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CONSTRUCTION QUALITY IMPROVEMENT COLLABORATIVE

A GUIDE FOR DEVELOPING A CLIENT CONSTRUCTION QUALITY PLAN



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This guidance is advisory and it is intended to support Client bodies to develop a Quality Plan that articulates the approach they will take in the effective fulfilment of their obligations in delivering projects to the expected standards of construction quality.

This guidance has been developed with support from a number of organisations for which CQIC is grateful. Feedback on the contents would be welcomed. This is a dynamic document and CQIC may update it to reflect such feedback.

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1. INTRODUCTION



1. Introduction

The Construction Quality Improvement Collaborative (CQIC) is an initiative involving Scottish Government, SFT, other public sector organisations and representatives from across the construction industry (including Construction Scotland, RIAS, RICS, SBF, CECA and SELECT) with the overall vision for a construction sector:

“where improving construction quality is central to all decision making”.

All too often efforts to drive quality start when a project commences on site. It is essential that the approach to quality is a feature of a project from the outset.

By setting out an appropriate plan and adopting a culture where everyone feels motivated to play a positive role in delivering sustainable construction quality, this will enable the drive towards getting it right first time, thereby saving time and cost, and reducing waste, and supporting the delivery of Scotland’s net zero carbon goals.

A construction client needs to take the lead in this work, prepare a plan at the beginning and create the conditions for achieving success.

This guide sets out to provide some supporting information for clients as they look to develop their client construction quality plan.

The CQIC Charter provides a framework for organisations to consider how they approach improvement and create the right conditions for success. A copy of the Charter can be accessed below and we would encourage all parties in a project to commit to the Charter.

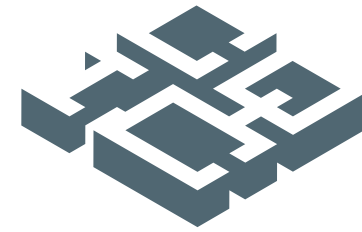
THE CQIC CHARTER

The CQIC is continuing to develop and will provide guidance, notes on good practice and case studies to support the achievement of quality. These resources will be made available on the CQIC website at: www.cqic.org.uk.

The Scottish Government’s Construction Phase Handbook (the Handbook), which provides guidance to assist public sector Clients manage and procure construction projects, has a chapter which is dedicated to the requirements for, and approach to, quality. Access to the Chapter 3 – Quality in the Construction Phase Handbook is available below.

CHAPTER 3: HANDBOOK

The Handbook is mandated guidance for all public contracting authorities which are subject to the Scottish Public Finance Manual, for all others it is considered good practice guidance.



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2. WHAT IS QUALITY?



2. What is Quality?

The Scottish Government's Construction Phase Handbook (the Handbook) defines quality as follows:

