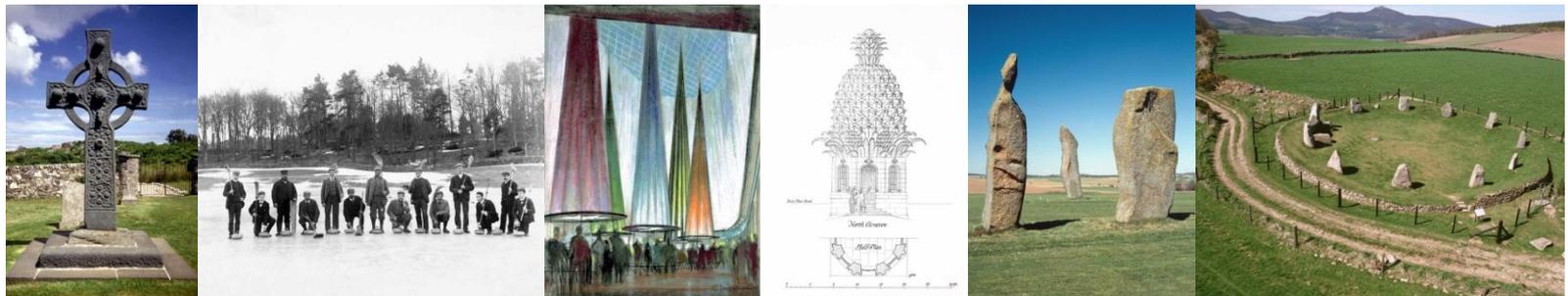


Whose CAD is it Anyway?



How different communities create, manage and maintain computer aided design: a case study from the Royal Commission on the Ancient and Historical Monuments of Scotland

Sharon McMeekin, Digital Archivist, RCAHMS



Whose CAD is it Anyway?

- Introduction to RCAHMS
- Case studies
 - Archaeology: Headland Archaeology Ltd
 - Architecture: RMJM
 - A bit of both: RCAHMS' Survey
- My CAD wish list
- The future rears its ugly head.....

“Connecting people to places across time”

- Identifies, surveys and analyses the historic and built environment of Scotland
- Preserves, cares for and adds to the information and items in the national collection
- Promotes understanding, education and enjoyment through interpretation of the information it collects and the items it looks after

RCAHMS' Collections

- Material covering all aspects of Scotland's built heritage including:
 - 2.5 million photographs
 - 2 million prints and drawings
 - 1 million manuscripts, maps and books
 - 400,000 digital objects
- National Collection of Aerial Photography
 - 2 million photographs of Scotland
 - Over 10 million photographs from reconnaissance missions worldwide

RCAHMS' Depositors

- Generated by in-house survey staff
- Commercial archaeological units
- Architects' practices
- Research projects
- Engineering firms
- Amateur enthusiasts

RCAHMS' Digital Collections

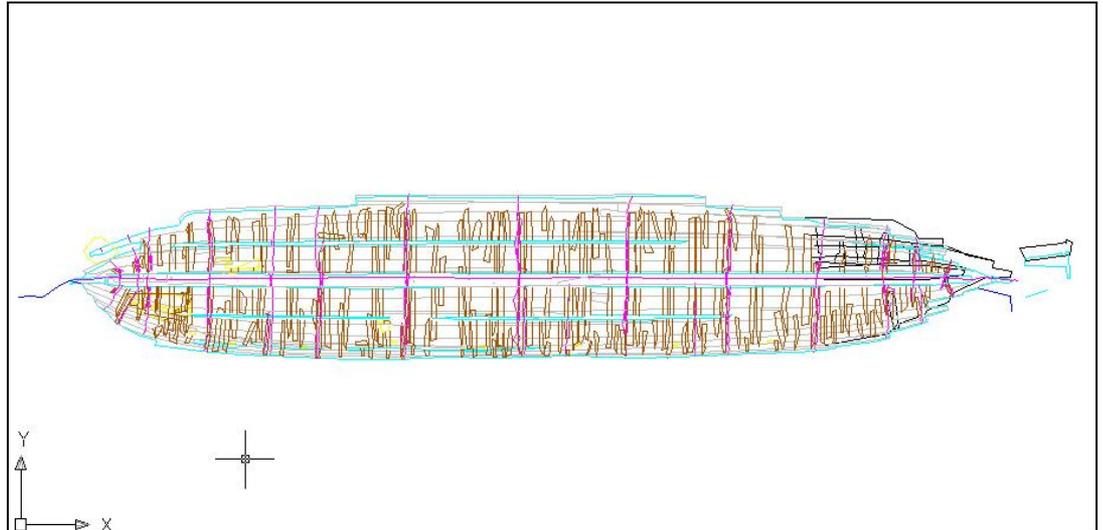
- Digital Images (c. 90%)
- Text documents
- Databases
- Spreadsheets
- GIS
- Survey data
 - Geophysics, LiDAR, Point Clouds
- CAD

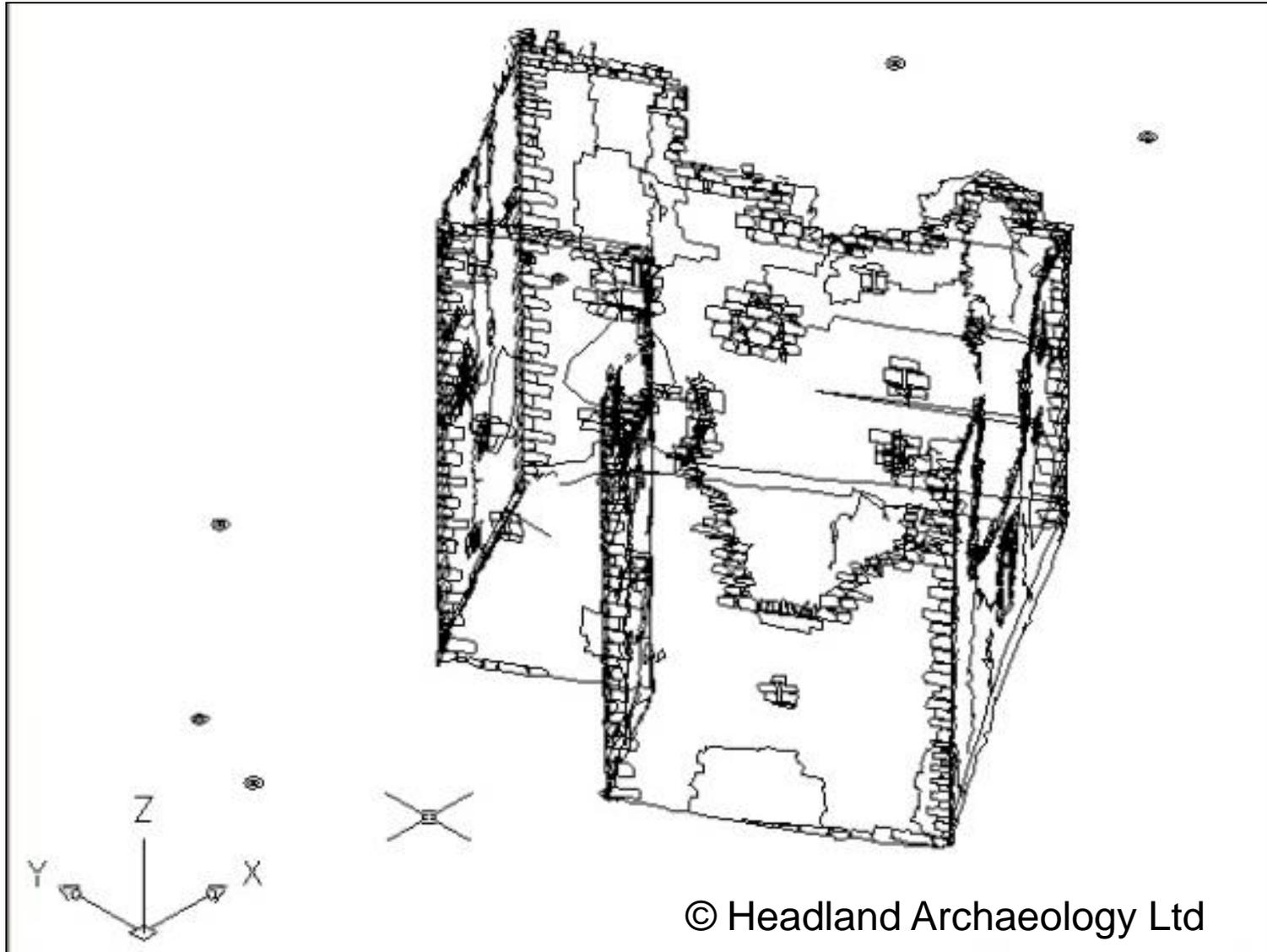
- Established in 1996
- Commercial archaeological unit working in the UK and Ireland
- Broad range of projects
 - Infrastructure
 - Renewables
 - Industrial
 - Artefacts
 - Maritime

