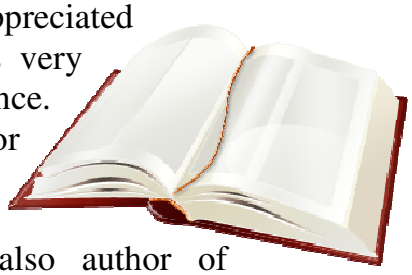
Professor Malcolm Hollis Lecture



You really need to have been there to have fully appreciated the points and issues made, and the lecture was very much developed around the requests from the audience. For those of you who are not familiar with Professor Malcolm Hollis' work he is author of "Surveying Buildings", together with the accompanying pocket book "Surveying Buildings". He is also author of "Surveying for Dilapidations" and "An Introduction to Dilapidations". He has also had many articles published in professional journals.

You can learn more about him at the www.malcolmhollis.org website, where he describes himself as a building pathologist and chartered surveyor. The website covers a helpful range of topics, including arbitration, building appraisal, building defects analysis and diagnostics, contract and defects disputes, dilapidations forensic reporting, party walls, repair and maintenance, service charge disputes, schedules of conditions, surveys and valuations. For the record, his qualifications are BSc, FRICS, FSVA, FBEng, MCIArb. He is a Chartered Surveyor, Arbitrator and Professor of Building Pathology.

In the lecture Professor Malcolm Hollis used a selection of real case studies that he had been involved in and he explained his thoughts and ideas on building pathology and his general pursuit of raising the standards in surveying. The examples very much show that it's not always what you first see that is important and that you do have to follow the trail of evidence.

Residential apartment, timber frame with a brick cladding

Photos were shown of the balcony dropping and distortion to the timber window frames and twisting of the floor. Professor Malcolm Hollis showed how his investigation identified there being problems with a leaking roof and that it was the original construction detailing and probably workmanship that led to the roof leaking, which affected the timber frame, which meant that the balconies dropped, the window frames distorted and the floors twisted.

Professor Malcolm Hollis showed some excellent photos of the opening up of the walls and the floors, where further investigations found missing studwork; the moral of the story was that there was many things you need

to investigate before you just repair the obvious thing; which in this case was the roof! You do need to analyse the building as a whole, which is what Professor Malcolm Hollis terms as building pathology.

Professor Malcolm Hollis made an interesting likening of timber frame construction to the flat packs you get from, for example IKEA (or any other reputable DIY store!) and how difficult these are. If you imagine the scenario of the flat pack being a timber frame high rise residential building, with a workforce that has had little proper training or supervision and you can therefore see where problems arise. He also advised us to look at the wider picture and said that lack of supervision is often a problem with these contracts, particularly where the traditional client role has changed. The traditional role was architects and surveyors and their engineers working for the client, and the builders' role was to carry out the work. Today, it is more common to have design and build, though there is no longer a safeguard on the long term future of the property, but equally this does mean there may well be work for Building Surveyors for many years to come.

Professor Malcolm Hollis offered the following framework of how to think about property:

Failure:

Of expectations of the builder, the developer, the purchaser, the occupier, the regulatory authority.

Discoverability:

Failure pattern, routine, replacement and testing.

Analyse:

Charts, fault trees, comparative, analytical, conjecture, deduction, destructive, analysis.

Common circumstances:

Alteration and conversion

Factual collection:

For civil or criminal action

Statute of Limitation

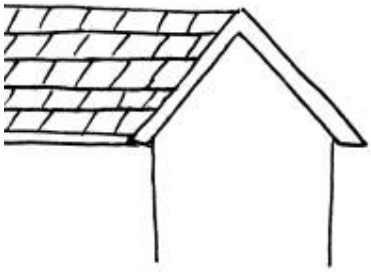
Six years to bring the claim or if death occurs no statute of limitation.

The Design Award Building Example

It may be a design award winning building but to Professor Malcolm Hollis it was a failure. There were basic things, such as access to the plant room, that were impossibly difficult, due to lack of space and thought. It's not as if maintenance is a new thing! He also gave a lovely example of the cost of changing a light bulb on the outside of the property, where you would need to abseil down the building. Costs £800 and then you would have to project over the glass extension, so to protect that, say at £1,400. Remember this is an award winning building, so to change a light bulb costs will be around £2,200. He also looked at the fire staircase that was glass clad and commented is this really a practical solution? It may look good but would you want to run into a clear glass fire escape?!

The question posed was whose fault is all of this? We were equally pleased to see that the building surveying investigation included the services part of the property, as we have had many a discussion with Building Surveying Practices who say it is outside their remit. We feel that you need to look at the building as a whole.

