Catrine Weir, East Ayrshire: Archaeological Mitigation

Written Scheme of Investigation

by Thomas Rees

issued 3rd February 2020

on behalf of Catrine Community Trust

RATHMELL ARCHAEOLOGY LTD

Quality Assurance

The document has been prepared in keeping with the procedures and guidance of Rathmell Archaeology Limited. All works reported on within this document have been undertaken in keeping with the Chartered Institute for Archaeologists' Standards and Policy Statements and Code of Conduct.

Signed Date …3rd February 2020…….

In keeping with the procedure of Rathmell Archaeology Limited this document has been reviewed and agreed by an appropriate colleague:

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Introduction

1. This Written Scheme of Investigation is for archaeological works required by Catrine Community Trust in support of the renewal and upgrade of the fish bywash offtake at the head of the Catrine Weir complex. This historic water management system is a Scheduled Monument, protected under the terms of the Ancient Monuments and Archaeological Areas Act 1979, known as *Catrine, water works for Catrine Mill 30m S of 9 St Cuthbert's Street* (SM5670).

2. The Catrine Community Trust is applying for Scheduled Monument Consent to Historic Environement Scotland for the renewal works. This Written Scheme of Investigation presents the archaeological works that have been designed to mitigate any adverse impact on archaeological remains associated with the Scheduled Monument. Mitigation will be through an archaeological survey of historic fabric and subsequent watching brief, this being a continuous site presence during all groundbreaking operations within or immediately adjacent to the Scheduled Monument to identify significant archaeological features and record them prior to their loss.

3. Rathmell Archaeology Limited has been appointed by Catrine Community Trust to undertake the development and implementation of archaeological mitigation works for the project.

4. This Written Scheme of Investigation provide the detail of the works (survey, monitoring, exclusion, excavation, post-excavation analyses and publication) for the mitigation pertaining to works that may disrupt the Scheduled Monument. No works can proceed on-site until Historic Environment Scotland has granted Scheduled Monument Consent. All works must comply with the submitted proposals and any conditions appended by Historic Environment Scotland.

5. The identified structure of appropriate mitigation works is those necessary to ensure that the development can proceed while dealing appropriately with the identified adverse impact on the archaeological resource.

6. A suggestive consideration of the possible post-excavation and reporting structure for these works is also presented. Inevitably as works proceed the character of the later stages of this Written Scheme of Investigation will be subject to review and enhancement.

Background

7. The works area comprises ground at the upstream end of the Catrine water management system being the eastern side of the mill lade, a portion of the spillway from the first weir and the bank of the River Ayr (broadly centred on NS 5353 2613). Of these areas only the mill lade wall forms part of the Scheduled Monument (see Figure 1 and Figure 2a).

Archaeological and Historical

8. Catrine Weir (Canmore Id: 43562, WoSAS Id 12437) lying to the immediate north of the works area forms an integral part of a larger water management system, which carried water drawn from the River Ayr, harnessing its power for use in the Ballochmyle Cotton Works. The hydraulic system consisted of a series of lades, both open and enclosed, ponds (also know as 'voes') and a weir, all features designed to enable a constant, reliable, and regulated flow of water for use in production.

9. The hydraulic system has its origins in the late eighteenth century. It was constructed in 1787, providing power for the contemporary Ballochmyle Cotton Works in Catrine. These works were founded jointly by Claud Alexander of Ballochmyle, and David Dale of Glasgow. Dale is better known for the New Lanark Mills, which he founded in partnership with Robert Owen (Mitchell & Murdoch, 2006).

10. An important part of the water management system is Catrine Weir, which played an important role in slowing the rate of flow in the river water prior to its entry into the voe/lade system. The weir appears to date from the earliest phase of the cotton works, which in 1796 is recorded as having 76 'jeanies' (i.e. 'jennies') in place, with 800 people employed there (Mitchell & Murdoch, 2006, 10).