Project Methodology

- Projects generally involve three phases
 - Desk-based research
 - Onsite Survey
 - Post-Excavation Analysis
- Onsite information gathering structured by contexts
- Archive an important consideration
 - Archaeology a destructive process
 - Information sharing key to the discipline
 - Professional guidelines published by IFA

Onsite Survey





© Headland Archaeology Ltd

CAD and Rectified Images



The screenshot shows the Layers Toolbox software interface. The main window displays a CAD model of a stone archway, with various layers and objects visible. The interface includes a menu bar (File, Edit, Graphics, Methods, View, ID, GIS, Maps, Misc, Options, Help), a toolbar with various icons, and a main workspace with a grid and various objects. A 'Layers Available' panel is open, showing a list of layers with their respective properties. A 'Definition' dialog box is also open, showing coordinates for the selected object.

Layer Name	Contour	Graphics	Length	Text	
OTHER	<input checked="" type="checkbox"/> Freeze	*****	Solid	1.00	⊙N
TEXT	<input checked="" type="checkbox"/> Freeze	*****	Solid	1.00	⊙N
benchmark	<input type="checkbox"/> Freeze	*****	Solid	1.00	⊙N
wall outline	<input type="checkbox"/> Freeze	*****	Solid	1.00	⊙N
wall face	<input type="checkbox"/> Freeze	*****	Solid	1.00	⊙N
grid points	<input type="checkbox"/> Freeze	*****	Solid	1.00	⊙N
arch	<input type="checkbox"/> Freeze	*****	Solid	1.00	⊙N
ledges	<input type="checkbox"/> Freeze	*****	Solid	1.00	⊙N

Definition	Start	End
Eastings:	24.314	43.244
Northings:	20.840	28.303

Archaeology: The Issues

- Guidelines describe the components of an archaeological archive but provide no standards for format or contents
- Often several versions of the same file
 - Which one should be archived?
- Complex data structures common and links between files must be preserved to allow their reuse
- Variable quality of accompanying metadata

Disseminating the data

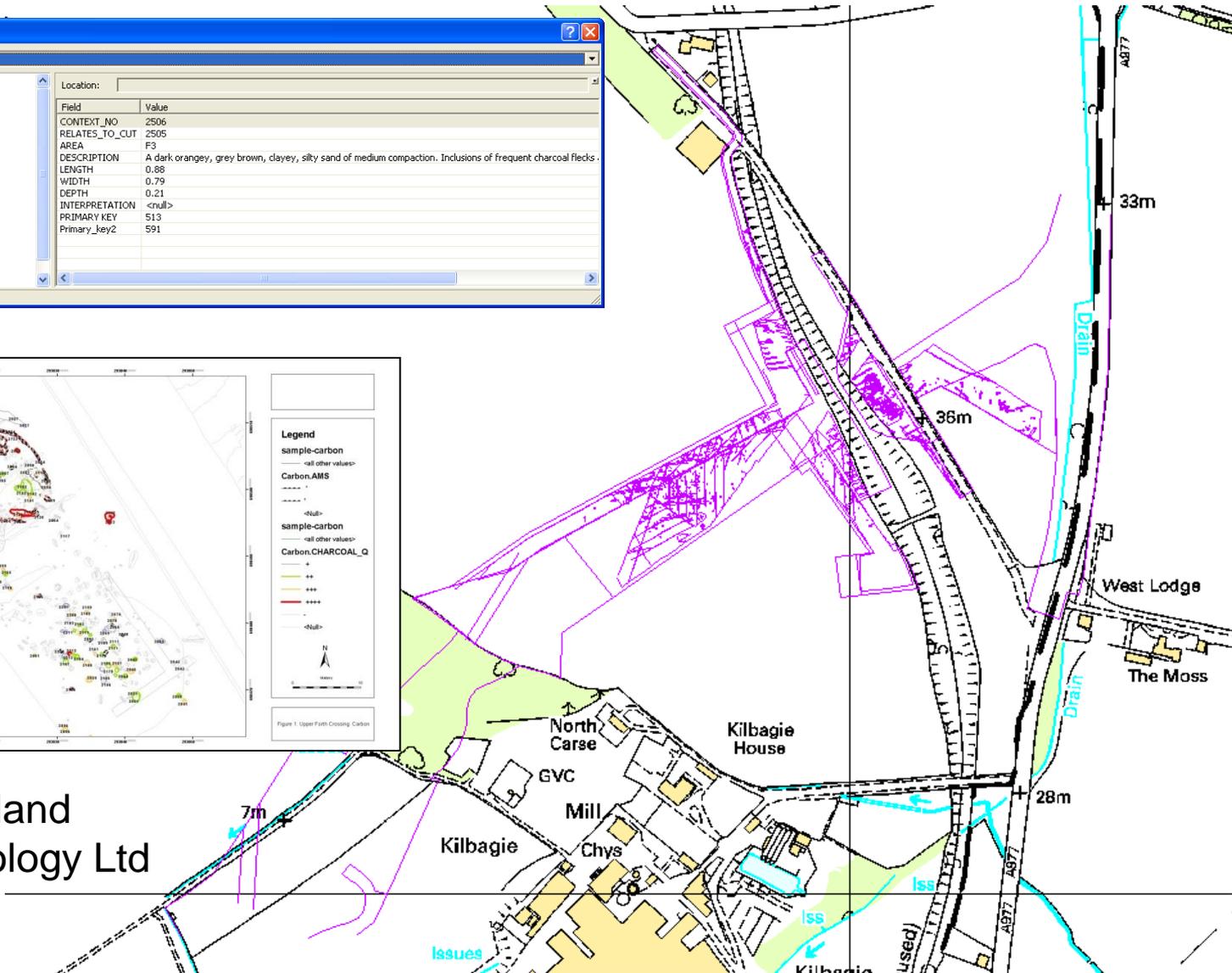
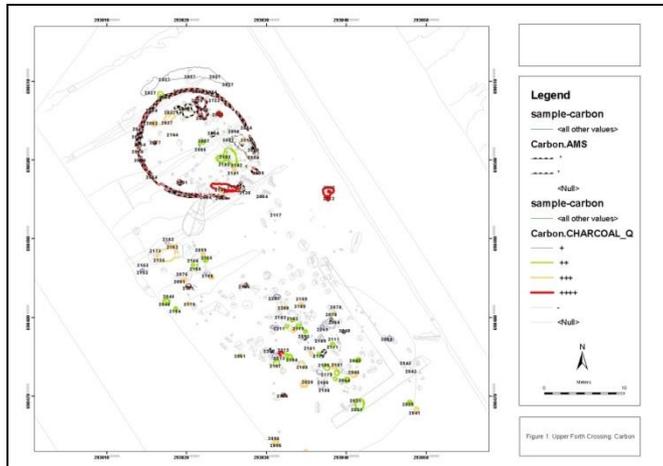
Identify

