

CONSTRUCTION MANAGEMENT AND QUALITY ASSURANCE PROTOCOLS

Repair and strengthening work in
occupied schools and health facilities



PLANNING



SITE
SUPERVISION



TESTING



SAFETY



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ASSURANCE



REPORTING



STRONGER DELIVERY • SAFER FACILITIES • BETTER QUALITY



Document control

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These Protocols are a companion to the approved project design and specification. They do not replace the Building Code of Pakistan, a site investigation, a signed design, a decision of the Authority Having Jurisdiction, or the project-specific judgement of a competent engineer. The intended result is a traceable design basis that records hazards, design horizons, selected criteria, calculations, review decisions and residual risks.

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Abbreviations

Term	Meaning
AHJ	Authority Having Jurisdiction
BCP-2021	Building Code of Pakistan 2021
DQA	Dr. Qaisar Ali Associates
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH
ITP	Inspection and test plan
KnK	Kokkyo naki Kodomotachi Japan
NCR	Non-conformance report

Release-point vocabulary

The meaning of each release point is fixed in the project quality plan and in every inspection and test plan. The definitions below are the drafting basis; the project definition governs.

Point	Intent	The project shall define
HOLD	The activity does not advance beyond the point until the named release is recorded.	Scope, trigger, notice period, evidence, releasing role, waiver route, restart and record status.
WITNESS	The named party receives a planned opportunity to observe a defined activity or test.	Notice, response, attendance, whether progress may continue after notice is given, and the evidence retained.
REVIEW	A controlled document or evidence package is routed for a stated review.	Purpose, response statuses, routing and the effect on procurement or work release.
SURVEILLANCE	Selective or continuing observation of process implementation and emerging risk.	Coverage, recorder, reporting and escalation route, and the relation to inspection and acceptance.

Release rule. Progress is permitted only after the release defined by the approved project quality plan has been recorded. Attendance at a witness point, non-attendance after notice, or completion of a checklist does not by itself authorize progress; unsigned or partly signed records have no release effect unless the approved procedure expressly defines the alternative authority, evidence and record status.

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1 Scope, Authority and Requirement Hierarchy

Repair and strengthening in an occupied school or clinic is carried out inside a working public building, on a structure whose properties were discovered rather than specified. The quality system has to control both the work and the interaction between the work and the facility.

Figure 1.1 shows how a package moves through the six stages of this protocol, and the four release points that gate every stage.

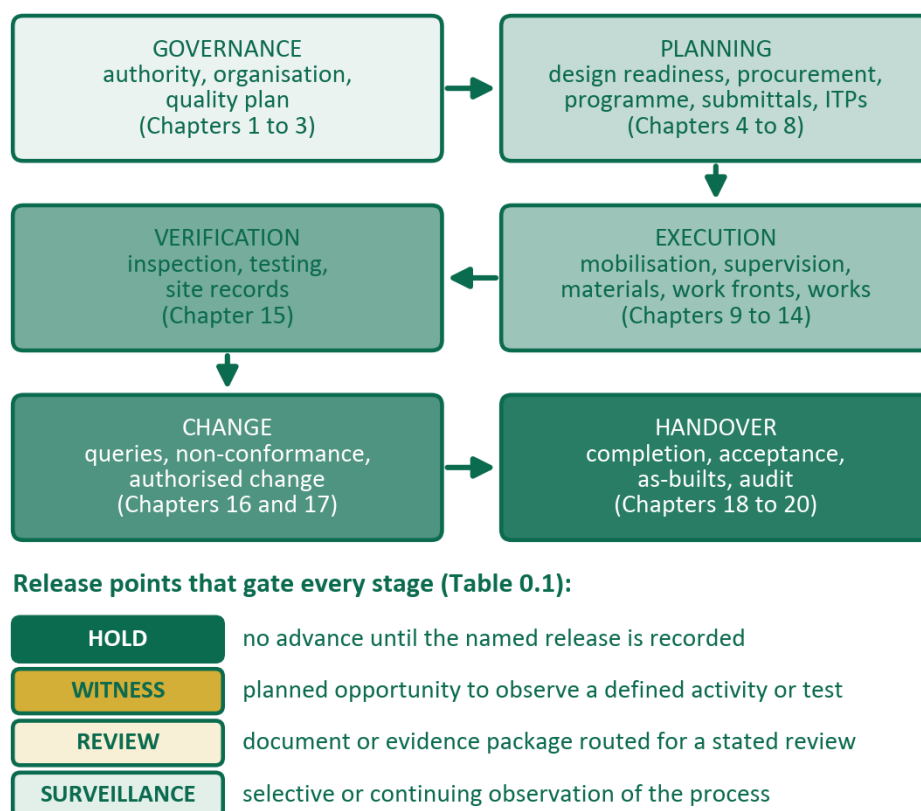


Figure 1.1 How a package moves through this protocol

1.1 Definition of the authority having jurisdiction

Authority Having Jurisdiction (AHJ): an organization, office, or individual responsible for enforcing the requirements of the applicable code or instrument, or for approving equipment, materials, an installation, or a procedure. Under BCP-2021, the AHJ is whichever of the following has jurisdiction for the location: Building Control, Housing and Development Authorities; District Administration; Tehsil or Town Administration; Municipal Administration; Station Headquarters (Army, Air Force and Navy); Cantonment Administration; Union Council Administration; Autonomous Bodies; Industrial Estates; Directorates of Civil Defense; Export Processing Zones; and other Federal or Provincial Authorities as notified. Where more than one instrument applies to a facility, more than one authority may hold jurisdiction, each within the scope of the instrument it enforces.

1.0.1 The project shall identify and record in the project quality plan, before any work front is released, the authority having jurisdiction for each instrument that has regulatory effect at the facility, selecting from the categories recognized by BCP-2021 whichever has jurisdiction for the location. For each, the record shall state the instrument enforced, the office or individual responsible for enforcing it, the basis on which that authority has jurisdiction for the location, and the scope and limits of its function. An authority shall not be recorded as the AHJ unless the basis for its jurisdiction is identified. Where the enquiry establishes that no office is responsible for enforcing a given provision at that facility, that finding shall be recorded and clause 8.3.3 applies.

1.2 Authority

Table 1.1 Authority controls

Control	Requirement
Use when	At project setup, package starts, change of contract or design issue, and whenever instructions conflict.
Required input	Contract, approved design and specification, permits and conditions of the Authority Having Jurisdiction, design handover, project plans and the responsibility matrix.
Authority	Applicable law, the decisions of the Authority Having Jurisdiction, and the contract hierarchy govern.
Boundary	This protocol does not design permanent or temporary work, set technical acceptance values, approve products or certify completion. Those remain with the designer, the specialist and the authorities.

1.3 Requirement hierarchy

Table 1.2 Requirement hierarchy

Priority	Class	Control question
1	Applicable law, notification, AHJ decision and permit	What has regulatory effect on this location?
2	Contract and the approved issued-for-construction design and specification	Which issue and revision governs this work front?
3	Approved project plans, quality, safety, environment, safeguarding, facility continuity	What controls has the project committed to?
4	Approved submittals, method statements and inspection and test plans	What has been accepted for this specific package?
5	Adopted management-system standards	What consistent process framework applies?

The precedence order and the conflict-and-hold rule are summarized in Figure 1.2.

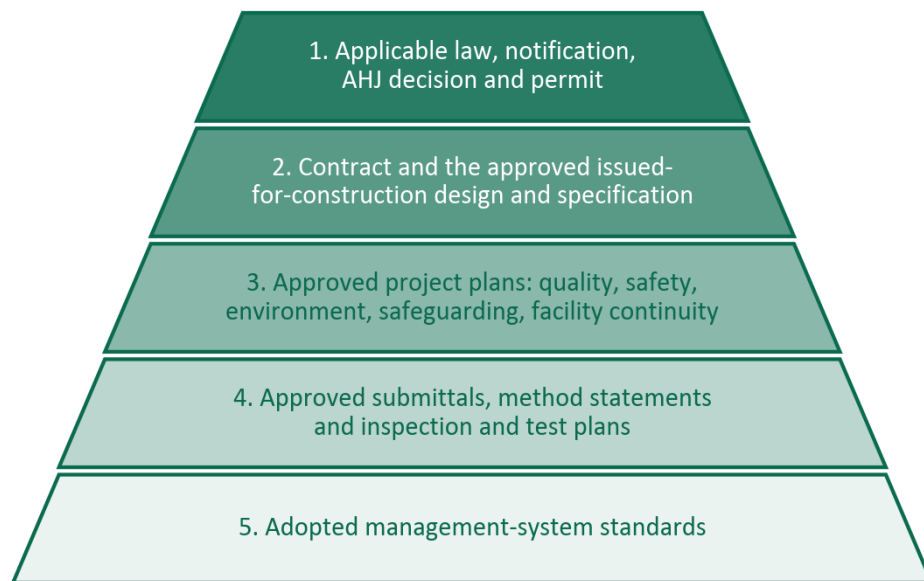


Figure 1.2 Requirement precedence and the conflict-and-hold rule

- 1.2.1** Where requirements conflict, the affected work shall be held, both sources preserved, and the conflict resolved through the contract route. The most convenient provision shall not be selected.
- 1.2.2** No work front shall be released without an applicable approved design issue. A general instruction to proceed is not a design release.
- 1.2.3** Under BCP-2021, provisions in the appendices do not apply unless specifically adopted. Where the works rely on Appendix A for seismic evaluation and retrofit, or on Appendix B for flood-resistant construction, the project shall confirm and record that the appendix has been adopted by the authority having jurisdiction for the location, or that it is applied as a project requirement under the contract. The basis of application shall be recorded before design release. An appendix shall not be treated as mandatory by default, and shall not be disregarded where the contract adopts it.

1.4 Package identity and release authority

Table 1.3 Package identity and release authority

Control area	Verified	Evidence and limit
Package identity	Facility and block, work package, design drawing and specification references and revisions.	One stable package reference across every record.
Release authority	The named role for document, work-front, concealment, test, temporary-works and completion release.	Contract-specific meanings recorded in the quality plan.
Design boundary	Owners of permanent and temporary design, delegated design and specialist design, and the checking and approval interfaces.	No transfer of design responsibility through a shop-drawing review stamp.
Acceptance basis	The exact project criterion, method, frequency or coverage, record and deciding role.	No criterion taken from memory or from a blank template.

Control area	Verified	Evidence and limit
Record status	Draft, submitted, reviewed, approved, rejected, superseded, as-built or closed, as defined by the project.	Status meanings fixed in the document-control procedure.

Figure 1.3 shows the document-status lifecycle these controls produce.

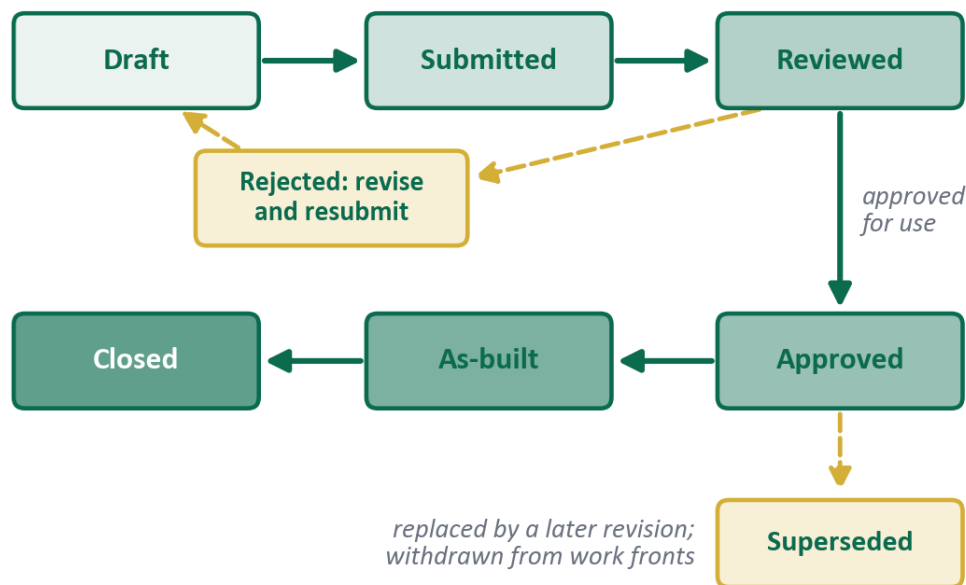


Figure 1.3 Document-status lifecycle

1.5 Hold and escalation

Table 1.4 Hold and escalation

Condition	Status	Response
No approved design or specification for the work front	HOLD	Obtain the applicable issue and resolve gaps.
Conflicting instruction, criterion or revision	HOLD	Raise a controlled query; preserve both sources.
Design or acceptance responsibility unclear	HOLD	Resolve the role and authorization in writing.
Request to proceed based on verbal direction alone	RECORD AND REFER	Use the contract instruction or emergency route before permanent work proceeds.
A quality release would expose people or the environment to unmanaged risk	STOP	Safety and environmental control are independent of quality acceptance.

Figure 1.4 maps conditions of this kind to their branch: STOP, RECORD AND REFER, or HOLD. The same logic recurs at every hold and escalation table in this protocol.

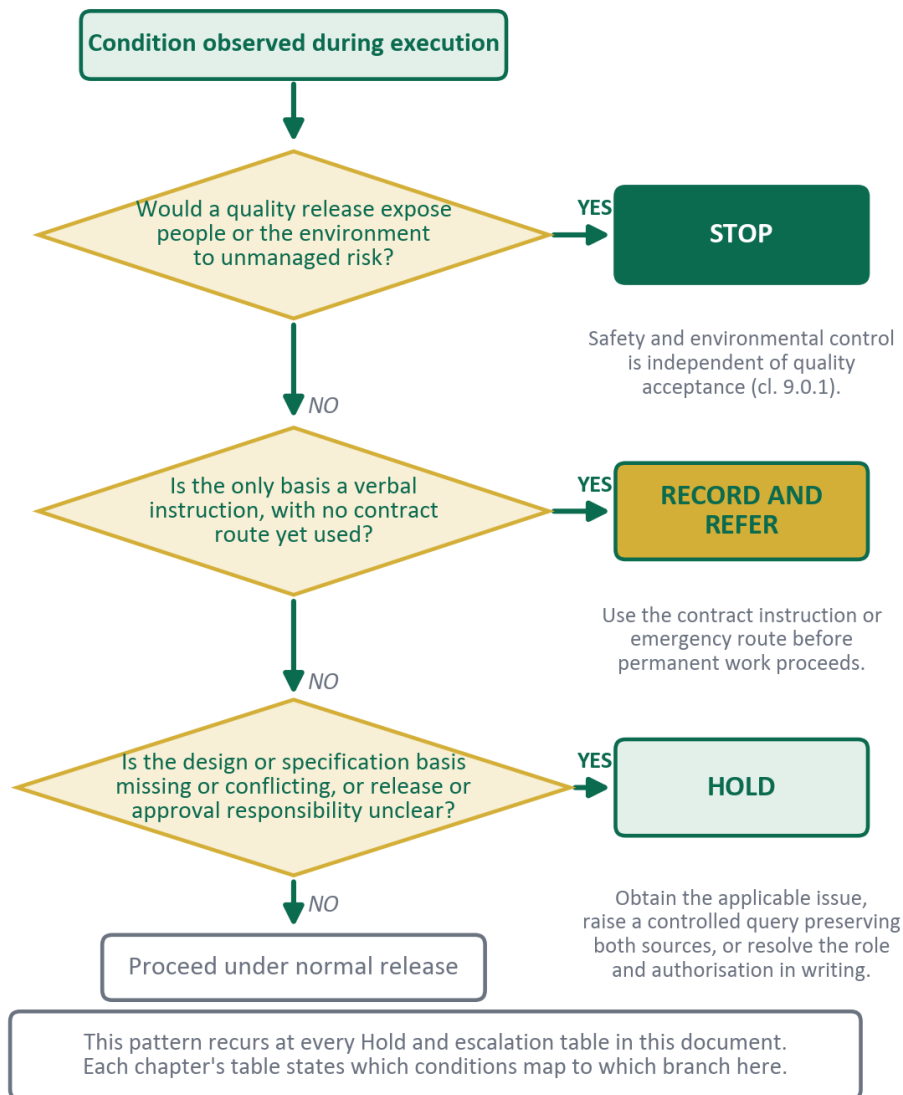


Figure 1.4 Master hold, stop and record-and-refer escalation logic

2 Organization, Competence and Conduct

2.1 Roles and delegation

- 2.1.1** The project organization shall name the client and owner, designer, engineer, contractor, specialist installers, laboratories, suppliers, facility representatives and the Authority Having Jurisdiction, using the project role names rather than assumed standard-form titles.
- 2.1.2** Delegation shall state who may instruct, review, release, witness, accept, close a non-conformance or sign a completion record, with the scope, limit, effective date and alternate.
- 2.1.3** Attendance, job title or prior experience does not establish competence for a specific method, decision or release. Competence is assigned by task and recorded.
- 2.1.4** The project shall establish and record the professional registration status required for each engineering role before that role is exercised. For each of the responsible designer, the supervising engineer, the technical reviewer and any delegated or specialist designer, the record shall state the registration or licence category held under the Pakistan Engineering Council Act and Bye-Laws, the discipline, the registration number, the validity date and any limitation on the scope of practice. Where a statutory or code provision requires a role to be held by a Professional Engineer, that requirement shall be stated in the project quality plan and verified before the role is exercised. Registration establishes eligibility; it does not by itself establish competence for a specific method under clause 2.1.3.
- 2.1.5** Where the scale of the works does not justify a separate appointment for each role, roles may be combined provided the following are preserved. The person releasing a hold point shall not be the person whose work is being released. A required independent check shall not be carried out by the person who prepared the work checked, under any title. The person accepting a test result shall not be the person who performed the test where the project requires independent verification. The person closing a non-conformance shall not be the person who caused or carried out the non-conforming work. Every combination adopted shall be recorded in Table A.2 with the roles combined and the independence preserved. Where a required combination would breach this clause, the function shall be obtained from outside the site team.

