

COTAC
Conference on Training in Architectural Conservation

Multi-Disciplinary Collaboration in Conservation Projects in the UK
Based on ICOMOS Guidelines for Education and Training in
the Conservation of Monuments, Ensembles and Sites

Enclosed are draft outline profiles of the main professions who may be asked to collaborate in a project for conservation of a Monument, Ensemble or Site, in the UK. The document, initiated by COTAC and based on the first draft by Sir Bernard Feilden, was discussed in a COTAC meeting in England, on 18 November, 1992. The profiles for Conservation Officer, Landscape Architect, Materials Scientist and Surveyors have been drafted by John Preston, Peter Goodchild, Nigel Seely and John Gleeson respectively, and helpful comments and revisions have been made by Poul Beckman, Deborah Carthy, Richard Davies, Gerald Dix, Francis Golding, Gersil Kay, David Lindford, Warwick Rodwell and T.G.Williams. The document was then presented to the International Training Committee (ICOMOS ITC-CIF), in its plenary meeting in Colombo, 2 August, 1993.

We pay lip-service to interdisciplinary collaboration, but do we know what each profession can and should offer? Possibly these profiles will help persons starting to work in the field of conservation. They cannot be complete or detailed enough and some points emphasised in one profile apply equally to another. Many in this list of professionals may not have a formal qualification but may well be highly specialized having a thorough mastery of their own area of knowledge and techniques and an understanding of its context and the ability to work within a team. A professional is defined as someone who contributes intellectually, artistically or practically to the process of conservation. The role of the professional will change with age and experience.

First (unless the discipline is fully dedicated to conservation), what might be described as the standard role of the professional is outlined - then, the additional skills needed for conservation. The tasks listed in Para 5 of the ICOMOS Guidelines for Education and Training for Conservation of monuments, Ensembles and Sites, are repeated. From the Chart it will be seen that all professionals contribute to at least half the tasks and some to all. Each profession will approach these tasks differently but where appropriate make its contribution.

Administrator or Owner	Environmental Engineers
Archaeologist	Landscape Architect or Historic Gardens
Architect	Conservators
Art/architectural Historian	Master Craftworker
Builder or Contractor	Materials Scientist
Conservation or Historic Buildings Officer	Building Economist (Quantity surveyor)
Conservator	Surveyors
Engineer (Civil or Structural)	Town Planner
	Curator

The ICOMOS Guidelines for Education and Training for the Conservation of Monuments, Ensembles and Sites was prepared by the International Committee for Training and has been approved by the Executive Committee for submission to the Colombo General Assembly in August 1993. For ready reference Para 5 is reproduced in full. This is followed by a Chart which shows the special relevance of particular sections to each professional.

Bernard M. Feilden

ICOMOS Guidelines, Para 5 (Colombo, 1993):

5. *Conservation works should only be entrusted to persons competent in these specialist activities. Education and training for conservation should produce from a range of professionals, conservationists who are able to:*
- a) *read a monument, ensemble or site and identify its emotional, cultural and use significance;*
 - b) *understand the history and technology of monuments, ensembles or sites in order to define their identity, plan for their conservation, and interpret the results of this research;*
 - c) *understand the setting of a monument, ensemble or site, their contents and surroundings, in relation to other buildings, gardens or landscapes;*
 - d) *find and absorb all available sources of information relevant to the monument, ensemble or site being studied;*
 - e) *understand and analyze the behaviour of monuments, ensembles and sites as complex systems;*
 - f) *diagnose intrinsic and extrinsic causes of decay as a basis for appropriate action;*
 - g) *inspect and make reports intelligible to non-specialist readers of monuments, ensembles or sites, illustrated by graphic means such as sketches and photographs;*
 - h) *know, understand and apply Unesco conventions and recommendations, and ICOMOS and other recognized Charters, regulations and guidelines;*
 - i) *make balanced judgements based on shared ethical principles, and accept responsibility for the long-term welfare of cultural heritage;*
 - j) *recognize when advice must be sought and define the areas of need of study by different specialists, e.g. wall paintings, sculpture and objects of artistic and historical value, and/or studies of materials and systems;*
 - k) *give expert advice on maintenance strategies, management policies and the policy framework for environmental protection and preservation of monuments and their contents, and sites;*
 - l) *document works executed and make same accessible.*
 - m) *work in multi-disciplinary groups using sound methods;*
 - n) *be able to work with inhabitants, administrators and planners to resolve conflicts and to develop conservation strategies appropriate to local needs, abilities and resources.*

Chart showing relevance of Para 5 sections to each professional

In the UK, sixteen different types of professionals involved in Conservation can be identified. A professional is a person who can contribute artistically, intellectually or practically to the process of conservation, and so includes craftworkers, contractors and builders. Of these professionals six may be involved in all the fourteen tasks, but all are involved to a greater or a lesser degree in more than half the tasks as the chart below shows:

	a	b	c	d	e	f	g	h	i	j	k	l	m	n	score
Administrator or Owner			x	x				x	x	x		x	x	x	8
Archaeologist	x	x	x	x				x	x	x	x	x	x		10
Architect	x	x	x	x	x	x	x	x	x	x	x	x	x	x	14
Art/architectural Historian		x	x	x	x	x	x	x	x			x	x		10
Builder or Contractor		x			x	x	x	x	x		x	x		x	9
Conservation or Historic Buildings Officer	x	x	x	x	x	x	x	x	x	x	x	x	x	x	14
Conservator	x	x	x	x	x	x	x	x	x	x	x	x	x	x	14
Engineer (Civil or Structural)		x		x	x	x	x		x			x	x		8
Environmental Engineers			x	x	x	x	x	x	x		x	x	x		10
Landscape Architect or Historic Gardens Conservators	x	x	x	x	x	x	x	x	x	x	x	x	x	x	14
Master Craftworker		x				x	x	x	x		x	x	x		8
Materials Scientist		x		x	x	x	x	x	x		x	x	x		10
Building Economist (Quantity surveyor)				x			x	x	x	x	x	x	x	x	9
Surveyors	x	x	x	x	x	x	x	x	x	x	x	x	x	x	14
Town Planner			x	x			x	x	x		x	x	x	x	9
Curator	x	x	x	x	x	x	x	x	x	x	x	x	x	x	14