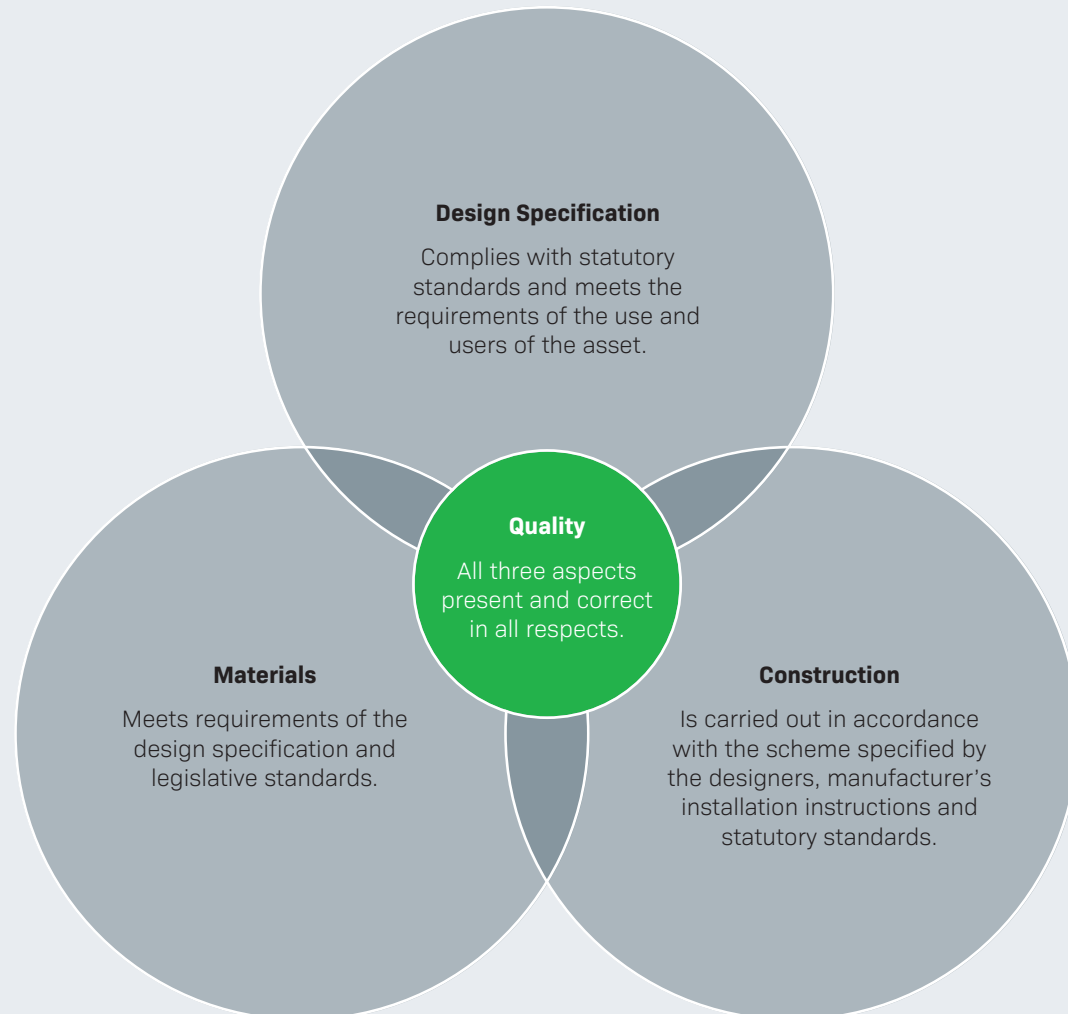
Figure 1.

Quality has two elements to it. Firstly, it is about defining a specification which meets the functional and operational requirements of the use and users of the built asset and, secondly, it is about delivery in all respects of that specification through its design, procurement, and construction.

The successful delivery of a construction project depends on many, sometimes competing, factors coming together. Quality is one such factor and an important one. Quality is objective not subjective and must be measurable against a defined standard. It must not be mistaken for a simple aesthetic, a shinier finish, or more expensive components. It is a combination of a number of aspects and can be defined as follows:

Delivery of the specification in itself will comprise a number of aspects of the project and the following schematic describes the key elements which, when they are all present and correct in all respects, will mean a quality output has been achieved.

Figure 2.



2. What is Quality? (continued)

Acceptable quality will not be delivered where there is un-remediated deviation from the specification. There must be procedures in place to ensure quality is delivered and deal with any deviation from the specification. Remediation may include correcting the deviation or redefining the specification. This applies to each of the three requirements:

- > **Design.** If the design does not meet the statutory and functional requirements of the use and users of the building, acceptable quality is not present.
- > **Materials.** If the materials are not ordered, supplied and/or received according to the design specification or manufacturer's standard as set out in the contract, acceptable quality is not present.
- > **Construction.** If construction is not in accordance with any or all of the design specification, manufacturer's instructions and statutory requirements, acceptable quality is not present.

There must be a continual review on behalf of the Client by personnel with the requisite skills, expertise, and experience of each aspect to ensure that the requirements are being met. This review must be routine as well as in response to planned or 'accidental' deviations. Each aspect should not be

viewed in isolation. A change in one is likely to have a knock-on impact on another. Therefore, a change prompted by a planned deviation during, for example, construction must be reviewed against that phase but also against the outputs of the design and materials aspects and any remedial action taken.

The delivery of quality, as described above in *Figure 2*, is non-negotiable. Contractors and consultants are obliged to deliver quality according to their contracts. The contract must set out what is required to deliver the expected output. The specification should define exactly what is required, no more no less; if more is required then the specification must be amended to reflect that.

Although the contractor is contractually obliged to deliver the specification, the Client cannot simply sit back and leave it all to the contractor. It is the Client that will have to live with the issues if the Contractor doesn't meet quality standards, irrespective of legal/contractual responsibility. Therefore, the Client must be proactive in ensuring and assuring that an effective quality management system is in place and being followed regardless of whether the procurement strategy and associated contract documentation places the majority of the risk with the contractor. This requires a collaborative approach led by the Client.