Figure 2.1 shows the project organization and the direction of authority between its parties.

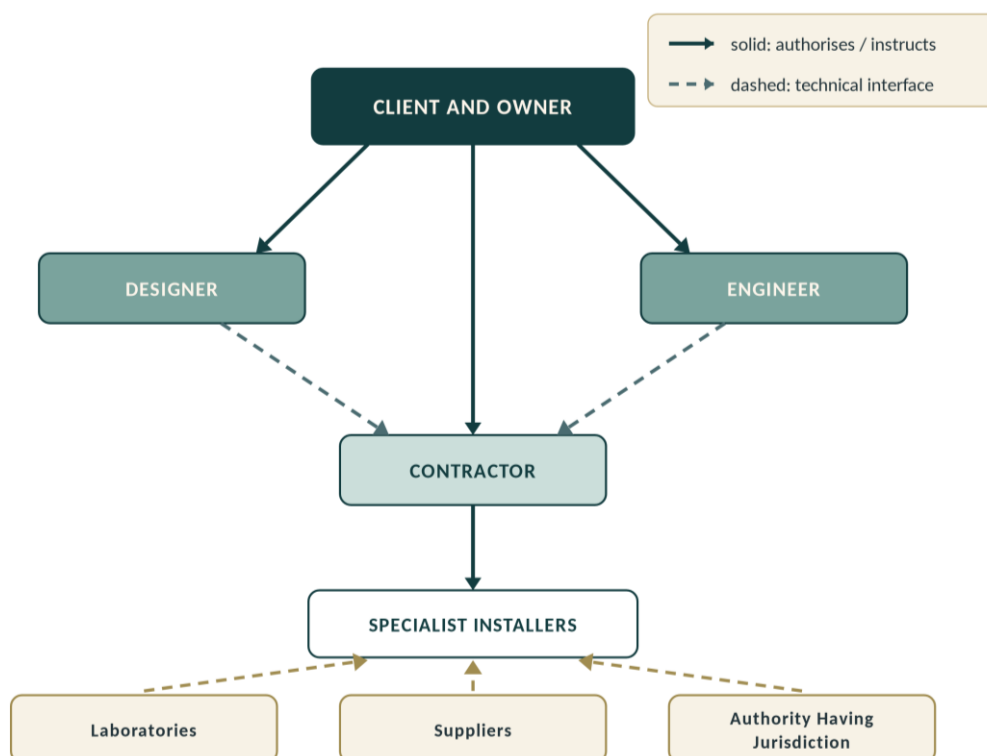


Figure 2.1 Organization and authority flow

2.2 Competence and communication

Table 2.1 Competence and communication

Area	Verified	Evidence
Technical competence	Education and experience, method and product training, required license or certification, observed capability.	Task-specific authorization with any limitation.
Communication routes	Meetings, requests for information, submittals, site instructions, urgent safety notices, design changes and reports.	Response and acknowledgement rules, including out-of-hours arrangements.
Worker participation	Practical feedback on hazards, method, access and quality risks without fear of reprisal.	Observations routed into controlled review.
Safeguarding and inclusion	Protection of children and patients, privacy, respectful conduct, accessible information, and a protected complaints route.	Facility and client rules applied and briefed.
Integrity	Original records, disclosure of conflicts, no manipulation of results, protected reporting.	Audit trail and a named escalation owner.

2.3 Hold and escalation

Table 2.2 Role and authority escalation

Condition	Response
The required competent or authorized person is absent	Hold the task; reassign or provide approved supervision.
An instruction is given by a person outside their delegated authority	Pause and use the formal route before acting.
Falsification of a record, pressure to pass work, or concealment is suspected	Stop, preserve the evidence and use the integrity and quality authority.
Safeguarding, harassment or privacy concern arises	Stop, protect and refer through the facility and client response route.
A communication failure affects design, safety or concealed work	Hold and confirm the instruction and evidence before continuing.

2.2.4 Every person mobilized to a work front in an occupied school or health facility shall acknowledge the applicable Code of Conduct and safeguarding requirements before first access, and shall receive a safeguarding briefing covering conduct around children and patients, prohibited areas and times, privacy, photography and the reporting route. Acknowledgement and briefing shall be recorded in the authorization and competence register. Access shall not be granted on the basis of attendance alone.

2.2.5 No person under eighteen years of age shall be engaged on the works in any capacity, or permitted to enter a work front. Repair and strengthening work is a hazardous occupation under the applicable provincial legislation, including work at or above two meters, powered cutting equipment and exposure to silica dust. Age shall be verified at mobilization against a NADRA registration certificate (Form-B), computerized national identity card or birth certificate issued by the competent authority, and recorded in the authorization and competence register. The presence of a person under eighteen at a work front shall be treated as a stop-work condition.

2.2.6 The project quality plan shall name a protected reporting route for safeguarding and conduct concerns, stating the recipient, the means of contact, the confidentiality applied and the response time. The route shall be independent of the site supervision chain, displayed at the work front, and included in the mobilization briefing.

2.2.7 Selection, engagement and task assignment shall not discriminate on any ground unrelated to competence for the task. Where the facility is a girls' school or a facility serving women patients, the project shall assess whether women workers or a woman team member are required for access to occupied areas, and the arrangement shall be recorded in the project quality plan. Welfare, sanitation and site facilities shall be provided appropriate to the composition of the workforce actually engaged.

3 Quality Plan and Document Control

3.1 Project quality plan

3.1.1 The project quality plan shall be approved before mobilization and updated whenever scope, organization, design, risk, supplier or process changes materially.

Table 3.1 Project quality plan contents

Content	Requirement
Scope and packages	Work breakdown by facility, block and package, and the interfaces between them.
Requirement hierarchy	The controlling documents and their revisions, and the conflict route.
Organization	Roles, delegations, competence requirements and alternates.
Quality risk	The characteristics whose failure would be consequential or hard to detect, and the controls assigned to each.
Control of processes	Submittals, method statements, trials, inspection and test plans, release points, laboratories, and statutory and special inspections.
Records	The record set, its custody, retention and the format required at handover.
Non-conformance and change	Identification, containment, disposition, verification and corrective action.
Completion	Completion criteria, commissioning, acceptance and handover requirements.
Review	How the plan is reviewed, by whom, and how changes are controlled.

3.1.2 The plan shall be risk-based. Effort shall be concentrated on characteristics that are consequential, that become concealed, or that cannot be verified after the fact, not distributed evenly across all activities.

3.2 Document control

Table 3.2 Document control

Control	Verified	Limit
Identification	Project, package, document type, originator, number, revision, status and date.	Unique and traceable to a controlled location.
Review and approval	Prepared, checked, reviewed and approved roles, with evidence of comments and their closure.	Electronic signature and authentication rules defined.
Distribution	Recipient and work front, effective date, acknowledgement, and withdrawal of superseded copies.	Offline field copies included in the control.
Record integrity	Original and raw records, the method of correction, author, time and reason, and version history.	No overwriting and no backdating.

Control	Verified	Limit
Model and digital data	Model version, federation, coordinate system, references and export settings.	A model does not outrank the contract documents unless the contract says so.
Security and privacy	Role-based access, sensitive facility, student and patient data, supplier confidentiality, secure transfer.	Minimum necessary data held.
Backup and recovery	Frequency, tested restore, offline continuity and incident response.	Evidence of a successful restoration test.

- 3.2.1** Electronic mail, messaging, an annotated print or a model view is not a controlled instruction or record unless the project procedure makes it one.
- 3.2.2** Where a superseded document is found at a work front, the affected work shall be held and the impact on work already completed assessed.
- 3.2.3** The project quality plan shall name the records custodian responsible for the control, storage, security, backup and retention of project quality records, and the custodian to whom records transfer at completion.

4 Design Readiness, Constructability and Temporary Works

A construction package is released only when the design intent, the interfaces, the existing conditions, the sequence and the temporary stability are sufficiently resolved for controlled execution.

4.1 Design readiness

Table 4.1 Design readiness

Area	Verified	Evidence
Design completeness	Issued drawings, specifications, calculations and design certificate; assumptions; selected measures; acceptance criteria; residual risks.	The exact project issue and its stated limitations.
Existing-condition match	Geometry, material and substrate, deterioration, reinforcement and services, foundations, access.	Field verification points and hold points defined.
Interfaces	Connection and transfer, penetrations, fire and waterproofing, finishes, utilities, drainage, facility operation.	Named interface owner and the governing drawing or detail.
Sequence	Unloading and support, removal, preparation, installation, curing and readiness, load transfer, support removal.	Stage criteria taken from the approved design.
Tolerances and access	Survey control, fabrication and installation tolerances, fit-up, access for inspection and test, and a remedial route.	Project criteria only.
Occupied facility	Isolation, phasing, egress, infection control, noise, dust and vibration, critical services, emergency access.	Approved facility-continuity plan.

- 4.1.1** A constructability review does not redesign the work and does not relieve the responsible designer of responsibility.
- 4.1.2** Where an existing condition differs consequentially from the design assumption, the affected work shall stop, the condition shall be preserved and recorded, and a disposition shall be obtained from the designer before the condition is concealed.

4.2 Temporary works

- 4.2.1** Temporary works requiring design shall have a named designer and a named checker, a design brief stating the actions and the stages, a checked design, an installation inspection, and a recorded release before the supported work proceeds.
- 4.2.2** Temporary safety shall not be inferred from the permanent design drawings. The permanent design describes the completed structure, not the incomplete configurations through which it passes.
- 4.2.3** Alteration, partial removal or reuse of temporary works requires the temporary-works designer's agreement and a further release.
- 4.2.4** The project shall state, in the project quality plan, the governing basis for temporary works design and management, comprising the procedural standard adopted for temporary works

control, the loading basis for actions on the temporary condition, and any product or system standard applicable to falsework, propping, scaffolding or edge protection. The basis shall be recorded before the first temporary-works design is commissioned, and shall be applied consistently across the project. Temporary works shall not be designed to the permanent works loading basis alone.

- 4.2.5** The project shall maintain a temporary-works register recording every temporary works item, its unique reference, the design category and who designed and checked it, the design brief and its issue, the location and the supported work, the installation inspection and release, any alteration, partial removal or reuse and the further release given, and the date of final removal. No temporary works item shall be loaded before it appears in the register with a recorded release.
- 4.2.6** The project shall appoint a temporary-works coordinator, named in the project quality plan and recorded in Table A.2. The coordinator maintains the register, confirms that each temporary-works design has been prepared and independently checked to the adopted basis, confirms that installation has been inspected against the design, and issues the release before the supported work proceeds. The coordinator shall not release temporary works whose design or installation was prepared by that person. Where the scale of the works does not justify a dedicated appointment, the function may be combined with another role provided the independence requirement of clause 2.1.5 is preserved, and the combination shall be recorded.
- 4.2.7** Temporary works shall be designed and checked for the actions arising in the temporary condition at that location and season, including wind on the temporary configuration and on any sheeting, netting or cladding attached to it; rainfall, surface water and flood where the works are in or adjacent to an excavation, watercourse or flood-prone area; softening or loss of bearing at foundations and sole plates from saturation; and thermal effects where relevant to the system. Where the temporary condition will remain in place across a season change, the design shall state the period assumed and the review required if it is exceeded. Sheeting or enclosure shall not be added to a temporary works item after release without a further check of wind action.

Figure 4.1 sets out the temporary-works release chain of clauses 4.2.1 to 4.2.3.

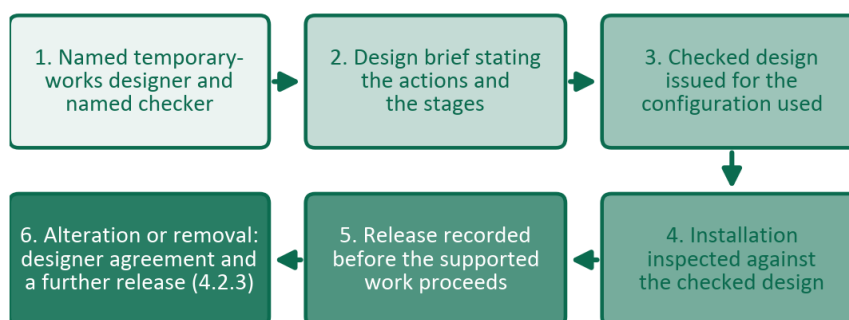


Figure 4.1 Temporary-works release chain

5 Procurement, Products and Specialist Installers

5.1 Controls

Table 5.1 Procurement, products and installers

Area	Verified	Limit
Prequalification	Relevant system experience, personnel, equipment, quality controls, capacity, past performance and support.	Package-specific, with a review date.
Technical compliance	Product and system components, properties, referenced standards, compatibility, exposure, fire and durability requirements against the approved design.	A clause-by-clause schedule; every deviation stated explicitly.
System integrity	Primer, adhesive, repair material, anchor, protective and accessory components, and the manufacturer's stated limitations.	No unapproved mixing of components between systems.
Installer competence	Product and method training, mock-up or first-off performance, supervision and authorization.	Named personnel and defined scope.
Supply continuity	Lead time, batches, shelf life, storage, climate, spares and replacement risk.	Program and preservation plan.
Substitution	Technical equivalence, design and compatibility effect, tests, warranties, program and cost.	No substitution procured at the work front.
Source verification	Factory and source documents, certificates, test reports, inspection and release status.	Authenticity and applicability checked, not merely filed.

5.1.1 Approval of a supplier, product or installer is specific to the package, the substrate, the exposure and the method for which it was granted. It does not transfer automatically to another application.

5.1.2 A product substitution shall reopen every affected calculation, detail, specification, qualification, sequence and acceptance requirement, and shall be dispositioned by the designer.

5.1.3 Where the value or nature of the works brings them within the Construction and Operation of Engineering Works Bye-Laws, the contractor shall hold a current constructor license in a category and specialization appropriate to the value and discipline of the package, and any firm engaged to supervise or manage shall hold the corresponding operator license. Prequalification shall verify the license category, the specialization code, the currency of the license and any limit on the value of work the category permits, and shall confirm that the package value falls within that limit. Where a firm proposes to undertake work outside its enlisted discipline, the extent permitted by the bye-laws shall be verified and recorded. Licence status shall be re-verified at renewal and on any change of category during the contract.

6 Program, Logistics and Facility Continuity

The program is where quality is commonly lost. Approval, curing, testing and temporary work durations are technical requirements, not float.

6.1 Controls

Table 6.1 Program, logistics and facility continuity

Area	Verified	Limit
Work breakdown	Package, block or zone, predecessors and successors, interfaces, completion boundary.	Consistent with drawings, inspection plans and records.
Approval lead time	Design queries, submittals, mock-ups, inspection plans, laboratory turnaround and permits.	No work assumed to start before release.
Technical durations	Preparation, curing, strength or readiness, protection, monitoring and staged load transfer.	Taken from the approved criteria, with evidence.
Facility continuity	Occupied routes, clinical and teaching schedules, utilities, sanitation, fire and egress, emergency operations.	Approval by the named facility representative before affected work.
Logistics	Access, hoarding, storage, lifting, debris and waste routes, deliveries, weather protection, restricted areas.	No conflict with public or occupant movement.
Constraint management	Constraint, cause, action, owner, due date and residual impact.	No reporting of progress that a constraint prevents.