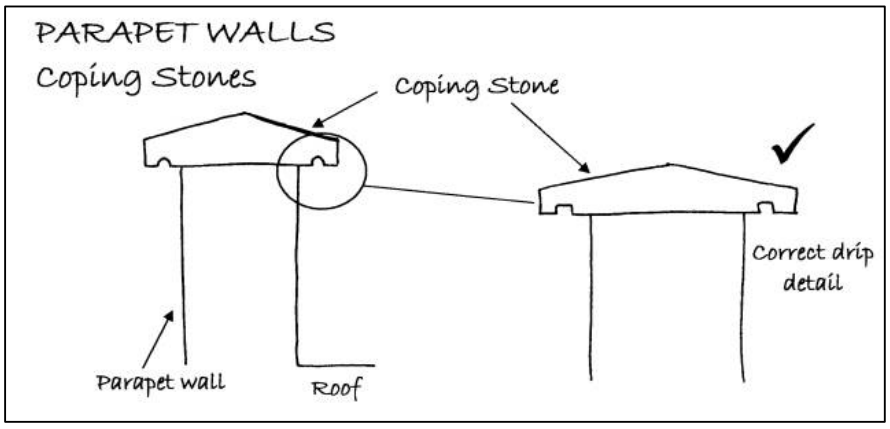
Roof Problem Example



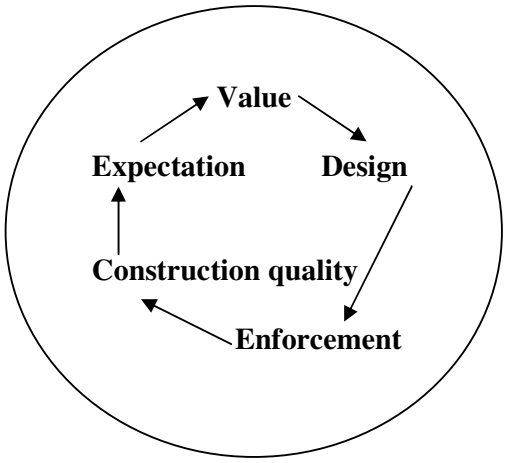
Considering a modern warm roof design, which had internal drains and a nice steel trough to collect the rainwater, no detail had then been thought about how the steel trough drained into the main pipe. The solution had been for a hole to be drilled through the concrete decking to the pipe the other side. However, the exposed concrete was there for the water to attack between passing from the roof and getting into the downpipe, with obvious results.

No-one knows how to building parapets correctly

Professor Malcolm Hollis has, like we have, discovered many problems with parapet walls and the coping stones over the years. He identified damp proof course's (DPC) not being wide enough to the parapet walls and dampness coming in. That's because DPC's come in standard widths and no-one's ever thought of using two layers of DPC! We would also add that we have come across problems with parapet coping stones not being wide enough and then the drip running down the face of the brickwork.

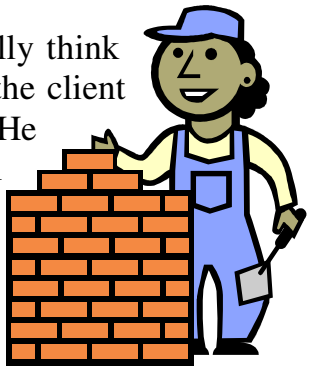


Thoughtful thoughts – the circle of construction



We had a discussion about best practice around the concept of value design, endorsement, construction quality and expectation.

Communication on building projects



Professor Malcolm Hollis posed the question: do we really think that we communicate in the best way; information from the client to the designers, the specifiers to the tradesmen on site. He painted the picture of a bricklayer building a brick wall with the plans in hand; the plans being covered by a protective waterproof layer, rather than the more typical scenario of the drawing plans being in the site hut, being seen by the site foreman but not really being seen by the person actually doing the work and perhaps this is why things go wrong.

Urine causing blocked drains example

Considering large, heavily used buildings, such as universities, Professor Malcolm Hollis talked about the practicalities of Building Regulations legislation, with a 32mm pipe and urine crystalising. He discussed the basics that waste pipes should have a fall on them and the need to clean pipes out every four months and again Professor Malcolm Hollis was intriguing us by advising us that this work related to another award winning building.

Factors that affect buildings

Professor Malcolm Hollis gave an example of Terminal Five at Heathrow Airport, which costed £4.2 billion, due to it taking approximately 12 years in the planning process. Many of the elements really need to be re-thought, for example how the insulation regulations and requirements and desires changed in that time, also on sustainability and green construction.

