

MAINTENANCE

I want to put a framework around this talk on maintenance. And my framework is really a metaphor - in form of the *2nd law of thermodynamics* - which says:

- *Everything goes from a more useful form of energy to a less useful form of energy in a closed system until equilibrium.*
- *OR Entropy (or disorder) in a closed system is increasing.*

Basically the message is that everything left to itself decays. Everything goes downhill!

Even if the general theory of evolution says it goes the other way and life evolves to become more complex over time, we still die, building fabric decays, cars have to be serviced, the weeds grow, and the sun one day will burn out.

I know the truth of this when I look at my desk. As a closed system, it does not tidy itself, it gets messier and messier. Entropy increases. And so it is with building fabric.

And everything will decay until energy is taken from outside the system to restore its previous condition. I have to introduce and expend energy to tidy my desk. Energy is required from somewhere to sustain performance.

And when it comes to fabric in buildings, you and I are that energy. Buildings don't look after themselves and self-repair. We have to bring our efforts to it and intervene in the decay process.

So when I think of maintenance I think of entropy and that it is I who must put energy into the system.

So where should we focus our effort and energy? What needs to be fixed? We do well to first understand the mechanisms of building decay in order to target that energy. This is where we should begin.

For the main mechanisms of fabric decay are twofold: they are the actions of 1. Water and: 2. the Quality of the environment. Both bring disorder.

So I propose to spend most of this time looking in some detail how these mechanisms operate. When we understand them, we will know better where, why, and how to focus our time and money.

Then we will look at QQL surveys, what goes in them and why, and then something to say around safety.

So water the climate in the uk is often wet. But not too wet. Comparison. But Singapore does not freeze. We still have to deal with rain and it is the most important consideration in maintenance.

Most churches - certainly those built before c.1920 whether listed or not are not like modern buildings, they are not hermetically sealed from water in the ground by modern membranes and damp courses. They don't have cavities in walls that prevent water from the sky penetrating through. They don't have draught proof windows and doors. The situation is more fluid.

Roof coverings can often be ok but old clay tiles get broken and may stay unnoticed for a long time, lead can be stolen and take a long time to get replaced. And the junctions of flat roofs with abutments to walls can easily become faulty.

Here is a diagram showing how an old building deals with water.

We need to identify the path of moisture movement at a macro and microscopic level. We start at low level; what we can see and imagine at eye level.

Water is present in the soil and comes up from the ground in the interstices of the materials by capillary action and evaporates; we don't see that. Or it also falls from the sky, and hits the building. We see that. And water will find its way inside by different routes.

You know the signs of a problem with water ingress: damaged decorations, failing plaster, timber decay, wet and dry rot, a musty smell, erosion of masonry and erosion of pointing.

The first requirement of maintenance is therefore to secure the outside of the building, make sure water is discharged and deal with the external causes of water ingress - not the internal symptoms.

There are some helpful diagnostic tools to track water pathways into a building and entry points. The routes are not always obvious. Infra red cameras operated by specialists can show by a thermal image where that pathway may be. Water evaporates so its presence will show up as cooler fabric against the drier. So we can target the problem more accurately.

Drones can also be used to visually explore places that are difficult to reach like towers and inaccessible roofs. We can see what the condition of a roof is. Or conditions on the steeple's stonework. Drones won't tell

us everything but can help show us where to target attention.

Now old historic buildings were designed to deal with water. Water is acknowledged in their design to be present and can be happily absorbed under normal conditions in the walls and floors and then released by evaporation. Sure there is moisture in the fabric but crucially not at difficult or dangerous levels.

Generally: the first general maintenance principle therefore must be this: make an effort to keep the building fabric at the levels of moisture content it was designed to work to by keeping rainwater pipes, outlets, gutters, pipes, drains, and roof coverings in good order. Make it a priority to mend the tiles, sort out leaking pipes, and unblock rainwater drains so water can be properly discharged.

The real problem with water is not the dampness it causes but saturation (11). Going back to our diagram (12) If walls get more than say 20% saturated they become a breeding ground for problems. Now rain does not fall in the same place twice by design. A leaking gutter however does. So does a leaking heating pipe. Drip drip drip on the same spot till saturation is complete.

You can then imagine what happens say when it freezes. Ice forms. Expansion of the water into ice has amazing power and it easily blows materials. We get spalling and erosion. Not all of this we can stop - remember the second law of thermodynamics. But we can slow down the process and then repair when needed. As the proverb says '*A stitch in time saves nine*'. It's 100% true.