1. Administrator or Owner

1. The normal role of an administrator is to take part in policy formulation ensuring that all potential viable courses of actions are considered and costed and their merits and disadvantages assessed .
2. To implement agreed policies faithfully by approval of projects and control of funding. (S)He needs to understand economic considerations and their consequences in the life of a building. (S)He should monitor the effect of agreed policies and need to get better ideas of long term costs of a building in use.
3. (S)He should make decisions early enough to enable the project team to do their work properly.
4. (S)He should ensure that agreed proposals are adhered to, monitor progress and handle publicity.
5. **For Conservation**
 - a) The owner should accept responsibility, as a trustee to future generations, for preserving and handing on a piece of cultural heritage.
 - b) He or she should understand the unique qualities of the property and work for their preservation and enhancement.

- c) He or she should promote' studies of the building to increase knowledge for future generations.
 - d) He or she should understand the costs of buildings in use and the economic advantages of good maintenance.
 - e) He or she should take advice to formulate policies after considering all viable options. (S)He should understand the "framework" of conservation including its theory. The owner/administrator must make sure that the use to which (s)he (directly or through an agent) puts a building is compatible with its conservation, and make sufficient funds available for continuing maintenance which will help its preservation.
 - f) The employer should accept that there are risks inherent in a project. These should if possible be exposed by a preliminary opening up.
 - g) (S)He should select professional advisors carefully through thorough references and appreciate their different roles and the potential contributions of different professionals, and ensure that causes of decay are properly diagnosed.
 - h) Define the objective of a conservation project.
 - i) Approve the project and programme.
 - j) Make available steady and sufficient funding.
 - k) Allow a separate budget for research and documentation and ensure that the documentation needed is completed.
- Referring to ICOMOS Guidelines Para 5, sections *c, d, h, i, j, l, m, n* are specially relevant.

2. *Archaeologist*

With acknowledgement to Dr W.J.Rodwell.

The archaeologist generally should :

1. Understand all techniques for investigating and recording sites, gardens and structures and be proficient in same. (S)He should make a detailed study of the building itself in the context of documentary and other research correlated with the physical evidence as to the nature and sequence of the changes it has undergone in its history.
2. Know all methods for dating artefacts and structures. Advise on the archaeological potential of sites and structures before development begins and recommend any investigations that may be justified.
3. Be able to supervise the detailed recording of structures before and during works, by drawn, photographic and written means.
4. Be able to supervise archaeological excavations and their proper recording. Excavations may be either of a "rescue" nature, to recover evidence that may be lost during the course of development, or of a "research" nature, designed to reveal hidden evidence and that which is required to inform other specialists in their work (e.g. architect, engineer).
5. Record contractor's excavations and chance discoveries, and interpret the significance of same.
6. Carry out investigations into the fabric of buildings, to elucidate historical sequences, reveal hidden features, study mortars and plasters, etc.
7. Be able to estimate for and organise excavations and building recording projects, and to manage site labour, within agreed schedules and time tables.
8. Be familiar with the briefs and requirements affecting building sites generally; understand the different pressures in terms of cost and time under which contractors

work; be able to work alongside, and in close collaboration with, contractors and other specialists; be prepared to modify tactics and procedures if circumstances so dictate, providing this can be done without serious detriment to the quality of the archaeological work.

9. Understand methods of dating structures and artefacts, and arrange for these to be carried out where appropriate.
10. Understand the conservation and curation of artefacts and records. Co-ordinate conservation on site with competent conservators.
11. Write regular progress reports, and supply information as required to other specialists engaged on the project; write an annual report on extended projects; and produce a final report on completion, suitable for deposition in an archive, or publication if appropriate, all within an agreed timescale and costing.
12. When conservation depends on re-use (s)he must be able to accept minor losses of archaeological material of secondary importance to enable the overall scheme to go ahead.
13. Referring to the ICOMOS Guidelines Para 5 sections *a, b, c, d, h, i, j, k, l, m*, are specially relevant.

3. *Architect*

An architect should generally be able to:

1. Understand the social significance of historic buildings, the evolution of their styles, and the technology of building. Appreciate architecture as a social art, objectively without preference for any style.
2. Design significant spaces, forms and structures in accordance with people's needs which have the qualities of "firmness, commodity and delight", in co-operation with the building owner. Drawings should be suitable for microfilming or CAD.
3. Understand the nature of materials and their appropriate uses. Write specifications in sufficient detail to allow the work to be performed by the contractor and for the contractor to prepare priced schedules or for the Quantity Surveyor to prepare Bills.
4. Consider causes of decay, and maintenance, and climatic conditions when designing.
5. Co-ordinate consultants and specialists, select suitable contractors and conservators, obtain tenders, oversee and administer contracts and settle final accounts. Act as an "enabler".
6. Ensure maintenance through design and follow up services.

For **Conservation** these additional skills are needed:

7. a) Visualize solutions to complex problems and advocate new uses to which a building could be put with a minimum of adaptation (if any). (S)He should be able to design any necessary adaptations, so that they preserve the historically essential features. (S)He should know enough about engineering to be able to question proposals that appear to run counter to conservation principles. (S)He should co-operate with planners, surveyors and landscape architects.
b) For conservation (s)he should appreciate the different approaches that are appropriate to ancient monuments (structures and sites not in use) and historic buildings which should be kept in beneficial use and for which (s)he needs to investigate the effects of different levels of intervention on the financial value of the building, usually with a view to persuading owners that less radical solutions make good financial sense.

