



IT Case study

CAD and electronic communication in surveying: Weatherall, Green & Smith, Leeds

This case study demonstrates to architects and surveyors the significant benefits of using CAD and email as a fast response service to clients, which will result in higher quality design output. It also illustrates the

potential for longer-term business benefits by integrating design with the client's business development process. This creates a stronger and closer bond between client and consultant, leading to a long-term virtual

partnership relationship. For clients it demonstrates the business benefits of a faster-response design service, simultaneously providing higher-quality design output than traditional processes.

Practice profile

Weatherall, Green & Smith is a multi-disciplinary practice of surveyors, providing a diverse range of services:

- Building consultancy;
- General agency;
- Insolvency;
- Investment;
- Landlord and tenant;
- Office agency;
- Planning;
- Plant and machinery;
- Property management;
- Rating.

The Leeds office of the practice, together with an office in Manchester, comprises Weatherall, Green & Smith North. A total of 150 staff is employed, and the practice is a member of Weatherall International, which has offices

throughout the UK, as well as in Europe, New York and Tokyo.

Following the formation of Weatherall, Green & Smith North in 1997, the practice's IT development began with an architectural CAD system which provided compatibility with the system installed in Weatherall's London office. The move to AutoCAD 14 with AEC 5.1 was made in 1997, with an AutoCAD Lite workstation added in 1998.

All UK offices are fully networked, with central services located in London and Leeds.

The Leeds office provides a wide range of services to an equally-wide range of clients. This Case Study focuses particularly on the service provided to major clients in the retail sector. The service comprises site search and procurement, together with new-build or shell fit-out design of premises.

CAD and electronic communication in surveying

Project, objective and approach

Weatherall, Green & Smith has transformed a traditional process of design production based on manually-drafted, paper-based design output transmitted by fax and post, into a virtually paper-free electronic process using AutoCAD and email

Benefits

- Increased speed of drawing production.
- Increased quality of final drawing output following several iterations of consultant/client amendments.

- Increased speed of communication between consultant and client, using email to transmit AutoCAD files which can immediately be viewed and amended by both parties.

- Reduced costs of photocopying and faxing.

- Reduced document-storage requirement for both consultant and client.

- Creation of closer consultancy/client relationship through integration of design process into client's own development process.

The process

The 'traditional' design process, shown in Figure 1, typically comprised:

- 1 Site identification;
- 2 Drawings of shell form provided by developer;
- 3 Layout drawings produced, including M&E.
- 4 Drawing extracts faxed to client;
- 5 Amendments made by client and returned by fax;
- 6 Drawings amended and step 4 repeated;
- 7 Final drawings issued to client by post.

The process was based on hand-drafting drawings up to AO size, with copying carried out by external agencies. The introduction into the practice of AutoCAD 14 with AEC 5.1, which was prompted by a major client, also coincided with the introduction of email. This combination has led to a transformation of the process which now appears as Figure 2.

The current process now comprises:

- 1 Site identification;
- 2 Shell drawings received on disk or by email from developer;
- 3 Client layout added with the aid of AEC 5.1 standard items;
- 4 M&E 'layers' added to AutoCAD layout;
- 5 Drawing files emailed to client;
- 6 Client amends using AutoCAD Lite;
- 7 Client returns amended files by email;
- 8 Final drawings issued in both electronic and plotted paper forms.

The transformation has provided significant benefits to Weatherall, Green & Smith and their clients. The most significant is the reduction in the overall time required between site identification and final drawings, which averages 50%. Within this overall timescale, a significant time saving has been achieved in the production of internal layout designs. A typical two-day manual production time has been reduced to a half-day of CAD effort.

Process development

The move to AutoCAD 14 was made to provide compatibility with systems in use by clients. It was clear to Weatherall, Green & Smith that communication with client's developers, and potentially with contractors, would be best enabled by adopting market-leading software.

The process developed rapidly by working closely with a single client. Having established the process, it is now being used as a marketing tool to encourage other clients to benefit from the time and quality advantages available.

The concept of electronic transactions also includes specification writing. A spin-off benefit of the AutoCAD development was the upgrading of the practice's Barbour Index Microfile information service to the CD-ROM-based Barbour Construction Expert which is now used to support specification writing.

The delivery of completed documents by email is also increasing.

The use of email is normal practice for all staff. Email communication with clients, contractors and other consultants is increasing dramatically, but concerns remain over security and authentication, particularly related to unauthorised amendments to complex drawings. The practice provides clients with weekly 'email schedules' showing all transmissions of drawing files sent and received by email. This provides a useful audit trail to exchanges of information that may occur several times a day on one project.

