

WHAT IS THE FUTURE OF METRIC HERITAGE DOCUMENTATION AND ITS SKILLS?

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ABSTRACT:

As the resources available for managing the historic environment and its assets are under pressure a number of choices are being made by the institutions responsible. The value and necessity of metric recording is undiminished as evidenced, for example, by the effective application of technologies like photogrammetry in post fire recovery, but key institutional cut backs have arrested the development of the necessary skill base to sustain metric technologies as a core function of heritage management.

1. BACKGROUND

1.1 Heritage Management in an International Context

It is proposed by ICOMOS to establish heritage management as the principal responsibility of conservation authorities by encompassing the social, economic as well as academic, archaeological and technical issues. This will demand ever more effective metric deliverables to meet heritage information needs. For heritage managers to achieve the right balance between heritage information need and heritage documentation technique sound experience in developing briefs, assessing capacity and understanding information standards is needed.

The performance of metric information sets for heritage can be described in terms of:

1. Meeting the information needs of the conservation cycle. (fitness for purpose) (Drury 2008,)
2. Application of an informed metric skill set. (respects significance) (Clark 2001)
3. Inventory information sets. (Bold, 2009)
4. Repeatable condition monitoring and its appropriate measurement thresholds and cycles.
5. Recording structures and their condition.
6. Disaster recovery data sets.

1.2 The 3 steps of mapping

In acquiring heritage information it should be recognised that all survey processes require a careful balance of 3 key functions:

1. *Measurement:* applying the metric sciences requires understanding of techniques and their performance in terms of both precision and accuracy.
2. *Selection:* the application of understanding of the subject to be mapped, answering the ‘what to we draw?’ question, is crucial to a successful outcome.
3. *Communication:* The presentation for onward transmittal of the information in a clear, consistent and accessible manner.

The misapplication or imbalance in these core functions leads to inappropriate data, unnecessary expense and repetition of effort.

1.3 The digital challenge: setting the quality benchmark

The ever increasing capacity to capture spatial data has not been matched by a development of standards in its presentation. The legible transmission of measured data has led to the development of a number of practices such as cartography, draughtsmanship and graphic design. The accepted norms of graphic information have derived from a continuity of practice which places clarity, consistency and ease of understanding as the primary concern of those charged with information transmission in graphical form. If information cannot be understood by its audience there is not only a failure of communication, there is an absence of control in the work flow evidenced by ignorance of the required standards inherent in the process. Standards are as much about work practice as they are about listing quality constraints. The current CAD standards are derived from the visual cues of a non-digital age and the practice of draughtsmanship is as relevant today as it has ever been: drawings need to be legible regardless of their origin. The present suite of developing documentation technologies (Digital photography, LiDar, Laser scanning and digital photogrammetry) need expert guidance on their application, and given the contraction of institutional support for sustaining metric skills in the UK an assessment of the risks of misapplied technique can be made in terms of:

1. Cost; e.g.: The point density of a point cloud or the stand off for a stereo image can be governed by cost and time and the required standard for restitution may not be achieved by either if the cheapest or the fastest capture method is deployed.
2. Appropriate deliverable: Often all that is needed is a simple plan for project development; all too often the desire for ‘rapid 3D’ data triggers the ‘point cloud as product’ idea to the detriment of architectural clarity.
3. Durability and flexibility: Data with a long term post capture utility needs careful procurement.

4. Metric performance: without impartially assessed examples of working practice choices of technique can only be informed by propriety information.

In heritage applications the scale constraints can be very demanding (1:20 scale is common for stone scheduling for example). The recoverability of post fire construction information requires a unique level of scalar and capture performances.¹

1.4 Standards for Heritage Documentation in the UK

English Heritage is the national authority on heritage matters in England. It has published a number of key documents which, when taken together constitute a standard. The English Heritage Metric Survey Team produced the first product based specification in 2000 (Metric Survey Specifications for English Heritage) and updated this in 2009 (re-titled Metric Survey Specifications for Cultural Heritage) with performance criteria. This descriptive specification is a development of the RICS specification method of describing both the performance of the captured data and the depiction of it as graphic media. It uniquely describes the performance of the data in terms of both required precision as well as presentational norms.

There are also two thematic specifications published by English Heritage: *Understanding the Archaeology of Landscapes, A guide to Good recording Practice English Heritage 2007* and *Understanding Historic Buildings A guide to good recording practice 2006*. These documents describe a process of investigation and offer a variety of presentational examples, in some cases a scalar constraint is alluded to but the primary role of the graphic products described is to meet a publication agenda, not a conservation or heritage management information need.

