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School infrastructure



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Education and Skills Committee

To consider and report on matters falling within the responsibility of the Cabinet Secretary for Education and Skills.



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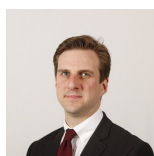
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Introduction

1. The Committee has undertaken a short inquiry into school infrastructure and the safety of school buildings in June 2017. This follows the collapse of a wall at Oxfords Primary School in Edinburgh on 29 January 2016 and the subsequent report of the Independent Inquiry into the Construction of Edinburgh Schools led by Professor John Cole CBE ("the Cole Report"), published on 9 February 2017.¹
2. It is not for the Committee to re-run the independent inquiry. Our focus has been on whether the necessary steps have been taken to ensure that the school estate across Scotland is safe and that lessons have been learnt for the future.
3. We took evidence over three meetings in June 2017, from Professor Cole, stakeholders, local authorities, the Scottish Futures Trust and the Scottish Government. The Committee received written submissions from a number of stakeholders from the education sector and the construction industry. The Committee also received responses from 30 out of the 32 local authorities in Scotland. The Committee thanks all of the individuals and organisations who contributed to the Committee's work. Links to all of the written submissions and Official Reports of the oral evidence sessions can be found [on the Committee's webpage](#).
4. The remainder of this report is in two parts: an [executive summary with the Committee's conclusions and recommendations](#); and a [summary of the evidence the Committee received](#).

Membership changes

5. Ross Thomson resigned as a Member of the Scottish Parliament on 12 June 2017. Oliver Mundell MSP was appointed as a Member of the Committee on Thursday 29 June 2017. Neither Member took part in the evidence sessions for this inquiry.

Executive summary and conclusions and recommendations

The Oxgangs incident

6. The Committee heard powerful evidence that it was only good fortune that prevented the collapse at Oxgangs school leading to injury and loss of life.
7. The Committee notes that the Cole Report praised the City of Edinburgh Council for its handling of the aftermath of the Oxgangs incident and subsequent school closures. The Committee also recognises that the City of Edinburgh Council quickly established an independent inquiry into the school closures which has ensured that issues around the problems of construction are well understood and lessons are being learned.
8. The Committee heard evidence from a wide range of stakeholders and was struck by the esteem in which the Cole Report is held. The Committee commends Professor Cole for his work and is determined that the risks and lessons to be learned that were identified by the Cole Report are disseminated and understood as widely as possible.
9. The Committee recommends that Scottish Government ensures that every devolved public body in Scotland studies the Cole Report in detail and reviews their own estates in light of its findings.
10. Specifically in the post-16 education sector, the Committee seeks confirmation from the Scottish Funding Council (SFC), along with Colleges Scotland and Universities Scotland, that their sectors are fully aware of the findings of the Cole Report and that they have taken appropriate actions to ensure that the college and university estates across Scotland are safe, including halls of residence.
11. The Committee draws the attention of the Scottish Council of Independent Schools (SCIS) to the findings of the Cole Report. The Committee asks that SCIS supports its members to understand any potential risks for the estates of independent schools and the appropriate actions to take.
12. The Committee requests an update on this work from the SFC, Colleges Scotland, Universities Scotland and SCIS by the end of 2017 to confirm they have studied the Cole Report and are implementing its recommendations.
13. The Committee will ensure that other relevant Committees of the Scottish Parliament are aware of the main findings of this report and the Cole Report as the problems identified by Professor Cole may not be limited to the infrastructure in our education establishments.
14. The Committee considers the Cole Report may have relevance across the UK. The Committee therefore recommends that the Scottish Government liaises with

the UK Government and the other devolved administrations to share information and the developing best practice in light of the Cole Report.

Quality assurance

Construction industry

15. The incident at Oxfangs is an embarrassment for the construction industry and it must take the Cole Report as a starting point from which to improve practice right across the industry. Professor Cole indicated that there are lessons to be learnt in the oversight and quality assurance practices that public bodies should undertake for capital projects and the Committee believes that rigorous oversight is needed to reduce the potential for organisations to cut corners and compromise on safety.
16. The Committee is, however, encouraged that the representative bodies in the construction industry as whole are taking the findings of the Cole Report seriously and that Construction Scotland is co-ordinating the industry's response.

17. The Committee asks the Scottish Government to keep the Committee informed of the work that it and Construction Scotland are undertaking on the industry's response to those findings.
18. The evidence the Committee received raises serious questions about the practices of contractors and sub-contractors that cut corners resulting in an unacceptable risk to children and the public in general. The Committee recommends that the Scottish Government's Construction Procurement Manual fully reflects the lessons learned in the Cole Report and ensures that public bodies' procurement practice provides sufficient assurance that contractors do not compromise safety for the sake of speed or reducing costs.

Contracts, the funding method and the role of the client

19. The Committee notes that the Cole Report found that the choice of funding method (e.g PPP or other design and build type funding models compared with traditional procurement) was not the cause of the defective construction. The failures were due to non-adherence to best practice, particularly in relation to hands-on quality assurance not being utilised.
20. Furthermore, the Committee was surprised to hear evidence that some local authorities had deliberately minimised their responsibilities for the safe design and construction of their schools. The Committee was unclear as to why this was the case. In the end, local authorities and other public bodies work on behalf of our communities and have ultimate responsibility for the safety of their schools.

21. The Cole Report recommended that public bodies should be "intelligent customers" when procuring buildings. This means that local authorities and other public bodies ensure that there is high-quality quality assurance, independent of the contractors undertaking the building work, which should be set out and costed at the initial stages of any capital project.

22. The Committee recommends that the Scottish Government ensures that the updated Construction Procurement Manual reflects the need for public bodies to act as "intelligent customers" and not seek to minimise their role in ensuring that their estates are safe.

Design and oversight of construction

23. As indicated above, the Committee heard evidence that local authorities had entered into a specific structure for contracts which created a gap between themselves as clients and the design team. We find this unacceptable.

24. While the focus of this inquiry has been on cavity walls, the Committee heard that public bodies should be mindful that there are a number of areas of risk. Any part of the building that would be subsequently be closed up particularly requires oversight during the construction process.

25. As part of a risk-based approach to quality assurance, public bodies should consider directly employing construction professionals in Design and Build or Design Build Finance and Maintain projects. This would add value in quality assurance both at the design and construction stages.

26. The Committee also heard a great deal of evidence that a Clerk of Works could provide the regular inspections necessary to ensure that buildings are built correctly, particularly for work that is subsequently closed up as construction progresses (e.g. installation of wall ties). The Committee's view is that in most cases, a Clerk of Works reporting directly to the client will be the most suitable way for public bodies to ensure quality and safety.

27. An increased use of both Clerks of Works and other design professionals by public bodies may lead to additional training demands. This Committee considers this later in this report.

28. Public bodies must maintain a strong interest in the quality and safety of their estates regardless of whether or not they directly own the buildings.

29. Public bodies' quality assurance should be risk-based and have a focus on potential faults that would not be seen once the building has been completed. The Scottish Government should identify these high-risk aspects of construction. The Committee also recommends that the Scottish Government produce guidance on a risk-based approach to quality assurance and regularly update the guidance to ensure that it keeps pace with contemporary construction techniques and incidents which uncover problems.

30. Public bodies must have access to the expertise of the design team to ensure that the design team can freely flag up any concerns about construction. The Committee recommends that the Scottish Government clearly identifies the risk factors that public bodies must take into account when deciding their particular contractual arrangements with design professionals.
31. The Committee recommends that, unless there are clear reasons why another method of quality assurance would be more suitable, the employment of a Clerk of Works reporting to the client should be part of every capital project in the public sector.
32. The Committee recommends that the Scottish Government take account of the Committee's comments in this section and reflect them in the updated Construction Procurement Manual.
33. The Grenfell Tower tragedy occurred just as the Committee began taking oral evidence on this inquiry. The Committee has not taken evidence on cladding specifically. Nonetheless, the Committee requests updates from the Scottish Government on inspections to ensure that the cladding on the school estates and post-16 education sector does not present a fire risk.

Handover of buildings

34. The Committee was surprised and concerned that several of the PPP1 schools in Edinburgh opened without receiving a completion certificate. The Committee notes Professor Cole's view that schools opening in buildings that do not have a completion certificate is in breach of the law.

35. The Committee considers that this is indicative of a lack of focus on quality by the local authority. The Scottish Government may wish to review whether there are any other examples of public buildings currently in use that have not had the required completion certificates.

