Construction Quality Management & Awareness Courses

What would we like to achieve

For any role in the construction industry, there must be an appropriate level of competence not only with respect to technical ability but also health & safety and environmental aspects. This is represented in Figure 1. For example, a discipline expert generally requires a greater level of competence in relation to H & S or environmental (HSE) aspects but less technical knowledge and vice versa for project managers.

Courses such as IOSH Managing Safely, IOSH Supervising Safely, and CITB Site Environmental Awareness Training (SEATS) provide a mechanism to increase competence levels where a ‘gap’ is identified as indicated in Figure 1.

![Figure 1: HSE vs Technical Competence Level corresponding to role](image)

Objective

In early-2014, the Construction Special Interest Competency Working Group (ConSIG CWG) membership reached a consensus that one of the greatest barriers to the achievement of ‘quality’ in construction is a lack of awareness of the value and practices of quality management. Furthermore, this lack of awareness is manifested
ConSIG Competency Working Group

not just at operations level - but at all business and project levels. This is represented in Figure 2, whereby the courses noted above for HSE do not exist for quality.

Figure 2: Quality vs Technical Competence Level corresponding to role

It was therefore proposed that the ConSIG CWG be the catalyst for the development of a range of courses for public or in-house delivery.

Thus, the ConSIG CWG set up the ‘Construction Quality Awareness’ workstream. The objective of the workstream was to develop a series of courses for the construction industry which would help resolve the issue identified above.

A wide-ranging discussion of the potential structure, format and content of the courses settled upon the analogy of IOSH’s and CITB’s Health & Safety courses that provide a graduated range of awareness training modules for construction personnel. Thus, the ConSIG CWG resolved to pursue the development of a similar range of course structures.

**Concept of ConSIG CWG Quality Awareness Courses**

Courses such as IOSH Managing Safely, IOSH Supervising Safely, and CITB Site Environmental Awareness Training (SEATS) are recognised to provide a basis upon which the required standards of HSE can be brought about and which can thus drive continual improvement.

As shown in Figure 2, the same principle applies to quality. Thus, the proposed Quality Awareness Courses aims to deliver the equivalent of these HSE courses providing an industry wide recognised qualification specific to quality.

Consequently, just as it is the aspiration that the Construction Industry achieves appropriate Health & Safety leadership, behaviours and culture, these courses aim to provide a foundation for:

- Quality leadership within the context of role
- Quality culture across construction projects and within construction organisations
- The right behaviours to bring about Right First Time, Defect Free, Excellence and reduce errors.
The syllabus of each course is based on a Quality Awareness Course Framework developed by the ConSIG CWG whose members include senior construction quality professionals representing major UK Construction Industry organisations.

**Courses**

The ConSIG CWG proposes that a graduated range of quality awareness training course profiles and courses be developed; the individual courses would be:

- Quality Awareness for Directors
- Quality Awareness for Managers
- Quality Awareness for Engineers
- Quality Awareness for Supervisors
- Quality Awareness for Operatives

A rough outline of each of the courses is appended. An example of the syllabus for the Supervisors Competency Awareness Course is also attached.

It is planned that the range of courses then be extended to cover more specialised professional groups which may include the following:

- Quality Awareness for Clients
- Quality Awareness for Designers
- Commercial Quality Awareness

**Style and Structure**

The content, duration and verification regime for the courses would be developed to be very similar to IOSH Directing/Managing/Working Safely and CITB’s SMSTS/SMSTS/SEATS courses that have become embedded in construction. This approach has several advantages, for example, directors and managers are familiar with the type/style of the courses, and HR teams are familiar with the planning and graduated director/manager/supervisor/worker levels of the courses.

**Accreditation Requirements**

To facilitate an industry recognised qualification such as IOSH Managing Safely, each course will need to be approved by an appropriate industry body. Training providers may also be required to be approved by the industry body to deliver training. For example, the Chartered Quality Institute offer a mechanism for courses whereby Approved Training Partners deliver courses which have been verified to meet relevant standards.

**Course Delivery**

To provide flexibility, the courses are designed to be delivered by means such as the following:

1) **‘Off the Shelf’**: The services of a training provider would be procured to deliver predeveloped and accredited courses.