- 6.1.1** Where program pressure conflicts with technical-readiness, curing, or testing requirements, the work shall be held and the conflict escalated. The requirement shall not be shortened at the work front.
- 6.1.2** The program shall identify the seasonal conditions applicable to the location, including the monsoon and flood season and periods of extreme heat or high wind, and shall state which operations are not to be started within those periods, how open works, excavations, exposed substrate and partially removed roofs are to be protected or made weathertight before them, and the trigger and method for securing the site on forecast of a severe event. Operations that cannot be interrupted once begun, including placement and the curing period that follows, shall not be started where the forecast conditions would breach a stated limit before the operation is complete.
- 6.1.3** Protection of the public, of facility users and of adjoining property during construction shall comply with the safeguards required by BCP-2021 Chapter 33 as applicable to the works, including the provisions governing demolition, site work, sanitary provision, protection of pedestrians and protection of adjoining property. Where the facility remains occupied, the pedestrian protection requirements shall be applied to the routes used by students, patients, staff and visitors, and the measures adopted shall be recorded in the facility continuity plan.

6.2 Separation in an occupied facility

Table 6.2 Occupied-facility separation requirements

Requirement	Provision
Physical separation	Secure hoarding and barriers around every active work zone, maintained as the work front moves.
Movement	A separate, marked and continuously usable route for students, patients, staff and visitors, including an accessible route that remains usable by wheelchair users and persons with reduced mobility for the duration of the works: continuous firm surface, minimum clear width, gradients and any temporary ramp, kerb transitions, handrails where required, and lighting. Temporary route changes shall be notified to the facility in advance.
Emergency provision	Unobstructed emergency exits and assembly routes, and continuous access for emergency and clinical vehicles, at all times.
Construction traffic	A separate delivery and unloading route and a separate debris and waste route, both kept clear of public movement.
Environmental control	Dust screening, local noise control and vibration limits appropriate to the adjacent use.
Services	Protected temporary routes wherever normal services are interrupted, with the interruption agreed in advance.
Hand back	A defined boundary between completed and active areas, with the condition of the handed-back area recorded. Before hand-back, the area shall be cleared of construction debris, sharps, chemicals, protruding fixings, temporary services and voids; accessible routes, sanitation, lighting and egress restored to at least the pre-works condition; and the handed-back condition jointly recorded with the facility representative.
Photography and recording	Images of children, patients or facility users shall not be taken without the consent required by the project; work-progress images shall exclude identifiable facility users. Recording device use is controlled at the work front.
Prohibited contact	Workforce access to occupied areas, sanitary facilities and circulation used by children or patients is defined and enforced, and separation is maintained during occupied hours.
Workforce welfare	Separate, secure and lockable sanitary and rest provision for the workforce, appropriate to the site and workforce composition, including separate provision for women workers where women are engaged. Not shared with facility users.
Programming against occupied hours	Noisy, dusty, vibrating or otherwise disruptive operations shall be programmed outside teaching or clinic hours, or outside the hours the facility identifies as sensitive. Where an operation cannot be so programmed, the alternative controls and the facility agreement shall be recorded before it proceeds.
Facility focal point	A facility focal point shall be named for each site, agreed with the facility and the line department, with an alternate. The focal point is the route for agreeing sensitive hours, service interruptions, temporary route changes and hand-back, and shall be recorded in the project quality plan with contact details.

Figure 6.1 illustrates the Table 6.2 requirements on a generic site plan, and Figure 6.2 shows the separation standard in practice at an occupied school.



Figure 6.1 Occupied-facility zoning, illustrative plan



Figure 6.2 Separation in an occupied school (illustrative, digitally generated; not a project record)

7 Submittals, Method Statements and Samples

7.1 Controls

Table 7.1 Submittal, method and sample controls

Area	Verified	Limit
Submittal scope	Package and location, controlling documents, purpose and status, components included.	Complete index and revision.
Shop drawings	Geometry, setting out, interfaces, fixings, tolerances, materials, sequence and inspection access.	Design responsibility shown explicitly.
Method statement	Resources, prerequisites, sequence, equipment, environmental and product limits, quality and safety controls, records produced.	Project-specific; generic text copied between projects is not accepted.
Product and sample	Data, certificates, test evidence, finish reference, system compatibility, storage and shelf life.	The actual proposed source, lot and system.
Deviation	Requirement, proposed alternative, justification and effect.	Every deviation flagged by the submitter, not discovered by the reviewer.
Review comments	Comment owner, technical basis, response, evidence and closure.	No ambiguous closure such as <i>noted</i> .

- 7.1.1** A shop drawing or method statement shall not reduce a design or specification requirement. A reduction requires an authorized design change.
- 7.1.2** A review stamp does not transfer design responsibility and does not approve information outside the stated review scope.
- 7.1.3** Work shall not begin before the required approved submittal is issued to the work front and briefed.

8 Inspection and Test Plans, Release Points and Laboratories

8.1 Building the plan

1. Break the method into inspectable stages and identify the characteristic verified at each.
2. Cite the exact acceptance criterion, and the test or inspection method and its edition.
- 8.1.1 The inspection and test plan shall be built from the criteria stated in the approved design and specification under Table 14.0. Where a criterion is absent from the specification, the plan shall not substitute a value from a standard, a previous project or a manufacturer default; the absence shall be raised through the query route and resolved before release.
- 8.1.2 Each inspection and test plan shall carry, for every operation subject to an environmental limit under clause 14.0.2, the stated limit, the measurement method and point of measurement, the person responsible for measuring, and the response required when a limit is exceeded. An operation subject to a limit shall not be released without the measured condition recorded against the stated limit.
3. Assign the preparation, self-check, inspect, witness, hold, review and accept roles, with notification rules.
4. Plan sampling, equipment, laboratory scope, chain of custody and result turnaround.
5. Define the response to a pending, failed or invalid result, and the release rules that follow.
6. Approve and brief the plan and maintain point-by-point records through completion.

Figure 8.1 shows the sequence, including the handling of pending, failed and invalid results.

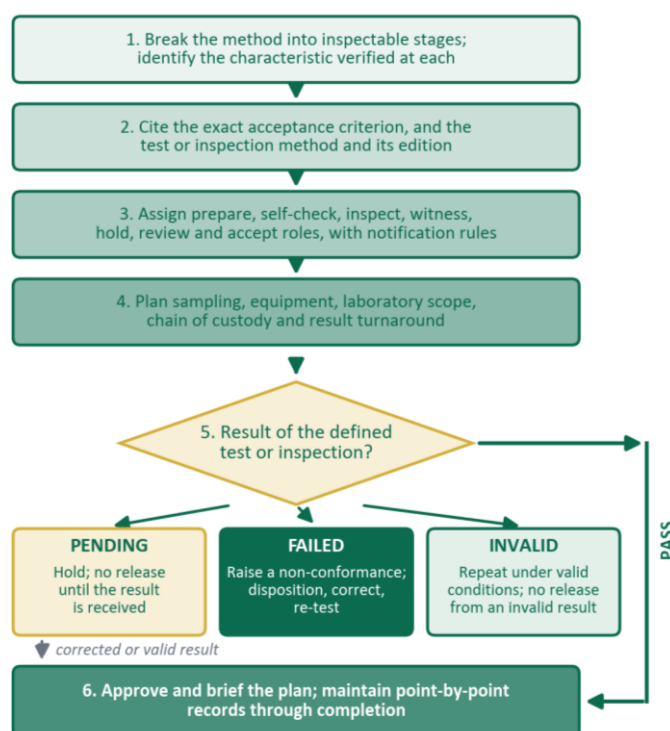


Figure 8.1 Building an inspection and test plan

8.2 Controls

Table 8.1 Inspection and test plan controls

Area	Verified	Limit
Stage definition	Prerequisite, activity, characteristic, location or coverage, and the dependency of the next stage.	Consistent with the method statement and sequence.
Criterion and source	The exact drawing, specification, code, product or project reference and revision.	A general reference to the specification is not a criterion.
Method and evidence	Inspection or test procedure, equipment, sample and the record produced.	Method edition and stated limits.
Release point	The meaning of each point, notification, waiting period, waiver route and releasing role.	The approved project quality plan and ITP status schedule govern.
Laboratory	Competence and accreditation scope, method, sampling and custody, reporting, impartiality.	The actual method must lie within the scope held.
Equipment	Identification, calibration or verification, pre-use and post-use checks, environmental limits.	Traceable to each result.
Result status	Result status is PENDING, PASS, FAIL, INVALID or DEVIATION, as defined by the project. A result status is evidence and is not itself a release decision.	No concealment, loading or next-stage work until the named release is recorded or an authorized disposition is issued.

- 8.2.1** Sampling rates, methods and acceptance values shall be project-specific and traceable to controlled standards, the design calculations and approved product qualifications.
- 8.2.2** Accreditation of a laboratory does not establish that a particular method and parameter lie within its scope. The scope shall be verified for each method requested.
- 8.2.3** Personnel performing field sampling and field testing of concrete shall hold a current certification appropriate to the test methods in the project specification (ACI Concrete Field-Testing Technician Grade I, or an equivalent qualification accepted by the responsible role identified for that decision in the responsibility and delegation matrix at [Table A.2](#), which shall be completed and approved in the project quality plan before this clause has effect), recorded in the authorization and competence register.
- 8.2.4** The inspection and test plan shall state, for each material subject to testing, the specimen type and dimensions, the sampling location and point in the placement, the sampling frequency by volume, area or lot, the number of specimens per sample, the age at test, the test method and the acceptance criterion. Fresh-property tests required by the specification, including consistence and temperature, shall be recorded at the point and frequency stated. Where a result fails or is invalid, clause 17.1 applies and dependent work shall be held; a further sample shall not be substituted for a failed result without an authorized disposition.

Figure 8.2 shows field sampling and testing of the kind these clauses control.



Figure 8.2 Concrete field sampling and testing (illustrative, digitally generated; not a project record)

8.3 Statutory and project inspections

- 8.3.1** Where work requires AHJ inspection under BCP-2021 §110 or special inspections and tests under Chapter 17, the project quality plan shall identify the AHJ or approved agency, scope, continuous or periodic classification where applicable, notice, reports, closure, and the responsibilities of the designer (the registered design professional under BCP-2021) and the AHJ.
- 8.3.2** A project HOLD or WITNESS release does not replace statutory approval. Work shall remain accessible until the required statutory inspection or approval is complete. If BCP-2021 Chapter 17 does not apply to the package, the quality plan shall record the project-specific basis.
- 8.3.3** Where the record under clause 1.0.1 establishes that no authority is responsible for administering a building-permit or equivalent approval function for the facility, the governing approval route shall be recorded in its place, comprising the administrative approval and technical sanction of the owning department, the certification of the registered design professional responsible for the design, and the inspection and test regime of the project quality plan applying the special inspection provisions adopted under BCP-2021 as a project requirement. The absence of an authority does not remove the requirement for a recorded approval route, and no work front shall be released without one.

9 Site Mobilization, Safety and Environment

- 9.0.1** Quality acceptance never authorizes unsafe, environmentally uncontrolled or safeguarding-incompatible work. Safety and environmental control operate independently of the quality system and under the applicable law and approved plans.
- 9.0.2** The method statement for each work package shall identify the environmental effects of the proposed construction measures and the corresponding mitigation, including waste arisings and their disposal route, dust and emissions, noise and vibration affecting the occupied facility, water use and effluent, spill risk from products and fuels, disturbance of vegetation, soil and drainage, and the protection of any water source used by the facility. Mitigation shall be verified in supervision, not merely stated in the plan.
- 9.0.3** A safeguarding or child-protection concern shall be reported through the protected route under clause 2.2.6 without delay, and shall not be routed through, or filtered by, the site supervision chain. Reporting shall not be deferred pending investigation.
- 9.0.4** The legal register shall identify, for each instrument, the provisions applicable to the works, the obligation arising, the responsible role and the evidence of compliance retained. Instruments applicable in the province of the works shall be identified before mobilization.

9.1 Controls

Table 9.1 Site mobilization, safety and environment

Area	Verified	Evidence
Access and separation	Workers, public, students and patients, deliveries, escape routes and restricted zones.	Physical controls and authorized routes.
Permits	Work at height, lifting, hot work, confined space, excavation, electrical and utility work, demolition.	A current permit and competent supervision.
Occupied facility	Noise, dust and vibration, infection control, sanitation, fire and egress, utilities and communication.	Facility-approved windows and controls.
Environment	Waste segregation, hazardous waste, water and sediment, dust and emissions, noise, spill control, vegetation and resource use, and the effects and mitigation identified under clause 9.0.2.	Legal register and monitoring route.
Safeguarding and privacy	Protection of children and patients, respectful conduct, photography and data, complaints.	Protected reporting and restricted records.

Area	Verified	Evidence
Emergency	Alarm, first aid, fire, collapse and temporary-works failure, flood and weather, spill, utility and evacuation. Emergency access and egress for the facility shall be maintained in the conditions foreseeable at that location and season, including surface flooding, debris and high wind, and shall not depend on a route that becomes impassable in those conditions.	Drills, contacts and coordination with the facility.
Existing asset protection	Structural elements, finishes, services, drainage, equipment, records and monitoring devices.	Pre-condition survey and a damage route.

9.2 Hold and escalation

Table 9.2 Hold and escalation

Condition	Response
A required plan, permit or emergency control is absent	Do not mobilize; stop the task until the control is in place.
Exposure of the public, students, patients or workers is uncontrolled	Stop and restore separation and safeguarding.
An environmental release, spill or uncontrolled emission occurs	Stop, contain and notify through the environmental and legal route.
A critical service or egress route is compromised	Stop and escalate; the facility and the emergency authority control the response.
An incident may have affected installed work or records	Quarantine and assess the technical and quality consequence.

10 Site Supervision and Surveillance

Inspection at a release point establishes the condition at that moment. Supervision establishes how the work was carried out between release points, which is where defects commonly originate and where none of them are recorded unless somebody is present.

10.1 Planning supervision intensity

Supervision is planned operation by operation, not by allocating several engineers to a site. For each operation, decide whether continuous presence is required, whether periodic attendance is sufficient, and what the supervisor must witness within each attendance.

Table 10.1 Supervision levels and their application

Level	When it applies	What the supervisor does
Continuous	Operations that are irreversible once complete, that conceal earlier work, that depend on sequence or timing, or where an error propagates through the element: concrete placement and compaction, anchor installation, post-installed reinforcement, prestressing, structural welding, temporary-works loading and unloading, and any work over or adjacent to occupied areas.	Is present throughout, records the actual sequence and conditions, stops the work when a control is not being met, and signs the record for that operation.
Periodic	Repetitive operations already proven by a trial and running under a stable method: subsequent identical anchor rows, routine reinforcement fixing after the first bay has been accepted, repetitive finishes.	Attends at a defined frequency and at defined points in each cycle, verifies a sample against the method statement, and increases frequency when a deviation is found.
On call	Operations with no concealment and no sequence dependency, where the work is fully verifiable afterwards.	Is available within a stated response time, and attends on request or when the program reaches a named activity.

REQUIREMENT

Set the supervision level in the inspection and test plan alongside the release points and staff to it. An operation designated as requiring continuous supervision does not proceed in the supervisor's absence, and rescheduling it is cheaper than accepting it on the contractor's account of what happened.

Figure 10.1 turns Table 10.1 into a decision sequence, operation by operation.