- c) (S)He needs to understand the scope and effect of limitations on the introduction of new services and have a sound knowledge of effective and acceptable measures for fire protection, means of escape and security.
8. As well as a specification (s)he should write "schedules of work" and ensure that the conditions of Contract face up to the hazards inherent to working on an archaeological site. The extent of cutting back or opening up should be decided by the architect/surveyor on site.
 9. With reference to para 5, of "The Guidelines for Training for the Conservation of Monuments, Ensembles and Sites", an architect should be able to:
 - a) read a monument, ensemble or site and identify its emotional, cultural and use significance;
 - b) understand the history and technology of monuments, ensembles or sites in order to define their identity, plan for their conservation, and interpret the results of this research;
 - c) understand the setting of a monument, ensemble or site, their contents and surroundings, in relation to other buildings, gardens or landscapes;
 - d) find and absorb all available sources of information relevant to the monument, ensemble or site being studied;
 - e) understand and analyze the behaviour of monuments, ensembles and sites as complex systems;
 - f) diagnose intrinsic and extrinsic causes of decay as a basis for appropriate action;
 - g) inspect and make reports intelligible to non-specialist readers of monuments, ensembles or sites, illustrated by graphic means such as sketches and photographs;
 - h) know, understand and apply Unesco conventions and recommendations, and ICOMOS and other recognized Charters, regulations and guidelines;
 - i) make balanced judgements based on shared ethical principles, and accept responsibility for the long-term welfare of cultural heritage;
 - j) recognize when advice must be sought and define the areas of need of study by different specialists, e.g. wall paintings, sculpture and objects of artistic and historical value, and/or studies of materials and systems;
 - k) give expert advice on maintenance strategies, management policies and the policy framework for environmental protection and preservation of monuments and their contents, and sites;
 - l) document works executed and make same accessible.
 - m) work in multi-disciplinary groups using sound methods, be aware of, and apply when appropriate, the contribution of art historians and archaeologists;
 - n) be able to work with inhabitants, administrators and planners to resolve conflicts and to develop conservation strategies appropriate to local needs, abilities and resources.

4. *Art/Architectural Historian*

1. A person with a degree in art history may find various fields of employment such as curator in a museum or administrator with English Heritage or as a freelance advising sales organisations or as an architectural consultant
2. Art / architectural historian's role in conservation should be to:
 - a) Investigate and report on the motivation and history of the creation of a work of art or historic building site or ensemble in its cultural context, researching sources and influences.

- b) (S)He should make a detailed study of the building itself in the context of documentary and other research correlated with the physical evidence as to the nature and sequence of the changes it has undergone during its history.
 - c) (S)He should analyse and advise on the authenticity and significance of the work of art, monument, ensemble or site. (S)He should be objective, and should understand to a sufficient level scientific conservation techniques to make collaboration meaningful.
 - d) The art/architectural historian should understand and accept the need for re-use, as a prerequisite for conservation in some cases, and the attendant minimum adaptations that this may require. (S)He must be able to distinguish between historically essential features, that must be preserved, and items of secondary importance, that may have to be sacrificed to enable conservation of the essentials to be realised.
3. The art/architectural historian, as part of a professional team must recognize the contractual rules and professional practices and discretion required between members of the team and the client be they individual or a public body. Aesthetic and structural considerations must be taken into account for the successful completion of the project.
 4. (S)He should never forget the joy and wonder that works of art can communicate.
 5. With reference to the ICOMOS Guidelines, Para 5 sections *b, c, d, e, f, g, h, i, l, m*, are specially relevant.

5. *Builder or Contractor*

1. (S)He should be a good employer of good labour and have a reputation for the quality of work which is appropriate to the project. The success of any project is dependant on the knowledge, experience, competence, general attitude and approach of the contractor who carries it out. The skills of craftsmen and effective organisation of the work are essential, there is no substitute for them.
2. a) **Normally** (s)he obtains a contract for a project either in competition (which may be open or closed) or by negotiation.
 - b) (S)He undertakes to complete a contract within an agreed time for an agreed price with the help of subcontractors, nominated specialists, artists and tradesmen. The responsibility for vetting and selection of subcontractors for skills, insurances, health and safety etc. must be defined.
 - c) (S)He undertakes to provide the skilled craftworkers and labour required to execute the programme.
 - d) (S)He makes a programme of work which brings all activities into harmony (This can be a computerized network programme).
3. S)he is entitled to claim extras for delays in providing information necessary for progress from the Design Team or for additional work required through no fault of his (hers) e.g. previously undiscovered defects.
4. (S)He is supposed to hand the project over, with all plant mechanical and electrical balanced and working properly.
5. **For conservation**
 - a) The contractor should become part of the team and should be paid for his management skills.
 - b) The contribution, that skilled craftworkers and conservators can make, should 'be integrated into the contract, but sub contracting should be kept to a minimum. The builder should maintain staff at all levels for general craftwork, surveying and management. Without such a policy the contractor cannot develop his or her own

workforce nor provide career development. This is the only method by which quality and effective team working can be guaranteed.

c) The contractor should advise on and adopt the most efficient way of working in relation to their time and resources available and on the correct size of labour force, and suitable duration of contract allowing the time needed for skilled work.

d) The contractor is responsible for protection of all the original fabric and historic contents. Potential causes of damage must be prevented including wind, rain and frost and mechanical damage during operations. Temporary works and fixing of scaffolding must not affect the fabric.

e) The contractor should co-operate in reducing non-productive expenditure and overheads and should anticipate hazards and reduce risks, and take all precautions against the outbreak of fire.

f) His programme should be flexible to give time for sorting out unexpected problems.

g) The Contractor should accept that a complicated (hence expensive) repair can, from a conservation point of view, be preferable to a replacement.

h) With reference to the ICOMOS Guidelines Para 5, sections *b, e, f, g, h, i, k, l, n*, are specially relevant.

