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Permeation/Pressure Grouting Checklist and QA Guide

Permeation/pressure grouting interactive checklist to confirm mix, stage pressures, grout take, refusal, and verification tests; fully commentable and export as PDF/Excel.

Project:	
Date:	
Filled by:	

Pre-Grouting Preparation	
1	Review approved method statement and drawings; confirm jet grouting is excluded; record approvals and version numbers with signatures.
2	Locate and mark utilities and exclusion zones using calibrated locator and survey; capture georeferenced photos and permit references.
3	Verify grout plant layout: mixers, agitators, pumps, hoses, and packers; ensure spill trays and washout area; photograph setup.
4	Confirm pressure gauges and flow meters have valid calibration; log serial numbers, ranges, and certificates; acceptance: within validity per approved project specifications and authority requirements.

Mix Design and Materials Control	
5	Check cement/chemical grout materials: type, batch numbers, and shelf-life; acceptance: materials match submittals; attach delivery tickets and photos of labels.
6	Confirm target mix: water–cement ratio or component ratios and admixtures; acceptance: proportions within ±2% by mass; record digital scale readings.
7	Measure Marsh cone viscosity and grout density; acceptance: within ±10% of target viscosity and ±20 kg/m³ of target density; upload instrument readings.
8	Control grout temperature; acceptance: 5–30 °C at injection; record with calibrated thermometer and ambient conditions.

Drilling and Hole Preparation	
9	Drill injection holes to designed depth and diameter; acceptance: depth within ±0.1 m and deviation ≤2%; record survey and drilling logs.
10	Install packers sized to hole; pressure test line and packer to 1.25× planned stage pressure for 1 min; acceptance: pressure drop ≤10%.
11	Flush hole until clear returns; acceptance: turbidity stable and no blockage; document with photo of returns and flow rate.
12	Log ground conditions per 1 m interval (soil/rock type, joints, water inflow); upload annotated log with timestamp and chainage.

Grouting Execution and Monitoring	
13	Begin injection at low pressure; ramp to stage pressure in increments; acceptance: do not exceed design stage pressure; record pressure vs time.
14	Track grout take volume per stage; acceptance: within design envelope or triggers for additional stages; log cumulative litres with timestamps.
15	Control flow rate using calibrated flow meter; acceptance: within ±15% of target; capture flow curve screenshot or photo each stage.
16	Monitor ground movement at reference points using level or prisms; acceptance: uplift/heave ≤5 mm outside treatment zone; attach survey readings.
17	Manage returns and leaks; seal surface cracks and annuli as needed; acceptance: no uncontrolled discharge; document mitigation steps.

Refusal and Stage Completion	
18	Apply refusal criteria: stable near-design pressure with flow <5 L/min for ≥5 min, or no take for two increments; record evidence.
19	Hold and observe pressure decay for 5–10 min; acceptance: decay trend per design expectations; decide on secondary/tertiary splits; document decision.
20	Mark completed holes on plan; advance primary–secondary–tertiary sequence per pattern; acceptance: spacing per design; upload marked plan.

Records and Verification Testing	
21	Conduct pre- and post-grouting water permeability (e.g., Lugeon) tests where specified; acceptance: permeability reduction meets design; attach raw data and plots.
22	Compile as-built report: hole logs, pressures, volumes, flow, refusals, batch tickets, calibrations; export PDF/Excel with QR; obtain digital sign-offs.

Comments:

Filled by:

Signature:

Introduction	How to use this checklist
Permeation/pressure grouting is a controlled injection method used to penetrate voids and joints in soils or rock, improving ground by reducing permeability and enhancing stability. This checklist focuses on permeation grouting and pressure injection, not jet grouting, and guides teams through confirming the mix, staging pressures, monitoring grout take, documenting refusal, and executing verification tests. It supports cementitious and chemical grouts, addresses packer use, and emphasizes calibrated meters, repeatable procedures, and acceptance evidence. By following these steps, contractors and inspectors minimize risks such as hydrofracture, heave, uncontrolled returns, underperformance, and undocumented variations. The outcome is predictable seepage control and reliable ground improvement, supported by traceable data for review. Use this interactive checklist to tick items, add comments with photos and readings, and export to PDF/Excel with a QR code that authenticates records for stakeholders.	1. Preparation: Assign roles, gather approvals, and ensure site access. Prepare grout plant, drill rig, packers, gauges, flow meter, thermometers, and sampling tools. Confirm devices are charged and connected for photo, GPS, and signature capture. 2. Open the checklist and switch to interactive mode. For each item, tick completion, enter readings (pressure, flow, volume, temperature), and add photos or sketches. Use comments to capture deviations and approvals. 3. Use tags to link items to specific holes and stages. Attach material batch tickets, calibration files, and test results to the corresponding steps for full traceability. 4. Export and share: Generate an audit-ready PDF/Excel with embedded logs, photos, and plots. A QR code on the cover authenticates the dataset for stakeholders. 5. Sign-Off: Capture digital signatures from contractor, inspector, and designer as required. Archive to the project folder and distribute the QR-authenticated report.