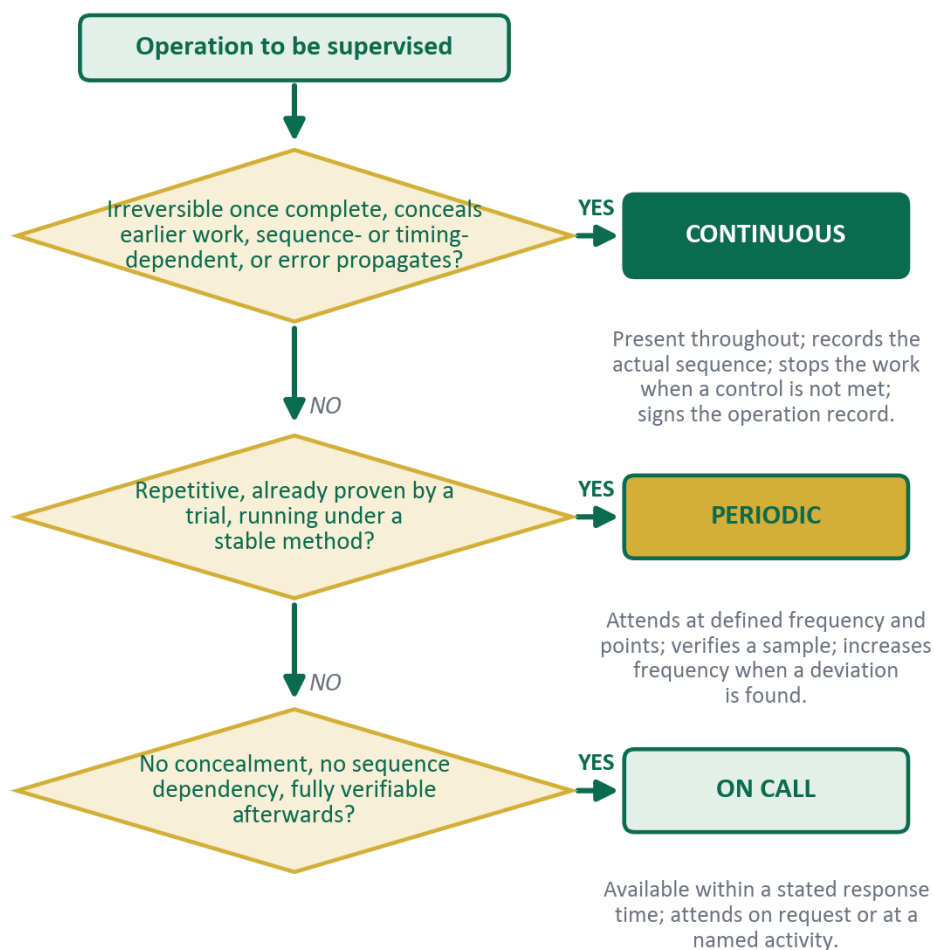


Figure 10.1 Choosing the supervision level

10.2 What a daily record must contain

Table 10.2 Content of the daily supervision record

Element	Requirement
Date, weather and conditions	Temperature, rainfall, wind and any condition affecting an operation with a stated environmental limit.
Work fronts active	Location, operation, and the released work front each belongs to.
Resources present	Contractor and subcontractor personnel by trade, plant, and specialist installers with their approval reference.
Operations witnessed	What was observed, when, and against which method statement and revision.
Materials received and used	Product, batch or delivery reference, and the element each was placed in.
Tests and inspections	What was carried out, by whom, the result, and the reference of the record raised.
Instructions issued	Any instruction given on site, to whom, and whether it was confirmed in writing.
Deviations and stoppages	What departed from the method statement or the program, the reason, and the action taken.

Element	Requirement
Facility and third-party matters	Access restrictions, occupant complaints, utility interruptions and neighbor issues.

GOOD PRACTICE

Write the record on the day, on site. A record reconstructed at the end of the week records what the writer remembers rather than what happened, and it is the first thing a later investigation discredits.

10.3 Stopping work

A supervisor's authority to stop work is stated in the appointment, communicated to the contractor before mobilization, and exercised without negotiation on the day. The circumstances are narrow and should not be left to judgment in the moment.

- A safety condition that places any person at immediate risk.
- Work proceeding on a work front that has not been released, or past a hold point that has not been released.
- A material or product on site that differs from the approved submittal, until its status is resolved.
- An environmental limit exceeded for an operation that states one, including temperature, moisture and wind limits attached to a product.
- Temporary works loaded, altered or removed without the release required by the temporary-works procedure.
- A structural condition exposed by the work that the design did not anticipate.

A stoppage is recorded the same day with the reason, the extent of work affected, the person notified and the condition for resumption. Work resumes only when that condition is met and the resumption is recorded.

Figure 10.2 shows the sequence from trigger to recorded resumption.

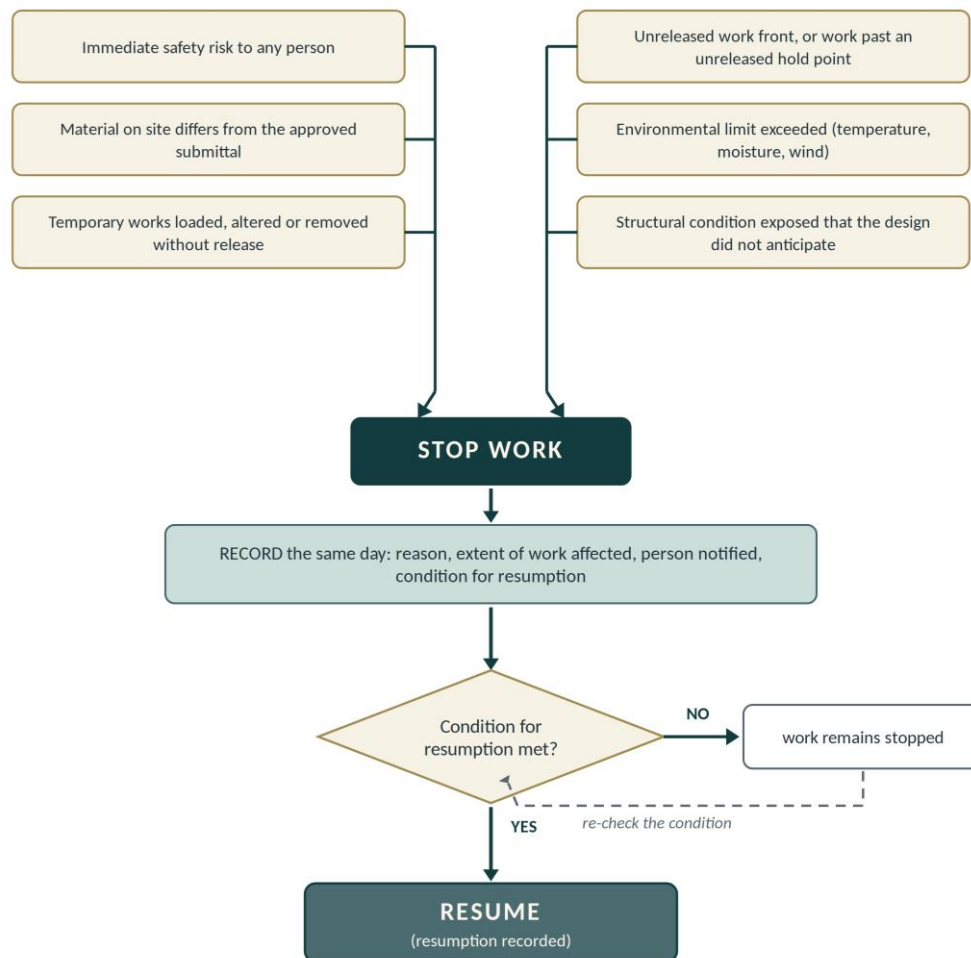


Figure 10.2 Stopping work: trigger to recorded resumption

10.4 Surveillance of subcontracted work

Subcontracting transfers execution and does not transfer accountability. The main contractor's quality plan covers every subcontracted package, and the supervision plan states who supervises each. Where a manufacturer's system is used, the approved product data and the contract govern warranty and declared performance. Departure from stated installation conditions is a non-conformance and requires written manufacturer or designer disposition before work continues.

Table 10.3 Subcontracted-work surveillance

Check	Evidence
The subcontractor is working on the current issue of the method statement	Revision reference recorded in the daily record
The named competent persons are the people actually present	Identity and qualification checked on site, not at award
The manufacturer's conditions are met	Substrate, environmental limits, tools, and installer certification for the system as supplied
The package's own records are being raised as the work proceeds	Records collected during the work, not requested at completion

11 Materials: Receipt, Storage and Traceability

11.0.1 Material shall be accepted into controlled storage, and released to the work, only where it matches the approved source, condition, lot, shelf life and traceability requirements. A delivery note, a label, a certificate or visual appearance alone does not establish compliance for the specific application.

11.1 Controls

Table 11.1 Materials receipt, storage and traceability

Area	Verified	Limit
Identity and source	Manufacturer and supplier, product, grade and type, lot or heat number, markings, and the approved submittal reference.	Exact match, or an approved deviation.
Condition and transport	Damage, contamination, moisture or temperature exposure, seals, packaging and handling.	Photographs and the transport record.
Dates	Manufacture, test, expiry and shelf life, and the minimum remaining window required.	No relabeling of dates.
Certificates	Report or certificate number, issuer, method and edition, linkage to the lot, and the project criterion.	Authenticity and applicability verified.
Storage	Temperature, moisture, ultraviolet, fire and security, stacking and support, segregation, and first-expiring-first-out control.	Manufacturer and project limits recorded.
Traceability to the work	Issued quantity and lot to block, element and location; installer and date; waste and returns.	Reconcilable to the as-built and to test results.
Special materials	Resins, adhesives and composites, anchors, repair mortars, reinforcement and steel, coatings, grouts and monitoring components.	System components kept to the approved and compatible set.

Figure 11.1 shows storage that meets these requirements: raised, covered, segregated and identified.



Figure 11.1 Controlled materials storage (illustrative, digitally generated; not a project record)

11.2 Quarantine

Table 11.2 Quarantine controls

Condition	Response
Identity, lot or source is not approved or not traceable	Quarantine; verify or reject through the project route.
Damage, contamination, expired shelf life or exceeded storage limit	Quarantine and raise a non-conformance; obtain a technical disposition.
A certificate cannot be linked, authenticated or shown to be applicable	Hold use; resolve the evidence or test as approved.
Quarantined material is found at the work front	Stop, investigate which installed work is affected, and control the remaining stock.
Components from different systems have been mixed	Hold and raise a non-conformance; assess compatibility and product status.

12 Work-Front Release, Setting Out and Trials

12.0.1 A work front shall be released only after prerequisites, geometry, existing substrate and interfaces, reference controls and representative trial evidence are accepted. Release of an adjacent work front, or performance on a previous project, does not release a different location or a different substrate.

12.1 Controls

Table 12.1 Work-front release, setting out and trials

Area	Verified	Limit
Readiness	Documents, submittals, method and inspection plan, resources, materials, access, permits, temporary works and preceding works.	A checklist tied to the package and location.
Setting out	Datum, grid and benchmark, dimensions, levels and alignment, survey method and equipment, and an independent check, where required.	Protected references and a stated tolerance source.
Existing condition	Geometry, soundness, moisture and contamination, reinforcement and services, cracks and voids, connections and deterioration.	Coverage and inaccessible areas stated.
Substrate preparation	Removal limits, edge and profile, cleanliness, saturation, temperature and moisture, contamination, and the acceptance method.	Project or product criteria only.
Trial representativeness	Actual material and lot, substrate, team, equipment, environment, sequence and geometry.	Differences from production conditions stated explicitly.
Trial outputs	Workability and appearance, process controls, test evidence, time windows and defect response.	Criterion and reviewer recorded.
Reference standard	Retained panels, sample or work area, photographs and data, in a protected location.	The trigger for retrial or reapproval defined.

12.1.1 The conditions that require a trial to be repeated, a change of source, team, substrate, method, equipment or environment, shall be defined and briefed to the work team.

13 Demolition, Opening Up and Temporary Stability

Removal and exposure are the stages at which the structure is least understood and least stable, and at which the most valuable design information appears.

13.1 Controls

Table 13.1 Opening-up controls

Area	Verified	Limit
Removal limits	Exact plan, elevation, depth and sequence; retained zones; prohibited cutting and drilling.	Marked physically at the work front.
Detection	Drawings, utility and reinforcement scanning, prestressing check, exposure, and service isolation.	Coverage, method and limitations recorded.
Temporary stability	Supports and bracing, load path, installation, preload or fit where designed, monitoring and staged removal.	Designer and inspection-plan release.
Process effects	Vibration, heat, water, dust, impact, debris loading and damage to retained material or monitoring devices.	Method controls and stated limits.
Retained substrate	Soundness, cracks, delamination, contamination, geometry, reinforcement and steel condition, edges.	Accepted before repair or interface work.
Hazardous materials	Identification, containment, segregation, transport and disposal.	Applicable law and the project plan.
Investigation of exposed fabric	Where exposure reveals a material or condition that the assessment characterized by assumption, sampling or inference, the need for in-situ investigation is determined by the responsible assessment or design role, and the method, extent, locations and acceptance of the results are instructed before the work proceeds.	Investigation is instructed, not improvised; sample locations recorded and made good.

REQUIREMENT

Unexpected bars, prestressing, services, voids, material changes, damage or movement are design information. Stop, preserve, record and route them. They shall not be resolved by unrecorded cutting or patching at the work front.

Figure 13.1 shows the gated sequence, with the required response to unexpected findings, and Figure 13.2 shows temporary propping of the kind released before removal begins.

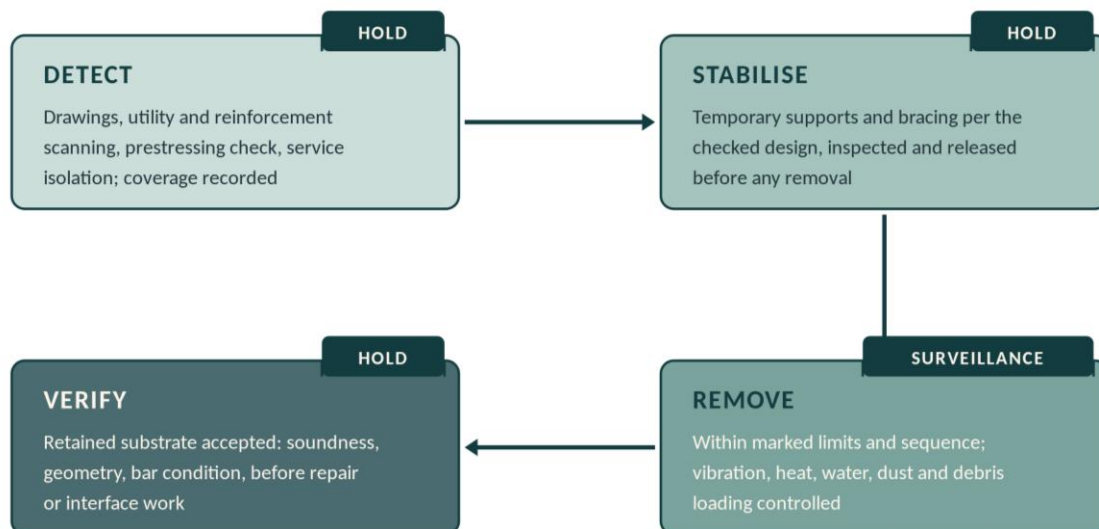


Figure 13.1 Opening up: a gated sequence



Figure 13.2 Temporary propping during opening up (illustrative, digitally generated; not a project record)

13.2 Hold and escalation

13.1.1 Where the condition of newly exposed existing fabric cannot be established by visual inspection alone, in-situ investigation shall be carried out under instruction from the responsible assessment or design role, using methods appropriate to the material and the property in question. These may include core sampling and compressive strength testing, reinforcement location and cover survey, measurement of section loss and corrosion state, carbonation depth, chloride content or other durability indicators, and masonry unit, mortar or in-situ strength testing. Indirect or comparative methods, including rebound hammer testing, shall not be used as the sole basis for a strength value unless correlated to direct testing on the same structure by the method the project specification requires. Sample

locations shall be recorded, and locations affecting the retained section shall be made good under the designer instruction.

13.1.2 Where removal of finishes, render, roof covering, floor, or any element providing lateral or edge support may leave masonry or another element without out-of-plane restraint, restraint shall be designed, installed, inspected and released under Chapter 4 before removal begins. Restraint shall remain until the permanent restraint is complete and released. The sequence of removal and restraint shall be stated in the method statement and released at a hold point.

Table 13.2 Hold and escalation

Condition	Response
Temporary support or sequence is not released, or has been altered	Stop and exclude; obtain the temporary-works designer's review.
Unexpected reinforcement, prestressing, service, detail or movement is encountered	Stop, preserve and raise a query; do not cut or remove further.
Removal exceeds the approved limit or damages retained material	Stop and raise a non-conformance; assess stability, design and repair.
Hazardous material, dust or waste control fails	Stop, contain and escalate through the safety and environmental route.
Retained substrate is not accepted before the next stage	Hold concealment or placement until repair and verification are complete.

14 Execution of Repair and Strengthening Works

14.0.1 Execution shall follow the approved design, method statement and inspection plan for the specific location. This protocol does not supply dimensions, reinforcement, anchors, material properties, design equations or acceptance values; those come from the project design.

The approved design and specification shall state the criteria listed in Table 14.0. A work front shall not be released where a criterion applicable to the work is absent; the omission shall be raised through the query route and resolved before release. Not every criterion applies to every package; the project shall record which apply and confirm each is stated.

Table 14.0 Minimum project-specific criteria required before work-front release

Category	The approved design and specification shall state
Materials and strengths	Grade or strength class of concrete, mortar, grout and overlay; reinforcement and mesh grade and type; product identity and qualification for proprietary systems.
Sampling and testing	Specimen type, sampling frequency by volume, area or lot, test age, test method, and the acceptance criterion applied to the result.
Failed and invalid results	The response to a result that fails or is invalid, including any further testing, investigation or engineering disposition required.
Curing	Method, duration, protection required, and the availability and quality of curing water.
Anchors	Product qualification, embedment, hole preparation and cleaning method, installer qualification where required, proof-test load, sample size and acceptance.
Overlay and mesh systems	Mesh type, number of layers, lap length, connector type and spacing, mortar mix, layer thickness, cover to mesh, and bond or pull-off acceptance where specified.
Earthworks and fill	Lift thickness, compaction target and method, moisture range, field-density test frequency, and drainage and weep provisions.
Substrate preparation	Removal boundary, surface profile or roughness, cleanliness, soundness and moisture state, and the method of verification.
Tolerances	Setting-out, fabrication and installation tolerances, and the remedial route where exceeded.
Durability and exposure	Exposure classification, cover, protective systems and any service-life requirement.
Environmental limits	The limits required by clause 14.0.2 for the operations in the package.
Load transfer and readiness	The strength or readiness evidence required before load restrictions are lifted or temporary support removed.