Identify from: <visible layers>

Location:

Field	Value
CONTEXT_NO	2506
RELATES_TO_CUT	2505
AREA	F3
DESCRIPTION	A dark orangey, grey brown, clayey, silty sand of medium compaction. Inclusions of frequent charcoal flecks.
LENGTH	0.88
WIDTH	0.79
DEPTH	0.21
INTERPRETATION	<null>
PRIMARY_KEY	513
Primary_key2	591

Identified 4 features



© Headland Archaeology Ltd

Architecture: RMJM

- Practice founded in 1956 as a partnership between Robert Matthew and Stirrat Johnson-Marshall
- Now one of the world's largest architectural firms
- RMJM (Edinburgh) archive to 1986 deposited with RCAHMS in 1997
 - c. 200000 drawings, manuscripts and slides
 - Includes Royal Commonwealth Pool, Stirling University, IBM Greenock and Longannet Power Station

CAD at RMJM

- Primary output of practice
- Work to national and international standards
- Currently renewing their in-house standards and guidance
 - Title blocks, drawing symbols, line weights and styles, folder structures, layer and file naming
- Currently maintain their CAD archive on CD/DVD
 - 1165 disks in Edinburgh with content up to 15 years old (CAD and PDF)
- Internal policy states that CAD files should be retained for 20 years



RMJM: Napier University (CAD)



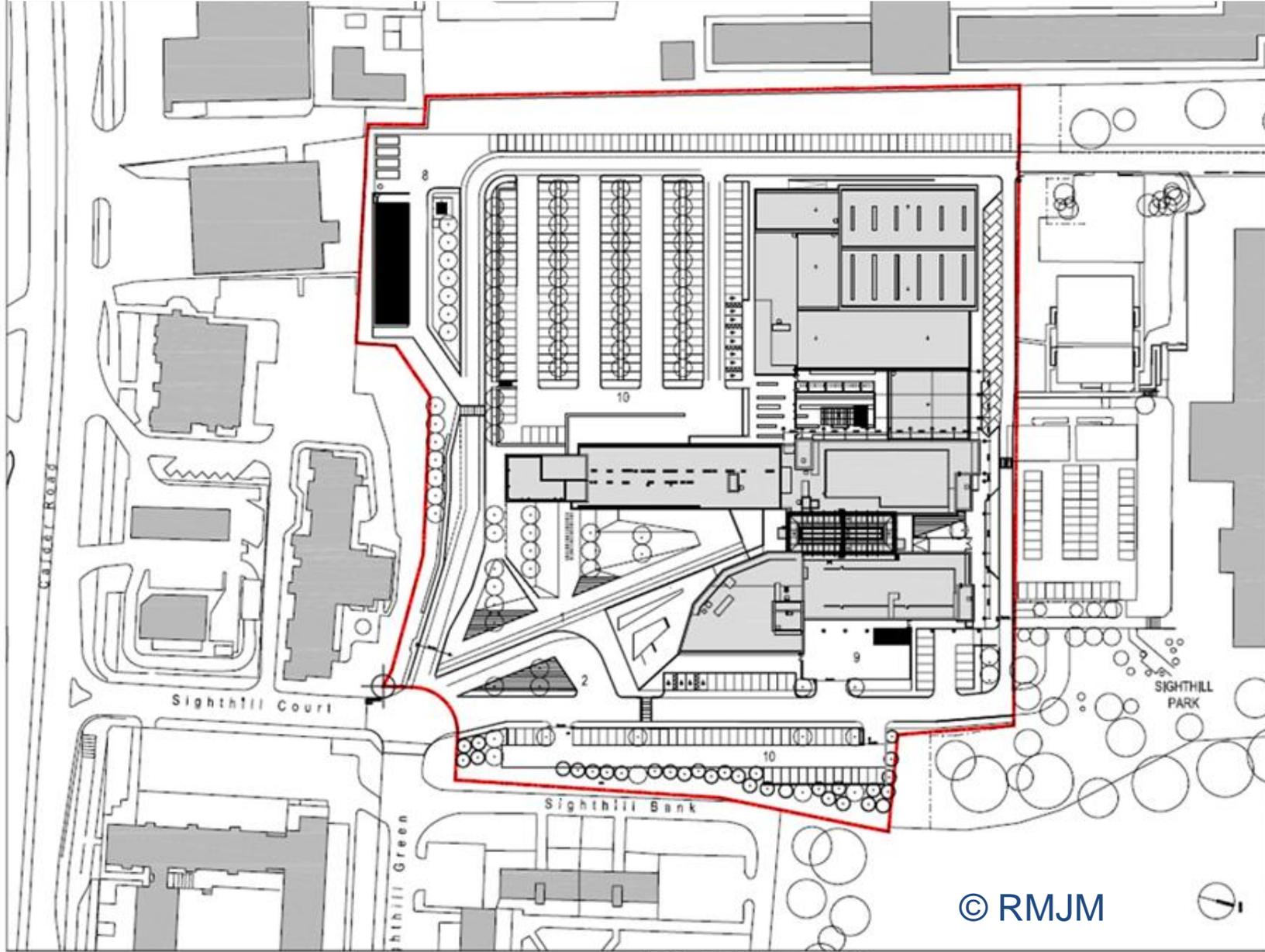
- 1. ENTRANCE SPACE
- 2. DROP OFF
- 3. SPINE BLOCK
- 4. L.I.C.
- 5. GENERAL TEACHING
- 6. FACULTY OF HEALTH AND SCIENCES
- 7. SPORTS FACILITY
- 8. BARBERS CENTER
- 9. SERVICE YARD
- 10. CAR PARK

1-6: MEASURES NOTIFIED

- 1. CITY OF EDINBURGH COUNCIL
- 2. STEVENSON COLLEGE
- 3. CITY OF EDINBURGH COUNCIL (SIGHTHILL PARK)
- 4a. SIGHTHILL BANK No. 7149 No. 8148
- 4b. SIGHTHILL TRING 14, 17, 17A
- 5. MRS LOTHIAN
- 6. BLOCHER HOUSE
- 7. THE — PUBLIC HOUSE
- 8. WATSON CAR GARAGE
- 9. SCOTTISH POWER



RMJM: Napier University (PDF)



Rev	Date	Description	By	Check
1	02.08.08	Issue for Publicity	RMJM	RMJM
2	08.11.08	Revised Site Plan	RMJM	RMJM

New Date: **PLANNING**
 Project No: **NAPIER UNIVERSITY SIGHTHILL CAMPUS**
 Drawing No: **SITEPLAN PRESENTATION**

Scale: 1:500	Date: 18.02.08	Drawn: CMG	Checked: OH	Approved: PE
 RMJM 10 Saltire Street Edinburgh EH3 9DF T: 0131 528 2000 F: 0131 528 2011 E: info@rmjm.com W: www.rmjm.com				
Sheet No: 3139	Block No: 3139-(TP)-003	9		

© RMJM

Architecture: The Issues

- Can we find a balance between commercial considerations and archival requirements?
 - Formats
 - Storage
 - Metadata
 - IPR
 - Transfer
- Can standards provide a basis for selection?