6. Conservation or Historic Buildings Officer

The Conservation or Historic Buildings Officer operates within the context of Local or Central Government and is concerned full time with all aspects of architectural conservation.

The Conservation Officer's job combines knowledge and skills which are applicable generally (the law, conservation, philosophy, general techniques, etc.) with specific local knowledge (architectural design, building traditions, local conservation issues, sources of expertise etc.) which require long service in one area to be most effective. Effective use of powers available comes only with experience; the importance of experience (and continuity) is not yet adequately recognised by employers.

Conservation Officers and Historic Building Officers should have:

1. An appreciation of architecture both grand and vernacular sufficient to be able to understand the special character of any individual building and the effect of proposed works upon it;
2. An appreciation of design issues, and in particular the challenges involved in providing for new needs within a historic environment;
3. A thorough knowledge of the legislation affecting historic buildings and conservation areas, and the ability to use it to achieve successful conservation;
4. A thorough knowledge of the local building tradition(s), and of relevant sources of information, expertise, materials etc.
5. The ability to communicate his knowledge to and encourage awareness among both professionals and lay people, particularly building owners;
6. The Conservation Officer should have a detailed knowledge of the planning and other legislation affecting historic buildings and conservation areas so as to achieve both successful conservation within control systems, and (together or separately) be able to use the powers available for enabling intervention. (S)He should have the knowledge, expertise and authority to be a successful expert witness in court and in public inquiries.
7. The Conservation Officer should appreciate (and have a working knowledge of) the requirements of other legislation (in particular building regulations, fire regulations, environmental health, disabled access, and street works) and statutory and non-statutory

agencies affecting historic buildings and areas, so as to be able to resolve conflicting requirements into successful solutions.

8. The Conservation Officer should understand the design process and factors affecting it, including the availability of appropriate products, and be able to suggest solution to individual problems either in broad terms or in detail as required.
9. The Conservation Officer should be a good negotiator, able to take the initiative and bring together disparate (and occasionally desperate!) bodies and individuals to work constructively and achieve successful solutions, and sometimes in situations (e.g. in relation to unauthorised works) which may require tact and sensitivity under extreme pressure.
10. The Conservation Officer should be able to provide expert input to the planning process in the form of policy preparation and input to design and planning briefs, and should be able to act as case officer or provide detailed advice to others on all matters affecting listed buildings and conservation areas.
11. The Conservation Officer should have a thorough knowledge of traditional building construction, its techniques and its failings, so as to be able to diagnose decay and its causes, advise owners and contractors on appropriate courses of action, initiate and specify appropriate works where necessary, and evaluate proposals submitted by others for remedial work (and where necessary suggest alternative solutions).
12. The Conservation Officer should be able to organise and administer contracts for conservation works, and supervise works on site.
13. The Conservation Officer should be able to assess differing demands and pressures so as to identify priorities and manage scarce resources to best effect.
14. The conservation Officer should have an expert knowledge of local building traditions, including the availability of appropriate skills and materials, in the areas in which (s)he works, but should also be aware of and develop good working relationships with sources of specialist advice in relation to technical, historical, and other matters.
15. The Conservation Officer should be able to organise and manage photographic and other record systems as both sources of direct information about individual buildings and as the basis for understanding forces for change.
16. The Conservation Officer should have a thorough working knowledge of statutory, non-statutory, and voluntary organisations in the conservation field, and of their roles as consultees and sources of specialist information and advice.
17. With reference to the ICOMOS Guidelines Para 5, ALL sections are relevant.

7. Conservator

With acknowledgements to Ms D.A.Carthy.

The conservator is wholly dedicated to a career in conservation. The profession is defined in the ICOM document.

1. The Conservator must appreciate the significance of an object or feature of a building with its contents and understand the building as a whole and the importance of a feature in the context of the building and have a good working relationship with the architectural historian and archaeologist or curator and architect, and other members of the team.
 - a) The Conservator as part of the professional team must recognize the contractual rules and professional practices and discretion required between the members of the team and the client, be they an individual or a public body. All these points and the aesthetic and

structural implications must be taken into consideration for a successful completion of the project.

b) When presenting the programme for conservation of the object or building the conservator should also consider cultural sensibilities surrounding the subject, whether religious, historical or social traditions, where relevant, and present their proposals on sound ethical conservation principles. In some circumstances they may also have to consider the effect of techniques on flora and fauna.

c) The conservator should be able to assess conservation priorities and maintain quality workmanship within budget restraints.

d) In the UK conservation work, particularly on larger projects, is often undertaken on a sub-contract basis under the control of main contractors. The Conservator must work under contractual conditions dictated by the main contractor, accommodating other trades, and under the main contractor's programme and site regulations.

2. (S)He must understand and practice with manual dexterity the techniques that were used to create the works of art.
3. (S)He must understand and be able to diagnose causes of decay, including environmental causes related to climate and buildings with methods of monitoring same.
4. (S)He must be able to offer a programme for preservation and restoration in such a way as to present the object to its audience.
5. (S)He must be able to lead a team of craft workers productively when appropriate.
 - a) (S)He should have sufficient theoretical knowledge of some of these skills to supervise members of their team in the execution of the work. (S)He should also recognise when less traditional processes should be used or where modern chemicals be they solvents, resins or consolidants should be introduced on a purely scientific basis. The selection of techniques will not only be governed by the condition of the building or artefact but also by whether they are practical to carry out in the conditions dictated by the site, the degree of conservator and craftsman skills available on the project and the availability and suitability of materials be they traditional, modern equivalents or chemicals.
 - b) The team should consist of a correct balance of craft workers, conservation technicians and conservators which the conservator must identify when building the team for the project.
6. (S)He must understand the chemistry , of treatments and materials and methods of investigation, research and analysis.
 - a) The conservator will have to be able to recognise when meaningful monitoring is beyond their expertise and identify the specialist centres where samples can be sent or experts contacted.
 - b) The conservator should also be able to identify the relevant specialist or institution to apply to for specialist advise if required.
7. With reference to the ICOMOS Guidelines Para 5, ALL sections are relevant.