14.0.2 The approved project specification, method statement and manufacturer product data shall state the environmental limits within which each operation may proceed and the protective measures required outside them, covering at least: ambient and substrate temperature limits for placing and curing concrete, mortar and overlay systems; the temperature of the material as placed and the method of measurement; curing method, duration and protection, and the availability, quantity and quality of curing water before placement begins; wind speed limits

for lifting, roof work and work at height, and for any operation using sprayed or airborne material; and rain exposure limits for placement, freshly placed work and open substrate. Where the specification adopts a standard for hot weather, cold weather or curing practice, that standard governs to the extent adopted. This Protocol does not set the limits; it requires them to exist, to be stated before work is released, and to be tracked.

14.1 Common sequence

1. Confirm the package identity, design issue, location, sequence, substrate and prerequisites.
2. Verify materials and system, personnel, equipment, environment and the trial reference.
3. Execute controlled preparation, setting out, interface work and staged installation.
4. Inspect and test at each defined point; record the mandatory HOLD release before concealment or loss of access and use WITNESS only for the planned observation defined by the approved ITP.
5. Protect, cure and maintain temporary support and load restrictions until approved readiness is established.
6. Capture as-built materials, geometry, locations, concealed details and deviations progressively before access is lost; reconcile test results and final acceptance at completion.

Figure 14.1 marks the release points along this sequence.

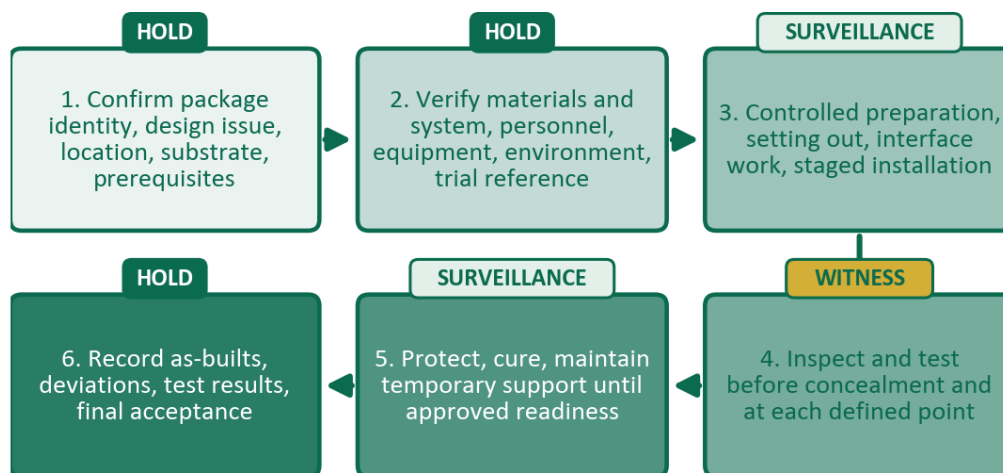


Figure 14.1 The common execution sequence with its release points

14.2 Controls by work type

Table 14.1 Execution controls by work type

Work type	Controls that govern acceptance
Added walls and bracing	Foundation, collector and connection work; setting out; embedment, anchors, welds and bolts; plumb and alignment; grout and concrete placement; controlled load transfer and support removal.

Work type	Controls that govern acceptance
Ties and anchorage	Substrate and concealed services and reinforcement; drilling, hole cleaning and embedment; anchor identity and installation; edge and interface condition; proof testing of the specified sample.
Jacketing, reinforced concrete	Removal and roughening; existing bar condition; connectors and reinforcement; formwork and placement; interface treatment; curing; continuity at joints and bases; controlled load conditions during the work.
Ferrocement and mesh-and-mortar overlay	Substrate removal, keying, cleanliness and moisture state; wall and existing bar condition; mesh type, number of layers, laps and edge returns; through-wall connectors and fixing to the substrate; mortar mix, application thickness and cover to mesh; curing duration, method and protection against drying; mortar sampling, strength and bond acceptance; continuity at corners, openings, wall head and plinth; controlled load conditions during the work.
Bonded composites	Qualified system and installer; substrate repair, profile and moisture; corner preparation; fiber orientation, laps and anchors; environmental limits during application; cure, protection and void survey.
Masonry confinement	Masonry condition; toothing, chasing and connection interfaces; reinforcement, concrete and mortar; opening and intersection continuity; diaphragm and foundation connection; work in controlled bay lengths.
Foundation, retaining and site protection	Excavation, support and construction-stage stability; groundwater control and dewatering; founding stratum verification and interface; scour and erosion works; fill placement in lifts to the specified thickness, compaction target, method and moisture range; field-density testing at the specified frequency and locations; drainage, filter and weep provisions and their protection during backfilling; surcharge and plant loading limits during construction; settlement or movement monitoring where specified; establishment and stewardship of any planted measures. The criteria for these controls are those stated in the specification under Table 14.0.
Flood-resistant works	Design flood level established and set out; plinth or floor raising including load path, connection to existing structure and differential movement; damp-proof course and continuity at junctions; water-resistant materials and finishes below the design level, with drying and cleaning access; sealing at service penetrations; surface and sub-surface drainage, falls, outlets and discharge point; protection of the facility water source; verification that the completed level and drainage function as designed.
Mass reduction and removal	Isolation and removal sequence; the remaining load path at every stage; roof, diaphragm and weatherproofing; services; the final configuration recorded.
Roof and diaphragm strengthening	Existing roof and diaphragm condition and connection survey; temporary weatherproofing and the sequence for maintaining cover; roof-to-wall and diaphragm-to-support connections including anchorage and collector continuity; new or supplementary members, fixings and fastener pattern; deck or sheet fastening at edge, corner and interior zones; chord and edge continuity at openings; wind uplift load path complete before release; reinstatement of drainage, flashings and penetrations; controlled load conditions and access during the work.
Crack and patch repair	Root cause and activity; removal and cleaning; corrosion and bar condition; ports, filling and placement; curing; verification of fill, bond and leak performance.

Work type	Controls that govern acceptance
Electrochemical treatment	Specialist design; continuity and isolation; conflicts with embedded metals and services; installation; commissioning; owner monitoring arrangements.
Common protection	Fire, corrosion, ultraviolet, moisture and impact protection; finishes; access for inspection; and marking of zones where later drilling or cutting is prohibited.
Non-structural and life-safety restraint	Component inventory and identification of items requiring restraint, including ceilings, fans, light fittings, storage units, shelving, cupboards, water tanks, gas cylinders and equipment; supporting substrate condition and its capacity to accept the fixing; fixing type, size, spacing and embedment; anchor installation and hole condition; clearance and movement allowance at services and pipework; restraint of items above occupied and egress routes as a priority; verification that function and required access are preserved; recorded completion by location.

The project document register shall record the controlled design and specification issue governing each work type. The work types above are those the Protocols control. Not every type arises on every package; the project shall identify which apply and reference the applicable inspection and test plans accordingly.

Figure 14.2 shows a column prepared and caged for jacketing.



Figure 14.2 A column prepared for jacketing (illustrative, digitally generated; not a project record)

14.3 Hold and escalation

14.1.2 For post-installed anchors, the hole shall be drilled to the diameter, depth and perpendicularity required by the approved design and the manufacturer instructions, and shall be cleaned and conditioned by the method and number of cycles those instructions specify. The moisture state of the hole shall be within the limits stated for the product. Drilling method, hole preparation, product identity and batch, embedment, setting or injection method, and cure time shall be

recorded for each location or lot as the inspection and test plan requires. Hole preparation is a controlled operation, not a site practice.

14.1.3 Where the governing anchor provision, product qualification or project specification requires the installer to be qualified or certified for the anchor system, that qualification shall be verified and recorded before installation begins, and shall be specific to the product and the installation orientation. The inspection level required by the governing provision, including continuous inspection where required, shall be stated in the inspection and test plan and applied.

14.1.4 Where a proof test fails, or the test is invalid because the procedure, equipment or load application did not comply, the following shall apply. Work depending on the anchor group shall be held. The affected anchor and the reason for failure shall be recorded, and the anchor shall not be re-tested to obtain a pass without an authorized disposition. The responsible designer shall determine the extent of testing to be expanded, the treatment of the failed anchor, whether adjacent or previously accepted anchors are affected, and any change to installation method, product or design required. Testing shall not resume, and the held work shall not be released, until that disposition is issued and recorded. A failed proof test is design information and shall be routed accordingly.

14.1.5 Curing shall begin at the time the specification requires and shall continue for the stated duration by the stated method, with the stated protection maintained throughout. The curing record shall state the method used, start and end times, the protection applied, the conditions measured under clause 14.0.2, and any interruption and its duration. Curing shall not be shortened at the work front for programme reasons; a reduction requires an authorized disposition. Where curing water is required, its availability and quality shall be confirmed before placement begins.

14.1.6 Load restrictions and temporary support shall not be lifted or removed until the readiness evidence required by the specification under Table 14.0 has been obtained, recorded and accepted by the responsible designer.

Table 14.2 Hold and escalation

Condition	Response
The work differs from the approved design, method or trial	Hold and obtain an authorized disposition.
Substrate, interface, reinforcement or connection is not accepted	Hold concealment; correct and verify before the next stage.
Product, environmental, time or curing conditions fall outside approved limits	Stop, quarantine the affected work and obtain a technical review.
Temporary support or a load restriction is changed early	Stop and exclude; obtain designer review.
A test or inspection fails, or required evidence is missing	Hold dependent work; use the non-conformance and retest route.

15 Inspection, Testing and Site Records

15.0.1 Records shall be contemporaneous, location-linked and independent of the party performing the work where the project requires verification. Presence on site, a signed checklist or a passed sample does not demonstrate conformity of work that was not observed or beyond the stated coverage.

15.0.2 Payment certification is governed by the contract. Where the contract or the project quality plan makes required quality records, released hold points or the status of open non-conformances a prerequisite to certification, those requirements apply as the contract states them. This document does not create, modify or supplement any payment mechanism.

15.1 Controls

Table 15.1 Inspection, testing and records

Area	Verified	Limit
Inspection basis	The inspection point, the criterion in the drawing, specification or method, the location and stage, and the responsible roles.	Exact reference and revision.
Process surveillance	Preparation, personnel, equipment, environment, sequence, materials and protection.	Meaningful sample, time and coverage recorded.
Measurement and test	Method, sample and location or lot, equipment and laboratory, raw result, uncertainty and criterion.	Not a transcription-only record.
Coverage	Full, sampled, remote, inaccessible or concealed extent, and the rationale.	The conformity claim is limited to the evidence.
Status and release	result: pending, pass, fail, invalid or deviation. release: released, not released, missed point or concession, under the approved procedure.	Result status and release authority remain separate in the record and audit trail.
Daily record	Activities and locations, workforce, materials and lots, temporary works, tests, holds, instructions, incidents and progress. Conditions: measured ambient and substrate temperature, wind, rainfall and the time of measurement, recorded against the limits applicable to the operations carried out that day, together with any operation held, stopped or protected as a result.	Contemporaneous and verified.
Damage and protection	Condition of completed work, curing and protection, impact by other trades, and repair.	Handover between trades recorded.

Figure 15.1 shows a proof test of the kind these controls govern.



Figure 15.1 Anchor proof testing (illustrative, digitally generated; not a project record)

15.2 Hold and escalation

Table 15.2 Hold and escalation

Condition	Response
A required point was missed or work was concealed	Hold and raise a non-conformance; assess exposure, retesting or alternative evidence and the design consequence.
A result failed, is invalid, is pending or cannot be linked	Hold the affected and dependent work; use the disposition route.
An inspector, tester, item of equipment or laboratory is not competent or current	Quarantine the evidence; assess the affected work and repeat or resolve.
There is pressure to sign an incomplete or retrospective record	Refuse and escalate; preserve the actual status.
Installed work is damaged after release	Reopen the status and raise a non-conformance; reinspect and obtain a disposition.

16 Technical Queries and the Designer Interface

Many site questions are answered correctly and informally, and the answers are lost. The purpose of this chapter is that the answers which change the work are recorded, by the person entitled to give them, before the work proceeds.

16.1 Classifying a site question

Three different things arrive at the design team in the same form, and they have different consequences. Classify the question before routing it.

Table 16.1 Classifying a site question

Type	What it is	Who resolves it	What it produces
Clarification	The information exists in the issued documents, and the question is where to find it, or which of two documents governs.	The design team, by reference to the issued documents.	A written answer citing the document and detail. No design change and no cost effect.
Design query	The issued documents do not resolve the point, or the site condition differs from what the design assumed.	The designer, who must assess the condition against the design basis and may need to recalculate.	A revised detail, a revised calculation, or a written confirmation that the design stands with the condition recorded.
Proposed change	The contractor proposes something different from the issued documents, for buildability, program, availability or cost.	The designer assesses technical equivalence; client accepts or rejects the commercial effect.	An accepted change instruction with the technical equivalence recorded, or a rejection with reasons.

Figure 16.1 gives the classification test.

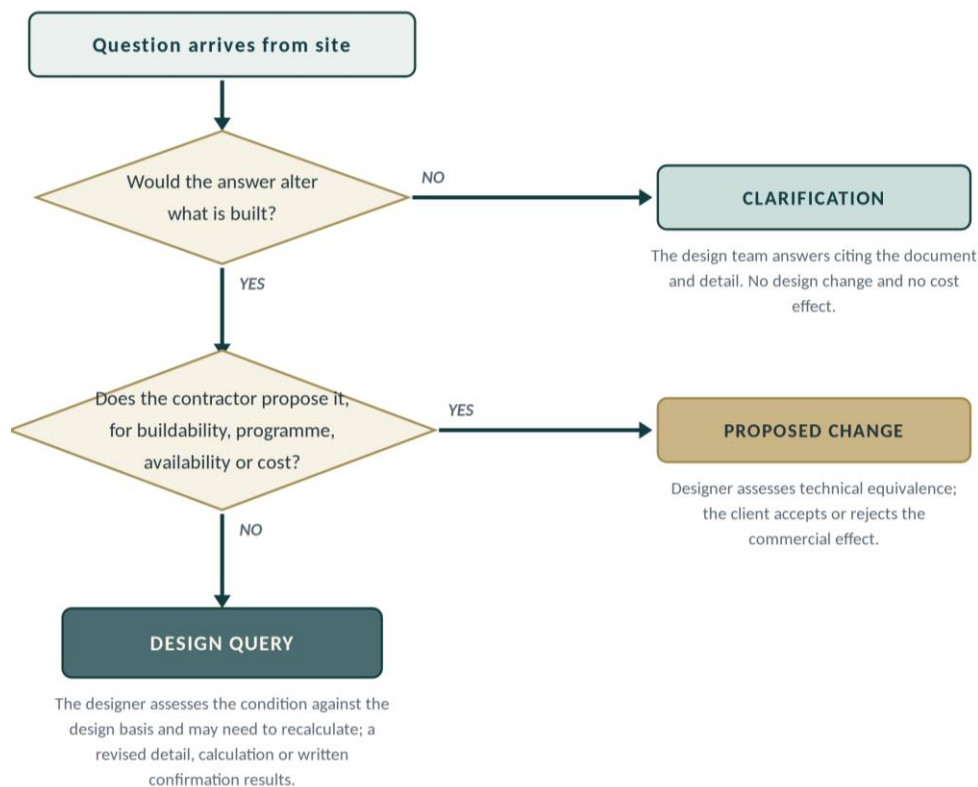


Figure 16.1 Classifying a site question

16.2 Raising a query

Table 16.2 Technical query record

Field	Content
Reference and date	Unique references, date raised, and the date by which an answer is needed to avoid disruption.
Location and element	The grid reference, level and element the question concerns.
Documents concerned	Drawing and specification references with their revisions.
The question	Stated so that it can be answered without a site visit, with dimensions, photographs and measurements attached.
Condition found	Where a site condition differs from the design, what was measured and how.
Effect if unanswered	The work fronts held and the program effect, stated factually.
Contractor's proposal	Where one is offered, with the reasoning behind it.
Answer	The response, its author, the date, and the documents it revises.
Closure	The revised documents issued, the work fronts released, and the records updated.