A Bit of Both: RCAHMS' Survey

- Projects spanning both archaeology and architecture
- Three main types of survey programmes:
 - Aerial
 - Landscape
 - Thematic
- CAD used as the principle tool for processing and amalgamating survey data

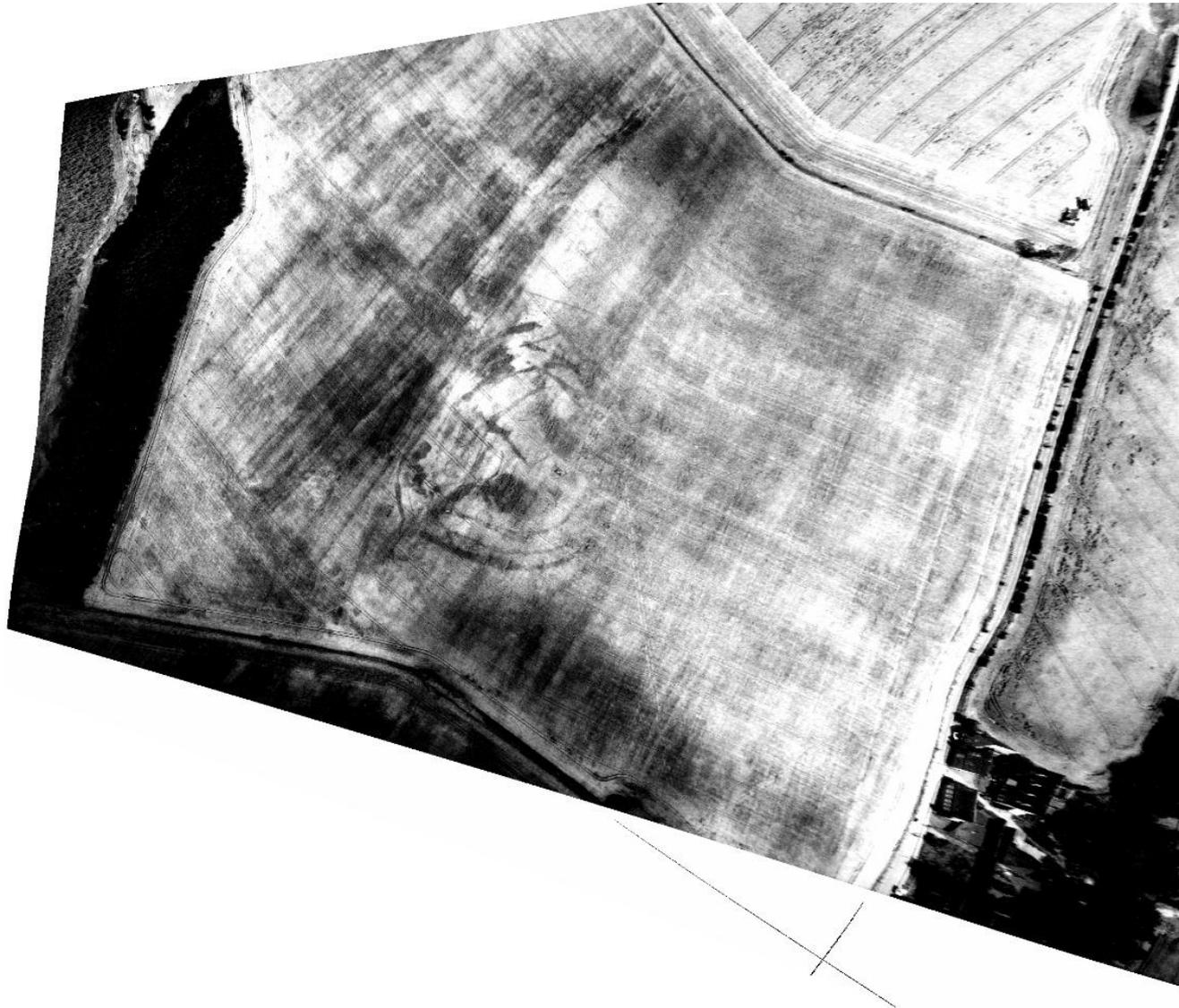


Royal Commission on the Ancient and Historical Monuments of Scotland