Building standards

36. The Committee found that there is a misconception about the role played by building standards verifiers. Building standards should not be considered as a proxy for quality assurance of construction, which is the responsibility of building owners. Nonetheless, building standards officers undertake inspections in the public interest and the Committee was surprised at how many of those inspections of Edinburgh's PPP schools had focused mainly on drainage issues. The Cole Report also suggested that the construction industry should do more to provide evidence to building standards verifiers that buildings have been built to the standard set out in the plans.

37. The Committee recommends that the Scottish Government considers how the role of a building standards verifier may be better communicated to procuring bodies and the wider public.
38. The Committee recommends that the Scottish Government provides more detailed guidance to building standards verifiers on taking a risk-based approach to inspecting sites.
39. The Committee recommends that the Scottish Government explores how it can ensure that the construction industry can support building standards verifiers by supplying evidence to verifiers that key elements of buildings have been built to specification.

Building maintenance

40. The Committee heard that the level of investment in the maintenance of council-owned schools is less than for schools procured through revenue funding. While the evidence points to the quality of the school estate improving, local authorities must keep investing in our schools. Not doing so would be a false economy in the long term.

Inspections of the school estate

41. The Committee endeavoured to obtain details of the work local authorities have undertaken on their school estates in light of the Oxfords incident and the publication of the Cole Report. The level of response as well as the detailed nature of many of the responses is reflective of the importance of the issue and how seriously any public body should take the safety of its buildings. The Committee thanks all of the local authorities that replied to the Committee's requests for more information.
42. Local authorities are best placed to consider the condition of their own estate. The Committee found that there were similar, but not identical, approaches to ensuring the safety of the school estate by local authorities. On the whole, local government appears to have taken a broadly risk-based approach to inspections. Local authorities are accountable to elected councillors and, ultimately, their local communities.

43. The Committee recommends that the Scottish Government works with local authorities to set out a standard risk-based approach to inspection of buildings of a similar type to Oxfords Primary School and confirm in writing to the Committee that the approach taken by all local authorities meets this standard.

44. The Committee would encourage, parents, teachers and local councillors to read how their local authority has responded to the Oxgangs incident and the Cole Report in their respective written submissions to this Committee.

Previous incidents

45. Three walls collapsed in January 2012 in other parts of Scotland for the same reasons that the wall at Oxgangs Primary School failed. However, unlike the Oxgangs incident, these incidents did not lead to schools across Scotland being checked for similar faults. This is surprising to say the least.
46. The Committee was also alarmed by evidence that, following the initial incident at Oxgangs Primary School, only a visual inspection was carried out. Following this visual inspection, pupils and staff were brought back in to the school for a number of days before more comprehensive intrusive inspections found further faults, causing the school to close. The Committee does not believe that a visual inspection was an appropriate response to the incident nor an appropriate mechanism by which to decide that pupils and staff could return to the building.

47. The Committee recommends that the Scottish Government create a duty for public bodies to share information about building faults that create significant risk to building users.

48. The Committee recommends that, if any fault identified in the future poses a potential threat to life, the Scottish Government and the Scottish Futures Trust should support public bodies' responses to the incident and develop an appropriate risk-based approach to inspection and remediation by those bodies.

Training and qualifications

49. The Committee notes some of the work underway to review the provision of training in the industry and skills issues.
50. Earlier in this report, the Committee also recommended that the public sector make greater use of Clerks of Works and construction professionals to ensure the quality of publicly procured buildings. There needs therefore to be training to ensure that there are sufficient numbers of clerks of works and other suitably qualified construction professionals available to carry out these tasks.
51. We also heard in evidence that the Scottish Building Federation ("SBF") raised a number of issues about the changes to SVQ construction qualifications with the Committee. The Committee asked the CITB and the SQA to provide more detail on the rationale for these changes. Ensuring that training of builders is up to date is

vital and it is important that there is good communication between the relevant parties.

52. The Committee recommends that the Scottish Government continues to support the CITB and the SQA to update training courses and qualifications in response to the Cole Report process and reports back to the Committee once it is complete.

53. The Committee recommends that as part of its response the Cole Report, the Scottish Government explore with representatives of the industry, trade unions and Skills Development Scotland how to retain experienced bricklayers in the industry and attract more young people into the trade. In this light, the Committee recommends that the Scottish Government work with stakeholders and Scotland's skills agencies to ensure that training is available to meet demand in the coming years.

54. The Committee recommends that the SQA and CITB meet with the SBF to discuss the new SVQ qualifications and take on board any remaining concerns the SBF may have.

Role of schools in the building process

55. The Committee was pleased to hear evidence that schools, teachers and parents, are involved in the design of new school buildings.

56. The Committee recommends that the Scottish Government identifies this involvement as best practice in its updated Construction Procurement Manual.

Summary of evidence

The Oxgangs incident - background

Edinburgh school closures - a narrative

57. On the morning of Friday 29 January 2016, after a heavy storm had hit many parts of Scotland, part of an external wall collapsed at Oxgangs Primary School in Edinburgh. The collapse happened hours before the school day started, with approximately 9 tons of masonry falling onto a footpath immediately below the wall.

58. The Cole Report noted that—

” The fact that no injuries or fatalities to children resulted from the collapse of the gable wall at Oxgangs School was a matter of timing and luck. Approximately 9 tons of masonry fell on an area where children could easily have been standing or passing through. One does not require much imagination to think of what the consequences might have been if it had happened an hour or so later.

Source: Cole, 2017²

59. Oxgangs Primary School was closed that day and the following Monday to allow temporary works to take place and to make the wall safe. Pupils at Oxgangs returned to school on Tuesday 2 February.

60. Oxgangs Primary School was built in the first decade of this century along with a number of other schools in Edinburgh. A total of 17 schools, including Oxgangs, were built through a public private partnership (PPP) in Edinburgh under the PPP1 scheme. After the Oxgangs wall collapse, visual inspections of the 16 other PPP1 schools in Edinburgh were undertaken by structural engineers. Based upon the visual inspections, the structural engineers advised that the PPP1 schools were safe to occupy.

61. The same structural engineers investigated the reasons for the collapse of the wall at Oxgangs. They reported on 29 February 2016 and found that the strength of the wind on the morning of 29 January was not sufficient to cause the failure of the masonry panel if it had been built correctly. The structural engineers found that the leaves of the cavity wall had been built too far apart and that a significant proportion of the wall ties used were not long enough to ensure that the embedment of the ties in the outer leaf of the cavity wall would have been sufficient, even had the cavity been the specified width.

62. The structural engineers recommended—

” The results of this investigation may be indicative of generic defects by the same build team. An intrusive investigation into all other similar external walls in the school should therefore be carried out to determine cavity widths and wall tie embedment at other locations.

Source: Cole, 2017³

63. As well as initiating investigations and remedial work at Oxbgangs Primary School, Edinburgh Schools Partnership ("ESP"), the special purpose vehicle that has responsibility for the Edinburgh PPP1 schools, instructed structural engineers to undertake intrusive surveys of all 17 PPP1 schools. Oxbgangs Primary School had been built in the second phase of PPP1 with three other schools, by the same contractor. The schools built in the second phase of PPP1 were the initial focus of the inspections and similar faults were found. As more inspections were done, it became clear the issue affected all 17 schools built under the PPP1 contract in Edinburgh.
64. Wall ties link the outer leaf of masonry to the inner leaf and the risk of absent or insufficiently embedded wall ties is that the outer leaf could collapse outwards. While the problem was thought to be confined to wall ties, it was considered that cordoning off external areas of schools and limiting access of pupils to the outdoor areas of the school, especially in periods of high winds, would make the buildings safe to occupy.
65. In undertaking remedial work to Oxbgangs, contractors found that header ties were also missing. In these types of buildings, header ties fix the masonry to the steel structure and the absence of these ties create a risk that the masonry could fall into the building - into classrooms, offices and halls. It was possible that similar high-risk faults could be found on the remainder of the PPP1 estate. The schools were therefore considered not to be safe to occupy and were closed forthwith.
66. In addition, structural engineers found that masonry accessories, such as wind posts and bed joints, were missing or insufficient in many places. Again these items are essential for the structural security of cavity walls especially in high winds. Due to difficulties in obtaining the original drawings, it was unclear to the independent inquiry if these had been included in the original plans.
67. Closing all 17 PPP1 schools meant that alternative accommodation was required at very short notice for around 7,600 primary and secondary pupils, 740 nursery pupils, and 655 teachers. This presented a significant logistical problem to the City of Edinburgh Council.