16.3 Answering

- Answer in writing, on the record, from the person holding design responsibility for the element. An answer given by another discipline, however senior, does not carry design responsibility.
- State whether the answer changes the issued documents. Where it does, reissue them; an answer that contradicts a current drawing without reissuing it leaves two governing documents on site.
- State whether the answer affects other elements, disciplines or already-completed work. Site conditions rarely occur once.
- Where the answer requires a calculation, complete and sign it before answering. A dimension given from memory to relieve a program pressure is the mechanism by which a design error reaches the work.
- Where the question cannot be answered within the time the program needs, say so, and agree what the contractor does in the interval. Silence is read on site as permission.

16.4 Conditions found during work

Opening up existing construction produces conditions the design did not assume. These are handled through the query route and not by adjustment on site, because the design basis they contradict is recorded in a calculation the site cannot see.

Table 16.3 Conditions found during the work and the required response

Condition	Required response
Reinforcement quantity, size or position differs from the drawing	Record the actual arrangement by measurement and photograph and refer to the designer before any further removal or loading. Do not adjust the details on site.
Section loss, deterioration or defects greater than assumed	Stop at the hold point, measure the extent, and obtain a written disposition and any revised extent before resuming.
A concealed structural element, service or opening not shown	Record it, assess whether it carries load or serves an occupied area, and refer before altering it.
Substrate condition outside the product's stated limits	Do not proceed with the assumption that the product will accommodate it. Establish whether the substrate can be brought within limits, or whether the product must change.
Dimensions that do not permit the detail as drawn	Refer with the measured dimensions. A detail compressed on site to fit loses the cover, embedment or lap the calculation assumed.

REQUIREMENT

Every condition found that differs from the design is recorded whether or not it changed the work. The record of a condition assessed and found acceptable is as valuable to the next engineer as the record of one that required a change, and it is the only evidence that the assessment happened.

Figure 16.2 shows the single controlled response these conditions share.

16.4.1 Where a condition found during the work, or the result of an investigation under clause 13.1.1, contradicts or materially qualifies an assumption on which the assessment or design was based, the information shall be routed to the responsible assessment or design role before the condition is concealed and before any work relying on the superseded assumption is released. The route shall establish whether the assumption applies elsewhere in the facility, whether the affected design remains valid, and whether the assessment record requires revision. Referral of the immediate work front does not discharge this requirement: a condition may be acceptable locally and still invalidate an assumption applied generally.

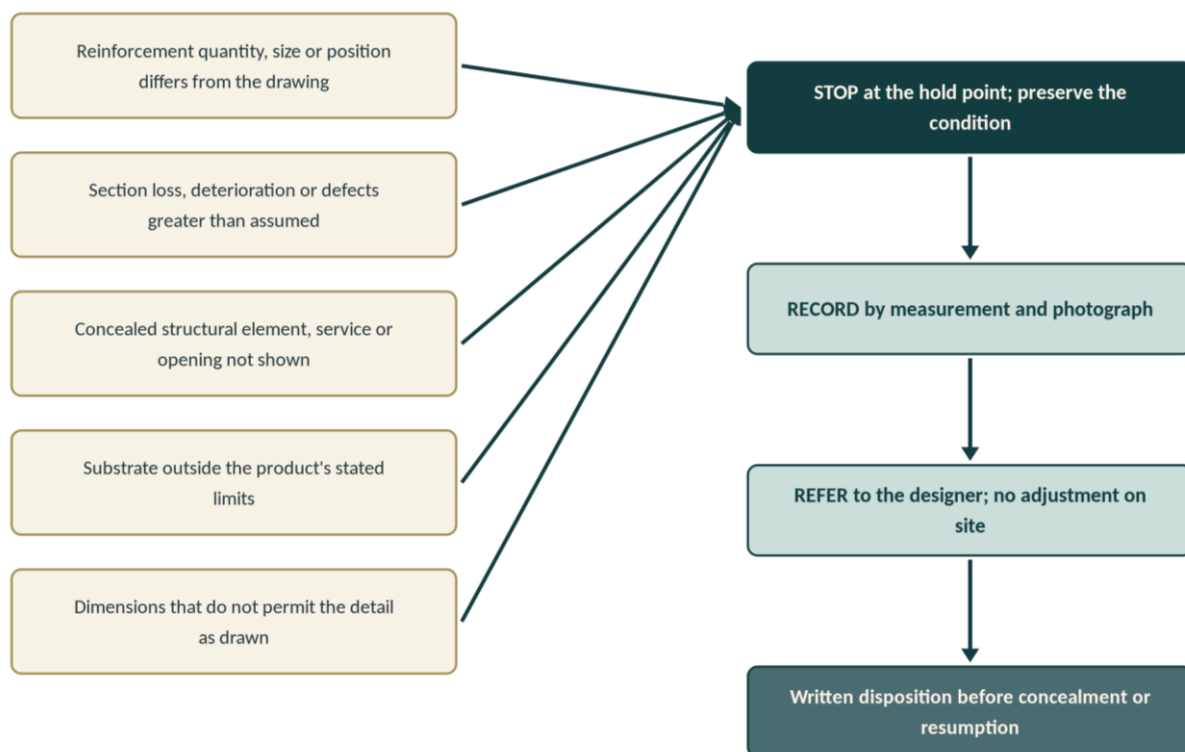


Figure 16.2 Conditions found during the work: the controlled response

17 Non-Conformance, Change and Rework

17.1 Non-conformance

1. Identify and contain the affected work, material, records and dependent activities.
2. State the exact requirement and the factual departure, without premature attribution of blame.
3. Determine the extent, the cause or causes, the technical consequence and the exposure of similar conditions elsewhere.
4. Develop a disposition: reject and remove, rework, repair, accept as it stands under a concession, or evaluate further, as the contract and the design permit.
5. Obtain the required design and contract approvals and execute under a controlled method and inspection plan.
6. Verify conformity, complete the corrective action, and check its effectiveness before closing.

Table 17.1 Non-conformance controls

Area	Requirement
Identification and containment	Reference, location or lot, condition, evidence, physical and system status, and dependent work, recorded immediately and visibly.
Requirements and departure	The exact source and revision, and objective evidence. A general statement of poor quality is not a non-conformance.
Extent	Other locations, lots, teams, dates and processes potentially affected, and the method of verification. The extent is not limited to the point of first detection.
Cause analysis	Immediate, contributing and systemic causes, using evidence proportionate to the consequence and to any recurrence.
Technical disposition	Designer or specialist assessment, calculations or tests where required, the method, acceptance and any residual risk.
Concession	Contractual authority, technical justification, owner and AHJ acceptance where required, and recording in the as-built and residual-risk record. Not a routine workaround.
Corrective action	The change to process, supplier, training, document or control, with an owner, a date and an effectiveness check.

Figure 17.1 shows the workflow from identification to closure.

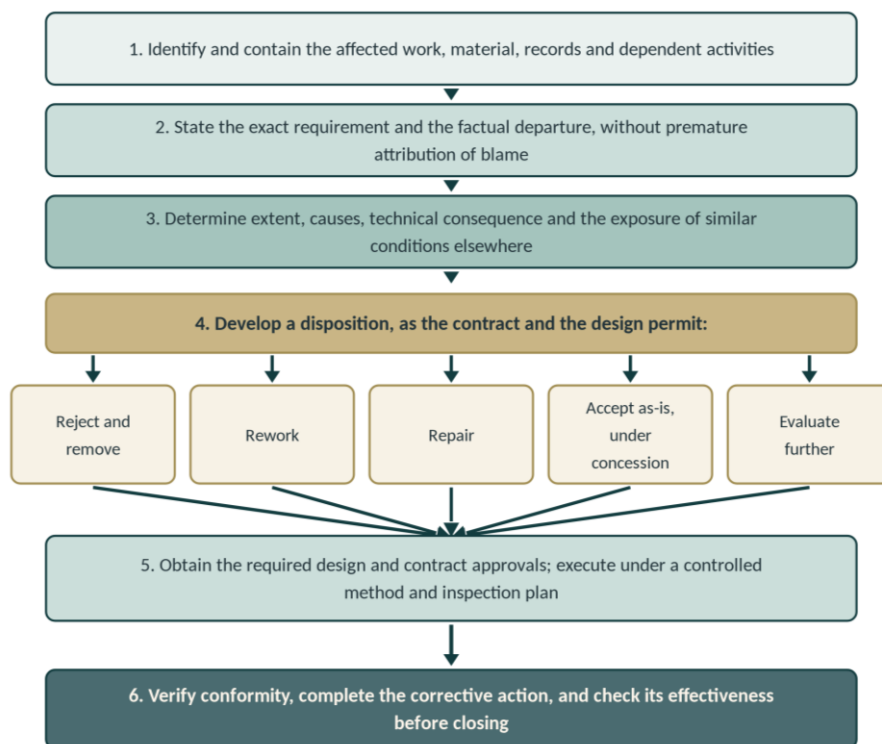


Figure 17.1 Non-conformance and corrective action workflow

17.2 Change and requests for information

Table 17.2 Change and query controls

Area	Requirement
Query clarity	One question, exact references, the evidence, the decision date required and the status of the affected work. A proposed answer shall not be presented as fact.
Change basis	The reason and its source, design development, field condition, non-conformance, authority requirement, supplier or owner request, with the original requirement retained.
Technical impact	Load path and performance, interfaces, materials, durability and fire, temporary works and sequence, inspection and testing, monitoring.
Other impacts	Permits and authority approvals, facility and users, safety and environment, program, procurement, cost and warranties.
Authorization	Request, design and check, approval or instruction, and the effective issue, by named roles within their limits.
Implementation	Affected documents, submittals, methods, inspection plans, materials and work fronts, with re briefing and any retrial.
Verification	The installed change is inspected and tested, and incorporated into the as-built record.

17.2.1 A response to a query, a shop-drawing comment, a meeting note, a non-conformance repair or supplier advice is not an authorized design change unless it is issued through the change route.

17.2.2 Where a change has been implemented before approval, the work shall be held and a non-conformance raised, and the verifiability of the affected work assessed.

18 Completion, Commissioning and Acceptance

18.0.1 Completion shall be demonstrated by evidence that the defined package is complete, tested, protected and coordinated. Punch-list reduction, visual cleanliness or a contractor's declaration does not substitute for technical, statutory and documentary completion.

18.1 Controls

Table 18.1 Completion, commissioning and acceptance

Area	Verified	Limit
Physical completion	Scope and location, workmanship, interfaces, finishes and protection, labeling and access, damage.	Matches the approved design, including authorized changes, and is reconciled with the as-built record.
Quality evidence	Inspection points, tests, non-conformances, changes, material traceability, surveys and specialist signoffs.	No record required for completion by the approved quality plan, inspection and test plan or completion readiness matrix is missing.
Outstanding-work classification	Safety, performance or code items; completion items; defects and damage; documentation; housekeeping.	A safety or performance item is not reclassified as a minor outstanding item.
Commissioning	Prerequisites, procedures, calibrated equipment, sequence, settings and results, failures and retests.	System, integrated and witnessed as required.
Return to service	Fire and egress, utilities, hygiene and infection control, accessibility, emergency provision, training and operational approval.	Facility and AHJ authority explicit.
Protection and custody	Completed work, settings, monitoring devices, access, warranties and damage liability until takeover.	Custody boundary recorded.
Exceptions	Item, technical or operational consequence, interim control, owner, due date and accepting authority.	Visible in the certificate and in the handover record.

Figure 18.1 shows the gates in order.

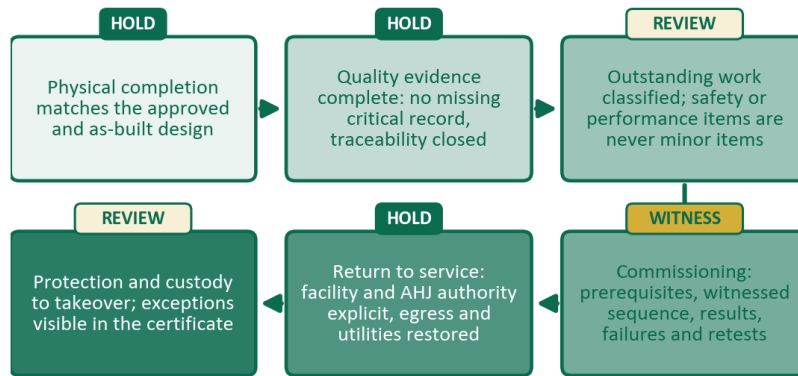


Figure 18.1 Completion readiness gates

18.2 Hold and escalation

Table 18.2 Hold and escalation

Condition	Response
Required inspection, test, non-conformance, change or as-built evidence is missing	Hold acceptance; complete or obtain an authorized disposition.
A safety, performance or code issue is placed only on the outstanding-work list	Raise a non-conformance and use the correct technical route.
A commissioning prerequisite or failure is unresolved	Hold the return of the system to service.
Facility or authority operational release is absent	Do not return the area to service.
Completed work is damaged before takeover	Reopen the status, raise a non-conformance and update the acceptance record.

19 Handover, As-Builts and Residual Risk

19.0.1 Handover shall transfer an accurate, usable asset record together with the competence, maintenance, monitoring and residual-risk responsibilities needed to sustain performance. A collection of files, an unverified redline or a training attendance sheet is not a handover.

19.1 Controls

Table 19.1 Handover, as-built information and residual risk

Area	Verified	Limit
As-built accuracy	Installed geometry, material, connection and lot, approved changes, concealed-work evidence and survey control, captured progressively before concealment and reconciled at completion.	Field verified and accepted by the responsible, competent engineer or other acceptance authority named in the responsibility matrix.
Asset identification	Facility, block, system, element and product references, linked to drawings, records, warranties and monitoring.	Consistent with the owner's register.
Operation and maintenance	Purpose and system description, operating limits, inspection and maintenance tasks, product instructions, spares and contacts.	Project-approved intervals and criteria only.
Monitoring	Instrument and reference, baseline, reading and review schedule, trigger and action, data owner, budget and access, replacement.	Owner capability confirmed before handover.
Residual risk	Assumptions, retained or inaccessible defects, accepted concessions, load, use and access limits, future work and trigger events.	Owner and AHJ acceptance where required.
Training	Audience, objectives, materials, demonstration, practical assessment, language and accessibility, refresher arrangements.	Evidence of understanding, not attendance alone.
Archive	Index, formats, access and security, backup and retention. Retention period as fixed by the contract, donor conditions or the project records policy; where none fixes it, retention shall be not less than the statutory limitation period applicable to the works. Custodian as named under clause 3.2.3.	Retrieval tested and receipt recorded; transfer to the receiving custodian acknowledged.

REQUIREMENT

The handover package shall allow a competent person who did not build the work to locate the intervention, understand its basis and limits, inspect and maintain it, interpret any monitoring, and trace every significant change and acceptance record.

19.2 Hold and escalation

Table 19.2 Hold and escalation

Condition	Response
The as-built record differs from the installed work or lacks verification	Hold handover; survey, reconcile and check.
The owner lacks the capability required for the monitoring or maintenance regime	Hold and escalate; provide resources, training or an approved alternative regime.
A residual risk, limitation or concession has been omitted from the record	Reject the handover dossier; make it explicit and obtain acceptance.
Data is inaccessible or archive retrieval fails	Hold the information handover until usable formats and access are restored.
Training does not demonstrate the required understanding	Retrain and reassess before handover is accepted.

20 Audit, Performance and Improvement

20.1 Audit

- 20.1.1** Audits shall be planned from risk, process importance, change, performance and prior results, with scope, criteria, team competence and independence, sampling and evidence plan defined before the audit.
- 20.1.2** An audit samples a system. It does not certify the technical conformity of work it did not examine, and it does not replace statutory or contractual acceptance.
- 20.1.3** Where an audit finding indicates an immediate safety or technical risk, it shall be escalated and a non-conformance raised without waiting for the audit report.

20.2 Performance measurement

Table 20.1 Performance measures

Measure	Purpose	Caution
Submittal and inspection timeliness	Identify where approval lead time is compressing technical durations.	Fast approval is not a thorough one.
First-pass acceptance rate	Identify processes producing rework.	May fall as inspection improves; read alongside coverage.
Non-conformance recurrence	Identify whether corrective action is effective.	A falling count may indicate suppression rather than improvement.
Record completeness at handover	Identify whether evidence is being generated as work proceeds.	Completeness is not the same as correctness.
Facility disruption events	Identify whether the continuity plan is working in practice.	Under-reporting is common where reporting is seen as blame.

- 20.2.1** Where a measure creates an incentive to suppress a non-conformance, release work early or report incompletely, the measure shall be changed. Balanced and truthful reporting takes precedence over a favorable trend.