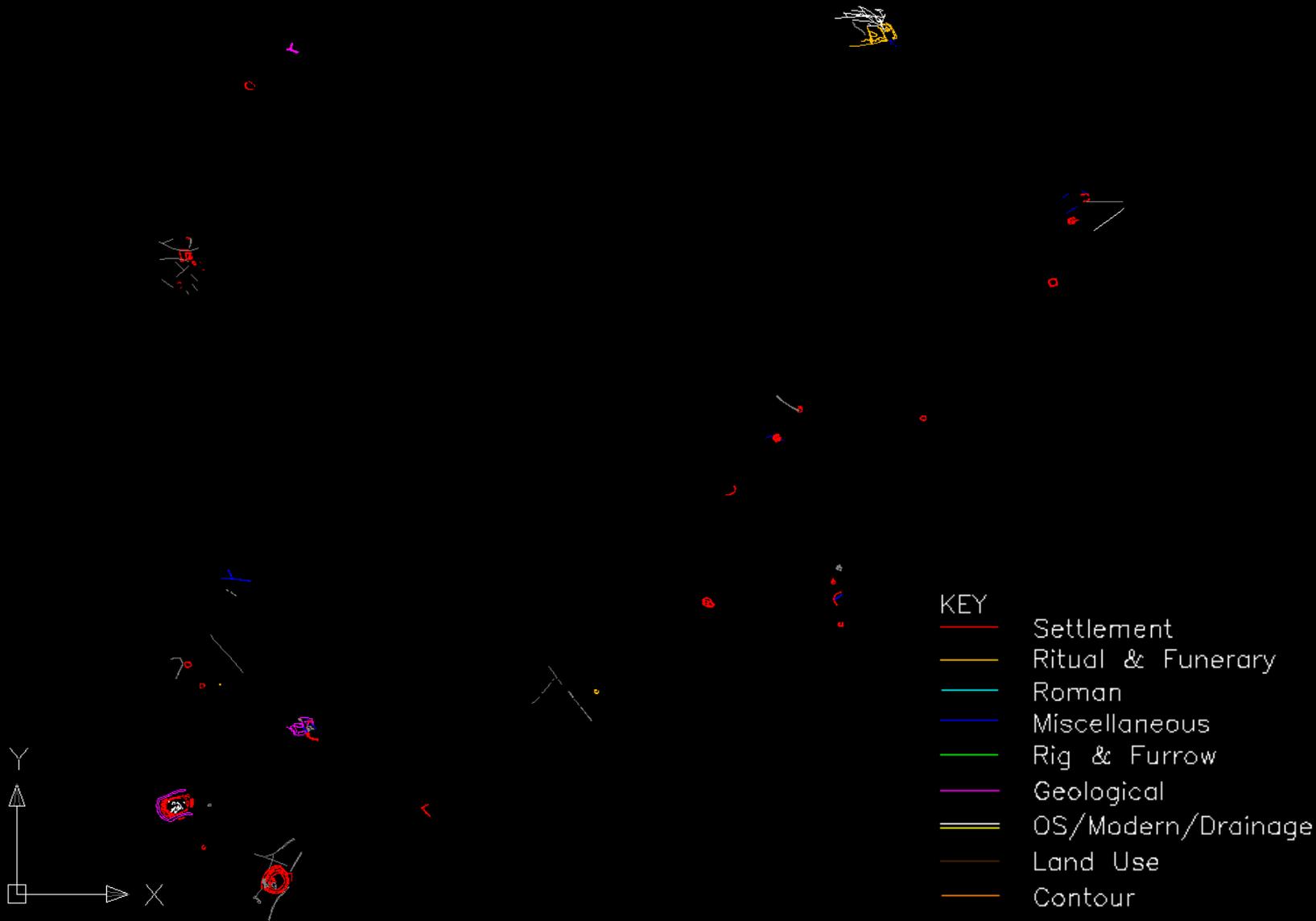
Aerial Survey



Aerial Survey: Crop Marks



Aerial Photography Transcriptions



Landscape Survey



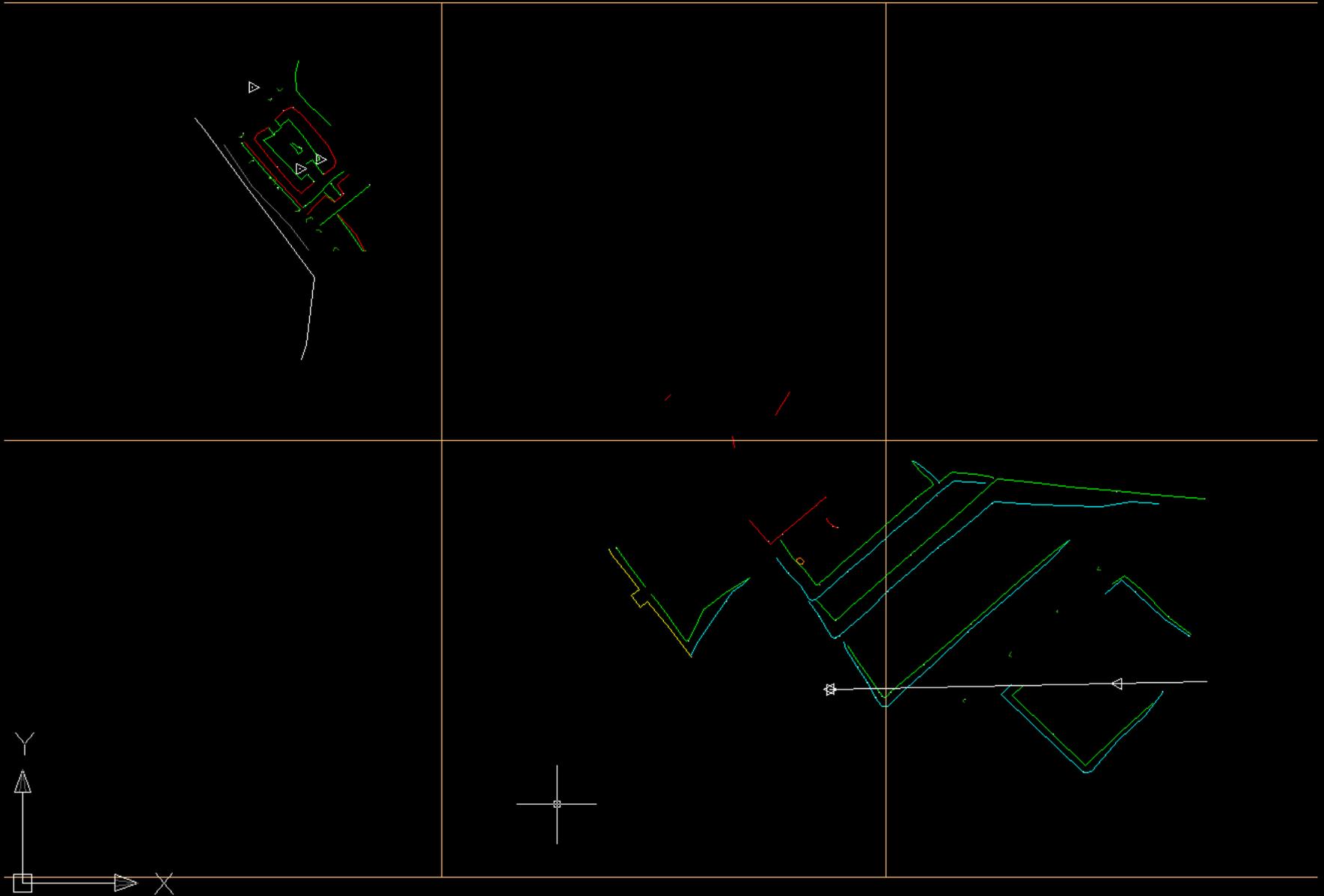


Royal
Commission on the
Ancient and
Historical
Monuments of
Scotland

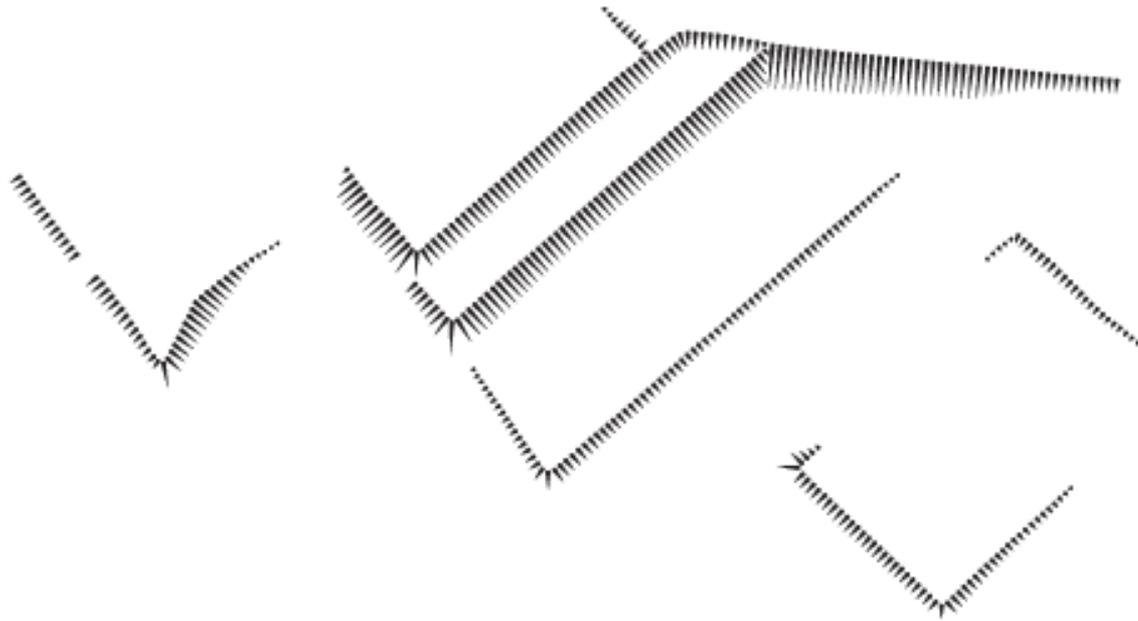
Survey using GPS and EDM



