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Verify project control points and benchmarks before works

Verify project control points and benchmarks before works via an interactive, commentable checklist that exports as PDF/Excel for coordinates and elevations.

Project:
Date:
Filled by:

Pre-mobilization Survey Control Review	
1	Obtain approved survey control plan and coordinate schedule; use the CDE to verify latest revisions, datum, projection, and units per approved project specifications and authority requirements; record reviewer, date, and file path; evidence: signed review log.
2	Calculate grid-to-ground scale factor using site elevation and projection parameters in survey software; acceptance: factor documented to six decimals and applied consistently; evidence: calculation sheet stored in CDE.
3	Confirm required positional tolerances for control class (horizontal and vertical) from project documents; acceptance: tolerances recorded (e.g., horizontal ±5 mm, vertical ±8 mm); evidence: QA checklist entry signed by survey lead.

Coordinate System and Datum	
4	Verify horizontal datum and projection by re-solving transformation from supplied base points using least-squares adjustment; acceptance: residuals ≤ 0.008 m; evidence: adjustment report uploaded to CDE.
5	Verify vertical datum and geoid model by running a two-benchmark closed level loop (approx. 1.0 km); tool: digital level and staff; acceptance: closure ≤ ±4 mm√km; evidence: level book and photos.
6	Confirm coordinate epoch and any time-dependent parameters for GNSS control; tool: GNSS processing software; acceptance: epoch stated and consistent across files; evidence: processing summary.

Reference Monuments and Benchmarks	
7	Locate reference monuments per drawings using GNSS for search, then total station for precise position; acceptance: measured coordinates within 0.020 m of published; evidence: comparison table and geotagged photos.
8	Inspect physical condition and stability of monuments/benchmarks; tool: visual inspection and gentle pry test if safe; acceptance: undisturbed, cap legible, no movement; evidence: close-up photos with IDs.
9	Check intervisibility between primary control points using prism pole and line-of-sight; acceptance: unobstructed sight lines or documented offsets/backsights; evidence: photos and notes.
10	Confirm redundancy: minimum three non-collinear primary control points accessible at all times; tool: site walk and sketch; acceptance: triangle geometry with angles > 30 degrees; evidence: annotated plan.

Field Verification and Tolerances	
11	Establish a closed leveling loop tying at least three benchmarks; tool: digital level; acceptance: closure ≤ ±4 mm√km, mean misclosure distributed; evidence: leveling report signed by checker.
12	Perform RTK GNSS check at control points with minimum 120 s occupations; tool: GNSS rover and base or network RTK; acceptance: H ≤ 10 mm + 1 ppm, V ≤ 15 mm + 1 ppm; evidence: rover screenshots.
13	Set total station resection using three or more known points; tool: resection routine; acceptance: distance/angle residuals ≤ 0.005 m and orientation error ≤ 20 arcsec; evidence: instrument report.
14	Execute independent check by a separate instrument/crew on a subset of points; tool: repeat survey; acceptance: differences ≤ ±0.008 m; evidence: comparison sheet signed by independent checker.
15	Verify calibration certificates for GNSS, total station, and digital level; tool: certificate review; acceptance: within manufacturer limits and issued within the last 12 months; evidence: certificate photos.

Documentation and Records	
16	Export raw observations and adjusted coordinates (CSV/RINEX/RAW) to the project CDE; tool: survey software; acceptance: files named to standard and versioned; evidence: CDE links recorded in checklist.
17	Update the control point schedule with IDs, descriptions, coordinates, elevations, tolerances, and access notes; tool: project template; acceptance: peer-reviewed and approved; evidence: signed schedule PDF.
18	Redline the site plan to show control IDs, tie distances, and protection details; tool: CAD or markup app; acceptance: legible, scaled, north arrow present; evidence: uploaded markup and photo of print.
19	Compile a control verification report summarizing methods, residuals, closures, and compliance per approved project specifications and authority requirements; acceptance: QA lead approval; evidence: signed PDF in CDE.

Controls Protection and Handover	
20	Install protective stakes/guards and high-visibility paint at each control; tool: stakes, caps, high-vis paint; acceptance: ID and elevation labeled; evidence: photos with tape measure for context.
21	Establish an exclusion zone around critical points; tool: barrier tape and signage; acceptance: zone extents recorded on plan; evidence: toolbox talk attendance and site photos.
22	Set a hold point: commencement of works contingent on control acceptance; tool: permit/ITP; acceptance: client or superintendent sign-off; evidence: signed hold-point release.
23	Place a QR code on the site noticeboard linking to the control report; tool: QR generator; acceptance: link opens on mobile devices; evidence: test screenshot saved.
24	Define re-verification triggers (weekly, after rainfall > 25 mm, or disturbance); tool: look-ahead planner; acceptance: schedule published to team; evidence: calendar invite.
25	Establish backup reference points offset from construction activity; tool: set nails/bolts and measure ties; acceptance: offsets recorded to ±0.010 m; evidence: sketch and photos.

Comments:

Filled by:

Signature:

Introduction	How to use this checklist
Verify project control points and benchmarks before works anchors all downstream setting-out to a stable, documented control framework. This checklist guides survey control verification, benchmarks validation, and the confirmation of reference monuments, coordinate systems, and elevations with clear tolerances. It focuses solely on pre-construction survey control, not production layout or as-built surveys. By confirming datums, projections, scale factors, intervisibility, redundancy, and documentation, you eliminate scale and orientation errors, height shifts, and mis-stationing that cause costly rework. Field methods include closed leveling, GNSS checks, and total station resection with independent confirmation and calibration evidence. Outputs include a signed verification report, updated control schedule, protected monuments, and a defined re-verification plan. Use this checklist to achieve geospatial certainty, meet approvals per approved project specifications and authority requirements, and protect control points before heavy equipment mobilizes. Start interactive mode to tick items, add comments, attach photos, and export PDF/Excel from a QR-secured link.	1. Preparation: mobilize GNSS rover/base or network RTK access, total station, digital level with staff, tripods/tribrachs, stakes/paint, PPE, and communication devices. Confirm the latest drawings, control schedule, and project specifications are in the CDE. Plan safe access and intervisibility before fieldwork. 2. Using the Interactive Checklist: open interactive mode, assign items to team members, tick completed steps, attach photos/screenshots, and log instrument reports. Use comments to capture observations, calculations, or deviations and tag reviewers for quick resolution. 3. Export and Sharing: when all items are completed or staged for approval, export the checklist and evidence as PDF/Excel. Share links from the CDE to stakeholders and print a QR code for site access to the latest approved records. 4. Sign-Off and Archiving: gather digital signatures from the survey lead and client representative, close any hold points, and archive versions with unique IDs. Retain raw data, reports, and sign-offs under controlled folders for audit readiness.