8. *Engineer (Civil or Structural)*

A structural/civil engineer should understand:

1. Analysis of stress, strain and torsion due to all dead and live loads that may be imposed on the building as well as those arising from drying out and imposed deformations e.g. settlements.

2. The nature and behaviour of building materials, especially traditional materials and methods of their use including their behaviour under stress and under changing environmental conditions.
3. The nature and behaviour of soils and geological strata.
4. The causes of decay in buildings.
5. Produce solutions to structural problems including design structures using first principles as well as Codes of Practice and Standards, consider alternative structural solutions and advise on structural economy and maintenance, as well as fire protection.
6. Collaborate with architects and other consultants.
7. **For conservation**
 - a) Understand and practice ethics of Conservation. (S)He should have several years experience in working on building structures before undertaking conservation projects).
 - b) Appraise an existing structure and report on its capabilities. He should understand the real three dimensional behaviour of structures, as opposed to the simplified assumptions on which most text books and design codes are based. Similarly, the real behaviour of materials, particularly obsolete ones, within and outside the elastic range as well as their time dependant behaviour under load. (S)He should be aware of the reasoning that determines *conventional* design of safety for *new construction* and the difference from *real* factors of safety for *existing structures*, (S)He should be able to assess whether testing is likely to materially improve the appraisal of strength and serviceability and to specify, supervise and interpret the results of tests. (Architects should also be aware of these matters.)
 - c) Organize meaningful tests and analysis of materials.
 - d) Advise on necessary studies and investigation of the structure.
 - e) Examine alternative schemes and propose interventions that are the minimum necessary and monitor same on a regular basis after completion
 - f) Civil and Structural engineers should have some years experience working on building structures of traditional construction and should preferably have taken a post graduate course in Conservation. (At present there are very few engineers who really understand historic buildings).
8. With reference to ICOMOS Guidelines Para 5, sections *b, d, e, f, g, i, l, m*, are specially relevant.

9. *Environmental Engineers*

The *Mechanical Services and Power Electrical Engineer* should be taught:

1. Older building technologies (to find existing interstitial space suitable for utilisation).
2. Properties of original materials.
3. Diagnosis of problems to select the right solution in consultation with architects, surveyors and historians.
4. How to deal with mechanical/electrical systems without irreversible damage to architectural integrity (including providing adequate access).
5. The *mechanical services engineer* should:
 - a) Design mechanical engineering installations that are compatible with the spatial thermal and physical characteristics of a building bearing in mind the need, for maintenance and future renewal of obsolete equipment e.g. hot and cold water and piped heating systems ducted plenum air and conditioning installations with heating,

cooling and filtering, fire and intruder alarm detectors and sprinklers and dry risers. Electric lighting and power supply. Telephone and other wired installations including audio loop and speech reinforcement.

b) Be able to design systems which, in order to respect the character of the building, 'may utilise components, that would usually be considered inefficient or uneconomical, i.e. air ducts with cross section six times as wide as high.

c) Understand the local climate as it affects the building.

d) Understand the physical and thermal characteristics of a building as a spatial structural environmental system.

e) Organize close co-ordination with adjacent trades and existing systems (i.e. electric conduits must be separate from water pipes). Provide emergency auxiliary power for pressurization and fire-fighting. Advise on protection of structure and surroundings during construction.

f) Obtain and approve specifications, obtain estimate, work with other consultants and contractors, supervise work in progress, work up and balance systems and settle contractor's accounts where necessary in the context of a main contract.

g) Provide maintenance manual and schedule for owner's use.

6. For Conservation

Special design skills and judgement are needed to obtain a balance of environmental skills which satisfy the different needs of occupants, contents and building fabric. Particular skills are required to utilise or harness the potential advantages of traditional buildings to meet modern standards; for example the effects of thermal mass and advantages of natural ventilation combined with shutters and blinds.

a) Knowledge of the history of electrical and mechanical installations.

b) Test and report on condition of existing systems and advise on refurbishment or renewal.

c) Use skill in concealing new installations to avoid inappropriate intrusions.

d) Understand air movement, deposition of pollutants, and condensation in historic building volumes.

e) Find and absorb all available sources of information relevant to the monuments ensemble or site being studied.

f) **The Power Electrical Engineer** (contributed by Gershil Kay).

(Note. In some countries the Environmental Engineer would include this work.)

(i) Get electric power from source to system without disrupting original design.

(ii) (S)He should be aware of adjoining trades so that they communicate and are co-ordinated to avoid drawing one system in the space of another.

(iii) Know how to install power into emergency systems so they last long enough under disaster conditions to get the occupants out (this may require more than the cheapest installation).

(iv) Anticipate effects of man-made or natural disasters in the electrical installation (do not place crucial equipment where it will be immediately vulnerable to water).

(v) Knowledge of existing products and imagination to adopt them to older buildings.

(vi) Consult historian or architect on appropriate styles, if selecting light fittings.

(vii) Careful documentation of as-built installation for future referral.

(viii) Restrictions on penetration of original fabrics wherever possible (knowledge of interstitial space).

- (ix) Knowledge of both old and new methods and systems to determine what can be reused and what cannot (most wiring must be renewed after thirty years).
 - (x) Control of electric power distribution cables and transformers in environmentally sensitive areas.
7. With reference to ICOMOS Guidelines Para 5 sections *c, d, e, f, g, h, i, k, l, m*, are specially relevant.