EDM Survey: Gardens at Monzie Castle



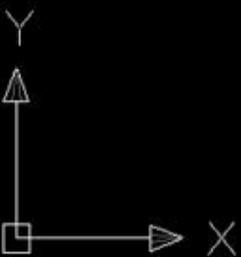
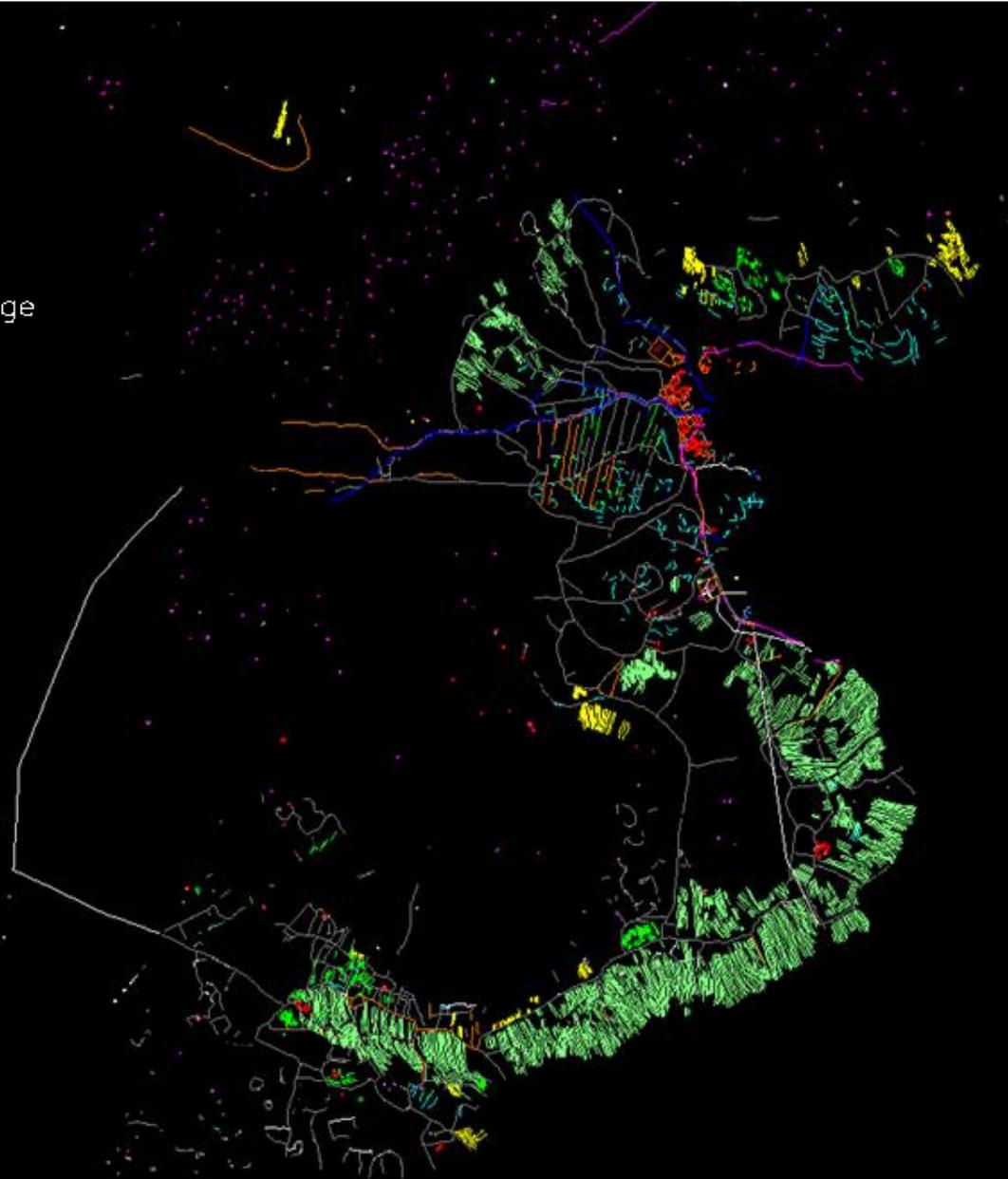
Monzie Castle Gardens: Illustration



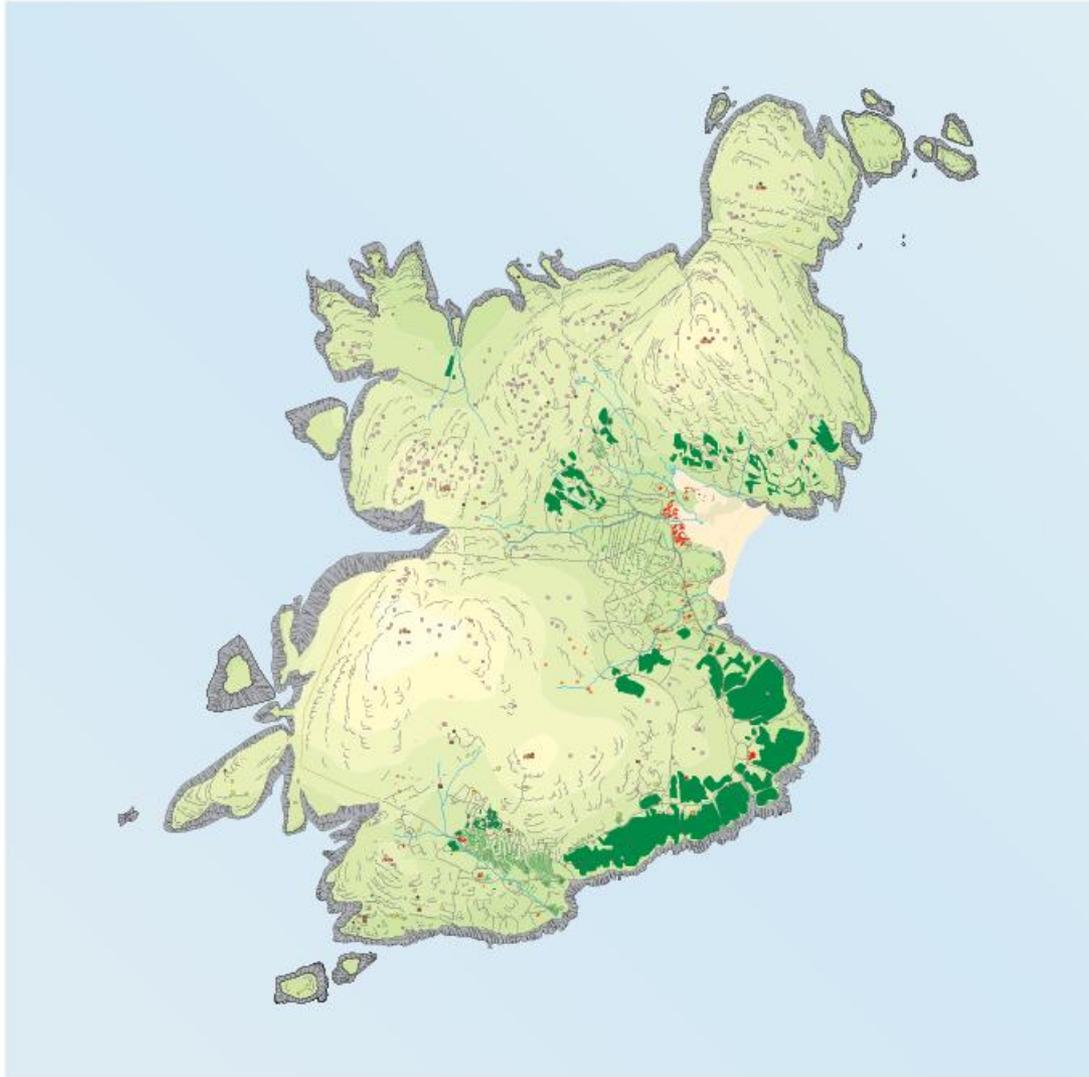
GPS Survey: Mingulay

KEY

- Settlement
- Ritual & Funerary
- Roman
- Miscellaneous
- Rig & Furrow
- Geological
- OS/Modern/Drainage
- Land Use
- Contour



