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Control bentonite slurry: QA tests and actions checklist

Control bentonite slurry with an interactive checklist for density, viscosity, sand content, pH, and filtrate loss; fully commentable and export as PDF/Excel with QR verification.

Project:	
Date:	
Filled by:	

Sampling & Preparation	
1	Confirm materials policy excludes polymers; review delivery tickets and Safety Data Sheets (SDS) to verify only bentonite and approved water conditioners are on site. Photograph labels and storage areas as evidence.
2	Record water source and clarity; ensure makeup water is free of oil and excessive silt. Document source, take a photo of water clarity, and note temperature (target 5–35 °C).
3	Hydrate bentonite by gradually adding powder to water under agitation; allow 4–12 hours. Acceptance: homogeneous gel with no lumps or undissolved clumps. Record start/finish times and batch mass (kg).
4	Take representative mid-depth slurry samples using a clean bailer or sampling thief after flushing the line. Label containers with location, depth, date, and time; photograph the sampling point.

Density & Viscosity	
5	Calibrate mud balance with freshwater (target 1000 kg/m³ at ~20 °C). Acceptance: instrument zero within ±10 kg/m³. Record instrument ID and calibration photo.
6	Measure slurry density at start of excavation and at least hourly. Acceptance during excavation: 1030–1100 kg/m³ unless project specifies otherwise. Log readings and attach balance scale photo.
7	Measure pre-concreting density at surface and near toe. Acceptance: ≤1150 kg/m³ before tremie placement. Record depth of sampling, value, and location photo of test setup.
8	Run Marsh funnel test to 946 mL (use stopwatch). Acceptance: 32–50 s during excavation; 32–40 s immediately before concreting. Record seconds and ambient temperature; photograph funnel discharge.

Sand Content	
9	Check sand content kit cleanliness, screen integrity, and graduated tube zero. Rinse with site water and document readiness with a photo.
10	Test sand content at least every 10 m³ pumped or hourly. Acceptance during excavation: ≤4% by volume. Record percentage and test location; include image of graduated tube.
11	Verify sand content immediately before concreting. Acceptance: ≤2% by volume. If high, circulate through desanding plant or clean the base; retest until within limit. Record corrective action and retest results.

pH and Chemistry	
12	Measure pH of makeup water and slurry with a calibrated meter or high-quality strips. Acceptance: 8.5–11.5. If pH <8.5, dose soda ash incrementally; if >11.5, dilute with compliant water. Record pH and actions.
13	Note slurry temperature (target 5–35 °C). If <10 °C, extend hydration time; if >35 °C, shade tanks and monitor viscosity drift. Record temperature and any adjustments.
14	Prevent contamination from cement, salts, diesel, or excavated debris. Inspect tanks, lines, and excavation base; photograph any contamination and document removal/cleaning performed.

Filtrate Loss (Filter Press)	
15	Inspect filter press cup, paper, and gaskets; set test pressure to 690 kPa and confirm gauge reading. Record instrument ID and pre-test photo.
16	Run 30-minute filtrate loss test on representative sample. Acceptance: ≤25 mL in 30 minutes unless project specifies otherwise; filter cake 1–3 mm, uniform, uncracked. Record volume and cake thickness photo.
17	If filtrate exceeds limit or cake is cracked, increase bentonite concentration (e.g., +5–10 kg/m³), allow rehydration, circulate, and retest. Record batch IDs, dosage, and improved results.

Recordkeeping & Corrective Actions	
18	Log all readings with date, time, excavation ID, depth, tester, and instrument IDs. Attach geo-tagged photos of each test and the sampling location.
19	Document out-of-tolerance causes and corrective actions taken (dilution, desanding, bentonite addition, pH adjustment). Include quantities, lot numbers, and retest results. Obtain supervisor review and signature.
20	Issue hold on concreting/excavation if any key parameter remains noncompliant; notify the engineer per approved project specifications and authority requirements. Record notifications and approvals.
21	Confirm exclusion of polymers daily: inspect deliveries, storage, and mix logs; segregate and label nonconforming materials for removal. Capture photos and keep SDS on file.

Comments:

Filled by:

Signature:

Introduction	How to use this checklist
Control bentonite slurry is critical to keeping excavations stable and ensuring clean, bondable concrete interfaces. This checklist focuses on bentonite slurry testing and slurry quality control using proven field methods: mud balance density, Marsh funnel viscosity, sand content kit, pH measurement, and filtrate loss on a filter press. It applies to bored piles, diaphragm walls, and similar foundations where slurry supports open excavation. By holding density, viscosity, solids, alkalinity, and filtrate within target ranges, you reduce risks of sidewall collapse, debris inclusions, excessive bleed, and weak zones in the completed element. The scope excludes polymers; only sodium bentonite hydration and non-polymer treatments (e.g., soda ash for pH adjustment) are considered. Outcomes include predictable excavation performance, lower cleaning time, and consistent concrete quality. Use this interactive list to track readings, flag nonconformities, record corrective actions, and attach evidence. Start in interactive mode, tick items, add comments, and export PDF/Excel with a QR-secured audit trail.	1. Prepare tools: mud balance, Marsh funnel, stopwatch, sand content kit, pH meter/strips, filter press (690 kPa), thermometer, sampling bailer, labels, and camera. Review project limits and confirm polymers are excluded. 2. Open the interactive checklist, select the project and excavation ID, and set test frequencies per approved project specifications and authority requirements. 3. Start sampling and run each test. Enter readings with units (kg/m³, s/946 mL, %, pH, mL, °C). Attach clear photos of instruments and sampling points. 4. Use comments to note site conditions, anomalies, and suspected causes. Tag supervisors or QA/QC for quick review. 5. If out-of-tolerance, log corrective actions, materials added (kg), times, and equipment used. Schedule and perform retests; link them to the action. 6. Before concreting, run and record final density, viscosity, sand content, pH, and filtrate loss at surface and at depth as applicable. 7. Export the completed record to PDF/Excel and share with stakeholders. The export includes a QR code for authentication. 8. Collect digital signatures from the tester, supervisor, and engineer. Archive the record for traceability and close the checklist.