2) **Bespoke Organisation Course**: An organisation may use the syllabus to develop a bespoke training course which meets the minimum requirements of the syllabus. The course would need to be approved by an accreditation body. Where appropriate, the training organisation would also need to be approved to deliver the training by the accreditation body. (This enables an organisation to develop a course covering the fundamental aspects but, for example, tailor it specifically to the company.)

3) **Bespoke Course delivered by organisation trainers**: An organisation may use the syllabus to develop a bespoke training course which meets the minimum requirements of the syllabus. The course would need to be approved by an accreditation body. Where appropriate, the organisation may need to obtain approval with the accreditation body to be authorised to deliver the training. (This enables an organisation to not only develop a course covering the fundamental aspects and tailor it specifically to the company but also deliver the course via trainers employed within the organisation. This may reduce
costs in the long run especially for large companies with significant numbers of employees who require training.)

Delegate Assessment

The knowledge gained by delegates would be assessed via means appropriate to the course. For example:

- The Operatives and Supervisors Quality Awareness courses would likely be assessed via a multi-choice question paper to verify understanding of the principles learned.
- The Quality Awareness for Managers and the Quality Awareness for Engineers, being more involved, could require a coursework exercise be completed which would verify understanding and the ability to practically apply the principles learned.

Training organisations would be required to mark the assessments against a specified criteria. Marked assessments would then be moderated by the ConSIG CWG.

Upon successful completion of the course, it is proposed that a recognised industry body would maintain a register of all those who pass and issue Certificates of Completion.

Background to Course Development

In mid-2014, a brainstorm session identified a wide range of topics that ought to be included in the potential courses. In late-2014, ConSIG members were asked to identify, via a simplistic SurveyMonkey poll, which of the identified topics should be included in prospective courses for directors, managers, engineers, supervisors and operatives. Members’ responses were analysed to provide a profile of the degree to which a particular topic should covered in each of the prospective courses. The results were distributed to ConSIG members and discussed at CWG meetings in early-2015. The CWG concluded that the analysis provided a reasonable guide to the importance of each topic for inclusion in each of the prospective courses. During mid-2015, CWG members discussed outline information for the prospective courses.

A Quality Awareness Course Framework for the quality awareness courses was subsequently developed 2016 – May 2017 via workshops attended by members of the ConSIG CWG. The Framework was approved by the ConSIG CWG and the syllabus for the Supervisors’ Quality Awareness Course subsequently developed.

A proposal document with the syllabus for the Supervisors Quality Awareness Course was sent to a number of key construction companies for comment during July 2017. Feedback to date has been very positive.

Next Steps

The concept for the courses has been determined, the Quality Awareness Course Framework developed, and the corresponding Supervisors Quality Awareness Course produced as an example. Positive feedback has been received to date. The ConSIG have therefore concluded that the workstream has successfully achieved an appropriate output pending one of the following:

1) An organisation with appropriate resource may (with the authorisation of the ConSIG) utilise the syllabus provided by the ConSIG CWG to develop courses as per the above proposal. The ConSIG CWG would, if requested, provide the syllabi for the other courses which would be based on the ConSIG Quality Awareness Course Framework.

2) An organisation may partner with the ConSIG CWG to utilise the ConSIG CWG Quality Awareness Course Framework to develop syllabi and courses aligned with the above proposal.

Subject to either option (1) or (2), it is proposed that a pilot scheme for the courses be developed. This would prove the concept and determine any amendments to the initial course structures and control processes prior to going fully ‘live’. 
ConSIG Competency Working Group

The work to date has been championed by (alphabetically): Hellen Ball, Mike Buss, Paul Greenwood, Tony Hoyle, Louise Jones, Karen McDonald, Neil Mellor, Ian Mills, and David Myers.