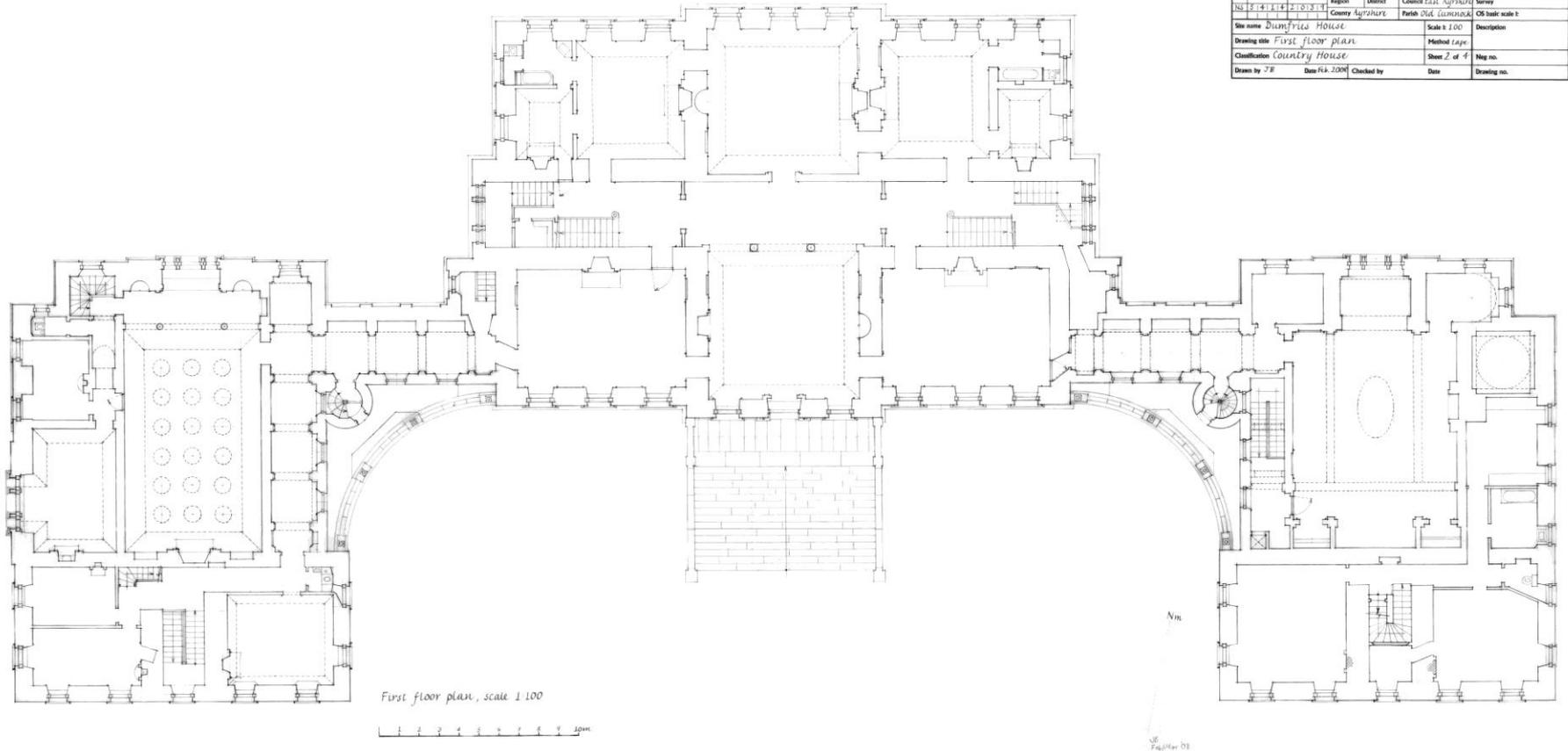
Mingulay: Mapping







Dumfries House: Hand Drawn Plan



Royal Commission on the Ancient and Historical Monuments of Scotland
The National Monuments Record of Scotland
RCAMRS John Sinclair House, 16 Bernard Terrace, Edinburgh, EH8 9NX. Tel 031-662-4565

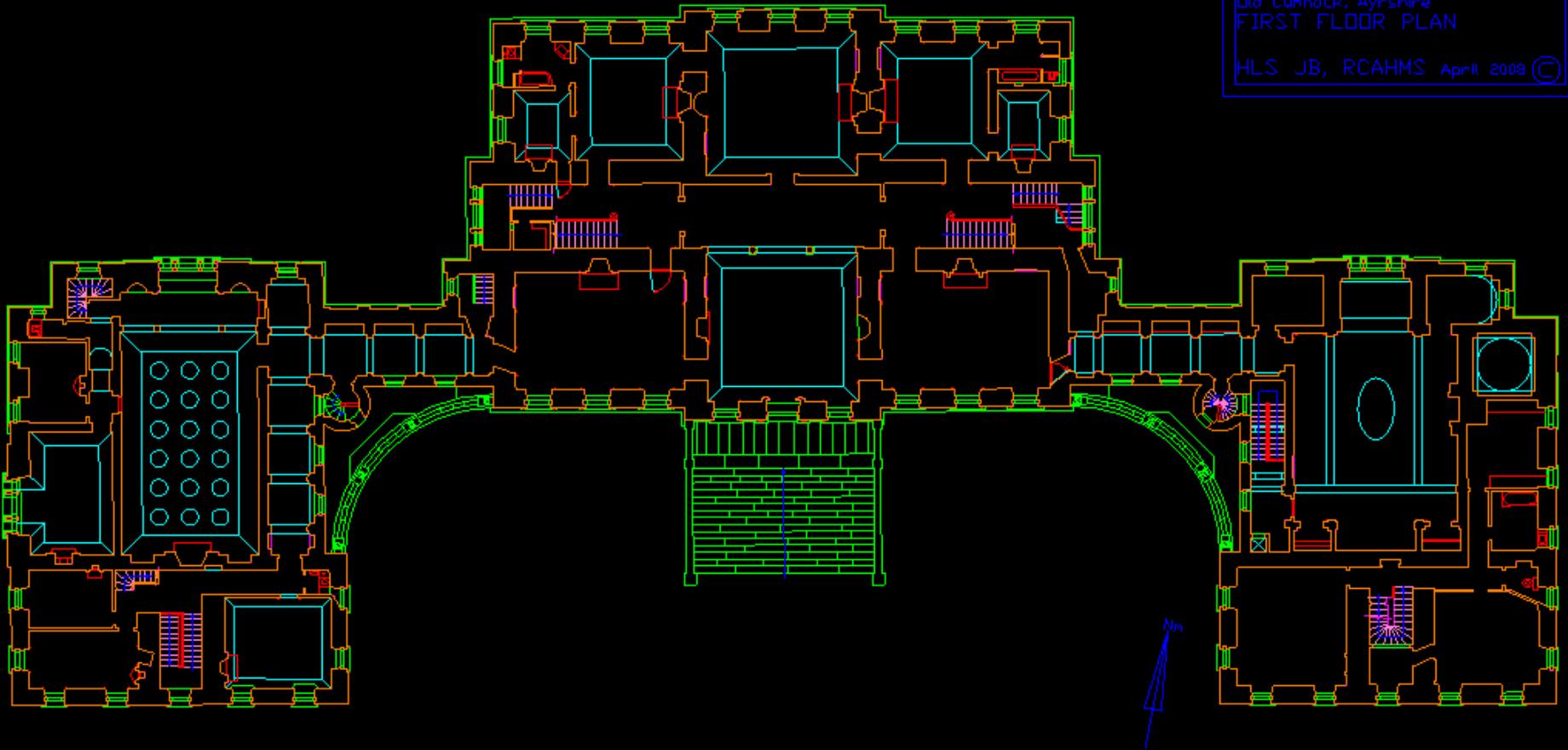
No	Region	District	Council	East	Authority	Survey	
	Country	Authority	Parish	Old	Common	OS basic scale 1:	
NS 214114 210131							
Site name	Dumfries House					Scale 1:100	Description
Drawing title	First floor plan					Method tape	
Classification	Country House					Sheet 2 of 4	Neg no.
Drawn by	ZB	Date	14. 2000	Checked by		Date	Drawing no.