Beyond Edinburgh's schools

68. The closure of 17 schools in the second largest, by population, local authority in Scotland and our capital city received widespread attention, not least from the Scottish Government and other local authorities in Scotland—

” On Saturday 9 April 2016, following the decision on 8 April to close all 17 PPP1 schools in Edinburgh, the First Minister chaired a meeting of Scottish Government's Resilience Committee and offered all possible support to the [City of Edinburgh Council] in its response to keep disruption to children's education at an absolute minimum.

Source: Scottish Government and Scottish Futures Trust, 2017⁴

69. Inspections by local authorities in other parts of Scotland identified similar faults in the masonry of schools. The Cole Report also noted that four other major incidents in Scotland had been caused by a lack of wall ties and other brickwork accessories

or those accessories not being installed properly. More details of these incidents are [covered later in this report](#).

70. In evidence to the Committee, Professor Cole noted that this issue is not solely confined to Scotland and nor is it likely to only affect schools. He said—

” A colleague of mine in London told me yesterday that two schools had been built and the contractor decided to open one on the basis of the report and found a wall with no wall ties. I hear stories like that all the time, and it is not just about schools; it is about all buildings. We are talking about walls—we should not forget that. It is just about walls, which could be in a leisure centre, a fire station or a hospital if they are panel walls that are built to the same construction. It is nothing to do with schools. We have called it the schools inquiry, but it is about construction.

Source: Education and Skills Committee 14 June 2017, Professor Cole, contrib. 54⁵

71. The recommendations of the Cole Report on how to avoid similar issues from occurring in the future therefore are not restricted to the building of schools, but apply more widely to procurement and construction in both the public and private sectors.

Quality assurance

72. It is clear that the quality of construction in the PPP1 schools in Edinburgh was sub-standard. A number of reasons for this have been identified in the Cole Report and replicated in the evidence the Committee has gathered in this inquiry.
73. The Committee heard evidence that in Edinburgh a “cocktail of issues” led to 17 schools being built defectively.⁶ The Cole Report addresses these issues in depth and the Committee has no wish to replicate that work. The Committee's focus has been on identifying the main issues that education authorities and public bodies need to address to ensure similar problems are avoided in the future.
74. The issue of quality assurance standards and procedures has been critical in the evidence we received, whether this was part of any of the four key stages in the building of a new school:
- contracting;
 - design;
 - construction; and
 - handover.

The following sections of the report looks at problems identified in our evidence in each of the four stages identified above.

Contracts, the funding method and the role of the client

75. The Cole Report states that the funding model (e.g. PPP or other design and build type funding models compared with traditional procurement) was not necessarily the cause of the client losing independent scrutiny of the quality of construction. It concluded—

” It is the view of this Inquiry that the financing method per se did not have such a direct relationship with the presence of defective aspects of the construction in the Edinburgh schools. There is no reason why properly managed privately financed public sector buildings, using best practice approaches, should not be capable of delivering buildings constructed to a very high standard.

The Inquiry is concerned however that some elements of best practice associated with more traditional models of procurement failed to be consistently incorporated into the implementation of PPP projects.

Source: Cole, 2017⁷

The intelligent customer/client

76. The Cole Report recommended that public bodies ought to become “intelligent customers”. That is, public bodies need to have the resources in place to ensure that building designs are of a high quality and that they are built to standard. The Report recommended that “there should always be an appropriate level of independent scrutiny in relation to all aspects of design and construction that are in effect largely or partly self-certified by those producing them” and commented “it is the view of the Inquiry that seeking savings through cutting investment in quality assurance is inevitably a false economy.”⁸

77. The key issue that led to the problems with the school estate in Edinburgh and elsewhere was the lack of independent scrutiny and quality control of the building process. Professor Cole told the Committee:

” The fundamental issue is the fact that there was no one with responsibility to ensure on the client's behalf that what the client procured was procured to the standard that was required in the contract. The quality assurance in the project failed.

Source: Education and Skills Committee 14 June 2017, Professor Cole, contrib. 6⁹

Transfer of liability

78. [As noted above](#), the Cole Report concluded that the choice of procurement method would not necessarily in and of itself contribute to faulty construction. The issue was that best practice was not universally adopted as public bodies began using PPP. Professor Cole told the Committee—

” That element of supervision, which was standard in previous procurement models has, to a large degree, been discarded by public procurement processes, particularly PPP, on the basis of quite a few legal advisers putting about the perception that the client does not want to take responsibility for contributory negligence by having their people look at the wall, comment on it and ask the contractors to do something. The client stands back and lets the builder do it.

Source: Education and Skills Committee 14 June 2017, Professor Cole, contrib. 6⁹

79. In evidence to the Committee, Allan Whyte from Aberdeenshire Council recalled the approach to PPP in the early 2000's. He said—

” It was a whole new concept and the property teams in particular took a light-touch approach. That was the concept: we were being sold a model of risk transfer to a provider that would undertake the works. Our involvement was to oversee some of the design aspects—general aesthetics and so on [...] much of the thinking was that it was a financial services delivery as opposed to a construction services delivery.

Source: Education and Skills Committee 21 June 2017 , Allan Whyte, contrib. 34¹⁰

80. One of Professor Cole's central findings is that the client for the new school should not seek to avoid responsibility for the safety of the buildings through the particular design of the contract. He said—

” The client—the City of Edinburgh Council in this case—cannot delegate away responsibility to ensure that what they are procuring is a safe building for children and other users to be in. The client has to take appropriate steps to ensure that there is independent scrutiny of whether a contractor is delivering what they have promised to deliver, rather than relying on that contractor to do it automatically.

Source: Education and Skills Committee 14 June 2017, Professor Cole, contrib. 6⁹

81. Peter Watton from the City of Edinburgh Council reflected on his organisation's experiences, telling the Committee that—

” In my experience, given what we have been through with the PPP arrangement, I would say that you can try to transfer all the risk you want, but you will never in practice be able to transfer reputational risk.

Source: Education and Skills Committee 21 June 2017 , Peter Watton, contrib. 100¹¹

Continuity in Special Purpose Vehicles

82. A perceived benefit of PPP was that the special purpose vehicle (“SPV”) that built the building would also be responsible for its upkeep over the course of the contract, thus providing an incentive to ensure high quality construction from the outset. Professor Cole told the Committee—

” There was a belief with PPP that, if it was a 30-year contract, when people built the building, they would build it right.

Source: Education and Skills Committee 14 June 2017, Professor Cole, contrib. 10¹²

83. Building contractors are partners in SPVs at the beginning of the process, however, Professor Cole found that in the case of PPP1 they then quickly sold their shares in the SPV and moved on. He stated—

” Contractors move their money through because they are builders of buildings rather than managers of buildings and they sell on to funds that buy into them. All the equity holders now are not the people who were originally involved in the scheme.

Source: Education and Skills Committee 14 June 2017, Professor Cole, contrib. 10¹²

84. Furthermore, it appears that, again in the case of the PPP1 project in Edinburgh, the facilities management partners of the SPV, who were responsible for the maintenance of the buildings once built, were not influential at the construction stage. Professor Cole stated—

” Only lip service was paid to the operator of the building in terms of when they were introduced into the process and their ability to influence the quality of design or construction.

Source: Education and Skills Committee 14 June 2017, Professor Cole, contrib. 10¹²

85. PPP contracts give responsibility for remedying faults to the SPV. In Edinburgh, the Edinburgh Schools Partnership SPV covered the costs of inspections and repairs and also lost money as the unitary charge was not paid in full due to the schools not being available. Many councils from across Scotland reported to the Committee that the costs of inspections and any remedial work have been met by the SPV for PPP/DBFM (Design Build Finance Maintain) schools.

Design of buildings and construction issues

86. While the faults with masonry was the main focus of the Cole Report, Professor Cole also identified problems with fire stopping in some schools in Edinburgh. The Cole Report indicated that this is not unusual—

” For some considerable time, there has been relatively widespread knowledge within the PFI industry that defective fire-stopping had been discovered to be a potentially problematic issue in PPP schools and hospitals.

Source: Cole, 2017¹³

87. A picture emerged through the Committee's evidence gathering that oversight and inspection to maintain quality assurance standards during design and construction should not only focus on walls, but there should be a risk-based approach to inspection. Professor Cole said—

- ” Areas that will be hard to inspect afterwards because they get closed up and nobody can see into them are those that are most likely to be skimmed on, because people can get away with it. They are not as obvious.