Rev 1.0: Original article written by Mike Buss, Chair of the ConSIG CWG (20/11/17). Article reviewed by Karen McDonald, Deputy Chair of the ConSIG CWG and lead for Workstream 2 Construction Quality Awareness Training (22/11/17).
## APPENDIX 1

### The Proposed Courses

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<tr>
<th>Introduction</th>
<th>Content Guide … for further development</th>
<th>Duration</th>
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<tr>
<td><strong>1</strong> The ‘Directing Quality’ course is intended primarily for directors and other business leaders with strategic responsibility in the Construction Sector; i.e. those who define the overall policy and direction of the business, provide resources and ensure effective implementation. Such individuals may include: Managing Director, Chief Executive Officer, Finance Director, Chief Operating Officer, Programme or Project Director, Construction Director, Commercial Director, etc.</td>
<td>Understand the importance of a quality culture and the costs and benefits of a systematic approach to the management of risk and quality - and the need for the integration of ‘quality’ with other business management aspects within a Construction context. Have an appreciation of: - What is ‘quality’ in a business context - How leadership frames the business’ governance, assurance and improvement - How ‘quality’ affects reputation, profitability and value, systematic business transformation - How competence, resources and materials affect quality - The legislative and standards requirements for quality - The benefits of managing quality - The consequences (cost++) of failing to manage quality effectively - ...</td>
<td>0.5 - 1 day</td>
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<td><strong>2</strong> The ‘Managing Quality’ course is intended primarily for operational managers in the Construction Sector; i.e. those required to define operational processes and manage quality, in order to meet their organisation's objectives and comply with their clients', customers', regulatory and other stakeholders' requirements. Such individuals include: Project Managers, Contract Managers, Site Managers, Site Agents, etc Others who may have an interest include: Quality Graduates, Quality Engineers, Quantity Surveyors, Supply-Chain Managers, Procurement/Purchasing Managers, Estimators, Planners, Temporary Works Managers, H&amp;S Managers, Environmental Managers, etc.</td>
<td>Understand the principles of quality management, assurance and control, and the common components of a recognised management system (e.g. ISO 9001) within a Construction context. Have an appreciation of: - What is ‘quality’ in an operational management context - The effect of risk and variability on quality - Legislation and standards requirements for quality - How competency and the working environment affect work - Operational planning and process management - Verification and validation - Review, audit, certification and accreditation - Non-traditional management methodologies, tools and techniques (lean, 6σ, TOC, etc) - ...</td>
<td>3-5 days Day or block based</td>
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## Competencies Working Group

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<td>3 The 'Engineering Quality' course is intended for managerial and supervisory staff who have a greater technical responsibility for delivery of the works in the Construction sectors; i.e. those who define, plan and/or verify the conformity of the works with contract or other technical requirements. Such individuals may include: Site Engineers, Sub Agents, Package Managers, M&amp;E Managers, Temporary Works Engineers/Supervisors, Technical Advisors, Technicians, etc.</td>
<td>Understand the principles of quality management, quality assurance and quality control, and the common components of a quality control system within a Construction context. Have an appreciation of: - What is ‘quality’ in an engineering/technical context - The effect of risk and variability on quality - Legislation and standards requirements for quality - Planning for quality control - Controlling materials, including quarantine - Ensuring competence - Monitoring, inspection, testing, calibration and commissioning - Controlling and analysing non-conformities - Records, certification and archival - ...</td>
<td>3-5 days Day or block</td>
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<td>4 The 'Supervising Quality' course is designed for operational supervisors, team leaders or junior managers in the Construction Sector. Such individuals may include: Trade Supervisors, 'black hat' Supervisors, Foreman, Site Supervisors, assistant managers, etc.</td>
<td>Understand the principles of quality assurance and quality control on construction site. Have an appreciation of: - What is ‘quality’ in a site supervisory context - Operational planning - Planning for quality control - Materials control - Competency verification schemes - Monitoring, inspection, testing, control of non-conformity - Improving quality - ...</td>
<td>2-2 days Day or modules</td>
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<td>5 The 'Operating Quality' course is intended for all those who carry out tasks on construction sites that may have an effect upon the quality of work or the works (and who are not within the scope of one of the above courses). Such individuals include: site operatives either directly or subcontract employed electricians, carpenters, ground workers, etc.</td>
<td>Understand the principles of planning for and achieving good workmanship and operational performance on construction sites. An appreciation of: - What is ‘quality’ (acceptance criteria) - Controlling your own work - Pride in work well done - The need for verification - Improving quality - ...</td>
<td>½ - 1 day Day or modules</td>
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The Supervisors Quality Awareness course should focus on key messages rather than too greater detail and be presented in the format of pictures and diagrams, bullet points, discussions, and relating topics to the learner’s role.