Effective communication is essential, and this starts with the Client ensuring that everyone involved in the project, whether part of the Client team, the consultants or the contractors and their sub-contractors, is clear about what is required of them both individually and collectively as a team. This will be done through a number of documents including the business case, conditions of appointment, personal job descriptions and contracts as well as being reinforced during meetings.

Procedures must be put in place to deal with issues relating to deviations from the quality standard set out in the specification. Remedial action to address such deviations must be taken and can include action to either correct the deviation or review whether the design specification requires to be redefined.

The delivery of all the Client contributions to quality, as defined in *Figure 1* above, need to be set out at the start of a project. This guide provides support to deliver best practice quality plans that can document, support, and embed a quality culture and practice within projects to deliver improved outcomes. A quality plan alone will not deliver success and it is the behaviours and collective ownership of quality across all project stakeholders that will improve quality across the project lifecycle.



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3.

CREATING CONDITIONS FOR SUCCESS



3. Creating the Conditions for Success

3.1 The CQIC Charter

The CQIC Charter provides a framework for organisations to consider how they approach improvement across the quality agenda and create the right conditions for success. The Charter includes four key drivers to help to deliver a sustainable quality culture that are underpinned by commitments necessary for success:

Quality Assurance & Control

To do it right first time - at the right time

- > Processes are in place to ensure compliance and to prevent errors
- > Mechanisms are in place to detect and address any variations to agreed standards
- > Appropriate project resources are available for programme, design, materials, skills and budget

Behaviour

To create the conditions that embed a positive 'right first time' culture at all stages and by all those involved in the project.

- > Leadership demonstrates a commitment to delivering the CQIC vision and values
- > All personnel are engaged and create a positive working environment with the right conditions for realising change

Alignment to Process

All parts of the process must be designed and implemented to drive quality and improve performance. This requires that:

- > Leadership support initiatives that are designed to align policy and guidance across the sector
- > Project delivery systems, including procurement, are aligned to drive quality
- > Everyone has access to the right information at the right time

Competence, Roles & Responsibilities

Ensuring that everyone is clear about their roles and responsibilities and is competent to deliver them.

- > Appropriate project leadership and management is in place
- > Culture encourages everyone to accept responsibility for delivering quality
- > Everyone has the right skills, experience, and qualifications to do a quality job
- > We are all committed to developing people

As a part of the development of their quality approach, Clients should consider how they will deliver all of these commitments and how they will be incorporated into their Quality Plan.

3. Creating the Conditions for Success (continued)

3.2 Information Management and Technology

Good quality information is intrinsic to the successful delivery of project quality and building safety. Inaccurate and uncoordinated information can increase project risk, defects and errors, which can be costly to resolve and often can lead to physical harm or loss of life.

This fact has been repeatedly identified in public enquiry reports of major UK building failures, which note poor quality information records have often hampered owner's ability to identify and mitigate issues before they happen and subsequently hindered investigators means to fully determine the root causes and liabilities post events.

As part of the quality plan development, it is important for Clients to adopt a whole-life or 'golden thread' approach to building information management, and carefully articulate at the outset what project and asset information they require, for design, construction, handover and operational purposes. A Soft Landings approach will support delivery of this key aspect of project delivery.

Early awareness of these approaches will enable design teams, contractors and operators to plan ahead and align new digital working practices and technologies to deliver quality building information, at key project stages. There are available industry resources and case-studies which help support Clients and delivery teams adopt digital information management standards, processes and new technologies to achieve quality outcomes and related benefits.

Links to these are provided below:

[SOFT LANDINGS APPROACH](#)

[STANDARD INFORMATION MANAGEMENT PLAN](#)

[INFRASTRUCTURE TECHNOLOGY NAVIGATOR](#)

3. Creating the Conditions for Success (continued)

3.3 How to Evaluate Success

Measurement of the impact and success of the approach to quality can be challenging. It is not unusual for quality to be judged by how many items there are on a snagging list at the due date for Completion. A high number of items on the list at this stage tends to suggest that the works are not to the required quality and perhaps are not yet complete. Equally, a small number of items at Completion may be due to expending a significant amount of time and resources in the latter stages of the construction to put right work which was not done properly in the first place.