Breathability: if walls can accept some level of moisture, old walls were also designed to breathe. The joints in walls in old buildings used lime in the mortar. Lime is remarkable stuff. It allows moisture to pass through it to the air. And in a way that can pull moisture out of the adjacent masonry it is binding together. I think that process has technically something to do with osmosis.

If you interfere with this requirement to breathe by using hard unbreathable external renders to cover up a problem or internal carlite plasters or unbreathable cement based pointing, or unbreathable barrier like paints, water levels build up behind and can destroy the fabric as the water presses hard to find a way out. Which it will do. How often have you seen this?

And how often have you seen? The pointing is lasting longer than the masonry. It's because the wrong modern material cement has been used on an old building. Hard cement remains and has driven moisture into the softer masonry - which has then decayed faster than it should.

And how good it can look when replaced with the right materials.

But modern buildings are not exempt. Reinforcement will rust if water gets to it. Spalls the concrete.

What about rising damp? Is this really as big a problem as some make it out to be? How many times do we hear the term. You cannot actually strictly have a rising adjective. It should really be called rising moisture or rising dampness. But the two adjectives combined together seem to have become generally accepted by default as a noun. However it does not have to be the problem damp proofing companies make it out to be.

Whatever may be claimed - old buildings do not need DPCs if the right conditions are retained. These buildings were not designed with damp proof courses and don't necessarily need them. If the external ground is not saturated, the internal floor can breathe, and rainwater is discharged properly there should be little problem. Often you will see french drains around old buildings as a way of reducing the risk. If the rainwater is taken away, the walls will breathe better and ground will be as dry as it needs to be up against the foot of the walls,

Mortgage companies often require damp proof courses to be installed to lend a borrower money. They don't seem to understand historic buildings; a damp proof course because it is a barrier can stop the breathing process and drive the problem elsewhere.

Salts: can sometimes be a problem. When they are dissolved in water they can rise up from the ground into the structure and crystallise out on wall surfaces and cause damage. What you may hear is a damp solving salesman urging you to install a barrier to salts and want to line the inside face of masonry before re-plastering. This does not solve the problem. What a lime plastered lining does is act sacrificially. Salts take the last line of resistance and a softer weaker material

The second issue after water is the local environment - the quality, humidity and temperature of the air. Some things we cannot easily change. Like acid rain from the sky from atmospheric pollution. It will attack masonry but is not a local issue and has to be solved politically. It does not seem to be quite the problem we thought it once would be, OR it is not now getting the press it once got.

But condensation is a potential difficulty. This is another source of water often evidenced by mould. And the unhealthy conditions that can result. It results from a combination of cold surfaces, high levels of internal water vapour, and lack of ventilation.

Often more a problem in a toilet, bathroom or kitchen where there are kettles, hot water, cold surfaces, and no extract fans. And less of a problem in old churches with plenty of draughty windows and lower levels of water vapour. But it can still be an issue. Condensation will occur on cold nights say on the glass of leaded lights and threaten the supporting metalwork.

It can also happen when we insulate old buildings. The intention to insulate is noble. Say when we reroof; but the point at which condensation occurs - when the level of moisture in the air cannot be held as vapour any longer - may arise in the wrong place. If you plan to insulate you need to do a condensation risk analysis.

And there is something to be said about: Heating

The stabler we can make the fabric the better. If you want to strategically protect the fabric apart from securing against too much water, the more the temperature of the building can be kept from swinging from hot to very cold the better. Makes sense. Warmth in the fabric increases ability of moisture to evaporate and reduces the chances of condensation on its surfaces. Big swings do the opposite. Current thinking is that it is best to always keep the heating on at a low level. The driver for that may be economic but it also benefits the fabric and in the long run that is an economic consideration.

So our understanding of these things takes our initial focus particularly onto the following

- Soundness of roof coverings
- Condition of junctions of roofs with walls
- Soundness of rainwater disposal system
- Soundness of pointing and external masonry.
- Condition of ground next to the building
- Right use of materials internally and externally and removal of wrong ones
- Quality of background ventilation
- Ventilation of voids.
- Heating systems and heating controls
- Soundness of heating pipes
- Soundness of water supply into the building

A finally a word about Timber decay: Dry Rot / deathwatch beetle.