11. In 1801, the business was sold to a Glasgow-based company, James Findlay & Co. A partner in this firm, Archibald Buchanan, had served as an apprentice to Richard Arkwright in Cromford, and he appears to have instigated the introduction of a series of improvements to the existing infrastructure. In 1824, a bleachworks was added to the complex, and in 1827 the mill itself was expanded. The improvements undertaken in 1827 included the removal of the original millwheels and their replacement with much larger suspension wheels, measuring 15.24m in diameter, designed by William Fairbairn of Fairbairn-Lillie.

12. Legal obligations in place when the weir was first built restricted its height to 2 feet above the river's normal level, but in 1848, following a change in land ownership, the weir was raised to its current height of 4 feet 8 inches above the river's normal level. This alteration is thought to have taken place during a period of upgrading undertaken by James Clark, a partner in the firm, and an engineer named Robert Barclay. It is the result of these improvements, created in order to increase the amount of power obtained from the river that we see today.

13. The weir represents an example of a crib-and-plank weir, a type which is unusual in a Scottish context (Mitchell & Murdoch, 2006, 22). It comprises a grid made of rectangular timber stalls (the 'cribs'), packed with rock and gravel and finished on the upper surface with a dressed stone apron, or spillway. Forming the upper edge of the weir is the weir dam, the watertight face of which is composed of abutting timber planks, with a variable slope according to the flow of the water, and surmounted by a weir crest, originally cast iron but now largely replaced with timber.

14. A deposit of puddled clay at the base of the weir dam would have helped protect the timbers from undermining or scouring through exposure to turbulence. The spillway sloped gently down from the weir crest, with the rock/gravel infill of the first 'crib' covered by planking, laid perpendicular to the weir crest, as opposed to masonry. The structure itself is thought to have been anchored solely by gravity, with no additional underpinning present.

15. The hydraulic system remained in use until the 1970s, and prior to this date it was repaired on several occasions. Some of these repairs, including the addition of a concrete screed over some of the spillway, have – it is suggested – served to accelerate the historic fabric's decay rather than assisting in its preservation (Mitchell and Murdoch, 2006, 37).

Location of adverse impact

16. The proposed works will result in the downtaking of a portion of the eastern wall of the lade as it flows south from the western side of the weir (see Figure 1). This wall can be characterised as a decaying mass concrete structure that was originally shuttered and poured *in situ* (see Figure 2b).

17. The works will retain the lower sections of this wall structure (i) renewing the concrete cap for a section that opens onto the spillway falling to the east to the River Ayr and (ii) at the southern end of the spillway (some 20m south of the sluices on the mill lade) inserting a precast concrete structure. This precast structure will form a Fish Bywash offtake, feeding into a pipe that will run beneath the adjacent ground to a submerged discharge into the River Ayr.

18. These works will both maintain the integrity of the lade wall and have the potential to inform on the construction process and character of the lade wall. There is also the potential to expose earlier iterations of the mill lade wall.

19. The default approach will be that all ground breaking activities taking place around the lade structure will be monitored by an archaeologist to ensure that any archaeologically significant material disturbed by the works can be recorded in the appropriate manner.