I am encouraged by the positive way in which the Scottish Government has approached the report's proposals. For example, it has set up various groups—indeed, I have participated in some of them—and some are looking at how the high-risk areas can be identified. One of the report's recommendations is about putting standard quality mechanisms into the process to ensure that checks are carried out on high-risk areas that could impact on the safety of users and the public in general. For example, if floor tiles have not been laid particularly flat, you can see that, and it will not kill anybody—unless they trip on the edge, of course. The issues that could impact on health and safety and the lives of the people who are using the buildings should get much more scrutiny than they currently get.

Source: Education and Skills Committee 14 June 2017, Professor Cole, contrib. 77¹⁴

88. The Committee received a submission from the Institution of Structural Engineers that also set out what it considered to be "critical interfaces".¹⁵ Among other things, these include:
- Wall and roof cladding fixings to secondary and primary structure;
 - Glazing and fixings of glazing and windows;
 - Fixing of ceilings and services to structural supports;
 - Restraint of parapet walls;
 - Head restraint to non-structural partitions; and
 - Co-ordination of bracing within cavities and cladding restraint ties and wall ties.

Independent scrutiny of works in PPP projects

Independent certifiers

89. PPP and the more recent Design Build Finance Maintain (DBFM) projects often include an independent certifier to monitor and ensure quality and timely completion of the project. The Cole Report suggested that the role of the independent certifier is often misunderstood and the role is more focused on the work progressing to completion on time rather than on day-to-day quality control. In the situation of the Edinburgh schools, the independent certifiers' visits to the PPP1 projects were not frequent enough for them to fulfil an in-depth quality assurance role.
90. In his submission to the Committee, Professor Cole said that the contracts for independent certifiers were "inadequate and poorly designed" and that clients had been mistaken in thinking that independent certifiers "certified assurance as to the quality of all aspects of the construction".¹⁶

Role of independent design professionals

91. The design team has a key role in ensuring that buildings are built to the specification set out in the design. Under a traditional procurement model, the design team would be either contracted by the client or, in many cases, be directly employed. Any issues identified by the design team would be reported to the client and would be taken up with the building contractor. Under design and build (“DB”) or DBFM contracts, the design team report to the building contractor. The Edinburgh PPP1 schools project again provides an example of how this can lead to problems.

92. Professor Cole told the Committee—

” There is an assumption that the professional is still acting on behalf of the client when in fact they can act only on behalf of the contractor, and in many cases they are forbidden from talking to the client directly without the contractor's approval.

Source: Education and Skills Committee 14 June 2017, Professor Cole, contrib. 6⁹

93. Later he gave an example where an architect pointed out to the contractor that the inner leaf of the walls were being built before the outer leaf, which significantly increases the risk of cavity wall ties not being fitted properly. Professor Cole continued—

” The contractor decided to ignore [the architect's warnings] because they wanted to build the inner leaf first to get a dry interior so that they could finish the build a bit more quickly and then finish the outside walls later. That contributed significantly to the faults that we found in the construction of the building. However, the architect did not have any authority. Under the old system, the architect would have said, “The specification that I wrote says that you can only build the walls together and bring them up together so that they are properly tied together.” However, he was overruled by the contractor because he was not working for the client; he was working for the contractor.

Source: Education and Skills Committee 14 June 2017, Professor Cole, contrib. 33¹⁷

94. Professor Cole also suggested that such a situation, where the building contractor becomes responsible for ensuring the quality of their own work with few external checks creates a risk that the builders will construct incorrectly. He said—

” There are perverse incentives for contractors not to mark their own homework down, which would force them to rebuild walls. It would cost them extra money and delays that could lead to liquidated damages. The contractor will always give the contractor's homework the benefit of the doubt, whereas independent scrutiny by others will allow errors to be captured.

Source: Education and Skills Committee 14 June 2017, Professor Cole, contrib. 6⁹

95. Ian McKee, from the Royal Institution of Chartered Surveyors, said that professional consultants and professional members of the design team “have become subservient in capital projects and have “no contractual link or means of communicating with the ultimate client”.¹⁸

96. The Institution for Structural Engineers said—

- ” Independent technical supervision of construction work is required by suitably qualified staff with verifiable competency. This should be applied to all key public buildings such as schools, hospitals and local government buildings.

Source: Institution of Structural Engineers, 2017¹⁵

97. Similar points were made in the recommendations of the Cole Report which notes—

- ” Public bodies should review current procurement arrangements to ensure they are providing the optimum level of communication between clients and key members of the design team and that clients are able to benefit to the fullest extent from their professional advice and expertise. They may wish to consider how more direct communication could be incorporated into current forms of contract, in addition to the existing requirement for the provision of collateral warranties.

Source: Cole, 2017¹⁹

Clerks of Works

98. The defects identified in some of Edinburgh's schools and elsewhere only came to light when a wall collapsed. The lack of wall and header ties and other brickwork accessories could not have been detected once the walls had been built. A recurring theme in many of the submissions to the Committee was the importance of a Clerk of Works (“CW”) as a means of helping to ensure the quality of construction and adherence to standards.

99. The Institute of Clerks of Works describes the role of a Clerk of Works as follows—

- ” Their main responsibility is to make sure that work is carried out to the client's standards, specification and schedule [...] Clerks of Works make sure that the correct materials and workmanship are used and that the client is given quality work and value for money.

Clerks of Works are either on site all the time or make regular visits. They need to be vigilant in their inspections of a large range of technical aspects of the work.

[...]

Clerks of Works liaise closely with the contractor's staff. They must, however, maintain their independence, as they are responsible for working in the best interests of their employer or client.

Source: Institute of Clerks of Works, 2013²⁰

100. The Committee received evidence that the use of CWs has reduced over recent years. The Institute of Civil Engineers (ICE) stated—

- ” Site supervision levels on both public and private sector projects are a concern. Clients are increasingly not requiring site supervision (on financial grounds) or at best relying on visiting supervision.

Source: Institution of Civil Engineers, 2017²¹

101. ICE also pointed out that some public authorities maintain site inspection have retained the use of CWs—

- ” There are however examples of better practice where a Clerk of Works has a full-time role on site with other professionals on a visiting basis. This has also been accompanied by a design solution chosen to minimise risks.

We are aware of Local Authorities which have, largely due to a greater level of supervision, avoided the issues experienced in Edinburgh schools [...] These Local Authorities have employed CWs on all sites regardless of the procurement route. The CW for the building elements are permanent Local Authority staff. These CWs are described as “inspecting” rather than “supervising” but they are usually on site daily if not full time.

Source: Institution of Civil Engineers, 2017²¹

102. This variability of the use of CWs and quality inspection more generally was borne out by other evidence the Committee received. Some councils felt it necessary to maintain a hands-on approach to quality assurance, while other did not. Danny Lowe, Director of Housing and Technical Resources, at South Lanarkshire Council told the Committee—

- ” We overlaid the PPP contract with our own in-house team. That in-house team included a senior architect and a full-time clerk of works, who were there to monitor quality assurance in the delivery of the PPP programme. They carried out their own assessments on behalf of the council so that we could satisfy ourselves in that regard.

Source: Education and Skills Committee 21 June 2017, Danny Lowe, contrib. 28²²

103. Peter Watton, Head of Property and Facilities Management at City, at Edinburgh Council explained that in later PPP built schools, Edinburgh had utilised in-house professional services and there have not been the same issues for those schools. Similarly, Allan Whyte from Aberdeenshire Council stated that in recent times, but before the findings in Edinburgh, his department had moved to having full shadow inspection teams. ²³

104. The Scottish Futures Trust also noted that the local authorities approach varied in respect of utilising CWs. Peter Reekie said—

- ” Over a number of years local authorities have taken differing approaches to monitoring. All the contract approaches that the SFT uses allow for clerks of works to be included. Some authorities have used them; others have not.

Source: Education and Skills Committee 28 June 2017, Peter Reekie, contrib. 55²⁴

105. The Committee wrote to all 32 local authorities and asked about the quality assessment processes. The great majority of which used CWs to some extent;

many stated they used CWs for all types financing methods and others were reviewing whether to do so in light of the Cole Report's findings.

106. The use of CWs has varied over time and depending on the public body involved. In its submission to the Committee, UNISON argued that there is merit in the idea of making the role of CW mandatory on projects over a certain size and that that this should be examined further.²⁵

107. As noted above, there were a number of issues that led to the defects in the schools in Edinburgh. Allan Whyte told the Committee—

” Fundamentally, a clerk of works is not a panacea: the building has to be designed and constructed correctly. A clerk of works will solve part of the problem, but there are other strands of activity that we need to resolve.