The great value of the *Metric Survey Specifications for Cultural Heritage* is the unique description of documentation products and the expected presentational requirements as linked aspects of the deliverable. The thematic specifications, while not in conflict with the science of measurement, offer no guidance on precision, data origin or conservation value. Despite the misnomer in the title concerning 'Cultural Heritage' (it only covers tangible, built and topographic heritage records and does not include artefact, museum or archival practice) *Metric Survey Specifications for Cultural Heritage* is almost unique in describing best practice in terms of data performance.

1.5 Refocusing English Heritage technical resources: what has been lost?

When English Heritage closed its Metric Survey Team in July of 2009, it lost a key standard setter and skill transfer asset. Closing the team has ended a longstanding skill pool, ended the crucial skills balance between metric technique and draughtsmanship, and broken the links between survey skills and conservation recording.

The team maintained a unique balance of metric and draughting skills with a continuity of expertise dating back over 400 years to the drawing offices of the Office of the Kings Buildings, the Ancient Monuments Drawing Office at The Ministry of Public Buildings and Works and from 1989 to 2009 as the English Heritage Metric Survey Team. The publication of key standards

in metric Survey by the team has been recognised nationally and internationally as unique and based on practical reference work applied to the properties in the care of English Heritage.

The unique cohesion between direct and indirect survey techniques achieved by the Team is expressed in the Team's specification and also broadcast in training initiatives. The Measured Survey Summer Schools (at Stowe) from 1989 up to 2008 (at Wrest Park) were a rare example of hands on training in metric techniques for heritage professionals.

The dispersal of the Team's surviving functions into thematic groups means that the continuity of experience is lost and future standards are likely to follow the thematic path indicated in the guidance published on 'good practice' in Architectural and Archaeological Investigation .

2. AN EXAMPLE OF AN UNBALANCED STANDARD

2.1 An example 'interpretive plan' is published

Many good examples of documentation practice are published by English Heritage, the standard of draughtsmanship has been upheld in many projects and, in offering the heritage conservation community guidance, it responded to the CAD presentation challenge early with a guide to the depiction of measured Building Survey in CAD in 1999. The more recent Laser Scanning for Cultural Heritage (3D Laser Scanning for Heritage: advice and guidance to users on laser scanning in archaeology and architecture 2007) responded swiftly to the 'provider pressure' by offering case study experience with the new data including early publication of examples of the application of LiDar to Archaeological Investigation.

The problems of digital workflow are such that consistent quality of output requires a skill-set which is not a given for using digital tools. The following example is, hopefully, a single failure in managing the digital path to publication but it is an indicator of skill failure and raises key questions about the skills needed to handle geomatic data for heritage.

The publication of *Understanding the Archaeology of Landscapes, A guide to Good recording Practice, English Heritage 2007* sets a *de-facto* digital cartographic standard and gives us an opportunity to examine the impact of the unbalanced skill set on data presentation.

The diligent landscape analysis, mapping and recording work presented shows us there is a clear shift away from traditional quality records and the acceptance of an inappropriately skilled approach to metric data. The map has been prepared in ignorance of cartographic design principles and has been presented as an example for the Heritage Conservation Community to follow. It is a clear case of placing the communication of hard won, valuable information in the hands of the cartographically illiterate.

The effect of this is threefold:

1. The communication of the information fails.
2. The standard broadcast announces an abandonment of quality graphical presentation norms.
3. The cartographic standard for GIS outputs in map form is compromised.

¹ Metric Survey Specifications for Cultural Heritage, English Heritage 2000 2nd edition 2009

2.2 Cartographic analysis

The example (Figure 1) published by English Heritage as a standard can be subjected to comparison with the internationally accepted cartographic standard (Anson 1984, 1988). The principal failings of the map are:

1. Text placing has not been conducted with reference to the name placement convention. It's consistently placed horizontally, and it does not use hierarchical font sizing or letter spacing. The draughtsman has resorted to pointer lines e.g.; 'Rumbling Churn' in some places and letter cramming in others e.g.; 'Cushnat Stiel' rather than align text to features. There is confusion between point and area annotation because a single font size has been used throughout.
2. Line weights. The shore line and fence lines are given equal weight.
3. Colour: Indistinct sea and lake shading. The reader cannot tell the sea is the white space, 'artificial water channels' and the 'mean high-tide' line share the same colour.
4. Tone shading. 'exposed rock' has an equal weight to a 'minefield'. Existing water courses are shown in the same weight as historic ones. The 'steep natural slope' shading ignores the huge relief of the cliff line-presumably because it's already covered by the tone indicating 'exposed rock'. The relief depiction shown also appears to be in conflict with previous standards for archaeological recording published by English Heritage (Bowden 2002)
5. Key panel. It is visually almost bigger than the map. The text in the panels (why are there 2?) is the same font size and weight as the map annotation. In an attempt to save space the line spacing of the text has been reduced to the point of near illegibility.
6. Edge cropping, the text 'Queen Margaret's Cove' is cropped by the margin. The coastline is cut by the edge margin. The North point is clipped by the frame.