In development terms, the practice has now consolidated its development of two-dimensional CAD, and makes some use of three-dimensional CAD facilities when demanded. Electronic mail (email) and electronic fax (transmission direct from a PC to a remote fax machine) are both normal practice. The movement towards a 'minimum paper' office continues. In the words of Ben Hunter, a surveyor who uses the

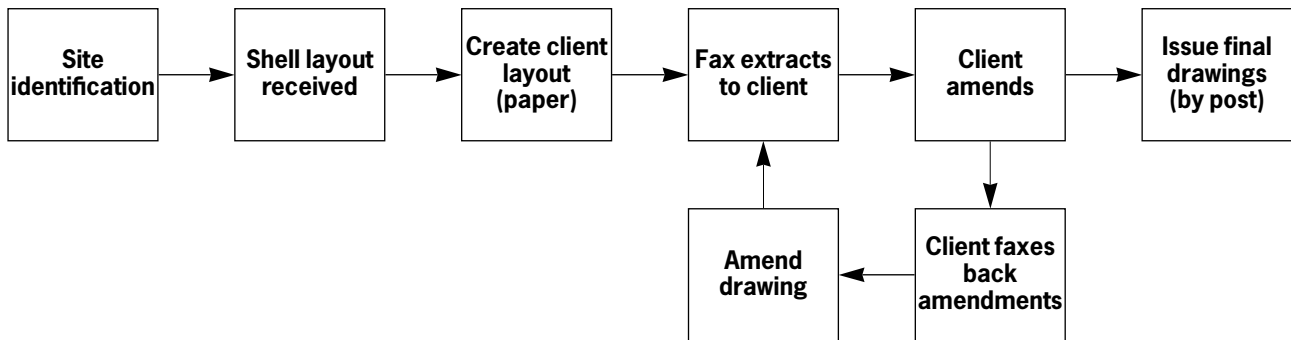


Figure 1 The traditional design process

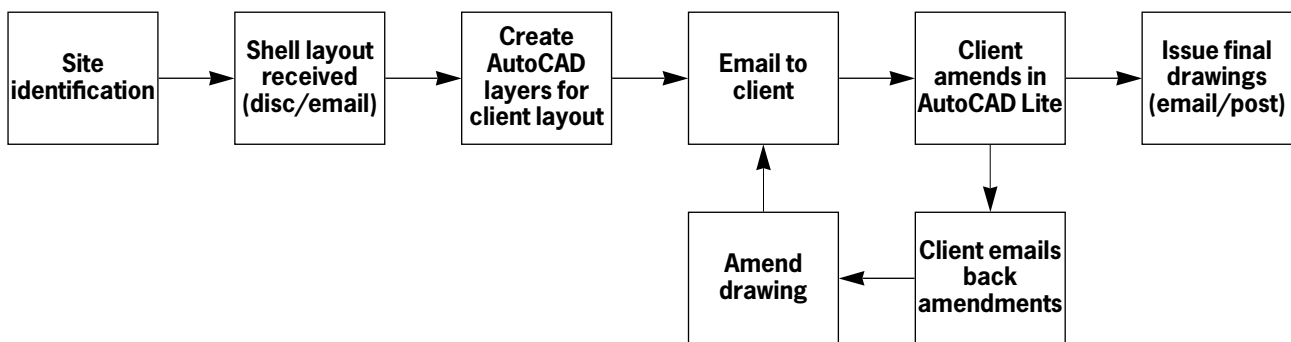


Figure 2 The transformed design process – overall timescale is about half that of the traditional practice

AutoCAD/email process at Weatherall, Green & Smith: “We could not go back – client expectations have changed and our own expectations in terms of speed and quality of service have changed with them.”

Benefits achieved

The benefits of using CAD and email in this way can be classified as:

- Time and cost reductions for the practice;
- Time, cost and quality improvements for clients;
- Closer, long-term relationships with clients through integration with clients’ own electronic processes.

Cost and time reductions include:

- Elimination of copying agency costs;
- Reduction of paper, postage and fax costs;
- Reduced document storage costs;
- Dramatic reductions in drawing production times;
- Reduction in overall process time (see Figures 1 & 2).

For clients, benefits include:

- Higher quality of design input with consistently high quality output;
- Quicker response to design changes;
- Faster occupation of premises due to shorter design phase;
- Savings on paper and fax use, and in document storage.

The major business benefit to Weatherall, Green & Smith, and the one that provides a competitive edge, is their ability to develop a closer working relationship with a client by using compatible CAD software and email communication to provide a service that integrates with the client’s own processes and demands.

Typical applications

Figure 3 shows part of a completed layout for a typical shell scheme. Mechanical and electrical 'layers' are also produced for each outlet. A project of this nature may generate several design iterations and Figure 4 shows a typical 'email schedule', which is used to record the drawings sent and received over a week period.

Other types of work are now being introduced to the CAD team.

Weatherall, Green & Smith's Agency division is beginning to receive AutoCAD files and has already provided a space-planning service for a major client by working with the AutoCAD system. It has also proven to be a valuable way of presenting high-quality information to prospective and retained clients as a marketing tool. The system has even been used to provide three-dimensional presentation material to support expert-witness evidence, and to furnish sales information for a property brochure.