Source: Education and Skills Committee 21 June 2017 , Allan Whyte, contrib. 101²⁶

108. Kevin Stewart, Minister for Local Government and Housing said that the Scottish Government will look into the Cole Report in depth and may require a variety of policy responses. The Minister identified the widespread use of Clerks of Works as being a one of those responses to the Cole Report. He said—

” There are some simple changes that could happen straight away, without legislative or regulatory change. They include making sure that the right folk are there on the ground overseeing projects, no matter how the projects are financed.

Source: Education and Skills Committee 28 June 2017, Kevin Stewart, contrib. 17²⁷

109. In answer to a Parliamentary Question about whether to introduce a legal requirement that clerks of works should oversee the construction of public buildings or that architects or other design professionals to verify the safety of public buildings, the Minister said—

” We have no current plans to make this a legal requirement. We will publish guidance towards the end of this year setting out the importance of employing the appropriate professional expertise and the factors to be considered in assessing what constitutes appropriate.

Source: Scottish Parliament, 2017²⁸

Handover of buildings

110. The Committee also took evidence on a number of issues relating to stage of the actual handover of buildings and the role played by different organisations.

111. One key issue raised in the Cole Report relates to the occupation of schools in advance of the issue of a temporary occupation or completion certificate. As the Cole Report notes—

- ” Two of the Phase 1 schools in Edinburgh, Craigmount High School and Royal High School, have never received approved completion certificates. In the case of a third school, Gracemount High school, the Certificate of Completion was applied for on 18th May 2010 and issued by Building Standards on 7th June 2010, some seven years after the school was occupied.

It should be noted that to occupy a new building without the issue of a Completion Certificate is a breach of both the original Building (Scotland) Act 1959 and the amended Building (Scotland) Act 2003.²⁹

Other practices in the construction industry

112. The Committee heard evidence that bricklayers were paid by the number of bricks they would lay in a day. In structures where additional bricklaying accessories are required, this clearly provides a perverse incentive to not install (or not install correctly) those accessories. Kevin Stewart MSP, Minister for Local Government and Housing said—

” We need to look at how the industry pays people. Dealing with that is an issue that I have a great interest in, and it is one that I will continue to raise with the industry. I do not think that the present system works, and I think that that needs to be resolved.

Source: Education and Skills Committee 28 June 2017, Kevin Stewart, contrib. 89³⁰

113. Professor Cole also identified a desire to complete work as soon as of possible as a contributing factor to the faults found in PPP1 schools in Edinburgh. When building cavity walls, best practice is to build both cavities at the same time however, Professor Cole told the Committee—

” [Contractors] were building the inner leaf first, which increases phenomenally the risks of building the wall and not getting the joints coursing properly or the ties fixed properly [...] The contractor [...] wanted to build the inner leaf first to get a dry interior so that they could finish the build a bit more quickly and then finish the outside walls later. That contributed significantly to the faults that we found in the construction of the building.

Source: Education and Skills Committee 14 June 2017, Professor Cole, contrib. 33¹⁷

114. The Scottish Government acknowledged that it, along with the Scottish Futures Trust, has a role in reducing systemic failures in the construction industry. Kevin Stewart MSP, Minister for Local Government and Housing said—

” I assure you that we will work with the Scottish Futures Trust, procurement services and building standards services to continue to do all that we can to minimise those failures even further.

Source: Education and Skills Committee 28 June 2017, Kevin Stewart, contrib. 91³¹

115. The Scottish Government pointed out that the construction methods used in Edinburgh's PPP1 contract are no longer routinely used in building new schools. Peter Reekie from the Scottish Futures Trust stated—

” Construction methods have changed. We now use a lot more steel framing systems, rather than brick and block, and we work more closely with designers, clients and contractors during the development process. The SFT also has a different role in supporting authorities to get what they are contractually entitled to as they move to the handover of buildings and as they move to the really important stage of monitoring a building in operation.

Source: Education and Skills Committee 28 June 2017, Peter Reekie (Scottish Futures Trust), contrib. 19³²

116. The Institution of Civil Engineers elaborated on this method, stating—

” Most of the local authorities’ modern schools use a lightweight structural frame with channels for cladding ties incorporated into it. This is more accurate than the method employed in Edinburgh.

Source: Institution of Civil Engineers, 2017²¹

117. The Committee heard evidence that the response from representatives of the construction industry in Scotland to the Cole Report has been positive. The Scottish Government and Scottish Futures Trust submission stated that Construction Scotland “are co-ordinating the agreement of a consolidated set of actions that the construction industry will take in response to the finding of the report” and that Construction Scotland will report back to the Government by autumn 2017.⁴ In addition, Professor Cole told the Committee—

” I am encouraged by recent conversations that I have had with chief executives of some major contracting firms, who have already said to me that, as a result of the report, they have strengthened the level of on-site supervision that they are applying to brick-working areas. One company said that it has just appointed 20 bricklaying supervisors in the UK.

Source: Education and Skills Committee 14 June 2017, Professor Cole, contrib. 10¹²

Building standards

118. Another theme running through the evidence taken by the Committee has been the system of building standards in Scotland. The Cole Report identified a misapprehension of the role of building standards and the level of quality assurance that the system of building standards provides.

119. The Local Government and Communities Committee has undertaken work on the building standards system and held evidence sessions in May and June 2017. However the focus of that inquiry has been on the quality of service provided by the system to its customers e.g. housebuilders. This Committee's work was more focused on what reassurance provision of a building warrant gives to communities and individuals that a building has been built to the required standard.

120. Local Authority Building Standards Scotland (“LABSS”) set out its position clearly in this respect. It stated—

- ” Building Standards has no remit to control quality assurance practices in the construction of a building.

Source: Local Authority Building Standards Scotland, 2017³³

121. In its submission, LABBS also quotes the Scottish Building Standards Procedural Handbook—

- ” The purpose of the building standards system is to protect the public interest. It is not intended to provide protection to a client in a contract with a builder. The system, therefore, does not so much control building as set out the essential standards to be met when building work or a conversion takes place, and only to the extent necessary to meet the building regulations. The system is pre-emptive, designed to check that the proposed building work meets the standards. Inspections during construction and on completion are to protect the public interest in terms of compliance with the building regulations and to discourage avoidance of the legislation. The inspections do not provide a system to control work on site, that is a matter for the contracts and arrangements put in place between the client and builder.

Source: Local Authority Building Standards Scotland, 2017³³

122. Bill Dodds from the Scottish Government explained further—

- ” The local authority building inspector or officer verifies the drawings at the front end, to make sure that the specifications are all properly set out. It is incumbent on the owner to build the building in the way that it should be built. There is then a last check. As we have heard, many other actors have a role to play, including the designer, the constructor and the developer.

Source: Education and Skills Committee 28 June 2017, Bill Dodds (Scottish Government), contrib. 25³⁴

123. In terms of inspecting building works, building standards are expected to make “reasonable inquiry”. The National House Building Council (NHBC) described this duty as “wooly”, undefined and left to local authorities to interpret.³⁵

124. The Cole Report looked at the type of inquiry that building standards in Edinburgh made with the PPP1 schools and concluded that the number and type of inspections “can only confirm that buildings are being built generally in accordance with approved warrants”.³⁶ A large proportion of building standards site visits were concerned with drainage (e.g. 37 out of 38 visits to the construction of Gracemount High School were in regard to drainage).³⁷

125. Professor Cole told the Committee that—

” An awful lot of time is spent getting warrants approved and signed on the basis of drawings, but what is the point of looking at drawings if the contractor can do whatever they want with them out on site, knowing that nobody will look into it any further? The focus needs to be on the site where the building is taking place. As I said to several building control officers that I interviewed, I do not think that anybody has been killed by a set of drawings falling on them, but people certainly have been killed by a wall falling on them. The site is where the real difficulties happen.

Source: Education and Skills Committee 14 June 2017, Professor Cole, contrib. 85³⁸

126. In his report, Professor Cole stated it is not "appropriate for Building Standards to be expected to undertake the type and level of detailed inspection that is necessary to identify in a comprehensive fashion the type of defects discussed in this Report, but that consideration should be given to requiring better practice methods of the construction industry that would in turn provide Buildings Standards with the proper level of assurance in these risk areas." His report also suggests that certification practices could be adopted by the industry, particularly for higher risk elements of construction, to assist building standards and provide assurance that buildings have been built to specification.³⁹

Building maintenance

127. The Cole Report found that ongoing routine maintenance work in the relevant schools could not have been expected to identify the faulty walls earlier, given that the faults were not visible after construction had taken place without an intrusive inspection.
128. In the course of taking evidence on this, the Inquiry into School Closures also took evidence on how satisfactory the maintenance of PPP schools has been. On the whole, the council and teachers were satisfied with the maintenance of PPP schools and some teachers contrasted a good level of service from the SPV to having to compete for budget to make repairs and alterations to council-owned schools.