Clearly no cartographic editorial process has been applied in the preparation of this map.

2.3 Standards in a contract culture are vital.

The need for good standards is self evident but in a cost cutting culture the need is even greater. A contract without a clear specification is a contract open to failure. English Heritage, like many public bodies, will need to rely on a skilled sector to supply the information it needs to manage its estate. As it reduces its ability to test and understand digital workflows it needs to set standards for the sector to follow. The publication

of defective standards signals a lack of care in the acquisition of heritage records.

3. WHERE DO WE LOOK FOR SKILLS AND STANDARDS IN HERITAGE RECORDING NOW?

3.1 How can Heritage Documentation skills be maintained?

The core skills of applied surveying are addressed by a number of graduate courses in survey or Geomatics. The specific application of survey skills to conservation and archaeological recording is not widely recognised as part of graduate courses and attention to documentation skills are included in only a handful of conservation courses. Practical 'hands-on' training in heritage specific documentation skills delivered by experienced practitioners is principally delivered by:

1. University of Leuven, Raymond Lemare International Centre for Conservation. (RLICC) Postgraduate in Conservation Studies.
2. International Centre for the Study of the Preservation and Restoration of Cultural Property (ICCROM) Architectural Records Inventories and Information Systems for Conservation. (ARRIS) Sponsored by Getty Conservation Institute (GCI), UNESCO and the Italian government cultural agency
3. University of Pennsylvania School of Design, Historic Preservation Diploma Course.

The simple answer is that we must place a higher value than we do on our standards in surveying and cartography: as heritage management tends to call on archaeological expertise it often neglects the professional core disciplines that should underpin it. As the shift towards digital data sets makes survey and cartography accessible to the untrained and the application of generations of accumulated presentational standards tends to be lost.

3.2 New technologies and Heritage records

An example of accessible technology with an impact on presentational and selection skills is the laser scanner. Many heritage managers are now aware of its power to capture 3D data. The standards required to achieve conservation specific data from laser scanners are developing and the indications are that the 'magic bullet' of the laser scan isn't all it appears in the sector. The publication of the Heritage 3D guidance (Barber 2007) on laser scanning by English Heritage has been of immense value to the heritage conservation community but the key mix of practice and products it describes is no longer being maintained by a balanced team at English Heritage. Examples of point cloud data presented as architectural records are now widespread (e.g; Cyark) and the skills required to interpret them as conservation records are underdeveloped.

Digital imagery is becoming ever better in terms of resolution and flexibility. The traditional routes for data extraction from imagery (photogrammetry) are developing, and low cost