20.3 Closeout and lessons

Table 20.2 Closeout and lessons

Area	Requirement
Closeout	Open actions, non-conformances, claims, records, access and accounts, with named ownership of post-completion actions. Administrative closure shall not close a technical risk.
Lessons	Context, event or problem, evidence, cause, what worked and what did not, and a transferable recommendation. No fabricated detail and no personal attribution.
Dissemination	Anonymized or permitted evidence only, approved before release, and routed into training and future project planning.

Annex A Roles, Responsibility and Communication

Table A.1 Project control header

Field	Entry
Project, facility and package reference	
Client, owner and facility representative	
Designer and engineer of record	
Contractor and specialist installers	
Authority Having Jurisdiction and permit references	

Table A.2 is a template. It has no effect until completed and approved in the project quality plan. Every role referred to elsewhere in this document as named in Table A.2 shall be entered before the clause referring to it is applied. A clause referring to an uncompleted entry shall be treated as an unresolved requirement and the affected work held.

Table A.2 Responsibility and delegation matrix

Action or decision	Prepare	Check	Approve	Accept	Inform
Approve project quality plan					
Release temporary works					
Approve alteration or removal of temporary works					
Issue controlled site instruction					
Approve design or change					
Release HOLD point					
Attend or waive WITNESS point					
Accept inspection or test result					
Approve NCR disposition					
Close NCR or corrective action					
Accept completion and as-built information					

Table A.3 Authorization and competence register

Person	Role	Competence evidence	Authorized scope	Limitation	Effective date	Expiry	Alternate

Annex B Quality Plan and Risk Register

Table B.1 Quality plan tailoring record

Field	Entry
Packages and interfaces covered	
Controlling documents and revisions	
Quality objectives and how they are measured	
Records set, custody, retention and handover format	
Non-conformance and change routes	
Plan review arrangements and change control	

Table B.2 Quality-risk register

Characteristic	Why consequential	Detectability	Control assigned	Verification	Owner

Annex C Document, Submittal and Change Registers

Table C.1 Master document register

Reference	Title	Originator	Revision	Status	Distribution	Superseded

Table C.2 Submittal register

Reference	Package and type	Planned	Submitted	Status	Work front need date

Table C.3 Query and change register

Reference	Issue, type and location	Technical / contractual impact	Raised / required by	Decision, approvals and effective issue	Implementation, verification and closeout

Annex D Supplier, Product and Traceability Registers

Table D.1 Supplier and installer register

Supplier or installer	Package	Prequalification evidence	Status	Review date

Table D.2 Approved product register

Product or system	Manufacturer	Approved submittal	Applicable packages	Limitations

Table D.3 Material receipt and traceability record

Delivery	Product and lot	Quantity	Condition	Documents	Status	Issued to

Annex E Inspection and Test Plan

Table E.1 Package inspection and test plan

Ref.	Activity and coverage	Characteristic and sampling frequency	Criterion and source	Method, equipment, calibration and laboratory	Point	Supervision level	Responsible	Record, result status and next-stage effect

Table E.2 Release-point log

Point	Notice and attendance	Evidence and chain of custody	Result status	Release decision and next-stage effect	Released by	Date

Annex F Non-Conformance and Corrective Action

Table F.1 Non-conformance record

Field	Entry
Reference, date and originator	
Location, lot or element affected	
Exact requirement and its source	
Factual departure and objective evidence	
Containment and status of dependent work	
Extent investigation and result	
Cause analysis	
Proposed disposition and technical basis	
Design, contract and authority approvals	
Execution method and inspection plan	
Verification of conformity	
Corrective action, owner and effectiveness check	
Closure, by whom and date	

Annex G Completion and Handover Records

Table G.1 Completion readiness matrix

Requirement	Evidence reference	Status	Outstanding	Owner

Table G.2 Outstanding work register

Item	Location	Category	Action	Owner	Due	Closed

Table G.3 Handover and acceptance record

Field	Entry
As-built and recorded documents transferred	
Quality dossier index and location	
Operation, maintenance and warranty information	
Monitoring baseline, schedule and data owner	
Training delivered and competence evidence	
Residual risks accepted, and by whom	
Custody transfer, date and signatures	

Annex H Specimen Inspection and Test Plans

The plans below illustrate how the controls of Chapters 8, 13 and 14 are expressed for three representative packages. Acceptance criteria are shown as references to the project documents, because the values are established by the project design and specification and not by this protocol. The plans are illustrative and are to be replaced by project-specific plans. The controls they express are requirements of the body chapters and are not optional.

H.1 Wall anchorage into existing masonry

Table H.1 Specimen inspection and test plan for wall anchorage

Ref	Activity	Characteristic verified	Criterion	Method	Point	Responsible	Record
A-01	Design and document release	Applicable issue, revisions and closed holds	Project document register	Document check	HOLD	Project manager	Release record
A-02	Installer and product approval	Competence, product identity, storage and shelf life	Approved submittal	Certificate and site check	HOLD	Quality manager	Approval record
A-03	Trial installation	Achievable embedment, hole condition, and load performance on the actual wall	Project specification and design	Site proof test	HOLD	Designer / quality manager	Trial report
A-04	Survey and scan	Anchor positions clear of services, reinforcement and concealed features	Issued drawing and scan procedure	Scan and mark out	HOLD	Survey lead	Scan record and marked drawing
A-05	Temporary restraint	Out-of-plane restraint in place before finishes are removed	Temporary-works design	Visual; dimension check	HOLD	Temporary-works coordinator	Temporary-works release
A-06	Hole drilling and preparation	Diameter, depth, perpendicularity, cleanliness and moisture state	Manufacturer's instructions and specification	Measure and visual	WITNESS	Site engineer	Installation log
A-07	Anchor installation	Product and batch, injection or setting method, embedment, cure time	Approved submittal and specification	Observe; batch record	SURVEILLANCE	Site engineer	Installation log
A-08	Proof testing	Performance at the specified proof load on the specified sample	Project specification	Proof test to the specified procedure	WITNESS	Testing agency / inspector	Test report
A-09	Plate, tie and connection	Bearing, alignment, movement allowance and corrosion protection	Issued detail	Visual; dimension check	HOLD	Site engineer / inspector	Inspection record

Ref	Activity	Characteristic verified	Criterion	Method	Point	Responsible	Record
A-10	Concealed-work release	All connections complete and inspected before closure	Issued detail and this plan	Joint inspection	HOLD	Releasing inspector	Concealment release
A-11	Reinstatement	Sealing, fire separation, finishes and drainage restored	Issued detail and specification	Visual, and review of the completion evidence package	REVIEW	Site engineer	Completion record
A-12	Progressive as-built capture and final reconciliation	Anchor positions, product, batch, concealed details and deviations captured before concealment, then reconciled at completion	Project as-built requirement	Survey and record	HOLD	Surveyor / acceptance authority	As-built drawing

H.2 Reinforced-concrete column jacketing

Table H.2 Specimen inspection and test plan for column jacketing

Ref	Activity	Characteristic verified	Criterion	Method	Point	Responsible	Record
J-01	Design and document release	Applicable issue, load restrictions and closed holds	Project document register	Document check	HOLD	Project manager	Release record
J-02	Load restriction and support	Restrictions in place before removal begins	Design and temporary-works design	Visual and instruction check	HOLD	Temporary-works coordinator	Temporary-works release
J-03	Removal of unsound material	Removal to the specified boundary without damage to retained bars	Issued detail and specification	Visual and sounding	SURVEILLANCE	Site supervisor	Removal log
J-04	Post-removal condition	Actual reinforcement condition, section loss and revised extent	Designer assessment	Measure; engineer inspection	HOLD	Responsible designer / engineer	Condition record and disposition
J-05	Reinforcement treatment	Cleaning and replacement or supplementary bars as directed	Designer disposition and specification	Visual and measure	HOLD	Site engineer / inspector	Inspection record
J-06	Substrate preparation	Profile, cleanliness, soundness, moisture and temperature	Specification and product data	Visual and the specified surface tests	HOLD	Site engineer / inspector	Preparation record
J-07	Connectors and reinforcement	Connector type, spacing, embedment; bar size, spacing, laps and cover	Issued detail	Measure and visual	HOLD	Releasing inspector	Pre-pour inspection
J-08	Formwork and access	Geometry, tightness, vents and access for placement and compaction	Issued detail and method statement	Visual	WITNESS	Site engineer / inspector	Pre-pour inspection
J-09	Material supply	Product and batch, mix records, delivery condition and time	Approved submittal	Batch record check	SURVEILLANCE	Quality inspector	Delivery and batch record
J-10	Placement and compaction	Placement method, layer control, compaction and void avoidance	Method statement	Observe	SURVEILLANCE	Site supervisor	Placement log
J-11	Sampling and testing	Specimens taken and tested at the specified frequency	Project specification	Sampling and laboratory test	WITNESS	Testing agency / inspector	Test reports
J-12	Curing and protection	Curing method, duration and environmental protection	Specification and product data	Observe; records	SURVEILLANCE	Site supervisor	Curing record
J-13	Finished condition	Geometry, surface defects, cracking, and void survey where specified	Specification	Visual, measure and specified survey	HOLD	Inspector	Inspection record

Ref	Activity	Characteristic verified	Criterion	Method	Point	Responsible	Record
J-14	Readiness and load transfer	Strength or readiness evidence before restrictions are lifted	Design and specification	Test results; engineer approval	HOLD	Responsible designer / engineer	Load-transfer release
J-15	Protection and reinstatement	Fire protection, finishes, services and inspection access restored	Issued detail	Visual, and review of the completion evidence package	REVIEW	Site engineer	Completion record
J-16	Progressive as-built capture and final reconciliation	Jacket geometry, reinforcement, materials, batches, concealed details and deviations captured before concealment, then reconciled at completion	Project as-built requirement	Survey and record	HOLD	Surveyor / acceptance authority	As-built drawing

H.3 Ferrocement and mesh-and-mortar overlay

Table H.3 Specimen inspection and test plan for ferrocement overlay

Ref	Activity	Characteristic verified	Criterion	Method	Point	Responsible	Record
F-01	Design and document release	Applicable issue, load restrictions and closed holds	Project document register	Document check	HOLD	Project manager	Release record
F-02	Load restriction and temporary restraint	Out-of-plane restraint and load restrictions in place before removal of finishes begins	Design and temporary-works design	Visual; dimension check	HOLD	Temporary-works coordinator	Temporary-works release
F-03	Removal of existing finishes	Removal to the specified boundary; existing wall not damaged or loosened	Issued detail and specification	Visual and sounding	SURVEILLANCE	Site supervisor	Removal log
F-04	Exposed wall condition	Actual masonry condition, mortar-joint soundness, cracking, damp and unexpected features	Designer assessment	Measure; engineer inspection	HOLD	Responsible designer / engineer	Condition record and disposition
F-05	Substrate preparation	Raking of joints or keying, cleanliness, soundness, dust removal and moisture state	Specification and product data	Visual and the specified surface tests	HOLD	Site engineer / inspector	Preparation record
F-06	Trial panel	Achievable build-up, mesh fixing, mortar workability and finish on the actual wall	Project specification and design	Trial panel on the substrate	HOLD	Designer / quality manager	Trial report
F-07	Material supply	Mesh type, gauge and aperture; cement, sand, admixtures and water; product identity, batch and storage	Approved submittal	Certificate and site check	HOLD	Quality manager	Delivery and batch record
F-08	Connectors and through-wall ties	Connector type, spacing, embedment, drilling and hole condition	Issued detail and manufacturer instructions	Measure and visual	HOLD	Site engineer / inspector	Installation log

Ref	Activity	Characteristic verified	Criterion	Method	Point	Responsible	Record
F-09	Mesh installation	Number of layers, orientation, lap length, edge returns, corner and opening continuity, tie-down spacing and standoff from the substrate	Issued detail	Measure and visual	HOLD	Releasing inspector	Pre-cover inspection
F-10	Mortar batching and mixing	Mix proportions, water content, mixing method and time, and working time	Approved mix design and method statement	Batch record check; observe	SURVEILLANCE	Quality inspector	Batch record
F-11	Mortar application	Layer sequence and thickness, compaction into the mesh, void avoidance, cover to the outermost mesh, and inter-layer timing	Method statement and specification	Observe; measure	SURVEILLANCE	Site supervisor	Placement log
F-12	Environmental limits during application	Ambient and substrate temperature, wind and rain exposure, and the limits stated for the mortar system	Specification, method statement and product data	Site measurement; records	WITNESS	Site engineer	Daily record
F-13	Sampling and testing	Specimens taken and tested at the specified frequency; bond or pull-off testing where specified	Project specification	Sampling and laboratory test	WITNESS	Testing agency / inspector	Test reports
F-14	Curing and protection	Curing method, duration, continuity of moisture supply, and protection against drying wind, direct sun and rain	Specification and product data	Observe; records	WITNESS	Site engineer / inspector	Curing record

Ref	Activity	Characteristic verified	Criterion	Method	Point	Responsible	Record
F-15	Finished condition	Thickness and cover achieved, geometry, surface defects, drummy areas, cracking and edge termination	Specification	Visual, measure and the specified survey	HOLD	Inspector	Inspection record
F-16	Readiness and load transfer	Strength or readiness evidence before restrictions are lifted	Design and specification	Test results; engineer approval	HOLD	Responsible designer / engineer	Load-transfer release
F-17	Protection and reinstatement	Finishes, services, drainage and inspection access restored; plinth and wall-head detail complete	Issued detail	Visual, and review of the completion evidence package	REVIEW	Site engineer	Completion record
F-18	Progressive as-built capture and final reconciliation	Overlay extent, mesh layers, connector positions, materials, batches, concealed details and deviations captured before covering, then reconciled at completion	Project as-built requirement	Survey and record	HOLD	Surveyor / acceptance authority	As-built drawing

Figure H.1 shows both sequences with their release points.

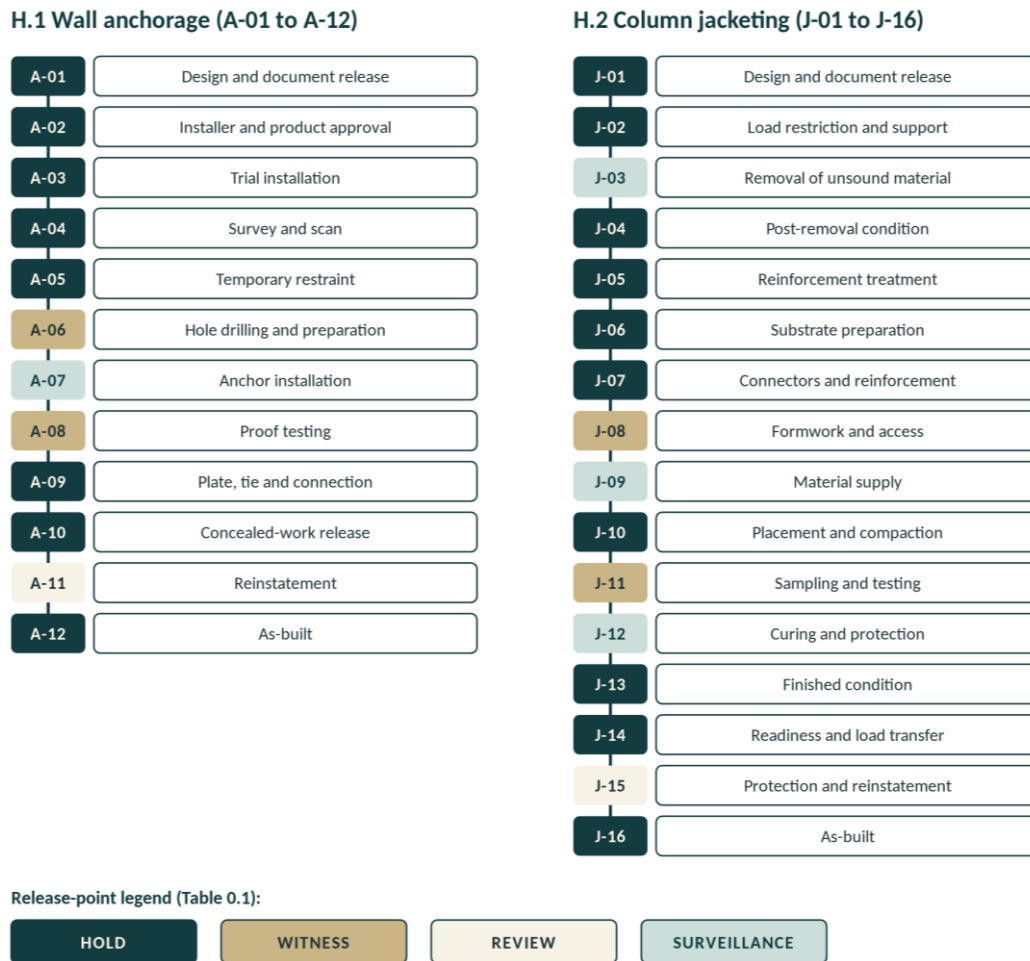


Figure H.1 Release-point sequences in the specimen inspection and test plans

Annex I Worked Example: Controlling a Package

The example below follows one package from release to handover. All details are assumed for illustration and are not a record of any project.