129. Professor Cole told the Committee—

” Schools that are owned and run by the council are maintained to a much poorer standard. The headteachers who are associated with the schools in question, who have experience of council-owned schools and PPP schools, have said in evidence that the PPP schools are better maintained.

Source: Education and Skills Committee 14 June 2017, Professor Cole, contrib. 17⁴⁰

130. Ian McKee from Royal Institute of Chartered Surveyors (RICS), who is a chartered surveyor, highlighted the importance of maintaining buildings and taking a strategic approach to repairs from the day a building is completed. He said—

” A lot of these condition-type surveys—large-scale surveys of portfolios—are reduced to box-ticking exercises. To my mind, that just cannot go on. You need an experienced professional individual who knows the building to get in there and really investigate the building as part of the maintenance inspection. Only by doing that can we get to the heart of how the building is built and how it is deteriorating, because all buildings—newly built buildings and old buildings—deteriorate from day 1, and maintenance starts from the day after practical completion.

Source: Education and Skills Committee 14 June 2017, Ian McKee (Royal Institution of Chartered Surveyors in Scotland), contrib. 35⁴¹

131. Professor Cole agreed—

” The key element in the maintenance of buildings is having in place appropriate regimes for long-term and short-term maintenance, and for funding of property. Unfortunately, most public buildings—I say this as somebody who for many years worked mainly in health, building hospitals and so on—fail miserably in terms of the level of maintenance funding that is supplied to them during their life cycle.

Source: Education and Skills Committee 14 June 2017, Professor Cole, contrib. 17⁴⁰

132. The Committee notes that the Scottish Government's School Estate Survey, which is based on returns from local authorities, shows that the quality of the school estate is improving. The latest results, published in December 2016, state—

” The proportion of schools reported as being in good or satisfactory condition has increased from 61 per cent in April 2007 to 84 per cent in April 2016. The percentage of pupils on the school roll of schools reported as being in good or satisfactory condition has increased from 61 percent in 2006/07 to 84 per cent in 2015/16.

Source: Scottish Government, 2017⁴²

Inspections of the school estate

Local authorities' inspections and remedial work

133. At the outset of this inquiry, one of the main aims was to ensure that local authorities have taken the actions necessary to be confident that their schools are safe.

134. The Committee wrote to each of the 32 local authorities in Scotland asking what inspections and remedial works those local authorities had undertaken. The Committee received responses from 30 local authoritiesⁱ. In addition, the Committee received evidence from the Scottish Futures Trust regarding its role in supporting local authorities' response to the Oxfangs incident and the Cole Report.

ⁱ Aberdeen City Council and Moray Council were the two local authorities from which the Committee did not receive a response.

135. Professor Cole also sought similar information from local authorities during his inquiry. Professor Cole felt that local authorities were cautious about sharing information with his inquiry. He said—

” We felt at the start of our inquiry that there was some hesitancy among local councils in giving information to us. They did not necessarily want their schools to be talked about, and they were hoping to manage the situation appropriately on their own.

Source: Education and Skills Committee 14 June 2017, Professor Cole, contrib. 122⁴³

136. It appears that the reticence to share information on this topic has lessened since the start of Professor Cole's inquiry. The Committee received a good response from local authorities to its requests for information.

137. All of the local authorities that responded told the Committee that they had reviewed their school estates. Many advised the Committee that they had undertaken a risk-based approach to inspecting their school buildings. Professor Cole explained to the Committee what a risk-based approach may entail—

” We and the Scottish Futures Trust asked all local authorities to examine their schools and to make a risk-based analysis, such that if they found something when they looked first, they would then look further. If sufficient initial checks are done and it is found that things are safe enough, it is probably reasonable to stop. The City of Edinburgh Council is still doing that on its other buildings, and it was reported in the press this week that another four buildings have been found to have the same defects.

Source: Education and Skills Committee 14 June 2017, Professor Cole, contrib. 124⁴⁴

138. In this context it is worth noting that Professor Cole also said—

” I have said in my report that visual inspections should not be considered to be satisfactory. One of the report's recommendations is that nobody can assume that because a wall looks straight from the outside it is built structurally well. That goes back to the maintenance issue: you cannot tell afterwards and you cannot go digging holes in walls to check them, because you can only see so much through a scope going into a wall.

Source: Education and Skills Committee 14 June 2017, Professor Cole, contrib. 29⁴⁵

139. Most local authorities had undertaken some intrusive inspection work and many indicated that they had taken a risk based approach to the process.

140. The inspections led to the discovery of similar faults in a number of locations and local authorities or SPVs have undertaken works to remedy faults. Local authorities often made the point that while the faults discovered were of a similar nature to those that led to the wall collapsing at Oxgangs primary, they were not always as serious and often works were undertaken on a precautionary basis. For example, East Lothian Council told the Committee—

” East Lothian Council's School estate has been fully inspected on a risk basis with any potential concerns escalated for further intensive survey.

Source: East Lothian Council, 2017⁴⁶

141. Glasgow City Council's response was also typical. It said—

” Glasgow commissioned its PPP partner 3Ed/Semperion to undertake invasive structural surveys of all the buildings constructed or extended as part of the PPP contract.

[...]

A representative sample of [council-owned buildings were] selected and inspected/surveyed invasively using the same scope as the buildings within the PPP estate. [...] A total of 8 buildings were selected for survey, which included 2 other public buildings which did not form part of the Education Estate, but had been identified as having similar construction methodologies to the buildings in question, and which had been constructed contemporaneously with the other buildings selected.

As a result of all of the survey work undertaken within both the PPP estate, the Pre-12 estate and the 2 other public buildings, no defects were identified that would give any significant cause for concern. Some very minor defects were identified, in line with the findings in the Edinburgh Schools with regard to wall ties, but to a much lesser degree and within what the working group agreed to be an acceptable level of tolerance. Despite the minor defects discovered being within an acceptable tolerance and causing no reason for concern, the decision was taken to undertake remedial works to provide a robust and high level of comfort for the Council that our buildings are structurally sound.

Source: Glasgow City Council, 2017⁴⁷

142. Similarly Fife Council informed the Committee that:

- Intrusive inspections were carried out on all PPP schools.
- A risk assessment has been carried out on other schools with some intrusive inspections carried out where deemed appropriate.
- There is an ongoing structural inspection regime which then addresses any issues requiring rectification to ensure the continued safety of the school and wider estate.
- Some minor issues have been identified.
- As a precaution, some minor rectification works have been carried out but these has not impacted upon the normal operation of the schools involved. ⁴⁸

143. Other local authorities did not consider it necessary to intrusively inspect their schools. For example, Orkney Islands Council stated—

” In light of the Cole Report a desk top exercise was undertaken on all the school estate to review the construction methods used for the school estate. No Areas of concern were raised as the council generally used its own staff for design and site supervision.

Source: Orkney Islands Council, 2017⁴⁹

144. Allan Whyte told the Committee about Aberdeenshire Council's approach—

” We moved forward with [a] desktop exercise and then appointed our consultant independent engineer, Fairhurst, to do the visual surveys. To provide additional reassurance, we carried out intrusive surveys, through which we established that some localised issues need to be remedied.

How we do that moving forward is all important. The PPP contractor, Robertson Education Aberdeenshire, has given a commitment that it will rectify the defects at cost to itself. I spoke to Robertson as recently as this morning and got a commitment that it is geared up to undertake the work during the summer. There is a slight debate between the engineers about the scale of work that has to be carried out to the wall head restraints. My view is that we should take no risks on that and we should just undertake the work. I gave Robertson firm advice that it needs to undertake the work on that basis.

To provide reassurance, our independent engineers and the PPP project company stated that there is no immediate risk to building occupants.

Source: Education and Skills Committee 21 June 2017 , Allan Whyte, contrib. 57⁵⁰

145. Danny Lowe explained South Lanarkshire Council's approach to inspecting its school estate to the Committee noting that the Council had access to as-built drawings and clerks of works reports and photographs from the construction of the schools. He said—

” We selected a school from each phase [of the PPP contract], which spanned the two contractors that worked on the programme for us. [Our contractor] then did a walk-around of sites to identify walls on which they wanted to carry out intrusive surveys, and it checked the as-built drawings. Following that, it did the intrusive surveys and confirmed that walls were built as they should be and were stable, so there were no issues in relation to that. A minimum amount of repairs were noted as a result of that survey, and those were carried out with no disruption to schools.