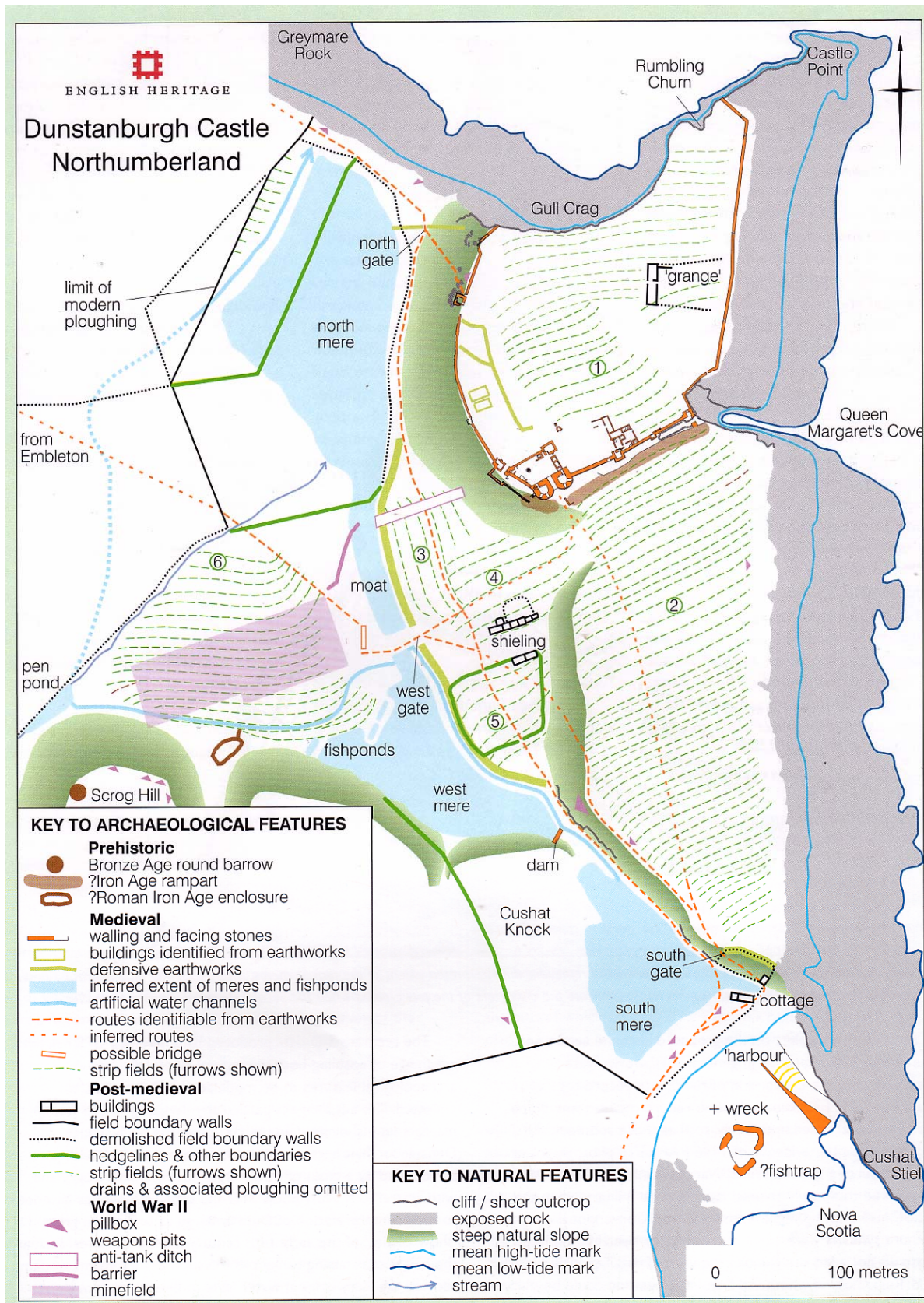


Figure 1
 Example of cartographic standard presented by English Heritage.
Understanding the Archaeology of Landscapes, A guide to Good recording Practice
 ©English Heritage 2007

web-based tools are emerging which challenge existing standards making the role of heritage bodies in guiding information users and provider alike in appropriate application ever more urgent.

4. CONCLUSION: SOURCES FOR STANDARDS IN HERITAGE DOCUMENTATION

4.1 The heritage conservation community

The long-standing commitment to draughtsmanship made by conservation driven organisations like HABSHAER in the US, Princes Trust and SPAB in the UK shows that skills in handling heritage data can be sustained and developed effectively in the face of pressure for heritage managers to choose ever more rapid and lower cost recording technologies. The need for data to inform conservation planning and actions has never been greater but the technologies of capture are almost useless without interpretation and appropriate presentation. The geomatics community is best equipped to supply heritage specific products but without guidance from key institutional partners efforts to achieve consistency, durability and reliability in heritage documentation are difficult. Internationally the needs of the World Heritage Centre and its client bodies have shown that the key institutions in propagating standards tend to be international ones rather than national as the obligation to maintain standards is not subject to the vagaries of local funding.

4.2 CIPA and Recorder and ICOMOS

CIPA, the internationally constituted expert committee on heritage recording technologies is composed of a vast reservoir of practitioner expertise. The main concern of CIPA is to achieve the optimum uptake of metric tools in heritage conservation. In symposia and workshops CIPA has been a convener for standards in work practice for heritage documentation from the early adoption of photogrammetric methods in the 1970s and laser scanning in more recent times.

The CIPA website explains:

'ISPRS and ICOMOS created CIPA because they both believe that a monument can be restored and protected only when it has been fully measured and documented and when its development has been documented again and again, i.e. monitored, also with respect to its environment, and stored in proper heritage information and management systems.'

The CIPA/Recorder (Recording and Document information management) initiative from 2002 to 2007 was an international partnership between international heritage conservation organizations working together to bridge the gaps that exist between the information users (researchers, conservation specialists of all trades, project managers, planners etc.) and the information providers (photographers, heritage recorders, photogrammetrists, surveyors, etc.). It convened a number of user/provider panels and generated guidance, a network of expertise in skill transfer and the training templates used at RLICC and University of Pennsylvania School of Design.

The success of the training template in delivering skills is a hope for the future that the digital age will not erode the excellence achieved by our national institution in an age where skills were placed in higher value.

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