2 most problematic issues I have ever had with old buildings have been caused by dry rot. It's almost as if old buildings are booby trapped for this. Dry rot spores are abundant but for this to become a damaging fruiting body 3 things are required: high levels of water in the fabric, lack of ventilation, and a food source (timber). Once again if the levels of moisture are controlled, the shedding of rainwater is looked after, walls can breathe, there is no saturation, and voids are ventilated it is not going to occur. The conditions for its appearance will not arise. It may lie dormant - and you can never say an old building is free of its potential to arise - but it will be controlled by attention to maintenance.

And death watch beetle. Very much a problem with oak timber carcasses - its not a softwood problem. Once again like dry rot, the food source -timber - has also provide to a source of moisture. The beetle needs water as well as food. If the oak is dry and the roof covering is sound there will be no problem.

So we can add one more item to our check list

- The condition of structural timbers embedded in external walls
- Ventilation of voids

But if all is dry all will be well.

QQL SURVEYS

So a QQL survey should highlight these issues and point out where they need to be addressed on your building. I hope this summary of the action of water in particular will help you understand the priorities better and enable you to look at your building in a new light.

So QQL surveys next and a brief summary of what you need to look for in particular when you get one.

QQL Survey normally start with introductory comments and general points to help you think about your building; it will schedule work done over past 5 years, give general summary of condition, might say how well you have looked after the building, and have a reference plan etc.

BUT bulk of report will be an elemental summary of condition of each part of the building's fabric and what needs to be addressed. I divide each element into three sections. So here

Each item is given a priority I use 8 categories. Other surveyors will have less.

Different reports will set out the survey differently – no set formula for writing them

Never easy to know what exact timescale should be given to some items as money may have to be raised and a strategy of repair identified combining say access to a roof with access to the tower when there is an economy of scale. You may have to judge the timing of some items

Also the report may have to point you to specialists. Clearly an Architect cannot inspect the safety of the electrical system; a registered expert has to do that; nor can an architect identify asbestos, nor the condition and health of the trees. The report will direct you to specialists where required.

Another aspect of the QQL survey is to try to get the church to own the care of its building and the need to monitor it. Those looking after maintenance need to own the issues and the way I write survey actions is to try and do that. It is no use waiting for 5 years to be directed to a problem. If water start to penetrate it needs to be dealt promptly; not in 4 years time when the next survey is due.

I have talked exclusively about water today but another theme will be safety as yours is a public building: E.G. is the structure stable, is there asbestos present; will the boiler blow up, or will I get an electric shock?

CDM

Moving on finally to one aspect of engaging a contractor. There are some things to say from an architect's perspective that you may not be aware of as regards health and safety and the legal framework. Under these regs you are a duty holder and must comply with the law to ensure maintenance projects are carried out in a way that secures health and safety.

There are still a large number of accidents and deaths on construction sites despite legislation going back to 1994. The HSE has sought to reduce the number by making revisions to the original regs in 2007 and then further revisions in 2015.

What I want to do is briefly summarise what a church ought to know, be aware of, and what its responsibilities are. The idea of the latest regulations from 2015 is to reduce bureaucracy when the focus had ended up on paperwork rather than active management of risk. Not all risks can be avoided or eliminated – if so we would all live in concrete nuclear bunkers; but they can be managed reasonably

The latest regs are much clearer about responsibilities of employers - in this instance you as churches - and help you think about what you are asking say a maintenance contractor to do. As the employer you are the one in the driving seat - not the contractor. Because you are asking the contractor to do something for you, you need to look after his safety. Even need to think of safety of your QQL surveyor or other specialist who you have asked to survey the building.

So what are the risks and hazards likely to be faced when you ask your maintenance man to clean the gutters, or repair the buttress, or sort out a heating pipe?

General risks: *e.g. fall from height / exposure to health risks*

What about the materials he uses in the repair: *lead / lime / dust from cutting masonry / asbestos*

As employer you control the budget and contract, you decide who will do the work, you can provide information about your building, and you can actively encourage safety co-operation. You take on responsibility for the successful execution of the project, the culture behind it, and for managing the project to secure the health safety and welfare of your workforce.

Don't panic – you can get assistance if you need it to manage the project. Our duty as a designer is to sometimes tell a client what some of these duties are. But just so you know here is a summary

- Make suitable arrangements for managing Health Safety and Welfare both before work begins, during the work and at the end
- Select the project team and formally appoint duty holders as necessary (i.e. the Principal Designer, other Designers, and the Principal Contractor.
- Provide relevant information to help with planning the work: asbestos survey, location of underground services etc.
- Notify the HSE of the project if over a certain size and duration
- Check that the main duty holder (The Principal Designer is carrying out his duties)
- Confirm that a preconstruction health and safety plan has been drawn up by the contractor
- Ensure suitable welfare facilities are in place
- Check that a Health and Safety file is provided on completion
- Give the file to anyone in the future who is working on the building.