We did a visual inspection of the whole primary school estate last April: we did a walk-around survey. We then selected for intrusive survey five primary schools on which the five different contractors that had worked across the programme had worked.

[...]

We could go back into our project records, which in many cases include photographic evidence—for example, of the external walls as they were being built, showing the presence and spacings of wall ties, and in which it is also possible to see the embedment of ties. Rather than having to go back and do further intrusive surveys, we could see the picture from the desktop exercise. Only minor repair works were noted as part of the intrusive survey and the visual survey, and they were carried out with no disruption to the schools.

Source: Education and Skills Committee 21 June 2017 , Danny Lowe, contrib. 65⁵¹

146. The City of Edinburgh has also been active in inspecting the remainder of its school estate. It has developed a risk-based approach to this work based on a number of factors, including the age of buildings and construction methods used. ⁵²

147. Peter Watton from the City of Edinburgh Council said—

” The City of Edinburgh Council is carrying out intrusive surveys. As a result of doing so, we have identified five properties that have similar problems. They are not identical or are not problems to the same extent—there might be only 80 wall ties in a panel in which there should be 100, for example. As I am sure members will appreciate, we have adopted a very risk-averse approach and are remediating in those circumstances.

Source: Education and Skills Committee 21 June 2017 , Peter Watton, contrib. 68⁵³

Role of the Scottish Futures Trust

148. After the collapse of the wall at Oxfangs Primary School and the subsequent closure of 17 schools, affecting 8,371 pupils, there was considerable interest from across the Scotland and the UK on what went wrong.
149. On 9 April 2016, a day after all 17 PPP1 schools in Edinburgh were closed, the Scottish Government held a meeting of its resilience committee and the Scottish Futures Trust ("SFT") offered to "lead a coordination effort, sharing technical information between local authorities and other public bodies to help inform their own response to the issues emerging from Edinburgh" as well as offering technical support to the City of Edinburgh Council.⁵⁴
150. The SFT also wrote to all relevant public bodies following the publication of the Cole Report highlighting its findings.
151. As part of its role in disseminating information about the faults identified in Edinburgh, the SFT informed public bodies, including local authorities that intrusive surveys are the most reliable approach to identifying the type of masonry faults found in Edinburgh schools.⁵⁴ Intrusive surveys are surveys involving a borescope or the removal of bricks to see whether wall ties and other brickwork accessories have been correctly fitted.
152. Peter Reekie, Deputy Chief Executive and Director of Investments of the Scottish Futures Trust said—

” You can imagine that the technical team in Edinburgh was rightly focused on dealing with the issues in the council. They were also faced with inquiries from all over Scotland and further afield asking, “What have you found? What does it mean for us? What should we be looking for?” We were able to act as a single point of contact. The Edinburgh team made time to speak to our team and we then shared the technical details with all the local authorities and public bodies throughout Scotland, such as the health service, to allow them to undertake their own assurance activities, which have been going on in some depth since then.

It has been reported, and John Cole has said, that the issue is not likely to be limited to schools. Areas of non-compliance have been found in other buildings, although they have not been anywhere near as serious as in the Edinburgh schools. However, that assurance activity has been undertaken by individual authorities that own and maintain buildings. They will follow up on any non-compliance that is found.

Source: Education and Skills Committee 28 June 2017, Peter Reekie, contrib. 102⁵⁵

Previous incidents

153. The Cole Report identified four similar incidents where masonry panels collapsed, three of which occurred before the collapse of the wall at Oxgangs Primary School. These were Trinity High School and Duncanrig Secondary School in South Lanarkshire (January 2012), Lourdes Primary School in Glasgow (January 2012), and Balfron High School in Stirlingshire (May 2016). These walls were all of a similar brick and block type that is found in Edinburgh's PPP1 schools and the defects that caused the failures were again due to a lack of brickwork accessories and incorrectly fitted ties.⁵⁶
154. These incidents did not lead to a significant number of schools being closed and attracted less public and media attention at the time.
155. In light of this, the Cole Report made a number of conclusions and recommendations on the sharing of information, including that—

” There should be a formal requirement on public bodies to make automatic disclosure to a central source of information on building failures, particularly in relation to building failures that bring with them potential risks to the safety of building users.

Source: Cole, 2017⁵⁷

156. It should be noted that the Scottish Futures Trust did provide this central source of information in the aftermath of the incident at Oxgangs as the [preceding section](#) of this report highlighted.

Training and qualifications in the construction industry

157. One of the themes that arose in the Cole Report and the evidence we heard in the Committee's inquiry was the training and qualifications for construction workers.
158. The Cole Report identified three key areas where there are "serious skills shortages and difficulties in recruitment" for bricklayers, clerks of works, and other construction professionals.⁵⁸

Bricklaying

Training

159. At a very basic level, the faults that led to the Oxfangs incident and that have been found elsewhere were due to faulty bricklaying and construction of the relevant walls. Failures in oversight and quality assurance have been discussed above, however building techniques evolve and it is important that training is available for individuals to develop and adapt to new practice. One aspect of this is understanding the importance of brickwork accessories and how to install them appropriately. Quality training is therefore very important to ensure that our built environment is of a high quality and safe.
160. Professor Cole explained to the Committee that the responsibility for ensuring that construction workers have the appropriate skills is the owner or the contractor. He said—
- ” There is no requirement in respect of the level of competency that enables someone to build: anyone can call himself a builder. The current regulations put the responsibility on the owner or developer to appoint somebody with the competence to do the job, but there is no definition of that competence because there is no standardisation and no licensing of construction companies. Therefore, anyone is allowed to build a wall.

Source: Education and Skills Committee 14 June 2017, Professor Cole, contrib. 21⁵⁹

161. Paul Mitchell from the Scottish Building Federation (SBF) and Scottish Building Apprenticeship and Training Council (SBATC) explained further—
- ” The main way to check an individual's credentials at the moment is through construction skills certification scheme cards. A person can obtain a CSCS card if they have a relevant qualification. Often, we find that such people are in circulation on larger construction sites. However, we still have a problem in that smaller local contractors will simply receive a call from somebody who says that they are a bricklayer. The contractor will tell them to start on Monday morning and they will know by the first tea break whether the person can hold a trowel and perform. We still have issues about candidates who do not have formally recognised robust qualifications entering the construction industry.

Source: Education and Skills Committee 14 June 2017, Paul Mitchell (Scottish Building Federation), contrib. 25⁶⁰

162. Particularly in regard to bricklaying, Paul Mitchell suggested that there are issues with initial training and continuing professional development. He said—
- ” Many bricklayers pass their apprenticeship and almost go through their whole career without receiving any further technical training on bricklaying. I am sure that they receive plenty of health and safety training, but there is no requirement, post completion of their apprenticeship, to do any continuing professional development whatsoever.
- Source: Education and Skills Committee 14 June 2017, Paul Mitchell, contrib. 91⁶¹
163. In its written submission, the SBF and SBATC confirmed that the content of the current apprenticeships and skills test for bricklayers was being reviewed with stakeholders in light of the Cole Report. The submission stated that from an initial review by the SBATC, "there may be a need in particular to place a greater emphasis in the content of bricklaying courses on the use of wall ties and the new types of ties now available." ⁶²
164. Work updating the requirements for construction apprenticeships was ongoing during the Committee's inquiry. The Scottish Government indicated in its submission that it had supported an initial workshop in June 2017 and that Construction Scotland would thereafter be co-ordinating this work. ⁴ In a later letter from the CITB, it stated—
- ” We recently took part in an industry-wide workshop looking at the findings of the Cole report. We have agreed to feed our views into Construction Scotland, who are drafting an agreed set of actions which are expected to be published later this year.
- Source: CITB, 2017⁶³
165. The SBF/SBATC also noted changes to the certification and assessment strategy for craft apprenticeship schemes. The SBF/SBATC raised concerns about: the "accepted time-served periods associated with craft apprenticeship qualifications"; the "end to the practice of the industry appointing independent 'skills test' assessors"; "a diminution in the value of craft apprenticeship qualifications by allowing candidates to achieve the SVQ3 without undertaking a structured apprenticeship or completing college training"; "the introduction of diluted SVQ level 2 qualifications in the traditional craft occupations" which would lead to the "undermining the traditionally high quality of SVQ Level 3 qualifications"; and "restrictions around the ability to simulate workplace conditions when submitting portfolio evidence, raising significant doubts over the ability of many apprentices to achieve their qualification." ⁶²
166. The Committee wrote to the CITB and SQA to highlight these concerns and received responses from both organisations.
167. The SQA explained that the skills test is not being removed from the level 3 craft SVQ. The skills test has been administered by the craft federations and therefore were "unregulated components within a regulated qualification". Five years ago, the SQA, in its role as the accreditation body, required that the skills test either be removed or become a regulated component of the qualification. The SQA stated that, in its capacity as the awarding body, it has worked with stakeholders and will

include the skills test which will be administered and quality assured by accredited awarding bodied in a new level 3 SVQ. ⁶⁴