10. *Landscape Architect or Historic Gardens Conservators*

by *Peter Goodchild*

1. The professional expertise of *Landscape Architects* relates to the planning, co-ordination, design and management of outdoor spaces. The spaces may be extensive or small; they may be rural or urban areas; often they are associated with buildings or built development. The traditional elements with which the landscape architect works are landform and soil, plants and natural vegetation, water, views, paving and simple structures such as fences and walls. But all natural and man-made elements come within their scope because they are concerned with the character, appearance, layout and composition of outdoor spaces. This holistic approach carries with it a professional responsibility to promote the coordination of all the different aspects of the external environment, such as the uses, processes, interests and values that operate within it, which affect its character etc. Landscape architects must take into account both ecological and cultural interests. The latter include historical, aesthetic, associative and recreational values.
2. In general landscape architects must be able to contribute to the preparation of a brief and work to it; they must be able to formulate and clearly present proposals or advice in the form of drawings, written text and the spoken word; they must be able to supervise efficiently and effectively the execution of proposals. Where required they must be able to work as part of an interdisciplinary team. They must understand local climate, microclimate and soil conditions. They must also understand the cultivation of plants, including the safe use of fertilizers, herbicides, pesticides and other chemicals. Where a landscape architect is acting as an Historic Gardens Conservator or as an Historic Landscape Conservator, (s)he must be proficient in the relevant skills.
3. *Historic Gardens Conservators* are concerned with the conservation of historic gardens, parks, designed ornamental landscapes and the settings of historic buildings and monuments. Whether their original professional training is in Landscape, Architecture, Horticulture or some other relevant subject they should generally:
 - a) Be familiar with the history of gardening and landscaping (including planting design) both as an art and as a craft. They must also be familiar with, or know how to find out about, the history of the different types of features, including plants, which are found in gardens and parks etc.. An understanding of the relationship of gardening and landscaping to other art forms, especially architecture, the graphic arts and literature, is important, so also is the relationship with the social and historical context in which a site was created or in which it developed to which the urban designer and planner can contribute.
 - b) Be able to appreciate and observe with an objective, critical and historically informed eye all the elements of a site, including landform, earthworks, rocks, water features, plants, plantings, constructions, buildings, ornaments, sculpture, views, spaces and subterranean archaeological evidence. They must also appreciate and take an interest in the natural flora and fauna.

- c) Be able to provide a critical assessment of the historical character and aesthetic characteristics of a site in consultation with architects and historians. From an intellectual point of view they must be flexible and not prejudiced by personal likes and dislikes of particular styles, periods or types of garden park etc..
 - d) Understand that their principal professional responsibility as an Historic Gardens Conservator is to conserve, as far as they can, the historical values, characteristics and integrity of a site. In this connection it is particularly important to recognize the criteria of authenticity and the importance of details, but because of the rate at which they grow and change and because they may perish after a relatively short life, the question of their replacement may have to be dealt with more frequently than building materials. At the time of replacement particular attention should be paid to the historical accuracy of the replacement.
 - e) Know and understand the theory and process of historical conservation as it relates to historic gardens and parks etc.. The different stages of the process include the surveying and recording of sites, making assessments, formulating and executing policies and proposals, and monitoring and reviewing existing policies. Time and the timing of operations is an important factor.
 - f) Be able to apply the theory and practical techniques to the conservation of historic gardens and parks etc.: This includes having an appreciation of the conservation of buildings, monuments, ornaments, sculpture, subterranean archaeological evidence and the natural flora and fauna.
 - g) Understand the relationship between historical conservation and other aspects of the overall management of the site. This includes recognizing other criteria and other interests that a site may have to serve such as the raising of income, the provision of domestic facilities, private or public amenity and the conservation of the natural heritage or other aspects of the cultural heritage.
 - h) Understand the respective roles of the conservator, consultant, owner, site manager and maintenance staff.
 - i) Understand the part played by national government, local government, non-governmental organizations and international bodies in historical conservation.
 - j) Formulate and put into practice proposals for the conservation of sites or aspects or features of them. This includes proposals for the presentation of sites to visitors and visitor facilities. New conditions caused by unsustainable tourism will have to be faced. In general the effect of over visiting is more dramatic and damaging to the planting and landscape than to the buildings made of hard material.
 - k). Be aware of the history of gardening and landscaping in other countries and also of the way conservation is practised within them.
 - l) Ensure that there are thorough records of conservation, including documentation of condition before work starts, the rationales of decisions and record of work as executed.
- 4) Reference to the ICOMOS Guidelines, Para 5, ALL sections are relevant.

11. Master Craftworker

The Master Craftworker is a specialist who supplements the general skills available to a contractor. He must command:

1. A group of related historic trades and be able to reproduce high quality replicas.
2. (S)He must be able to guide and lead a small group of craft workers.
3. (S)He must be able to sketch details and take all relevant dimensions allowing for tolerances, shrinkage and movements.

4. (S)He must know the history of his trade and how it has developed.
5. (S)He must know the characteristics of the relevant materials and how these affect workmanship and design.
6. **For Conservation**
 - a) The master craftworker must understand repair is always better than renewal although it may require more time (and skill).
 - b) (S)He should be able to advise other members of the conservation team at the initiation of the project and explain the scope of craftsmanship and efficient working methods. Often in conservation normal building practice fails due to the complexity of the problems and the master craftworker should be asked to lead in reviving historic practices.
 - c) (S)He must be able to command a group of related historic trades and be able to repair and contribute to the conservation of objects and building elements, as well as to produce high quality original work and replicas.
- 7). With reference to the ICOMOS Guidelines, Para 5, sections *b, f, g, h, i, k, l, m*, are specially relevant.

12. Materials Scientist

Contributed by Dr Nigel Seeley

There is a variety of circumstances in which a materials scientist can provide evidence which is vital to well founded decision making in architectural conservation projects.