I think the idea is to get everyone on the same page; by getting employers to own the problem. A bit like owning the issue of maintenance generally rather than leaving it all to experts to understand and knowing nothing.

Which is really what this talk has been about: ownership of the problems by understanding them.

Ownership leads to knowledge and knowledge leads to control. And if you are in control you are on top - and far less at the mercy of events outside your control: that could take you by surprise, or suddenly empty your pocket, or lead to pressure and stress about liabilities.

CDM 2015

If you appoint a contractor to work on your building you are responsible for his health and safety and you may have to delegate that responsibility to others.

You must make suitable arrangements for managing a project, including the allocation of sufficient time and other resources.

Arrangements are suitable if they ensure that—

- *(a) the construction work can be carried out, so far as is reasonably practicable, without risks to the health or safety of any person affected by the project; and*
- *(b) the facilities required by Schedule 2 are provided in respect of any person carrying out construction work.*

(3) A client must ensure that these arrangements are maintained and reviewed throughout the project.

(4) A client must provide pre-construction information as soon as is practicable to every designer and contractor appointed, or being considered for appointment, to the project.

(5) A client must ensure that—

- *(a) before the construction phase begins, a construction phase plan is drawn up by the contractor if there is only one contractor, or by the principal contractor; and*
- *(b) the principal designer prepares a health and safety file for the project, which—*
 - (i) complies with the requirements of regulation 12(5);*
 - (ii) is revised from time to time as appropriate to incorporate any relevant new information; and*
 - (iii) is kept available for inspection by any person who may need it to comply with the relevant legal requirements.*

(6) A client must take reasonable steps to ensure that—

(a) the principal designer complies with any other principal designer duties in regulations 11 and 12; and the principal contractor complies with any other principal contractor duties in regulations 12 to 14;

(b)

(7) complies with the duty in paragraph (5)(b)(iii) by providing the health and safety file to the person who acquires the client's interest in the structure and ensuring that that person is aware of the nature and purpose of the file.

(8) Where there is more than one client in relation to a project—

- *(a) one or more of the clients may agree in writing to be treated for the purposes of these Regulations as the only client or clients; and*
- *(b) except for the duties specified in sub-paragraph (c) only the client or clients agreed in paragraph (a) are subject to the duties owed by a client under these Regulations;*
- *(c) the duties in the following provisions are owed by all clients—*
 - (i) regulation 8(4); and*
 - (ii) paragraph (4) and regulation 8(6) to the extent that those duties relate to information in the possession of the client.*

Regulation 5 Appointment of the principal designer and the principal contractor

(1) Where there is more than one contractor, or if it is reasonably foreseeable that more than one contractor will be working on a project at any time, the client must appoint in writing—

- *(a) a designer with control over the pre-construction phase as principal designer; and*
- *(b) a contractor as principal contractor.*

(2) The appointments must be made as soon as is practicable, and in any event, before the construction phase begins.

(3) If the client fails to appoint a principal designer, the client must fulfil the duties of the principal designer in regulations 11 and 12.

(4) If the client fails to appoint a principal contractor, the client must fulfil the duties of the principal contractor in regulations 12 to 14.

Who is a client?

23 CDM 2015 defines a client as anyone for whom a construction project is carried out (see regulation 2(1)). This definition includes both non-domestic (or '**commercial**') clients and '**domestic**' clients (ie clients for whom a construction project is carried out which is **not** done in connection with a business). The Regulations apply in full to commercial clients, but for domestic clients, the effect of regulation 7 is to pass the client duties on to other dutyholders. This includes the principal designer and principal contractor duties falling to the designer and contractor in control of the pre-construction and construction phases, where the domestic client does not make these appointments. Further guidance on how the Regulations apply to domestic clients is set out in paragraphs 53–56.

24 The guidance in paragraphs 25–52 applies to commercial clients, and any reference to 'clients' elsewhere in this book should be read as referring to commercial clients **only**, unless specific reference to domestic clients is made. Commercial clients are organisations or individuals for whom a construction project is carried out in connection with a business, whether the business operates for profit or not. This includes clients based overseas who commission construction projects in Great Britain.

25 In any project there may be more than one client. Regulation 4(8) may be used where there is more than one client, but all agree that only one of them should be responsible for carrying out the requirements of CDM 2015.