I.1 The package

Two ground-floor columns in an occupied clinic are to be jacketed. The clinic runs outpatient services six days a week and has a 24-hour emergency room on the same floor, at the far end of the corridor. The work is programmed over three weeks.

I.2 Before release

Table I.1 Findings before work-front release

Control	What was found	What was done
Design readiness	The issued detail assumed a column dimension taken from a drawing, but a site survey showed that the dimension differed materially.	The work front was not released. The survey was reconciled and the designer reissued the details before procurement of the reinforcement.
Facility continuity	The proposed hoarding line would have narrowed the corridor serving the emergency room.	The line was moved and a separate construction access created through an external door; the emergency route was left at full width.
Temporary works	The proposed support was to bear on the slab below, whose capacity was not established.	The temporary-works designer checked the slab, revised the arrangement to spread the load, and the arrangement was inspected and released before any removal.
Submittals	The repair material proposed differed from the specified system in one component.	Rejected as a system substitution; the complete approved system was procured.

I.3 During execution

Table I.2 Events during execution and the controlled response

Event	Response under this protocol
Removal exposed greater section loss on one column than the design assumed.	Work stopped at hold point J-04. The condition was measured, photographed and referred to the designer, who issued a revised extent and supplementary reinforcement. The change was recorded and the affected calculations reissued before work resumed.
A delivery arrived with a batch whose remaining shelf life was shorter than specified.	Quarantined at receipt. Not used. The supplier replaced the batch; the incident was recorded against supplier performance.
A pre-pour inspection was requested at short notice, and the inspector could not attend.	The J-07 HOLD point was not waived. Placement was rescheduled. The alternative permitted by the approved project procedure, inspection by a second named person, was used for the following pour and recorded by the releasing authority.

Event	Response under this protocol
Ambient temperature exceeded the product limit during one afternoon.	Placement suspended, recorded in the daily record, and rescheduled to an early morning window. Curing protection was reviewed for the remaining pours.

I.4 At completion

The completion dossier contained the reissued design, reconciled survey, temporary-works release, post-removal condition record and disposition, material and batch traceability to each column, test reports, load-transfer release, and the as-built drawing showing the revised extent. One residual item remained: a small area of the second column could not be exposed because of live service. The record identified its location and evidence, the designer's technical disposition, the authorized concession, required owner or AHJ acceptance, the consequence of incomplete access, and the monitoring trigger and owner.

REQUIREMENT

An inaccessible area is not accepted by recording alone. The handover record shall identify the location and evidence, the designer's technical disposition, the authorized concession, the consequence of incomplete access, any owner or AHJ acceptance required, and the monitoring trigger and owner.

Figure I.1 places these events on the package timeline, keyed to the Table H.2 activity code.

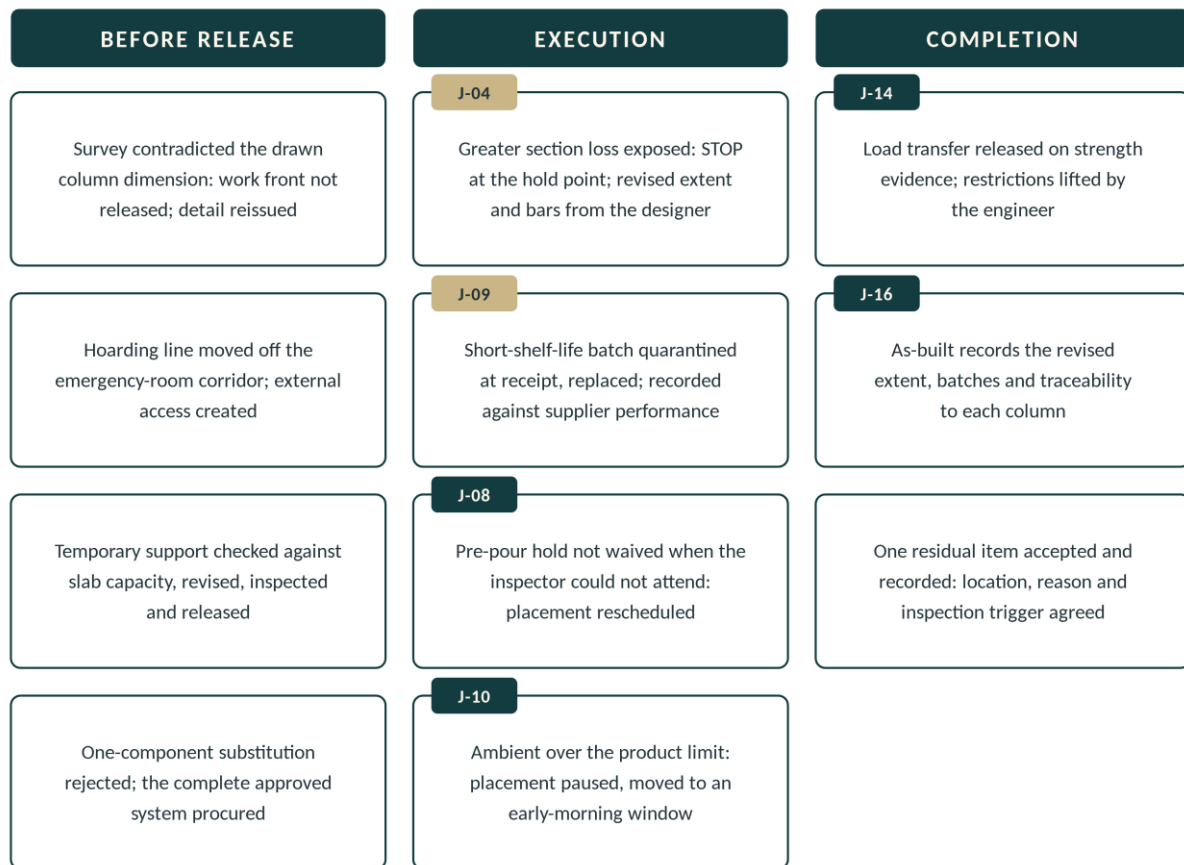


Figure I.1 The Annex I package: three-week control timeline

Annex J Work-front Summary

This one-page summary carries the principal controls for use at the work front. It does not replace the body of this document, the approved design or the inspection and test plan.

Table J.1 Release points

Release point	Meaning at the work front
HOLD	Work stops at this point and does not proceed until the named role gives a recorded release.
WITNESS	The named role must be present and must observe the activity; the activity is recorded.
REVIEW	Evidence is examined and accepted after the activity, before the next stage depends on it.
SURVEILLANCE	Selective or continuing observation of how the work is carried out between release points.

J.1 Stop and hold triggers

- No approved design or specification for the work front.
- Work differs from the approved design, method statement or trial.
- Unexpected reinforcement, prestressing, service, void, damage or movement is encountered during opening up.
- Substrate, interface, reinforcement or connection is not accepted, and concealment is imminent.
- Temporary support or a load restriction is altered, removed or loaded before release.
- Product, environmental, time or curing conditions fall outside the limits stated in the specification or the inspection and test plan.
- A test or inspection fails or is invalid, or required evidence is missing.
- Exposure of the public, students, patients or workers is uncontrolled, or separation has failed.
- A required plan, permit or emergency control is absent.
- A person under eighteen is present at the work front.

J.2 Occupied-facility controls

- Secure hoarding and barriers around every active work zone, maintained as the work front moves.
- A separate, marked and continuously usable route for facility users, including a usable accessible route.
- Emergency exits, assembly routes and vehicle access unobstructed at all times.
- Noisy, dusty or otherwise disruptive work programmed outside teaching or clinic hours, or as agreed with the facility focal point.
- No workforce access to occupied areas, sanitary facilities or circulation used by children or patients.
- No photography of children, patients or facility users without the consent the project requires.
- Area cleared and restored before hand-back, jointly recorded with the facility representative.

J.3 Safeguarding

- Every person mobilized is briefed and has acknowledged the Code of Conduct before first access.
- Safeguarding and child-protection concerns go to the protected reporting route named in the project quality plan, without delay, and not through the site supervision chain.

References

Pakistani codes and legal instruments

1. Pakistan Engineering Council. Building Code of Pakistan 2021. 2nd ed. Islamabad: Pakistan Engineering Council, 2021. Relevant provisions: §104.11, "Alternative Materials and Methods"; §110, "Inspections"; Chapters 16, 17, 19, 21 and 33; and Appendices A and B.
2. Pakistan Engineering Council Act, 1976 (Act No. V of 1976), and the Pakistan Engineering Council Bye-Laws.
3. Construction and Operation of Engineering Works Bye-Laws, 1987, as amended.
4. Constitution of the Islamic Republic of Pakistan, Articles 11(3) and 25-A.
5. Khyber Pakhtunkhwa Prohibition of Employment of Children Act, 2015 (Act No. XIX of 2015), section 3 and Schedule Part II item 33.
6. Punjab Restriction on Employment of Children Act, 2016 (Act L of 2016), section 3 and Schedule item 36.
7. Pakistan Environmental Protection Act, 1997.
8. Khyber Pakhtunkhwa Environmental Protection Act, 2014, and the Khyber Pakhtunkhwa Environmental Assessment Rules, 2021.
9. Punjab Environmental Protection Act, 1997, as amended, and the Punjab Environmental Protection (Review of IEE and EIA) Regulations, 2022.
10. Khyber Pakhtunkhwa Occupational Safety and Health Act, 2022.
11. Punjab Occupational Safety and Health Act, 2019.
12. Factories Act, 1934, Chapter 3; Khyber Pakhtunkhwa Factories Act, 2013; Hazardous Occupations Rules, 1963.
13. Pakistan Engineering Council. Building Code of Pakistan: Fire Safety Provisions 2016. Islamabad: Pakistan Engineering Council, 2016.
14. Government of Pakistan, Ministry of Science and Technology. "Statutory Notification S.R.O. 971(I)/2008." Gazette of Pakistan, Extraordinary, September 8, 2008.

Management-system standards

Unless the controlled project basis adopts an earlier edition, the management-system standards listed are the editions current at the issue date of this document. A revised edition of ISO 9001 is scheduled for publication in September 2026 and is not applied before publication and adoption. Where it is published before issue, the project quality plan shall record the edition adopted and any transition arrangement, and shall apply it consistently. The project quality plan shall record the adopted edition and apply it consistently.

1. International Organization for Standardization. ISO 9001:2015 — Quality Management Systems — Requirements. Geneva: International Organization for Standardization, 2015.
2. International Organization for Standardization. ISO 10005:2018 — Quality Management — Guidelines for Quality Plans. Geneva: International Organization for Standardization, 2018.

3. International Organization for Standardization. ISO 19011:2026 — Guidelines for Auditing Management Systems. 4th ed. Geneva: International Organization for Standardization, 2026.
4. International Organization for Standardization and International Electrotechnical Commission. ISO/IEC 17025:2017 — General Requirements for the Competence of Testing and Calibration Laboratories. 3rd ed. Geneva: International Organization for Standardization, 2017.
5. International Organization for Standardization. ISO 14001:2026 — Environmental Management Systems — Requirements with Guidance for Use. 4th ed. Geneva: International Organization for Standardization, 2026.
6. International Organization for Standardization. ISO 45001:2018 — Occupational Health and Safety Management Systems — Requirements with Guidance for Use. Geneva: International Organization for Standardization, 2018.
7. International Organization for Standardization. ISO 21502:2020 — Project, Programme and Portfolio Management — Guidance on Project Management. Geneva: International Organization for Standardization, 2020.

Technical standards

The acceptance basis for each work type is the approved project specification. Where the project specification adopts or refers to a code, standard, product qualification or test method, that document governs to the extent adopted. The standards listed below are those the project specification may adopt; listing does not itself make a standard applicable. The project shall record the adopted standard and its edition for each work type before the work is released, and shall not rely on a generic standard where the project specification is the controlling source.

Table R.1 Acceptance basis by work type

Work type	Acceptance established by
Added walls and bracing	Project specification; BCP-2021; concrete or steel design standard as adopted; welding standard where welded connections are used.
Ties and anchorage	Project specification; anchor product qualification; anchoring-to-concrete provisions as adopted; proof-test method.
Jacketing, reinforced concrete	Project specification; concrete code and repair code as adopted; concrete sampling and strength test methods.
Ferrocement and mesh-and-mortar overlay	Project specification; mortar and mesh material specifications; mortar strength and bond test methods; ferrocement or cementitious-matrix guidance where adopted.
Bonded composites	Project specification; FRP system qualification and manufacturer data; externally bonded composite guidance as adopted; bond and void survey methods.
Masonry confinement	Project specification; masonry code and specification as adopted; unit, mortar and prism test methods.
Foundation, retaining and site protection	Project specification and geotechnical report; compaction and field-density test methods; drainage requirements as specified.
Flood-resistant works	Project specification and design flood level; BCP-2021 Appendix B where adopted; material and finish specifications; damp-proof and sealing requirements as specified.

Work type	Acceptance established by
Roof and diaphragm strengthening	Project specification; wind load basis as adopted; fastener and product data; connection and fastening requirements as specified.
Mass reduction and removal	Project specification; design disposition for each stage; temporary works design basis.
Crack and patch repair	Project specification; concrete repair code and guidance as adopted; bond and fill verification methods.
Electrochemical treatment	Project specification; specialist system design; cathodic protection standard as adopted; commissioning and monitoring requirements.
Non-structural and life-safety restraint	Project specification; component and fixing manufacturer data; anchor qualification where post-installed anchors are used.
Common protection	Project specification; product data and manufacturer requirements for each protective system.
Structural welding, wherever it occurs	Project specification; welding standard as adopted for structural steel or for reinforcing steel; procedure and welder qualification; inspection method.

1. American Concrete Institute. ACI 318-19 — Building Code Requirements for Structural Concrete and Commentary. Farmington Hills, MI: American Concrete Institute, 2019.
2. American Concrete Institute. ACI 562-19 — Code Requirements for Assessment, Repair, and Rehabilitation of Existing Concrete Structures and Commentary. Farmington Hills, MI: American Concrete Institute, 2019.
3. American Concrete Institute. ACI 546R-14 — Guide to Concrete Repair. Farmington Hills, MI: American Concrete Institute, 2014.
4. American Concrete Institute. ACI SPEC-311.6-18 — Specification for Testing Ready-Mixed Concrete. Farmington Hills, MI: American Concrete Institute, 2018. Cited as an informative benchmark for testing-service and technician-certification requirements.
5. American Society of Civil Engineers. ASCE/SEI 41-17 — Seismic Evaluation and Retrofit of Existing Buildings. Reston, VA: American Society of Civil Engineers, 2017.
6. American Welding Society. AWS D1.1 - Structural Welding Code, Steel.
7. American Welding Society. AWS D1.4 - Structural Welding Code, Reinforcing Steel.
8. American Concrete Institute. ACI 355.2 - Qualification of Post-Installed Mechanical Anchors in Concrete.
9. American Concrete Institute. ACI 355.4 - Qualification of Post-Installed Adhesive Anchors in Concrete.
10. ASTM International. ASTM E488 - Standard Test Methods for Strength of Anchors in Concrete Elements.
11. ASTM International. ASTM E1512 - Standard Test Methods for Testing Bond Performance of Adhesive-Bonded Anchors.
12. ASTM International. ASTM C31, C39, C143 and C172 - Concrete sampling, specimen preparation, slump and compressive strength test methods.
13. ASTM International. ASTM D698 and D1557 - Laboratory Compaction Characteristics of Soil.
14. ASTM International. ASTM D1556 and D6938 - Field determination of in-place density and water content.

15. The Masonry Society. TMS 402/602 - Building Code Requirements and Specification for Masonry Structures.
16. ASTM International. ASTM C270 and C1314 - Mortar for unit masonry and compressive strength of masonry prisms.
17. American Concrete Institute. ACI 440.2R - Guide for the Design and Construction of Externally Bonded FRP Systems for Strengthening Concrete Structures.
18. American Concrete Institute. ACI 549.1R and ACI 549.4R - Ferrocement and externally bonded fabric-reinforced cementitious matrix systems.
19. American Concrete Institute. ACI 305.1 - Specification for Hot Weather Concreting.
20. American Concrete Institute. ACI 306.1 - Specification for Cold Weather Concreting.
21. American Concrete Institute. ACI 308.1 - Specification for Curing Concrete.
22. American Concrete Institute. ACI 301 - Specifications for Structural Concrete.
23. ASTM International. ASTM C1064 - Temperature of Freshly Mixed Hydraulic-Cement Concrete.
24. International Organization for Standardization. ISO 12696 - Cathodic Protection of Steel in Concrete.