The materials scientist should provide information on all aspects of the materials of historic buildings, and on the materials, traditional or modern, used for their conservation and repair. To be effective, this requires that the materials scientist should have a sound knowledge of the history of building construction in all periods, and the technology of the materials concerned, both in order to ask the right questions and to interpret scientific data in a useful way. Knowledge of the scientific techniques alone is not sufficient, as incorrect interpretation can lead to the drawing of false conclusions.

The various ways in which the materials scientist can provide assistance in historic building conservation may be summarized under the following headings.

1. *Identification* The identification of the materials used in historic buildings, including the provision of information on their source, date of introduction, history, mechanical properties and technology.
2. *Deterioration* The recognition of evidence of deterioration, and explanation of the cause(s) and process(es) involved.
3. *Preservation* The recommendation of steps to be taken to assist in the preservation of historic materials.
4. *Prediction* The prediction of behaviour with respect to performance and compatibility, and likely life, of both historic materials and modern materials used for conservation purposes and of their interaction with each other under different environmental conditions. The effect of paints on timber, rendering and other materials should be carefully assessed.
5. *Interpretation* The interpretation of analyses and other scientific data obtained, by materials scientist or by others, during the examination or analysis of historic or modern materials.

6. *Specification* To contribute to the specification of materials and methods to be used in the conservation of historic buildings in so far as this relates to the properties and performance of the materials forming a part of the structure. Also, the specification of analyses or other scientific techniques to be employed in the examination of historic or modern materials, in order to explain their history or technology, or to determine their suitability for use in the conservation of historic buildings.
7. (S)He should understand the effects of climate, microclimate and pollutants in the atmosphere.
8. (S)He should visit sites, ensembles and monuments with members of the conservation team to establish causes of decay and advise on any research necessary.
9. Reference to ICOMOS Guidelines Para 5, sections *b, d, e, f, g, h, i, k, l, m*, are specially relevant.

13. Building Economist (Quantity Surveyor in UK)

It should be noted that in countries other than the United Kingdom and Commonwealth, that the work of the Building Economist or Quantity Surveyor is integrated into the Architect's or contractor's office. Normally the architect produces the drawings and (s)he should produce a specification but too often the Quantity Surveyor includes the specification in his/her Bills of Quantities, which include the *Conditions of Contract*.

1. The Quantity Surveyor analyses what needs to be done subsequently converting his understanding into a budget.
2. The Quantity Surveyor makes approximate estimates of the cost of the project taking into account all relevant factors such as availability of labour, materials, subcontractors, access and "tender climate", takes the architect/surveyor/engineers specifications and makes Bills of Quantities which measure the amount of work to be done and specify quality of work often by reference to Standards and Codes of Practice prepared for new construction. (S)He should understand the possibilities of conservation and rehabilitation.
3. Advises on the economic aspects of a project .
4. Advises on the most suitable form of contract.
5. Provides tender documents based on design drawings and specifications produced by others.
6. Checks tenders when received and advises on acceptance.
7. Prepares valuations for interim payments taking any claims into account .
8. Checks and prepares the final account.
9. **For Conservation**
 - a) the Quantity Surveyor needs to have imagination backed by experience to help him realize what the time and total scope of the works might be. It is essential that his initial budget is "man enough" to include the full scope of the works. (S)He should be able to explain the build-up of his estimate in simple terms and prepare an independent cash flow programme for the building owner.
 - b) (S)He should advise on contract procedures which give, flexibility in the case of unforeseeable difficulties arising during execution of the works and which serve the needs of the building. Foreseeable risks should be indicated so that the contractor can organise his work properly. He should prevent increases in cost and eliminate grounds for, claims .
 - c) (S)He should not conflate incompatible sub contracts.

- d) (S)He should encourage the craftsmen to contribute skill and efficiency and make provisions for conservators.
 - e) (S)He should understand the uses of scaffolding and other fixed plant such as temporary roofs and structural supports and its effect on programming the building operation and costs.
 - f) (S)He should report at monthly or quarterly intervals to the client on the cost of the project taking into account all changes initiated by client, architect or others. This is to enable strict control of costs against budget and to verify work done against grants being provided.
 - g) (S)He should be solely responsible for control of costs. (S)He should avoid excessive and unproductive overheads.
10. With reference to ICOMOS Guidelines Para 5, sections *d, g, h, i, j, k, l, m, n*, are specially relevant.

14. Surveyor

By John Gleeson

1. **The Surveyor** is an honourable historic title and included architects such as Sir Christopher Wren. The role of the Chartered Surveyor is thought to be particularly unique to the U.K. but can also be relevant or compared with the roles of other professionals in many countries throughout the world. Within the U.K. the title of Chartered Surveyor is spilt into various specialisations or divisions as shown below:
 - a) General practice
 - b) Quantity Surveying - see section 13
 - c) Building Surveying
 - d) Planning and Development - see section 15
 - e) Rural Practice
 - f) Land and Hydrographic Surveying
 - g) Minerals Surveying
 - h) Marine Resource Management

Of these it is the first 6 who are particularly related to the care and management of land and property.
2. When specifically considering building conservation it is again possible for all 6 of these divisions to become involved with historic buildings or landscapes. Although it is more common to find the building surveyor particularly active in building conservation with the Quantity Surveyor; General Practice Surveyors and the Planning and Development Surveyors are also involved within their own specific specialisations.
3. **The General Practice Surveyor:** specialises in the valuation, transactions in and management of all types of land and property. The basic expertise of the G.P. is valuation - which is the assessment of what an interest in property is worth at a particular time. This may be in connection with purchase, sale, letting, investment, mortgage, rating, insurance, compensation or taxation. (S)He should understand causes of obsolescence and changes in building and site values. The GP may also be involved with Estate Agency (the negotiation for sale or purchase, leasing or auction of all types of property and land) and Estate Management (the management of residential, commercial and industrial property). Some specialise in the valuation and auction of furniture and works of art and plant and machinery, while others practice in the investment and management of property and land. Such skills demand a comprehensive

knowledge and understanding of the local property market, land and property values, valuation methodology, construction forms and common defects, investment and management techniques and property and land law.