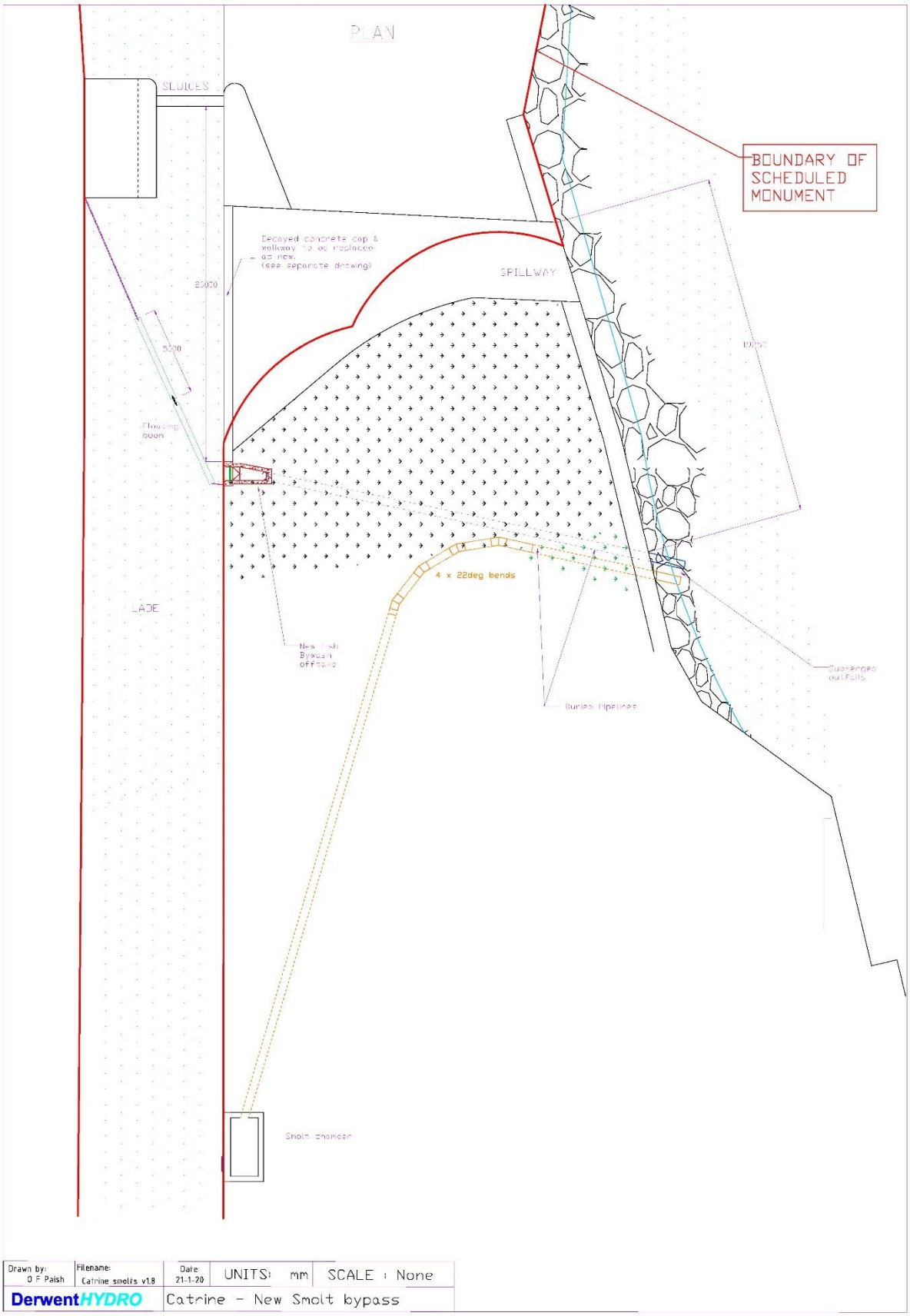

Figure 1: Proposed Works relative to the Scheduled Monument

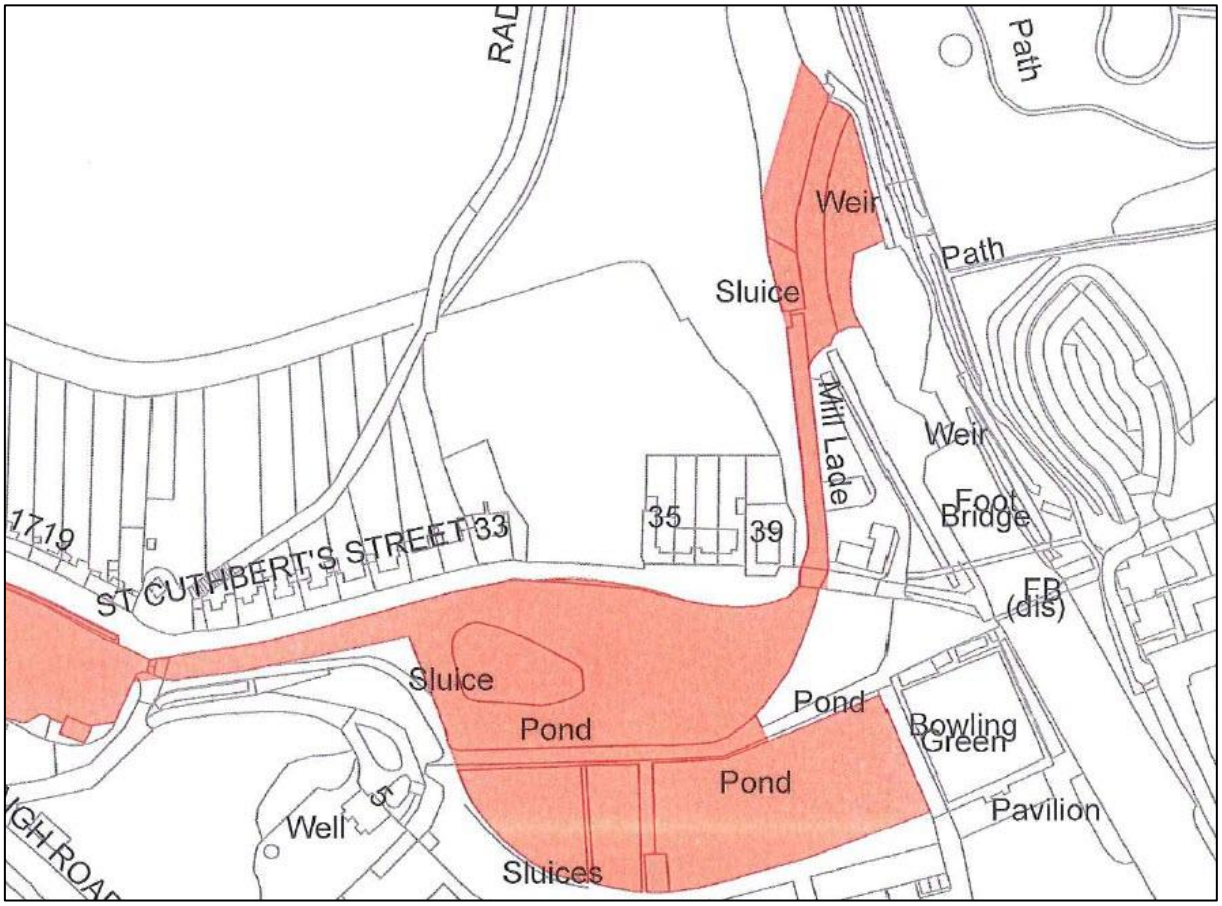

Figure 2a: Extract from scheduling document showing eastern half of area.

Figure 2b: Opening onto spillway and E mill lade wall from the west with River Ayr beyond.

Research Objectives

21. The character and scope of the archaeological resource within the works area is uncertain though the background enables us to anticipate that we can expect to encounter the last iteration of the mill lade wall (formed in mass concrete).

22. We infer that the works have the potential to expose *in situ* and *ex situ* archaeological materials relating to the the construction, use and abandonment of both the current and earlier iterations of the mill lade wall. Beyond this we cannot safely make further assumptions about the likely date, duration or function of the archaeological resource.

23. Necessarily, therefore, the broad research objectives must remain quite general:

- to determine the nature, form and extent of the archaeological resource within those areas adversely impacted upon by the development;
- to establish, wherever significant archaeological features are exposed, a programme of preservation *in situ* to protect the archaeological resource; and
- where preservation is not credible - to investigate, sample and record the archaeological resource that is adversely impacted upon by the development works.

24. Currently, there is no Regional Archaeological Research Framework available for this area, in this context the following site-specific objectives are recognised regarding the phasing and construction of the mill lade:

- to record the character of the construction process and form of the lade wall to more specifically clarify the date range and construction process for the structure; and
- to recover any sub surface structural information on the pre-concrete lade wall that may have stood at this location and explore the development of structures on the site.

25. The research objectives defined above within the works area are to be achieved through the programme of works detailed within this Written Scheme of Investigation.