Dilapidations Break Clauses Examples, you only need one minor problem

There were some great examples given by Professor Malcolm Hollis of how break clauses can be decided on the smallest elements. A client was lucky enough to have a break clause that meant that they could extract themselves from a lease agreement costing many, many, many thousands of pounds. Upon checking a hinge to a skylight it was not working correctly. This one fault could have meant that the company in question had to carry on the lease of the property for many years to come. With break clauses one failure is enough to mean you have to pay the rent!

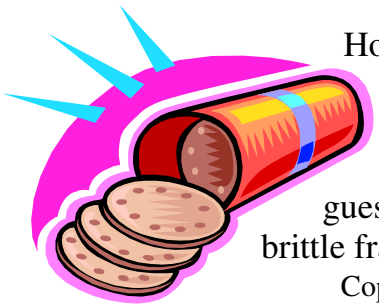
Is it civil or criminal failure?

One is beyond reasonable doubt and one is beyond the doubt of competent professionals; which is which?

It's what's between your ears

Professor Malcolm Hollis made the point that whilst he can offer useful tools as to how to analyse a building, such as diagnostics charts, fault trees and fault tree hierarchy, it is in the end what's between your ears that we as Building Surveyors sell.

The life changing story and biscuits



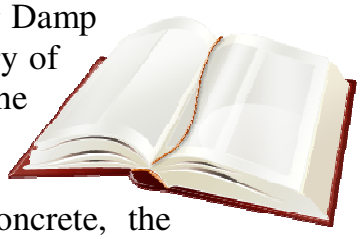
How many people here eat biscuits were the words Professor Malcolm Hollis said? Next time you have a biscuit hold it in two hands, with your thumb underneath it and bend the biscuit and guess where it's going to break. This is known as brittle fracture and that's similar to concrete.

This brings us back to the life changing story of a canopy over a house entrance door falling on the person below it (when they were swinging on it like many people do) and caused them a life long injury. An investigation took place and discovered that the reinforcement rods ran front to back, or side to side? Before we give you the answer, to explain how difficult a brittle fracture is to predict – only the week before a well known window manufacturer had had workers standing on it while they were replacing windows above and of course the reinforcement bars should go from front to back and they ran from side to side.

Dampness in buildings and example

Photographs were shown of a beautiful newly renovated Georgian property. The property had for years been damp free, or as damp free as a Georgian property can be, but after the renovation work dampness occurred. The reason was the inappropriate materials that were used, which were cement renders and modern plasters. A common quote from SPAB is "lime every time on older properties". You do need to make sure that older buildings are breathable. There was also an aside from Professor Malcolm Hollis about no-one knows how to carry out parapet walls, where he commented on the parapet wall to the top of the Georgian property where the bricks to the parapet wall had been laid frog up, as correctly they are meant to be, which meant at the end of the brick the cement was visible and had become a moisture trap, allowing dampness into the property.

How to create rising damp



Reference was made to Jeff Howell and the 'Rising Damp Myth' book and Professor Malcolm Hollis was very of the opinion that rising damp does exist, but not in the quantities that it is found in! The how to create rising damp focused on the removing of a suspended timber floor and replacing it with concrete, the change in windows allowing natural ventilation.

Joints at Ramsgate Harbour; remember design is location specific

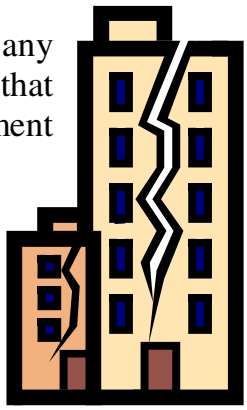
Professor Malcolm Hollis gave an excellent example of a joint at Ramsgate Harbour, which was used but failed but had been used in many other locations. However, when you look at the other locations they are within the Harbour walls, whereas the ones they had used at Ramsgate were outside the Harbour wall, requiring a different solution.

Another example of how design can be location specific was an example in a high humidity area where the humidity carries grip, which means that the buildings surrounding it are effectively being washed by grit all the time.

Building Pathology

Chronology – establish order of events
Logic – if this then that
Mind set – no guessing
Does it match expectations?
Don't try and prove you are right
Build up an argument - how to organise files

Building Surveyor Expert Witness Case



A house survey in the Cambridgeshire area didn't identify any cracks in the property, although there were signs that movement had occurred, which the surveyor didn't comment upon and cracks appeared.

The cost of the Building Surveyor getting wrong in the current environment, where legal fees are no win no fee, means that whoever loses any disputes pays double the cost. The Building Surveyor didn't see the signs that if he'd followed the trail would have led to a very different report.

Signs that were there to be seen were such things as a disturbance of the window sill, the brick coursing was out of line, trees close by, probably defective drainage, the age and era of the property and there were limited foundations. The report wasn't what could be reasonably expected of a competent surveying practitioner.

