



Install piezometers or observation wells – QA checklist

Install piezometers or observation wells using an interactive checklist that is commentable and export as PDF/Excel. Ensure proper development, sealing, and baseline groundwater levels.

Project:

Date:

Filled by:

Pre-Installation

1	Obtain written utility clearances and drilling permit; scan the area with GPR or EMI before mobilization. Acceptance: documented clearances, marked exclusion zones. Evidence: permits, utility maps, photos with dated markings.
2	Survey and stake borehole coordinates and ground elevation using GNSS/total station. Tolerance: horizontal ± 0.05 m, elevation ± 0.01 m. Evidence: survey report, stake photo with ID and coordinates.
3	Verify materials (screen, riser, caps, centralizers, filter sand, bentonite, grout) against approved submittals. Acceptance: dimensions, slot size, SDR/class match. Evidence: photos of labels, mill certs, lot numbers.
4	Decontaminate tools, surge blocks, pumps, and sampling gear with approved detergent and potable water. Acceptance: no visible residue; equipment tags updated. Evidence: decon log with time, method, and initials.
5	Calibrate electronic water level meter and field probes (EC, pH, temperature) per manufacturer. Acceptance: level meter repeatability ± 0.01 m; probe checks within spec. Evidence: calibration sheet and serial numbers.

Drilling and Borehole Preparation

6	Drill borehole to design depth/diameter using hollow-stem auger or cased rotary per approved project specifications and authority requirements. Tolerance: depth ± 0.2 m, diameter per tool size. Evidence: driller's log and depth tags.
7	Record lithology, groundwater strikes, and penetration rate at 1 m intervals. Acceptance: continuous log with times and depths. Evidence: completed borehole log with photos of representative cuttings/cores.
8	Stabilize borehole with temporary casing or drilling fluid as required to prevent collapse. Acceptance: no loss of sidewall material or bridging. Evidence: notes on casing depth and fluid properties.
9	Clean borehole bottom by bailing/circulating until returns are clear of fines. Acceptance: visual fines reduced; bottom tagged within 0.05 m of target. Evidence: photo of discharge clarity and tag depth reading.

Screen and Riser Installation

10	Assemble screen and riser with flush-threaded joints; apply PTFE tape if specified; check straightness. Acceptance: deviation <1% of length. Evidence: assembly photos and joint torque record if applicable.
11	Install centralizers at specified intervals to center the screen. Acceptance: uniform annular gap 20–50 mm around screen. Evidence: photos before lowering and at surface with spacing noted.
12	Lower string to place screen across target interval; confirm with weighted tape or tag line. Tolerance: top and bottom screen elevations ± 0.05 m. Evidence: depth verification log and photos of measurements.
13	Fit bottom end cap and verify secure attachment. Acceptance: positive engagement, no play. Evidence: photo of cap prior to lowering and note in log.
14	Record screen slot size, length, and riser diameter/class as installed. Acceptance: matches design/submittal. Evidence: photos of product markings and entry in materials register.

Gravel Pack and Annular Seal

15	Place washed filter sand/gravel via tremie from bottom up to design elevation above screen. Acceptance: continuous placement; volume within $\pm 10\%$ of annulus calculation. Evidence: tremie log and delivery tickets.
16	Install bentonite seal above filter pack (minimum 0.5 m or per design) and hydrate with clean water. Acceptance: full swelling achieved, no bridging. Evidence: hydration time/volume recorded and photo of pellets/chips.
17	Grout remaining annulus to surface using bentonite-cement or neat cement via tremie. Acceptance: continuous positive return at surface; volume within $\pm 10\%$ of theoretical. Evidence: batch tickets and grout volume log.
18	Construct surface completion: protective steel casing with lock, concrete apron (fall 1:40), and marker. Acceptance: cap secure; finish flush or stick-up as specified. Evidence: photos and dimension check.
19	Establish permanent measuring point on riser; survey top-of-casing elevation. Tolerance: ± 0.01 m elevation. Evidence: survey file, benchmark reference, and stamped note.

Development and Baseline Measurements

20	Develop well by surge-and-purge or low-rate pumping until stabilization: turbidity and EC/temperature vary <10% over three consecutive readings. Evidence: development log with volumes, times, and parameter trends.
21	Manage and dispose of development water per project environmental plan. Acceptance: no discharge to sensitive areas. Evidence: disposal manifest or photos of controlled discharge area.
22	Measure static groundwater level relative to reference point using calibrated water level meter. Acceptance: duplicate readings within ± 0.01 m; record time and barometric pressure if available. Evidence: field sheet and photo of meter display.
23	Record baseline field parameters (temperature, EC, pH) after stabilization. Acceptance: values stable across three readings at 1–2 minute intervals. Evidence: instrument serial and data sheet.
24	Apply durable ID tag showing well ID, total depth, screen interval, and surveyed datum. Acceptance: legible and weather-resistant. Evidence: close-up photo of tag.

Documentation and Handover	
25	Compile as-built drawing with coordinates, elevations, depths, screen/pack intervals, and seal volumes. Acceptance: reconciles with logs and delivery tickets. Evidence: PDF/DWG and sign-off.
26	Attach photo record: location stake, materials, assembly, tremie placement, surface completion, and datum marking. Acceptance: clear, dated images. Evidence: photo index embedded in as-built.
27	Update well register and monitoring plan; include access instructions and lock key control. Acceptance: database entry complete. Evidence: updated register export and distribution email.
28	Brief operations team on safe access, measurement procedure, and contamination prevention. Acceptance: attendance sheet signed. Evidence: toolbox talk record and slides.

Comments:

Filled by:

Signature:

Introduction	How to use this checklist
Install piezometers or observation wells is a specialized task requiring disciplined drilling, precise installation, proper sealing, and accurate baseline groundwater measurements. This checklist supports groundwater monitoring wells—standpipe piezometers and observation boreholes—ensuring the annulus is sealed, wells are developed effectively, and data quality is defensible. It focuses on construction and commissioning steps only; pump test analysis and long-term aquifer testing are intentionally excluded. By following these steps, teams mitigate risks such as formation collapse, inter-aquifer leakage, clogged screens, contaminated readings, and uncertain datums. You'll confirm materials against submittals, track borehole conditions, place gravel filter packs and bentonite/grout seals via tremie, develop with surge-and-purge or low-rate pumping, and capture stabilized water levels with a surveyed reference. The outcome is a durable, verifiable installation ready for routine monitoring and compliance reporting per approved project specifications and authority requirements. Use this interactive checklist to tick items, add field comments, and export PDF/Excel—secured by QR.	1. Preparation: Confirm scope, locations, and approved submittals. Gather drilling, tremie, development tools, survey gear, calibrated water level meter, PPE (gloves, eye protection, hearing protection), decon supplies, forms, and camera. Ensure permits and utility clearances are uploaded. 2. Using the Interactive Checklist: Start interactive mode, tick items as completed, attach photos, enter measurements and volumes, and tag comments to items for clarifications or NCRs. Mention serial numbers and lot codes directly in item fields. 3. Export and Share: Generate an export as PDF/Excel to share with supervisors and the client. The QR code on each export links back to the authenticated record for verification and audit trails. 4. Sign-Off and Archive: Capture digital signatures from contractor, supervisor, and client. Lock the checklist to prevent edits, archive it in the project document system, and distribute the final as-built package with coordinates, logs, and photos.