The measurement of the success of a proactive approach to the delivery of quality during the construction stage needs to take into consideration a range of factors including, for example:

- > How many issues or non-conformances are being recorded as the work progresses?
- > How significant are these issues – a measure may be the time, resources and materials that are required to remedy the issues.
- > Do you have confidence in the records that are being kept of the issues that are being raised?

- > How expediently and efficiently are issues that are raised being remedied? Are they being reported as outstanding over a significant or sustained period?
- > Are the same issues being repeated or have lessons been learned from early incidents and has preventative action been taken to avoid repetition?
- > Is there evidence of good collaboration, openness and transparency between your team, the design team and the contractor and between the contractor and the supply chain?
- > Even though there are a relatively small number of snagging items at Completion, is there a longer list of items being raised, and which needs to be remedied, once the facility is in use?

It is important that Clients have available resources with the experience and expertise to review and report on all these matters.

Whilst the majority of the above items refer to things that have still gone wrong, it is important to note that real success is prevention of issues arising. However, it is difficult to measure the things that did not happen. By measuring the above items across a series, or programme, of projects, it can be determined if improvement is taking place.

To truly measure the impact of a pro-active approach to quality it is important that a thorough lessons learned session takes place at the end of each key stage of the project. As well as identifying what went wrong, and what must be done better on future projects, it must also consider what went well and how this can be assuredly replicated on future projects.

Analysis can be done of the records kept of issues that have been recorded as snags or defects either during the execution of the works or once the facility is in operation. This can give an insight into the extent of failures of quality and also provide invaluable lessons learned for a project as it proceeds or for future projects. The Get It Right Initiative research suggests that the basic cost of such failures is at least 5% of project value. They note that the true cost of the impact of failures in quality is much higher.

It should be noted that analysis of the records of snags and defects is not something that is done as a matter of course. The records of snags and defects are generally used as a checklist of what needs rectified and what has been rectified. The data is seldom used to proactively assess the extent or nature of problems which have arisen. Such an approach would have to be a specific requirement, and this would have to be included in the contract.



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4.

THE DELIVERY OF THE PROJECT QUALITY PLAN



4. The Delivery of the Project Quality Plan

4.1 Introduction

Implementation of a Client Project Quality Plan

The development of a quality plan within a project should address all stages in the delivery process including briefing, design, procurement, construction, and handover. It needs to be developed as a part of the project initiation and kept up to date as the project progresses. The quality plan should set out an agenda for action and cultural change and not just be a document to evidence the process for assessing quality within a project. The plan should set out:

- > Ethos and project vision for quality
- > Aligned quality process for project delivery process
- > Roles & responsibilities
- > Culture and behaviours
- > Quality Control Process
- > Document the requirements by stage
- > Consider the role of technology to support quality.

Section 4.5 of this guide provides suggested considerations and themes to be addressed when preparing and developing a project quality plan. It is not a template for the quality plan but details the issues that need to be considered and incorporated

in a plan and will help to proactively manage and achieve the required quality. The Client Project Quality Plan (PQP) should emphasise the ethos that must be adopted for the project. By doing so it will support positive culture, and behaviour beyond a checklist and assure that the project delivers a high quality product and outcomes. It will support the delivery of the quality cycle as contained in Figure 3 below.

4.2 The Value of the Client Project Quality Plan

Quality does not happen by accident! In the majority of instances, a reasonable standard of quality is achieved, and the outcome is deemed satisfactory, even without a clear quality plan. This is normally due to the knowledge, experience, expertise, and efforts of those involved. However, without a clearly thought-out quality plan there is a much higher chance that quality will not be achieved, and circumstances will intervene to cause a failure of quality. That plan needs to be written down and shared so that all parties have a common understanding of the approach to assuring quality and how this will be achieved. A quality plan should not just be an explanation of how the works will be snagged and the non-conformances fixed, but it should set out the pro-active steps and approaches that will be taken throughout the project lifecycle from initiation

through to completion to ensure that quality is central to all decision making.

4.3 When Should it Start?

The earlier that a quality plan is produced, the better. Ideally by RIBA Stage 1. This will be a Client task.