Dumfries House: CAD

DUMFRIES HOUSE
Old Cumnock, Ayrshire
FIRST FLOOR PLAN

HLS JB, RCAHMS April 2009 ©



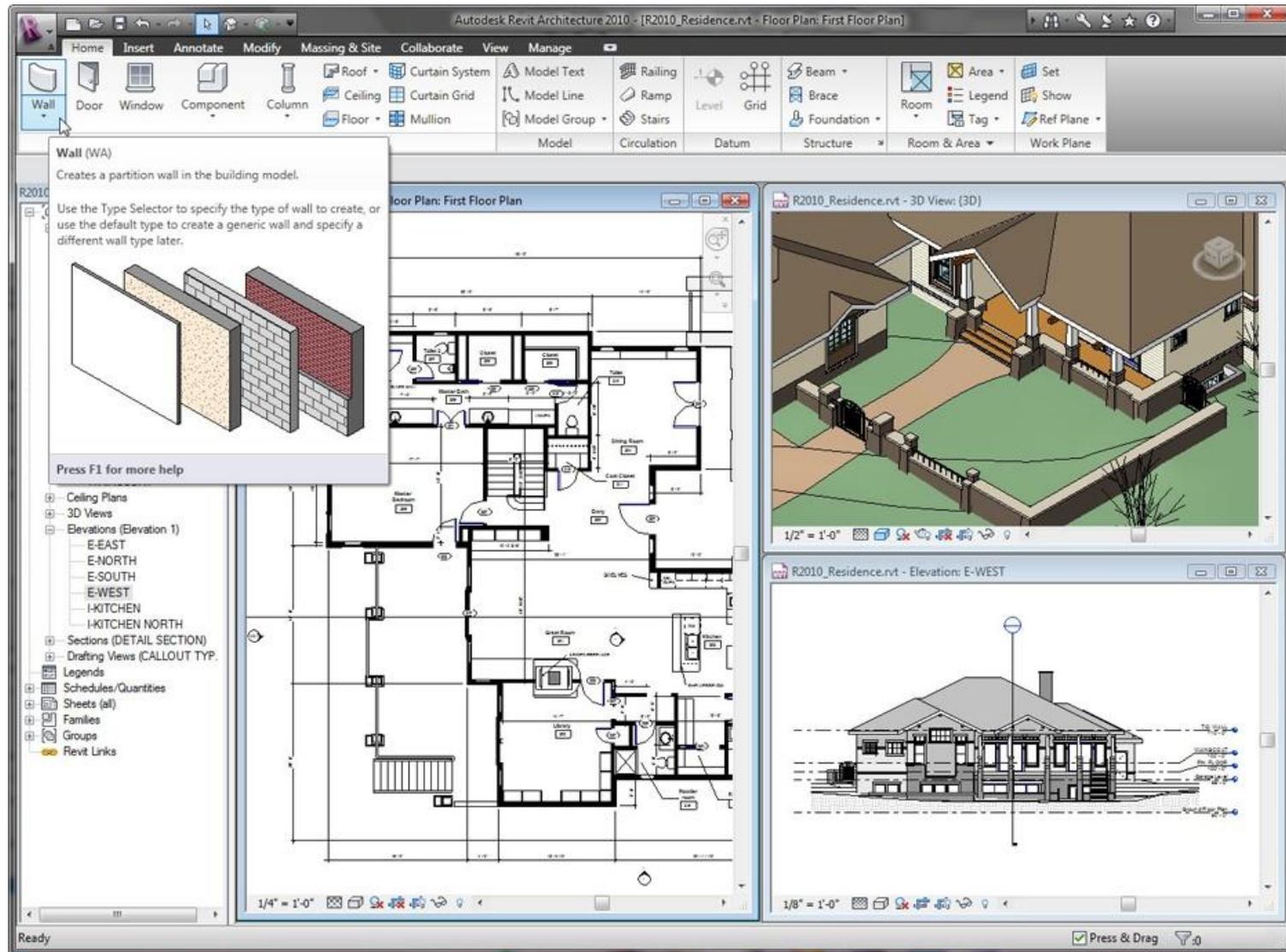
RCAHMS: The Issues

- Need to identify which outputs should be archived
 - Improve procedures and systems for ingest and cataloguing
- More comprehensive standards required
- How to disseminate content to users
 - Are free viewers available/suitable or will files require conversion to a different format?

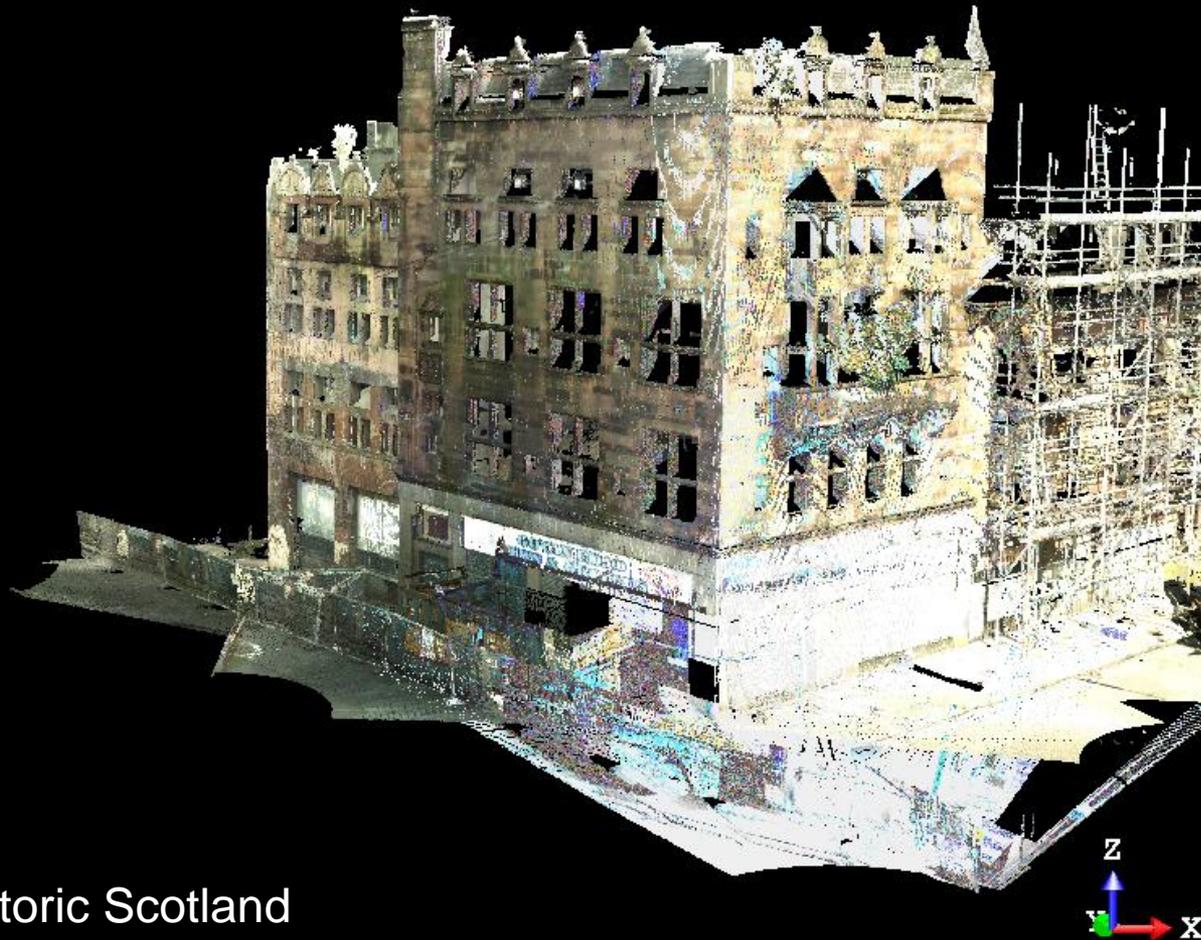
My CAD Wish List

- Guidance on file contents for each the relevant disciplines
- A metadata standard
- A format suitable for preservation
- Guidance on selection criteria
- Recommendations for dissemination routes
- A solution to the commercial interests vs. preservation conundrum

The Future: Building Information Models



The Future: Laser Scanning



The End

- RCAHMS
 - <http://www.rcahms.gov.uk>
- Headland Archaeology Ltd
 - <http://www.headlandarchaeology.com>
- RMJM
 - <http://www.rmjm.com>
- Email
 - sharon.mcmeekin@rcahms.gov.uk