Project Works

26. A staged programme of works that are anticipated to satisfy the requirements of Historic Environment Scotland will be undertaken. The first stage of these works is outlined below, including:

- agree on preparatory paperwork including risk assessments encompassing safe working procedures;
- undertake a building survey to record the character of the upstanding historic fabric prior to works;
- undertake continuous archaeological monitoring on relevant groundbreaking works within and immediately adjacent to the Scheduled Monument in a manner that will expose any significant archaeological horizons with care;
- hand excavation of archaeological features exposed by the works which would be subsequently impacted on by the build;
- inspection of the upstanding historic fabric after downtaking to record the form and character of concrete structure in cross-section;
- production of a report which integrates the findings of the works, detailing the nature, form and extent of the archaeological features;
- the preparation of a DES entry and the submission of an OASIS form; and
- in the event of significant archaeology being identified an additional report will be prepared to design appropriate post-excavation analyses and reporting, including publication where appropriate.

27. The most efficient way to manage the works would be for the main contractor to strip, under archaeological supervision, substantial areas which they will in due course need access to. This will suppress the duration of archaeological presence on-site and allow the identification of any archaeological features, enabling their excavation or managed retention, in advance of the main contractor needing access for their build.

Standards

28. This specification conforms to the requirements of PAN 2/2011 Planning and Archaeology. It has been designed in accordance with current best archaeological practice and the appropriate national and regional standards and guidelines including:

- ALGAO:Scotland, 2013, Historic Building Recording Guidance
- Brown, D., 2007 Archaeological Archives: A guide to best practice in creation, compilation, transfer and curation, Archaeological Archives Forum;
- Historic Scotland, 1997, The Treatment of Human Remains in Archaeology (Historic Scotland Operational Policy Paper 5) Reprinted and Amended 2006;
- Chartered Institute for Archaeologists, 2014, Standard and Guidance for an archaeological watching brief;
- Chartered Institute for Archaeologists, 2014 Standard and Guidance for archaeological excavation;
- Chartered Institute for Archaeologists, 2014 Standard and Guidance for the collection, documentation, conservation and research of archaeological material;
- Chartered Institute for Archaeologists, 2014 Standard and Guidance for the creation, compilation, transfer and deposition of archaeological archives;
- Museums and Galleries Commission, 1992, Standards in the Museum Care of Archaeological Collections
- Procedural Guidance for Archaeology and Development (West of Scotland Archaeology Service);
- Royal Commission on the Ancient and Historical Monuments of Scotland, 1996 Guidelines for Archiving of Archaeological Projects;
- Scottish Government 2008 Treasure Trove in Scotland – a code of practice.

29. The archaeological works will be carried out with due regard to all appropriate health, safety and environmental legislation and guidance. All works will comply with the Chartered Institute for Archaeologists' Standard and Guidance statements and Code of Conduct and Historic Environment Scotland Policy Statements.

30. The archaeological works will be carried out with due regard to all appropriate health, safety and environmental legislation and guidance, including:

- Health and Safety at Work Act 1974;
- Avoiding Danger from Underground Services HSG47;
- FAME Safety Manual.

Recording Historic Fabric

31. Prior to commencing demolition or construction works an archaeologist will attend site to undertake a historic building survey.

32. The archaeologist will return after the downtaking of the lade wall but prior to any further change occurring to the structure to expand the original record.

33. It is not appropriate to monitor the downtaking of the concrete structure as this will be removed by cutting (not percussion) hence the return will be after these works are complete.

34. The historic building survey will meet the Basic Level (Historic Building Recording Guidance

2013, ALGAO:Scotland). This will generate a record for the historic fabric subject to change prior to the impact occurring and after the substantive change.

35. The recording will encompass an enhanced photographic record; a written record; and the sketching and annotation of all plans and elevations. In greater detail the archaeologist will:

- ❖ compile a written record of the structure;
- ❖ a photographic record will be compiled of exterior elevations, details of interior elements and general views to place the structure in its immediate landscape to show changes or temporary exposure of fabric within the structure; and
- ❖ annotated sketch plans and elevations of the structure that incorporate historic fabric to identify location, character and phasing of historic fabric supplemented where necessary by additional measured drawings.

36. The ability to generate a record will be controlled by the Risk Assessment, hence considerations of safety.

37. The findings from these works will be prepared as an element of the overall report which will integrate with the monitoring programme to explore the character of the structure and its function within the larger complex of water management features.

Monitoring

38. Any groundbreaking operations within or adjacent (within 2m) to the Scheduled Monument will be monitored by an archaeologist as they occur. This will ensure that any significant archaeological features are identified and safeguarded until an appropriate response can be agreed.