26 In some circumstances, it may not be clear who the client or clients are. Any uncertainty should be resolved as early as possible by considering who:

- (a) ultimately decides what is to be constructed, where, when and by whom;
- (b) commissions the design and construction work (the employer in contract terminology);
- (c) initiates the work;
- (d) is at the head of the procurement chain; and
- (e) appoints contractors (including the principal contractor) and designers (including the principal designer).

If there is still doubt about who the client or clients are, all the possible clients should agree that one or more of them is treated as the client for the purposes of CDM 2015. It is in the interests of all those involved to identify and agree who the client or clients are. If not, they may all be considered to have client duties under CDM 2015.

27 Those clients who have not been identified as the client for the purposes of CDM 2015 will still have duties. These are to:

- (a) provide any information in their possession that may be relevant to help pull together the pre-construction information; and
- (b) cooperate with anyone involved in the project.

Why is the client important?

28 The client has a major influence over the way a project is procured and managed. Regardless of the size of the project, the client has contractual control, appoints designers and contractors, and determines the money, time and other resources available.

What must a client do?

29 CDM 2015 makes the client accountable for the impact their decisions and approach have on health, safety and welfare on the project. This section provides guidance on client duties under regulations 4 and 5. See guidance on the other duties a client has under regulation 6 (Notification – paragraphs 47–52) and regulation 8 (General duties – paragraphs 57–71).

Making suitable arrangements for managing a project

30 Most clients, particularly those who only occasionally commission construction work, will not be experts in the construction process. For this reason, they are not required to take an active role in managing the work. However, the client is required to make suitable arrangements for managing the project so that health, safety and welfare is secured.

31 To be suitable, the arrangements should focus on the needs of the particular project and be proportionate to the size of the project and risks involved in the work. Arrangements should include:

- (a) assembling the project team – appointing designers (including a principal designer) and contractors (including a principal contractor). See paragraphs 35–40 for more guidance;
- (b) ensuring the roles, functions and responsibilities of the project team are clear;
- (c) ensuring sufficient resources and time are allocated for each stage of the project – from concept to completion;
- (d) ensuring effective mechanisms are in place for members of the project team to communicate and cooperate with each other and coordinate their activities;
- (e) how the client will take reasonable steps to ensure that the principal designer and principal contractor comply with their separate duties. This could take place at project progress meetings or via written updates;
- (f) setting out the means to ensure that the health and safety performance of designers and contractors is maintained throughout;
- (g) ensuring that workers are provided with suitable welfare facilities for the duration of construction work.

32 Clients should take ownership of these arrangements and ensure they communicate them clearly to other dutyholders. Clients could prepare a clear 'client's brief' as a way of setting out the arrangements. The client brief normally:

- (a) sets out the main function and operational requirements of the finished project;
- (b) outlines how the project is expected to be managed including its health and safety risks;
- (c) sets a realistic timeframe and budget; and
- (d) covers other relevant matters, such as establishing design direction and a single point of contact in the client's organisation.

33 Where the range and nature of risks involved in the work warrants it, the management arrangements should also include:

- . (a) the expected standards of health and safety, including safe working practices, and the means by which these standards will be maintained throughout;
- . (b) what is expected from the design team in terms of the steps they should reasonably take to ensure their designs help manage foreseeable risks during the construction phase and when maintaining and using the building once it is built;
- . (c) the arrangements for commissioning the new building and a well-planned handover procedure to the new user.

34 If a client needs help in making these arrangements, the principal designer should be in a position to help with this. Clients could also draw on the advice of a competent person if they are required to appoint such a person under the Management of Health and Safety at Work Regulations 1999 ('the Management Regulations' – see www.hse.gov.uk/toolbox/managing/managingtherisks.htm for more information). The HSE leaflet *Getting specialist help with health and safety* provides more guidance on this.²

Assembling the project team

35 The management arrangements must cover what clients will do to ensure that the people and organisations they appoint have the skills, knowledge, experience and (if an organisation) the organisational capability to manage health and safety risks (see paragraphs 58–65 for further guidance). This applies to both:

(a) single contractor projects where the client will appoint the contractor and/or designers directly; and projects involving more than one contractor where the client is required to appoint, in writing, a principal designer and a principal contractor.

(b) dutyholders they appoint will depend on the complexity of the project and the range and nature of the risks involved. See paragraphs 58–62 for further guidance on the help available to clients in selecting the right dutyholder.