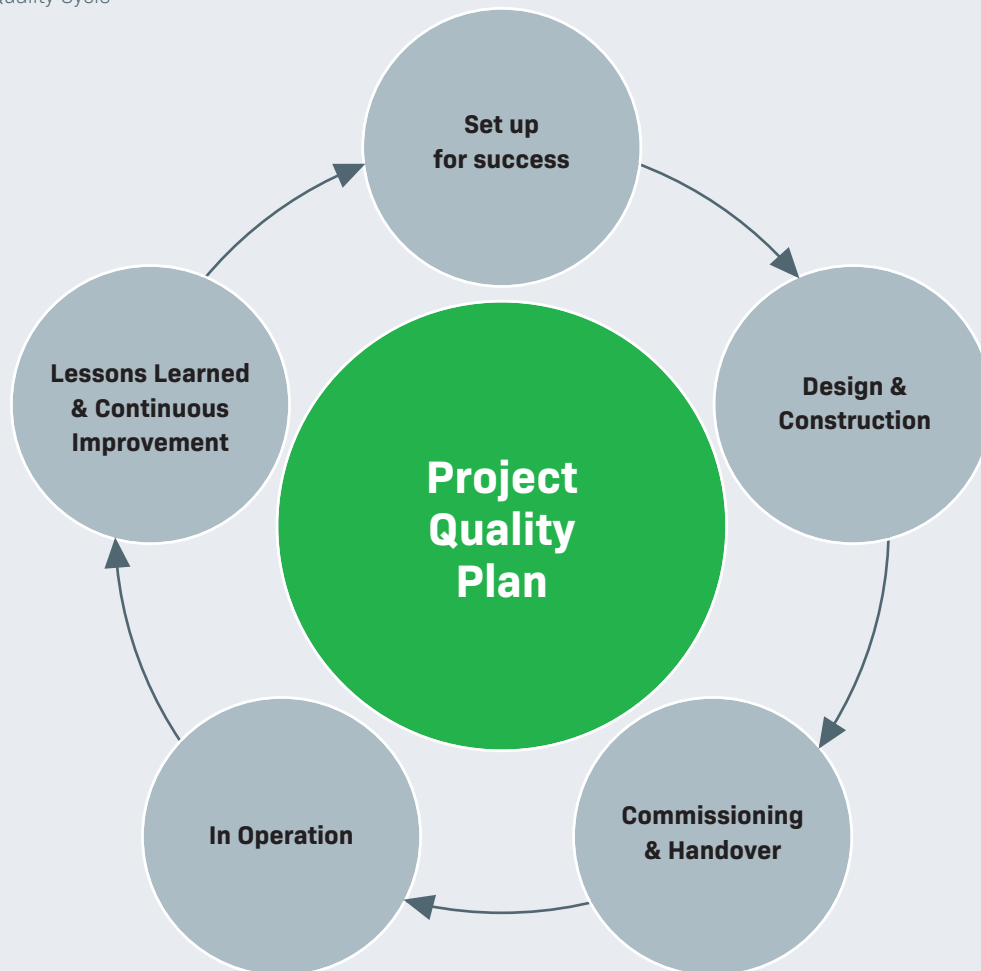
However, it is never too late to start focusing on quality and articulating how it will be assured. Projects that are already underway can have Quality Plans developed. This will bring a much needed focus to quality going forward for the remainder of the project.

4.4 The Contractor's Quality Plan

This plan should not be confused with the Contractor's Quality Plan (CQP). The Contractor's plan will describe how they are going to manage quality for those aspects of the project which they can manage and control. It will not cover how the Client is going to fulfil their role in proactively managing, and supporting the delivery of, quality. How the Client organisation will specify the requirement for a Contractor's Quality Plan, receive and review it, should be included in the Client's Quality Plan.

4. The Delivery of the Project Quality Plan (continued)

Figure 3. The Quality Cycle



The CQP must be drafted by the contractor and provided to the Client before the start of the construction works, as compliance with it should form part of the contractual agreement. The contents of the CQP must be reviewed by the Client who should satisfy themselves that it is comprehensive and complete. It must also be kept up to date during the course of the construction contract.

4.5 Who is Responsible for the Project Quality Plan?

The key step change in the creation and management of a project quality plan is the need to ensure the quality plan is led, managed and delivered by the Client organisation. The contractor and supply chain will support the development, and may supplement the quality plan, but will not have overall responsibility for it.