39. Specifically when monitoring is undertaken:

a. one archaeologist will monitor each excavator (mechanical or hand dig team) that is working to reduce an area;

b. any monitored mechanical excavator should work wherever possible with a drawn toothless bucket. No plant should track over any stripped surface until cleared to do so by the archaeologist;

c. the archaeologist will have the authority to halt the excavator should an archaeologically significant horizon be met. The archaeologist will monitor the excavator until the underlying natural subsoil has been exposed or the maximum working depth reached;

d. minor or isolated potential archaeological features identified during the course of works will be archaeologically excavated (in keeping with excavation protocols below); and

e. more extensive or significant potential archaeological features will be assessed, delimited and secured by temporary fencing (erected by the main contractor) pending determination of how the material should be dealt with.

40. A site specific response will be needed for any extensive or significant potential archaeological features. The response will typically prefer preservation *in situ* where this is practicable; alternatively archaeological excavation will be undertaken. Historic Environment Scotland will take the final decision on the most appropriate response in any single case.

41. For each temporary fenced area (i.e. site) the proposed response will need to be formally agreed with the Historic Environment Scotland through an addendum to the Written Scheme of Investigation. A targeted investigation will be carried out within the fenced area to help determine the nature and form of the archaeology in order to better inform this response. No further works will be progressed within the fenced area (either development or archaeological) until the response is formally agreed.

Treatment of Human Remains

42. Should human skeletal material be exposed then works on that area should be paused to enable the notification of the local constabulary and the Historic Environment Scotland.

43. Sites with buried human skeletal material are protected. The removal of a body from the grave is not considered theft; rather Scots common law recognises the offence of *crimen violati sepulchre* (violation of sepulchre). In essence, the crime is the disturbance of the corpse without permission. Care must be taken to ensure that no works undertaken conflict with this law; this would in part be achieved by complying with Historic Environment Scotland's operational policy paper 5 *The Treatment of Human Remains in Archaeology*.

44. Should extensive deposits of human skeletal material or numerous intact graves be uncovered the response should typically be to alter works to preserve them *in situ* where this is practicable; archaeological excavation can act as an alternate. This has been agreed in the past in certain instances, especially where no record of burial or lair plan can be sourced or the burials are pre-modern. However, there may be a requirement to seek a Sheriff's order for exhumation.

Excavation

45. Where archaeological remains are accessible and where excavation is agreed as the appropriate response the areas will be cleaned using hand tools to define surviving archaeology. The exposed archaeology will then be excavated and recorded.

46. After the cleaning and planning the sampling strategy will be finalised. This will take into account the project aims and the type, quality and quantity of remains revealed. The excavation sampling strategy will seek to maintain the following levels, but the Historic Environment Scotland will take the final decision on the appropriate levels of sampling to be applied in any single case within the planning boundary and may insist on 100% excavation of any archaeological features to be destroyed by the development proposals:

    a. all structures and all zones of specialised activity (e.g. funerary, ceremonial, industrial, agricultural processing) will be fully excavated and all relationships recorded;

    b. ditches and gullies will have all relationships defined, investigated and recorded. All terminals will be excavated. Sufficient lengths of the feature will be excavated to determine the character of the feature over its entire course; the possibility of re-cuts of parts of the feature, and not the whole, will be considered. This will be achieved by a minimum 10% sample of each feature (usually a 1m section every 10m);

    c. sufficient artefact assemblages will be recovered (where possible) to assist in dating the stratigraphic sequence and for obtaining ample ceramic groups for comparison with other sites;

    d. all pits, as a minimum, will be half-sectioned. Usually at least 50% (by number) of the pits will be fully excavated. Decisions as to which pits will be fully excavated will be taken in the light of information gained in the half-sectioning taking into consideration, amongst other things; pit function, artefact content and location

    e. for post and stake holes where they are clearly not forming part of a structure (see above) 50% (by number) will be half-sectioned ensuring that all relationships are investigated. Where deemed necessary, by artefact content, a number may demand full excavation;

    f. for other types of feature such as working hollows, quarry pits, etc the basic requirement will be that all relationships are ascertained. Further investigation will be a matter of on-site judgment, but will seek to establish as a minimum their extent, date and function; and

    g. for layers, an on-site decision will be made as to the limits of their excavation. The factors governing the judgment will include the possibility that they mask earlier remains, the need to understand function and depositional processes, and the

necessity to recover sufficient artefacts to date the deposit and to meet the project aims.

