

## **ICE Scotland submission of evidence to the Education and Skills Committee regarding Edinburgh Schools**

### **Introduction**

The Institution of Civil Engineers (ICE) Scotland welcomes the opportunity to contribute written evidence to the Education and Skills Committee inquiry on Edinburgh Schools. Our response addresses the Committee's questions pertaining to quality assurance practises.

ICE is the independent voice of infrastructure and the leading source of expertise in infrastructure and engineering policy. The Institution is a global body with 91,000 members. Our 8500 Scottish members, who are drawn from public and private sectors and academia, design, build and maintain Scotland's vital transport, water, flooding, energy and waste infrastructure and educate the next generation of engineers.

ICE members work both in 'civil engineering' and 'building' and to an extent there is a difference of approach to construction supervision in each of these sub-sectors. In 'building' there is usually a multi-disciplinary team which introduces challenges when considering technical supervision which is often on a visiting basis. In civil engineering, contract management and site supervision are typically carried out by one body and supervision is full time.

In much of our response we have drawn on experience gained from major PPP (including DBFO/NPD) and D/B contracts carried out by Transport Scotland (TS) in recent years.

### **Quality Assurance Practices**

#### **1) How quality assurance is undertaken on current capital projects on the school estate;**

There are two issues to consider here:

- 1) Quality Management Systems (QMS)
- 2) Site supervision

In the case of QMS, the Concessionaire (assuming PPP but Design/Build is similar) and his Contractor, Designer and others, operates to a registered QMS. This ensures that the work is properly planned before construction and there are inspection and test plans to ensure that the construction complies with the contract. Modern QMS covers Design, Construction, Health & Safety, and Environment. The process is auditable and ideally all parties have access to the system (including the client and any supervisors) and have the ability to raise 'non-conformances'.

The process is not without difficulties; it is paper (or systems) 'heavy' and requires much attention, which can reduce the time supervisors spend on the site. Given the disparate nature of the building industry we doubt this approach is universally applied and it will be expensive for small subcontractors to be registered. We therefore doubt that this is universally used. TS requires this approach on their major projects.

Site supervisors are the second aspect of ensuring quality. Although a contract puts the onus for this on the Concessionaire/Contractor, experience suggests that site supervision is required. On building work site supervision is typically on a visiting basis (although not wholly) whereas in civil engineering it is typically full-time. The amount of site supervision required is best assessed on a risk basis dependant on the construction type/location etc.

It is preferable that the site supervision is tied into the QMS with the site supervisor having wholly transparent access to the system. Levels of site supervision have to be optimised for the project as it does come at a cost.

Our members believe that 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. That said, there are still some examples of good practise where supervision has been thought through.

TS provide a robust approach to this issue. They require the Designer to have a presence on site, quality tested during procurement, and to certify that each design element has been properly translated into construction. In addition, TS field their own site supervision team, and in the case of PPP it is usual that the funder will have a representative on site.

This approach is quite different to that adopted in the Edinburgh Schools estate but it does come at a cost. All that said, no supervision will on its own achieve perfection.

### **Information Sharing**

Information sharing is essential to ensure quality assurance. It is a fact that the more bodies involved in a contract (and PPP/DB tends to lead to that) the more important document control becomes. Public bodies need to be aware of the effort needed (which includes the resources needed) on this aspect and without a comprehensive methodology right first time will not be achieved.

As built drawings are clearly necessary for the ongoing asset management of infrastructure, and a lack of provision is unacceptable. A client can only fulfil their H&S obligations for future works if they have records. The ultimate safeguard for provision is payment and completion certification. In TS contracts, record drawings (and other data) must be certified by the Designer/ Contractor before a permit to use is issued and payment released. A similar approach would address the Building Control issue. To provide a comprehensive approach clients would be better to specify their record requirements at tender to obviate issues which would arise near completion.

Building Information Modelling (BIM) has the capacity to provide a much more comprehensive and useful record of the completed asset with embedded specification and quality record information. However, with this technology comes a new set of issues around ownership and liability for collaborative (or eventually truly integrated) models which must be carefully considered.

## 2) Whether the quality assurance of school capital projects has been reassessed since 2016;

As discussed above, we still consider that site supervision is less than optimum and in the main is almost certainly not full time. Increasingly we are advised that Local Authorities (LAs) are reducing site supervision and material testing (mainly on financial grounds). Where supervision is provided it is likely to be on a visiting basis and the Designer may or may not have a role.

There are however some examples of better practise where a Clerk of Works (CW) 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 construction risk.

We are aware of LAs which have, largely due to a greater level of supervision, avoided the issues experienced in Edinburgh schools. These schools have been delivered through a mixture of procurement methods. The slightly older ones used PPP. In the modern schools, this has been replaced with Design, Build, Finance and Maintain (DBFM) but they also use more traditional routes using in-house lead design and Design and Build (D&B).

These LAs have employed a CW on all sites, regardless of the procurement route. The CW for the building elements are LA permanent staff. These CWs are described as “inspecting” rather than “supervising” but they are usually on site daily if not full time. Many are members of their Institution and have usually previously been experienced tradesmen. There are also architects and a project manager assigned to each project, who regularly supervise. The Project Managers (PMs) come from construction related backgrounds. Staff engineers visit site as required but there is no Resident Engineer from the client team.

The other reason for the avoidance of the issues experienced in Edinburgh is the design/construction technique employed. Most of the LAs’ 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.

The Designers will work for the Contractor regardless of contract type. However, there are still mechanisms in place for Designers reporting to the client. The Designers work with the client on things like layout but do not undertake any structural checks. However, a lot of the work is done through HUB, and often this means having the same design team whether directly employed or via the contractor, meaning there is a fairly close relationship. The Designer has a part-time presence on site in all contracts though who they are working for officially depends on the contract.

Completion of construction to the design specified is signed off by the Contractor. However, the internal quality procedures also require an element of signing off too to meet contractual requirements.

Anecdotally, LAs tend to step back more when the Contractor is responsible for design. It is possible that some authorities are ‘burying their heads in the sand’ when it comes to investigating the potential problems.

An issue going forward is a lack of CWs. Many CWs are getting close to retirement and they are struggling to find people ready to step into that role. Additionally, continued budget pressures are squeezing staffing levels.

The conclusion of the Edinburgh Schools Inquiry was clear: a deficiency of site supervision. The solution is also clear: much more robust supervision should be provided and we do not consider that this has been universally taken on board.

### **3) Whether there are, or were, particular issues depending on the funding model and the lessons to be learned?**

We consider that it was unlikely that the PPP form itself was the cause of the problems, and they are likely to occur on a wider basis. We therefore took views on the building industry which confirms most of the issues identified by the Inquiry.

We agree with the Edinburgh Schools Inquiry report that there need not be any difference in the level of independent supervision whatever the financing arrangements for the project. Appropriate arrangements can be put in place either engaged directly by a client or as part of a wider technical advisory / contract administration team whatever financing or procurement route is selected. In civil engineering, there are likely to be more materials testing requirements on an ongoing basis, and a geographically larger site so a larger absolute number of independent supervisors may be required than in building projects. What is important for either is the continuity of presence, professionalism and relevant experience of the individuals in relation to the activities being undertaken on site at the time, and clarity of the role in relation to the other parties involved and contract form being followed.

Overall, we consider that clients should not take a 'hands off' approach whatever the type of contract employed. PPP may well transfer risks from away from a client body, but it would be unwise to walk away from the process. An intelligent client will, and should, still want to be involved with their project.

**Institution of Civil Engineers Scotland**

**12 June 2017**