**Introduction**
- Trainer introduces the trainer’s role and overall plan.

**Course Learning Objectives**
- The learner will be able to develop an awareness of the principles related to quality assurance and importance to the construction industry.
- The learner will be able to describe the principles related to quality assurance and importance to the construction industry.
- The learner will appreciate the importance of ensuring all tasks are completed in relation to the ITP.

**What is construction quality and why?**
- The learner will understand the importance of temporary works and that temporary works should be managed using the same management concepts such as ‘just in time’.
- The learner will appreciate that quality can be viewed from different perspectives (i.e., the ‘product’ but also a ‘service’ and different stakeholders).
- The learner appreciates the importance of having access to the latest information and effectively communicating to relevant parties / persons.
- The learner appreciates that plans are established for a project to manage delivery of the works and the reasons why (e.g., planning, working to the plan and record evidence).
- The learner appreciates the need to focus on other parties beyond their immediate customer (including understanding the work of other parties / persons).

**Quality Assurance & Quality Control**
- The learner appreciates the importance of mock-ups and how these should be used differently to ‘benchmarks’ (e.g., focussed on construction as opposed to first of a kind).
- The learner understands the principle of planning, working to the plan and record evidence.
- The learner will understand the purpose of checklists and how to use them effectively.
- The learner will appreciate when and how a benchmark should be produced, presented, and maintained.
- The learner appreciates the principle of the PDCA cycle.

**QA/Training Exercises**
- Site visit. The trainer provides insight into the work on the construction project.
- Trainer facilitates a discussion on the impact of poor quality.
- A discussion on the purpose of checklists and their importance in ensuring quality is achieved.
- A discussion on the importance of mock-ups and their role in ensuring quality is achieved.
- A discussion on the importance of evidence and what this may consist of (photos, films, documents, red-line drawings, etc.).
- An exercise in which the learners review an ITP and present how they would ensure all tasks are completed in relation to the ITP and the importance of evidence.

**Project Execution Plan**
- The learner appreciates that there must be a distinct process to resolve issues which are not right (Error & Defect Management).
- The learner appreciates the importance of ensuring adequate protection of completed works and the works area including information, materials, equipment, environment.)
- The learner appreciates the importance of leadership within the context of their role.
- The learner appreciates the importance of temporary works and that temporary works should be managed using the same management concepts such as ‘just in time’.
- The learner appreciates the existance of standards for management of quality including ISO 9001 (Quality Management System standard).
- The learner appreciates the importance of having access to the latest information and effectively communicating to relevant parties / persons.

**COURSE WRAP UP**
- The learner appreciates the potential implications of errors and how effective quality management can contribute to continual improvement.
- The learner understands the importance of evidence and what this may consist of (photos, films, documents, red-line drawings, etc.).
- The learner appreciates that plans are established for a project to manage delivery of the works and the reasons why (e.g., planning, working to the plan and record evidence).
- The learner understands the importance of ensuring adequate protection of completed works and the works area including information, materials, equipment, environment.
- The learner appreciates leadership within the context of their role.
- The learner appreciates the importance of temporary works and that temporary works should be managed using the same management concepts such as ‘just in time’.

**Course Wrap Up**
- The learner appreciates the importance of ensuring adequate protection of completed works and the works area including information, materials, equipment, environment.
- The learner appreciates the importance of leadership within the context of their role.
- The learner appreciates the importance of temporary works and that temporary works should be managed using the same management concepts such as ‘just in time’.
- The learner appreciates the existance of standards for management of quality including ISO 9001 (Quality Management System standard).
- The learner appreciates the importance of having access to the latest information and effectively communicating to relevant parties / persons.

**Assumptions**
- Course is aimed at those with responsibility for quality of the works on construction sites.
- Course will be delivered by a trainer who is a qualified trainer and has experience in the construction industry.
- Learners will have basic literacy and numeracy skills.
- Learners will have access to a computer and internet.

**Target Deaudience**
- The Supervisors Quality Awareness course is aimed at those with responsibility for quality of the works on construction sites. This includes both on-site supervisors and those who are responsible for ensuring that quality standards are met. The course is designed to provide learners with an appreciation of the principles related to quality assurance and the importance to the construction industry.

**Total Time**
- 13.25 hours (target)