Recording

47. All recording will be by Rathmell Archaeology Limited standard method. In summary: all contexts, small finds and environmental samples will be given unique numbers; bulk finds will be collected by context; digital images will be captured throughout the work; and all recording will be undertaken on *pro forma* record cards. An overall site plan will be recorded at 1:100, with significant individual features planned at 1:20 and sections drawn at 1:10.

48. Any artefacts retrieved will be catalogued and subject to standard Treasure Trove procedures. Archaeological deposits will be sampled systematically in accordance with Rathmell Archaeology Limited standard environmental sampling practice. All investigated features believed to be significant and man-made will be sampled along with a selection of natural features and topsoil to provide control samples. Bulk samples, a minimum of 10 litres but up to 30 litres if possible, will be taken for wet sieving and flotation.

Liaison

49. At all points during the ongoing works the client or their representative shall be kept informed of progress and significant developments. Similarly, Historic Environment Scotland and the West of Scotland Archaeology Service shall be kept informed progress of works and significant developments.

Reporting

50. The products of each stage of the works will be as follows:

- Data Structure Report presenting the results of the works and incorporating detailed listing of the materials (artefacts, sediments; written record) recovered; in addition, a narrative would explain the character of the archaeology investigated and compare this to comparable archaeology in the area;
- Costed Post-Excavation Research Design will be prepared to identify the potential analyses necessary and the structure for the publication and dissemination of results;
- Project archive, to be deposited in National Record of the Historic Environment; and
- Lists of finds (if any) to be submitted to the Scottish Archaeological Finds Allocation Panel.

51. A full draft of the Data Structure Report will be circulated to Historic Environment Scotland and the West of Scotland Archaeology Service for comment. An appropriate number of copies of each finalised report will be supplied to Historic Environment Scotland and the West of Scotland Archaeology Service.

Project details

52. Rathmell Archaeology Ltd could start when required. The subsequent on-site works can then be commenced. The duration of works on-site will depend on the archaeology encountered and the work programme of the main contractor, for the monitoring elements.

53. The initial reporting would be completed within four weeks of the completion of all on-site works.

54. The scope of any post-excavation stages of work will then be agreed with Historic Environment Scotland within three months of the end of on-site works. All post-excavation works will be completed within twelve months of the agreement of the scope of these works.

Health & Safety

55. Rathmell Archaeology maintains high Health & Safety standards on-site and a copy of our Health & Safety policy is available. The lead archaeologist will liaise with the Main

Contractor before coming on-site to ensure that works are conducted in a safe manner.

56. Archaeological excavations will not proceed if there is a risk of structural collapse or injury. In this event recording and sampling will be carried out where possible at the depth achieved. Archaeological excavations may be restricted due to the presence of dangerous or live services or contaminants.

Project team

57. The lead Archaeologist for the monitoring will be an experienced field archaeologist and sufficient additional archaeological assistants as are required to deliver the programme of works.

58. Rathmell Archaeology will maintain close contact with Historic Environment Scotland and the West of Scotland Archaeology Service with all significant findings being reported immediately. Historic Environment Scotland will be kept informed of the progress of the project and monitoring visits during fieldwork will be facilitated if requested.

Insurance

59. Rathmell Archaeology is fully indemnified and all necessary insurances can be presented on request. A summary of insurances held is presented below:

- *Public Liability Insurance* - A policy with limit of indemnity of £5,000,000 is held with Aviva;
- *Employer's Liability Insurance* - A policy with limit of indemnity of £10,000,000 is held with Aviva; and
- *Professional Indemnity Insurance* - A policy with limit of indemnity of £1,000,000 is held with Hiscox.

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Contact Details

60. Rathmell Archaeology can be contacted at our Registered Office or through the web:

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