Professor Malcolm Hollis showed how he analysed the structure, looking at it and to outside sources for information, for example line diagrams were made of the property identifying the correct patterns. Investigations also showed that 2002 was what was known as an event year in the insurance world, due to the dryness. Crack monitoring took place and further clarified Professor Malcolm Hollis' thoughts. A very expensive day out for the building surveyor concerned.

Disease -The spread of disease in buildings SARS 2002

Interesting list of ways to die!

Legionnaires disease – 3,000 deaths
Influenza – 50,000 deaths
Pneumonia – 70,000 deaths
Motor car – 1.2 million worldwide killed each year

The first ones relate to transmission, touch and inhale. We were shown an interesting map from 1854 of Cholera in London.

The point made was that statistical collation between two phenomenas does not prove that one phenomenon causes another. SARS was spreading in Hong Kong in March 2003; 41% came from one building and then a block of buildings. A diagram was shown how the increase in SARS occurred and where. Using Google Maps, etc, this was zoomed in on. Investigation then identified various possibilities.

Going back to the pathology list

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Chronology

The time lines shows residents frequently complained of foul smells in the properties. Investigations found that these were coming from the drainage traps in the floors of the bathrooms, which were not being recharged (refilled with water), as the floors were being wiped rather than flushed with water, as was originally expected in the design and therefore drying out and allowing the smells to come up. What also drew the smells up was that the extract fans were on within the bathrooms, with the door shut for modesty, and this reduced the pressure in these areas and dragged the smells up through the properties into the bathrooms and the germs and disease as well. The negative pressure in the bathroom was literally pulling the germs out of the drains.

Tests had to be quite innovative, using, for example, balloons to see the air circulation around the property.

Other contributing factors were:

1. The use of the floor traps
2. The pattern of air movement around the property
3. There needs to be a minimum gap of at least 2.2 metres.
4. The surface used.

The cost of SARS

In simple figures: all flights were cancelled, everyone was wearing masks and the streets were deserted. What cost has this been to the traders and business as a whole?

Example: Ashford, Middlesex Building Collapse

This was a warehouse style building, three storeys high and a rectangular box shape. During the course of engineering works to strengthen the property it collapsed.

Chronology

It can be seen that this was originally a single storey building that has had storeys added. The building workers working on it had consumed alcohol at lunchtime over the legal limit to drive.

From investigations it was found that the original drawings were of no use, as is often the case, as they are not as built drawings and do not represent how the property was built.

Interesting fact: the property was probably at its weakest when the engineering work was being carried out, as elements have to be taken out for the work to be carried out.

The building was brick with a concrete plank floor. Professor Malcolm Hollis commented that it is often good to explain things and then ask how does it have any relevance to the issues at hand. Also, he commented on the sheer difficulty of the original design; a model was made of the building and interestingly if one peer is removed the whole of the property would collapse.

The investigations took the following format:

Examine the remains
Look at drawings
Obtain aerial pictures
Witness statements
Reconstruction
Material testing
Look at load path analysis
Look at model of how the structure worked

Interestingly, the witness statements were not that helpful.

Netherland Warehouse - £12 million of commercial drugs and the sprinkler system washes them away without a fire example

The insurers were obviously not pleased to pay out for water damage from the sprinkler system when no fire had occurred. Investigations found that corrosion in screws/bolts was occurring, due to water being trapped around the bolts, ironically caused by a manufacturers test to see if the bolts were of the right strength. A maintenance person was also tightening the bolts, which as metal when it's slightly corroded is weak in tension and becomes brittle, and break. This resulted ultimately in the sprinkler system coming on for no reason at all and spraying over the goods in the warehouse ruining them.

Casino and wet rot example

The casino was let on a lease and was part of a dilapidations claim. Dry rot was found. The casino was let only at ground floor level and there was a basement beneath it that was the landlord's responsibility. The argument was did the dry rot come from the bottom up or from the top down.

Interestingly, dry rot moves approximately 900mm a year (originally 3 foot in old money) and in bad conditions it can be made to move faster! The possible causes of the drama were looked into; from the leaking pipes discharging efflorescence and warm water into the basement, which were primarily efflorescence and warm water from the blocked pipes. Whose responsibility was it?

They also looked into the pattern of how the dry rot grew and ultimately this claim led to the original casino tenant going bankrupt and the new landlord, who interestingly was a casino owing company, taking over and moving one of their casinos in.

Learning Outcomes

Use a structured approach when carrying out surveys. Never make any assumptions and keep an open mind to the possible causes of a problem, as well as a trail of any problems that you found. Don't forget building pathology:

Chronology – establish order of events
Logic – if this then that
Mind set – no guessing
Does it match expectations?
Don't try and prove you are right
Build up an argument - how to organise files