168. The CITB elaborated on its role in this process, stating that it consulted 173 employers in Scotland and 95% of those favoured retention of the skills test and this is reflected in the new qualifications. CITB also stated that the new qualifications would be ready for the August 2017 intake. ⁶³

169. The SQA also explained the rationale for reintroducing an SVQ level 2 craft qualification which had been withdrawn in 2012 due to lack of demand. The SQA identified two reasons for its reintroduction: first that demand for this level of qualification had been identified by Historic Scotland and second that a gap has been created by the withdrawal of the Construction Related Occupation (CRO) card by the Construction Skills Certification Scheme (CSCS) on 31 March this year. While the CSCS CRO card is not mandatory to work in the construction industry but most large contractors require these cards to employ individuals. The SQA stated—

” The withdrawal of the CRO affects around 23000 workers in Scotland. Some of these workers will be covered in the future by a Visitor card or other CSCS card, but those who are not face the potential of being unable to access sites which require a valid CSCS card.

Source: Scottish Qualifications Authority, 2017⁶⁴

170. The SQA also explained how it envisages its new level 2 and 3 qualifications to work in practice—

” It is thought likely that candidates achieving a Construction SVQ at SCQF Level 5 will receive a CSCS Blue Skill Card while those who achieve a Construction SVQ at SCQF Level 6 (the old SVQ Level 3) will receive a CSCS Gold Card. This will enable employers to clearly distinguish the level of competence/capability of the worker and the appropriate level of pay for them simply by looking at the CSCS card.

Source: Scottish Qualifications Authority, 2017⁶⁴

171. The CITB explained that the apprenticeships would still require a minimum time-served element. However, employers could use stand-alone SVQ qualifications to train their employees. It stated—

” These qualifications are typically used to help experienced or adult workers gain formal recognition for their skills. The delivery and quality assurance of these qualifications is the responsibility of the Scottish Regulator, working through approved and recognised Awarding Organisations.

Source: CITB, 2017⁶³

Recruitment

172. A related concern was raised in relation to the lack of skilled bricklayers. Professor Cole said—

” Something that recurred in the presentations that we had as part of the inquiry was a recognition and statement by every main contractor who came to talk to us that there is great difficulty in getting highly qualified, highly experienced bricklayers in the industry, and that that is part of their problem. It is to do with the boom-and-bust nature of our economy. It is also partly to do with the seasonal issues in Scotland, where it is difficult to build with bricks at certain times of the year, but there has also been a loss of people. In particular, many people left the industry last time there was a dip in the economy—it was a huge dip—and they have not come back. The dearth of people brings problems.

Source: Education and Skills Committee 14 June 2017, Professor Cole, contrib. 100⁶⁵

Other professionals

173. The Committee also heard evidence that there are skills shortages in other areas, namely: clerks of works, building standards officers, and other professionals with expertise in quality assurance.

174. While a number of local authorities still utilise clerks of works, the Committee received evidence that numbers across the sector are reducing. This in turn may have led to less demand for courses supporting the role and a reduction of these courses. Professor Cole reported to the Committee—

” There are fewer opportunities for clerks of works. Somebody advised me—I need to look into this in more depth—that there is a lack of availability of courses to become a qualified clerk of works. Because we are not using it, the skill is dying, and the skill is fundamental in relation to the problems that we are discussing.

From a skills perspective, we need to build up a cadre of people with the necessary experience. In the past, those people would generally have come from the construction industry—they would have been joiners or bricklayers, for example—but that is not happening any more because there are reduced opportunities or no opportunities for clerks of works

Source: Education and Skills Committee 14 June 2017, Professor Cole, contrib. 38⁶⁶

175. As Professor Cole notes, more work is needed to understand the current situation in relation to training opportunities but similar themes emerged in evidence in relation to building standards officers and surveyors and other professionals with the skills and knowledge to understand and oversee the construction stage. Ian McKee told the Committee—

” On the point about building control and professional skill, what is happening has been happening over a number of years, and it is an erosion of professional skill. We have a chronic skills crisis at the moment, whereby we are not attracting young people into the built environment professions. Because of the demographics, a lot of people will retire over the next 10 to 15 years, and there is also the impact of the financial crisis, so we have a big hollowing out of experience within the profession and we need to turn that around. We will not turn it around if the professionals are being asked to do only pre-contract work. If they create the design but do not see the construction work through, they will gain no experience. If they are not on site, seeing the thing built and interacting with the contractor and the other professionals, they will not know what a properly built wall looks like.

Source: Education and Skills Committee 14 June 2017, Ian McKee, contrib. 57⁶⁷

176. Professor Cole also said—

” The procurement model that we are using is deskilling the professions and the industry as a whole.

Source: Education and Skills Committee 14 June 2017, Professor Cole, contrib. 58⁶⁸

Role of schools in the building process

177. The final issue for the Committee in the evidence we received is the extent to which communities and a school's leadership are involved in the design and construction of a school.

178. Jim Thewliss from School Leaders Scotland told the Committee—

” Engagement of the headteacher and—through the parent council—of the school community is becoming much more prevalent; it is now much more standard practice. When PPP was the only game in town, if the contract was for 10 secondary schools, we tended to get 10 secondary schools that were based on the same model. The design process is now tailored much more specifically to the needs of individual schools. There is still a way to go, but there is much more interaction and engagement, and the process is much more flexible than it was.

Source: Education and Skills Committee 14 June 2017, Jim Thewliss, contrib. 138⁶⁹

179. Peter Watton from the City of Edinburgh Council told the Committee that headteachers are part of a project board when building or replacing schools.⁷⁰ Danny Lowe, from South Lanarkshire Council, that while headteachers and parent teacher associations are not involved in the contract process, they do have a role in the interior design and over all look of the school. He said—

” We engaged with the headteachers of every school that was constructed throughout the programme on what makes a good learning environment, by asking what the best use of space in the school could be and how the classrooms should be laid out. It was not particularly about the size of classrooms, bricks and blocks and what a roof should look like—the design of the property and the structural implications—but the things that would make it a good teaching environment. We asked what the flow of the school should be in order to make it a good learning environment that is fit for the current situation and for future needs.

Teachers were involved in picking the colour schemes to make the schools look good, bright and vibrant, and they were involved in the interior design at the end of the project and in setting the logos and how they would look in the school.

However, taking a step back from that, in South Lanarkshire our schools modernisation team provides a conduit between the designers, the property constructors and their managers, and the headteachers, once they are involved in the process. When a design for a school is ready, based on initial discussions of the modernisation team with the headteachers, that design is presented to the headteacher for comment and amended if appropriate.

The parent-teacher association for the school then has a chance to view the design—the layout and how it will look and feel—and thereafter we arrange a roadshow in the school to allow the wider community to have a look at the proposals and give their view. That means that at the end of the day, when the project is constructed, there are no surprises concerning what is being built. We were not looking for the headteacher to design the structural requirements of the school or to choose the materials that should be used. Instead, it was more about layouts, flow and generally making a good teaching environment.

Source: Education and Skills Committee 21 June 2017, Danny Lowe, contrib. 39⁷¹

180. PPP1 schools in Edinburgh were procured in batches. Peter Reekie from the SFT told the Committee that—

” With schools delivery, we now work on individual schools rather than on large batches. That allows a focus on the individual development and on what is right for any one building. [...] We now have a much more detailed specification for our buildings, rather than the sort of very high-level output specification that was the case at the time of PPP1, which left a lot of the design development to the industry.

Source: Education and Skills Committee 28 June 2017, Peter Reekie (Scottish Futures Trust), contrib. 19³²

Annex - written and oral evidence

The [written and oral evidence](#) received by the Committee as part of our inquiry is available online.

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