4. **For conservation** (s)he should:
 - a) Develop management techniques for improving the condition of historic buildings and areas.
 - b) Organize preventive maintenance strategies.
 - c) Find with the collaboration of other relevant professionals, beneficial new uses for redundant historic buildings and execute rehabilitation or refurbishment projects which respect architectural, archaeological and historic values.
5. ***The Building Surveyor***: The Building Surveyor is a growth area in the Function of the Chartered Surveyor dealing with a wide range of legal and technical problems relating to buildings and construction projects. The base skill of a BS is an in-depth knowledge of building construction and materials of both modern and traditional buildings, coupled with a similar appreciation of architectural design and style, project control and property and building law. (S)He offers a specialist service on all matters relating to building construction with particular reference to existing buildings. This will often include such matters as the conservation or restoration of historic buildings, building maintenance, project control and co-ordination, the survey and inspection of buildings of all types, defect recognition and analysis and the upgrading, improvement and refurbishment of existing buildings including recycling and change of use.
6. In the field of Building Conservation the BS offers a unique understanding of how traditional buildings operate in modern times and how best they can be maintained, repaired, conserved and restored if appropriate. These varied/particular skills often lead to the BS operating as a team or project co--ordinator.
7. **a) *The Planning and Development Surveyor***: The Chartered Planning and Development Surveyor specialises in all aspects of urban and rural planning, offering advice on economics and amenities, conservation and urban renewal schemes and may also be involved in the whole development process from its inception to its completion.
 - b) Such Surveyors have a sound understanding of planning law and procedures and are able to advise on most aspects of strategic planning. Other skills include knowledge of property values, construction techniques and design principles, finance and general property law.
 - c) For conservation (s)he should be skilful in finding appropriate new uses for redundant historic buildings.
8. **a) *Rural Practice Surveyor***: The Chartered Rural Practice Surveyor traditionally works in rural surroundings where their major functions include the valuation, sale and management of rural property and the sale by auction of live and dead stock.
 - b) More recently the RP Surveyor has become increasingly involved in forestry management, rural estate management and rural planning with great emphasis towards responsibilities for the conservation of the countryside and the natural environment.
9. ***Land and Hydrographic Surveyor*** (S)He is involved in the measurement of natural or man-made features. This may include measuring of positions of existing buildings, fences, woods etc. In conservation (s)he is becoming involved in accurate recording of historic structures.
10. Ref. ICOMOS Guidelines Para 5, ALL sections are relevant.

15. *Town Planner*

A town planner is primarily concerned with land use, development control, and planning policies.

1. A town planner should be trained in design and learn to appreciate urban landscape and spaces. (S)He should be trained to take a constructive role in preparation of proposals for the repair, maintenance and re-use of historic buildings, based on a clear understanding of their individual merits (i.e.. what is significant and what is not) .
2. Be able to read a monument, ensemble or site and identify its significance.
3. Understand the historical, morphological, social and economic aspects of monuments, ensembles and sites.
4. Review past plans and projects and evaluate their successes or failures and appraise the reasons.
5. Collect and use national data on population, traffic and commerce as it relates to the area being considered. Identify the needs of the community, and guide the economic forces to support conservation.
6. Offer options for future actions for public participation and political decision making with continuing financial implications.
7. Manage change and ensure the best possible use of resources balancing the economics of retention versus redevelopment.
8. Operate controls on the height massing, silhouette, window wall ratio and materials with their colour and texture used in development. Paving, street furniture and planting should be included.
9. **For Conservation**
 - a) There should be a presumption *in favour of conservation* of monuments, ensembles and sites, but this does not mean an unquestioning policy of preservation at any price. There may be tired old buildings that want to lie down.
 - b) In the UK the Conservation Officer or Historic Buildings Officer works within the context of Town Planning legislation. His special role is to persuade owners of buildings to respect the historic and cultural values of their property and to give helpful technical advice on repairs and preservation. (S)He also advises on the suitability of projects which require formal "listed" building consent. It should be noted that his role varies greatly from Authority to Authority and may increase in the future.
10. With reference to the ICOMOS Guidelines Para 5, sections *c, d, g, h, i, k, l, m, n*, are specially relevant.

16. *Curator*

1. (S)He should be a scholar with wide terms of cultural reference. Continued self education is essential.
2. (S)He should have training in museology including management, documentation, preventive conservation, security and administration.
3. (S)He should recognize the ICOM Code of Professional Ethics with special reference to personal responsibilities to the public and colleagues.
4. (S)He should inspect the collection with a conservator at regular intervals and make formal reports on its condition. Conservation of objects should be a joint procedure with limitations on aesthetic reintegration.

5. (S)He should arrange for a specialist architect to inspect the museum buildings at five yearly intervals, or less, and advise on environmental questions which might affect the collection. There should be a "fire and security" audit after the architect has made his inspection. The curator and architect must make a formal report. The curator must ensure for regular fire drill rehearsals at not less than six monthly intervals and initiate a salvage plan in conjunction with conservators and other professionals.
6. (S)He should be able to monitor the internal environment if no other professional assistance is available.
7. (S)He should present the collection with sufficient information in legible format. Visitors should be given options for tours of differing duration and content. Literature should be prepared for sale. Exhibitions may be arranged provided they do not prejudice other more important activities.
8. As conservation is a single discipline, and as objects in historic building are also included the guidelines should be extended to include all objects of cultural heritage.
9. All the items in Para 5 of the Guidelines may be deemed to apply to the Curator.
10. (S)He has the obligation to educate the public and to safeguard public interests.