Resources Required

A decision has to be made on the right resources to deliver the plan within the Client organisation. Although it may be necessary to have an external resource to draft, or support drafting, of the plan, it is essential that it reflects the Client's intended approach and that they take ownership of the plan and its implementation. The articulation of the approach to quality, and the production of a Project

4. The Delivery of the Project Quality Plan (continued)

Quality Plan, can be a daunting prospect. However, it is likely that many of the areas included in a Quality Plan are already addressed by Clients and are just not articulated in a written plan. The Client's Project Quality Plan should sit within the overarching Project Execution Plan (PEP) which sets out the overall strategy for managing the project, describing who does what and how, and defining the policies, procedures and priorities which will be adopted.

4.6 What Should be Considered and Documented?

This section outlines some key questions and considerations for addressing within a Project Quality Plan. These issues support the vision and commitments articulated in the Construction Quality Charter at the heart of the CQIC initiative.

Project Vision and Ethos for Quality

1. What is the project vision and ethos for quality and how will this be communicated to stakeholders and supply chain members?

2. What ways will the requirements for, and approach to delivering, quality be communicated to project members – e.g. appointments, initial inductions to the project, site inductions, project review meetings etc.
3. How will you ensure that quality is central to all decision making throughout the project lifecycle?

Governance, Roles, and Responsibilities

4. Are the roles and responsibilities of all the key parties on the project clearly defined? Who is involved and how do they link together?
5. Has the Baseline Skillset Toolkit been used for those leading the project? [Click here](#) for more information on the Baseline Skillset Toolkit.
6. What are the governance and project structures? How will they support the definition and achievement of quality?
7. Is there an identified role which includes being a champion for quality? This might not be a separate appointment but is someone within the senior management of the project identified as a focal point to show leadership and drive delivery of the required quality. They will not be solely responsible for the delivery of quality but should have knowledge and experience of how quality is

achieved, what the risks to quality are and be prepared to intervene, and where necessary escalate matters, where they perceive that the approaches being taken, or behaviours being displayed, are putting quality at risk. They should report directly to the Project Board on any issues or concerns about the approach to quality. This should not be about individual quality issues unless these are particularly significant.

8. How will the approach to quality and associated monitoring be embedded within the overall project assurance process? An example would be that the Project Board receives a regular report on quality matters.
9. Do all stakeholders understand the principles of quality of design and construction being sought, and do they have a collective ambition for quality across the project?

4. The Delivery of the Project Quality Plan (continued)

Information Management and Technology

10. How will the information management approach and process support the quality process?
11. Will the Client organisation ask for access to the constructor's quality management software? This was a successful approach taken on a number of quality pilot projects and is very beneficial to the Client's team. It provides openness and transparency on how quality is being managed and a shared insight into the extent of snagging and non-conformance. It provides one source of information on the quality records and avoids the risk of these records being located across multiple systems. Has the requirement for access to the contractor's system been, or will it be, highlighted during the procurement process? What records of quality achievement will be required to be maintained during construction and provided as part of the project documentation at handover?
12. Is a photo-capture technology or progression scanning technology to be used during the construction process? Is it allowed for in the project budget? Information on the use of technology is available from the Tech Navigator which is accessible [here](#).

13. Will there be use of technology such as a Common Data Environment? If so, who will provide it and how will it be used?

Briefing & Procurement

14. How will the lessons learned, specifically on construction quality, from previous projects be captured to inform an improved approach to quality? This might include consultations, post project reviews and post occupancy evaluations and engagement with operational teams. This is with reference to lessons learned across the whole process. Gathering lessons learned from all the participants in a project, and doing research as to what lessons learned are available from the wider sector, will be invaluable. Elements of the in-use lessons learned may be covered by the Briefing and Evaluation process. Information on Briefing and Evaluation is available [here](#).
15. How will the brief be developed and reviewed to ensure it captures the expectations in terms of quality?

16. How will the project budget and programme be established to allow sufficient resources (of funds and time) in design and construction, to allow the required quality to be achieved?
17. How will procurement take the delivery of quality into account (for all aspects – design and construction)? It is important that delivery of quality is a key criterion in the selection of consultants and contractors. There must be clarity that a Contractor's Quality Plan will be required that explains the approaches they will take to getting the work right and not just how they will fix snags. Separate guidance on approaches for delivering quality during construction is being prepared by CQIC.