Appointing principal designers and principal contractors

37 The principal designer should be appointed as early as possible in the design process, if practicable at the concept stage. Appointing the principal designer early will provide the client with help in matters such as pulling together the pre- construction information (see paragraphs 42–43) and giving the principal designer enough time to carry out their duties. The duration of the principal designer's appointment should take into account any design work which may continue into the construction phase or any issues that may arise during construction involving the need to make suitable modifications to the designs. For projects involving early work by a concept architect or project management company where a design and build contractor or novated designer is subsequently involved, it may be appropriate for the initial principal designer appointment to be ended and a new principal designer appointed.

38 The principal contractor should be appointed early enough in the pre- construction phase to help the client meet their duty to ensure a construction phase plan is drawn up before the construction phase starts. This also gives the principal contractor time to carry out their duties, such as preparing the construction phase plan and liaising with the principal designer in sharing any relevant information for health and safety.

39 The principal designer should be in place for as long as there is a need for their role to be performed. But where a principal designer's appointment finishes before the end of the project, the client should ensure that the principal contractor is fully briefed on matters arising from designs relevant to any subsequent construction work. The client should also make sure that the principal designer passes the health and safety file to the principal contractor so it can be revised during the remainder of the project if necessary.

40 If a client fails to appoint either a principal designer or a principal contractor, the client must carry out their duties.

Maintaining and reviewing the management arrangements

41 The client must maintain and review their arrangements to ensure they remain relevant throughout the life of the project. Some projects do not go smoothly and clients may experience difficulties and delays as they progress. Examples of actions the client can take to maintain and review their arrangements are:

- . (a) establishing key milestones so they can assess the progress of the project and determine whether health and safety standards are being met;
- . (b) where necessary, seeking advice. On larger projects, the client may value an independent review of standards;
- . (c) ensuring arrangements for handing over the building to a new user are sufficient to protect anyone (including members of the public) who may be affected by risks arising from any ongoing construction work, eg snagging work.

Pre-construction information

42 Pre-construction information is information already in the client's possession (such as an existing health and safety file, an asbestos survey, structural drawings

The extent of the checks a client must make into the capabilities of etc) or which is reasonable to obtain through sensible enquiry (regulation 2(1)). The information must be relevant to the project, have an appropriate level of detail and be proportionate to the nature of the risks.

43 The client has the main duty for providing pre-construction information. This must be provided as soon as practicable to each designer (including the principal designer) and contractor (including the principal contractor) who is bidding for work on the project or has already been appointed. For projects involving more than one contractor, the client should expect the principal designer to help bring the pre-construction information together and provide it to the designers and contractors involved. Appendix 2 gives further guidance on the requirements relating to pre-construction information. Appendix 5 shows how pre-construction information relates to and influences other types of information during a construction project involving more than one contractor.

The construction phase plan

44 The client must ensure that a construction phase plan for the project is prepared before the construction phase begins. The plan outlines the health and safety arrangements, site rules and specific measures concerning any work involving the particular risks listed in Schedule 3 of CDM 2015. For single- contractor projects, the contractor must ensure the plan is prepared. For projects involving more than one contractor, it is the principal contractor's duty. See Appendix 3 for further guidance on the requirements relating to construction phase plans and Appendix 5 for how a construction phase plan relates to and influences other types of information during a construction project involving more than one contractor.

The health and safety file

45 **A health and safety file is only required for projects involving more than one contractor.** The client must ensure that the principal designer prepares a health and safety file for their project. Its purpose is to ensure that, at the end of the project, the client has information that anyone carrying out subsequent construction work on the building will need to know about in order to be able to plan and carry out the work safely and without risks to health.

46 To ensure that an appropriate health and safety file is produced at the end of the project, the client must:

- . (a) provide the principal designer with any existing file produced as part of an earlier project so the information it contains can be used to plan the pre- construction phase of the current project;
- . (b) ensure the principal designer prepares a new file (or revises any existing one);
- . (c) ensure the principal designer reviews and revises the file regularly and passes the completed file back

at the end of the project;

- . (d) ensure the file is handed to the principal contractor if the principal designer's appointment finishes before the end of the project;
- . (e) ensure the file is kept available for anyone who needs it to comply with relevant legal requirements;
and
- . (f) pass the file to whoever takes over the building and takes on the client duties if the client decides to dispose of their interest in it.

Appendix 4 gives further guidance on the requirements relating to the health and safety file. Appendix 5 shows how the health and safety file relates to and influences other types of information during a construction project involving more than one contractor.