |
|---------------------------|--|
| 18                        | Confirm beam/box sections, stiffeners, and spreader plates match drawings; evidence: member ID photos and heat/grade certificates attached.  |
| 19                        | Examine welds and bearing seats; acceptance: no visible cracks, undercut, or distortion; method: visual inspection with good lighting; evidence: close-up photos and inspector initials. |
| 20                        | Verify bolts/clamps grade and pretension; torque to approved values; acceptance: $\pm 10\%$ of target; evidence: torque log and bolt batch certificates.                                 |
| 21                        | Check hardened bearing plates under jack; flatness within 0.2 mm across bearing; method: straightedge/feeler gauge; evidence: measurement photo.   |

| Instrumentation and Data Chain |  |
|--------------------------------|--|
| 22                             | Confirm hydraulic jack and pressure gauge/transducer calibration certificates current (e.g., within 12 months per approved project specifications); evidence: certificates and serial numbers. |
| 23                             | Verify load cell capacity $\geq$ required and calibration traceability; perform zero check; acceptance: zero within $\pm 0.5\%$ FS; evidence: zero log and certificate.                        |
| 24                             | Ensure displacement sensors (LVDTs) mount to independent reference frame, not the reaction system; evidence: photos showing mounting and gauge lengths.  |
| 25                             | Check data logger channel mapping, sampling rate $\geq 1$ Hz, and time synchronization; evidence: configuration screenshot and saved setup file.   |

| Documentation and Approvals |   |
|-----------------------------|---|
| 26                          | Verify approved method statement, drawings, and risk assessment cover the reaction system; evidence: approval stamps, revision numbers, and reviewer signatures.  |
| 27                          | Establish exclusion zone, barriers, and signage around the reaction system; acceptance: access controlled on all sides; evidence: site photos and permit-to-work. |
| 28                          | Conduct multidisciplinary pre-use walkdown (contractor, consultant, QA); record actions closed; evidence: signed checklist and QR-secured sign-off.               |

**Comments:**

Filled by:

Signature:

| Introduction   | How to use this checklist   |
|--|---|
| <p>Verify Reaction Systems is a focused checklist for confirming the capacity, stability, and instrumentation of kentledge, reaction piles, and reaction beams before any load is applied. It covers reaction system checks, kentledge verification, and anchor/reaction pile readiness without entering into load test execution. By systematically reviewing design capacity, bearing and bracing, alignment and clearances, and the entire data chain (jack, gauges, load cells, LVDTs, and logger), you reduce the risk of catastrophic instability, under-capacity, eccentric loading, or misleading measurements. The outcome is a stable, compliant, and traceably documented reaction arrangement that is ready for the separate load test procedure. This checklist is tailored to site engineers, QA/QC leads, and third-party inspectors working on static load test setups for foundations and structures. Use it to standardize evidence capture, accelerate approvals, and prevent costly rework. Start in interactive mode to tick items, add comments, attach photos and certificates, and export to PDF/Excel with a QR-secured record.</p> | <p>1. Preparation: Gather approved drawings, method statement, geotechnical report, and calibration certificates. Bring measuring tapes/laser, digital level, torque wrench, feeler gauges, camera, laptop/tablet, and PPE. Ensure safe access and lighting. 2. Open the checklist on your device, enter project identifiers, select reaction system type (kentledge, piles/anchors, beams), and confirm the maximum required jack force from the approved documents. 3. Using the Interactive Checklist: Tick items as you verify, attach photos, enter measurements (mm, kN, MPa), and link certificates. Add comments to flag issues and assign actions with due dates. 4. Capture Evidence: Upload calculation sheets, torque logs, calibration records, and marked-up drawings. Use the device camera to document alignment, stacking patterns, labels, and cable routing. 5. Collaborate: Share the checklist with contractor, consultant, and QA reviewers. Use threaded comments to resolve findings and record approvals per approved project specifications and authority requirements. 6. Export: Generate an export as PDF/Excel for pre-test review meetings. Include photos, signatures, timestamps, and equipment serial numbers for traceability. 7. Sign-Off: Obtain digital signatures from responsible parties. Lock the record with a QR code for on-site verification and archive it in the project document control system.</p> |