4. The Delivery of the Project Quality Plan (continued)

Design & Construction

18. How will designs be reviewed and the risks to their compliance aligning to the Client's project requirements addressed? Does the Client have an internal resource to support this or will external support be required?
19. Who will review the Contractor's Quality Plan? Have the requirements for the provision of the CQP been clearly set out? Guidance for approaches to achieving quality during the construction stage will be provided as a part of the CQIC. How will the implementation of the designer and/or Contractor's Quality Plan be monitored during the execution of the project? Will compliance audits be carried out in addition to physical inspections of completed works?
20. Is there a design responsibility matrix? How will Contractor's Design Portion (CDP) elements be dealt with? Who will review the CDPs for compliance with the overall design?
21. What is the process for independent quality assurance during the construction phase? CPN 1/2017, issued as a follow up to the Report of the Independent Inquiry into the Construction of Edinburgh Schools. This report made it clear that regardless of the procurement strategy, it is incumbent upon public sector clients to implement project appropriate site inspection and assurance processes that mitigates resultant risk from the construction phase. Is a Clerk of Works, Inspector or Technical Advisor to be appointed? How much time will be dedicated to the project by these resources? Again, separate guidance on the use of Independent Quality Assurance will be produced as a part of the CQIC and will be made available. Will a separate M & E Clerk of Works/Inspector be provided? If there is off-site fabrication or assembly how will this be covered? Are the costs of the resources required included in the budget? How will the role be formalised and how will the resulting reports be dealt with?
22. Will there be dedicated Quality Meetings during both the design and construction stages – i.e. not just an agenda item on Design Meetings or Progress Meetings? These can make a significant contribution to the pro-active management of quality. During the design and procurement stages these would cover how the lessons learned are being designed in or dealt with and how the design is enabling quality. In the package procurement stage, it could cover how the procurement process is affecting the ability to deliver to the required quality. Is there discussion taking place with the supply chain to get the benefit of their expertise, experience and input? During the construction stage, quality meetings cover the actions being taken to get the work right in the first place, not just what snagging and errors have been found. There needs to be a look ahead to forthcoming work and consideration of what risks to quality can be identified. What is being done to avert such risk? This can include measures such as sample panels, benchmarking of work, workshops to discuss the quality risks, toolbox talks with operatives etc. If snags are reported, then what is being done to avoid them happening again? Will the requirement for attendance at Quality Meetings be included in appointments and contracts?
23. What are the expectations/requirements in terms of the design team involvement during the construction stage? Is it, or will it be, allowed for, and a requirement, in the appointments? It is important that the contractor is aware that such involvement will be taking place and must be supported.
24. Change control for design & construction – how will this be done and how will it address the potential risks/impact on quality?

4. The Delivery of the Project Quality Plan (continued)

Commissioning and Handover

25. Who will maintain the completed facility? How will the project effectively engage with and transition the facility to the FM/Property Team? Is it intended to use a “soft landings” type approach?
26. Is a digital operation and maintenance manual being specified and how will the quality of this information be validated? This is linked to the requirement to adopt a Standard Information Management Plan (SIMP) on Learning Estate Investment Programme (LEIP) projects. Further information on this is available [here](#).

In Operation

27. Post Project Reviews (PPR) and Post Occupancy Evaluation (POE) are key aspects of the process. The requirement for them needs to be highlighted in the quality plan and included in appointments and contracts. The lessons learned, both positive and negative, will be invaluable for future projects.