Management issues

The initial proposal to move to a CAD solution came from an architectural technician and a building surveyor in the Leeds office. The proposal was taken up by the head of the practice's Building Consultancy, and was approved by equity partners of the practice, who have invested approximately £15 000 in hardware and software to date.

Having made the decision to invest in AutoCAD 14 with AEC 5.1, two young surveyors, both with previous CAD experience from practice or education, were given three days intensive training at the offices of the turnkey system supplier. In the words of one of these surveyors: "... the initial training demonstrated the basic principles of the AutoCAD system and gave us sufficient competence to begin production, but the only way to really learn to 'drive' the system is consistent use and trial and error – there is no substitute for experience."

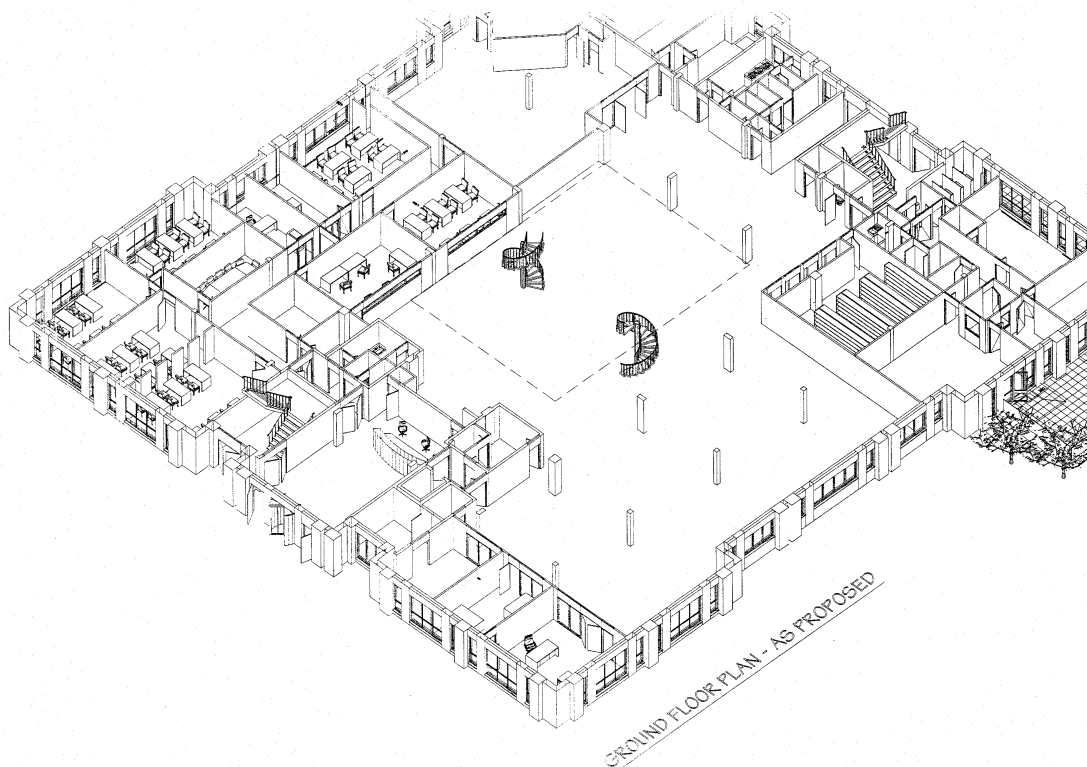


Figure 3 Part of a typical shell layout for a retail outlet

Further developments

Further developments will be dictated by market forces, but the practice has now featured their AutoCAD /email process in marketing literature and is actively encouraging clients, contractors and fellow consultants to use email communications. There is a quiet confidence that their marketing and championing will soon lead to further developments, for example in the increased use of the Internet.

Plans are well advanced to use palm-top/hand-held computers to input data on site and to download the data into office-based databases that are compatible with both client and other office (eg London) systems.

Good practice notes

The primary points made by this case study may be summarised as:

- The introduction of weekly schedules of emails sent to, and received from, a client. This procedure provides an audit trail of communications for both parties, eliminating the possibility of doubt in an area of communication which often causes concern.
- The installation of local Zip drive backup facilities at the CAD workstation to eliminate heavy network traffic normally created when backing up very large CAD files to a network drive.

Other IT Case Studies

- 1 Electronic exchange of project information: 3COM Project, phase 2
- 2 Property portfolio management using a CAD-linked database: Stoke Mandeville Hospital
- 3 Electronic information systems: Fitzroy Robinson
- 4 Modelling of building services: 33 Old Broad Street
- 5 Information systems within a design practice: Levitt Bernstein Associates

This is one of a series of case studies on the application of IT to construction produced by the Building Centre Trust. Each case study is written by an impartial author and monitored by an independent steering group drawn from various sectors of the construction industry.

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