Other Considerations

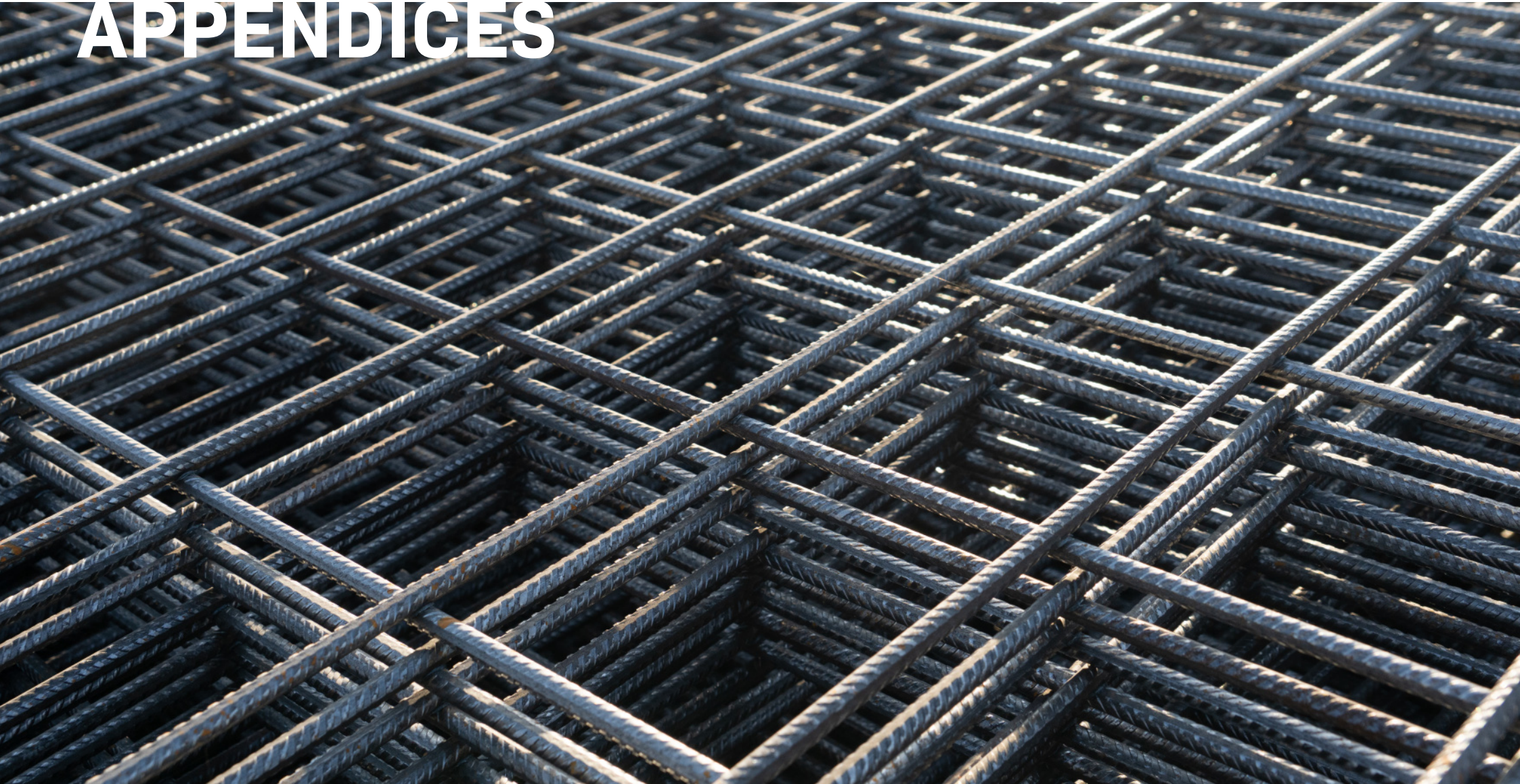
28. Are any project level initiatives or awareness raising activities going to be delivered to support cultural change amongst stakeholders in support of the delivery of construction quality – workshops, communications etc.

The list of questions above are not exhaustive and early engagement with the project team should be carried out to develop a proportionate, project specific quality approach.










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APPENDICES




Appendix 1: Table of Links to Supporting Advice

Referenced in the body of this guide

Page	Title	Link
2	Get It Right Initiative	
3	Scottish Government Construction Phase Handbook - Chapter 3 - Quality	
6	Infrastructure Technology Navigator	
6	Standard Information Management Plan (SIMP)	
8	Baseline Skillset Toolkit	
9	Construction Quality Assurance Initiative	
9	Benefits and Evaluation Framework	

Other advice and guidance

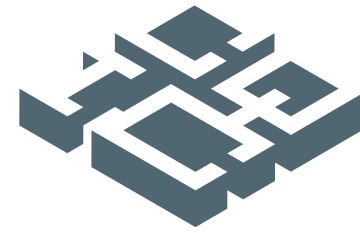
Link	Description
	CIOB Improving Quality in Construction

Appendix 2: Template Contents List for a Quality Plan

A potential contents page for a Quality Plan might be:

Contents

1. Project Scope
2. Project Governance
3. Roles and Responsibilities
4. Quality Management Approach
 - 4.1 Developing the Brief
 - 4.2 Procurement
 - 4.3 Design Stage
 - 4.4 Construction Stage
 - 4.5 Operational Stage
 - 4.6 Meetings Structure
 - 4.7 Change Control
5. Information Management and Technology
6. Communications Plan



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