ARCHAEOLOGICAL GUIDELINES SERIES No. 1

Investigation and recording of buildings and standing structures

HERITAGE NEW ZEALAND
POUHERE TAONGA

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Contents

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Cover image: Westney Homestead, Mangere, Auckland (Martin Jones HNZPT IMG002).

Below image: Cotons' Cottage, Heritage New Zealand Pouhere Taonga List number 3071 (HNZPT IMG001).

1. Purpose

This document is a revised version of guidelines published in 2006 to provide information and standards for archaeological buildings investigation and recording. Since then, the importance of systematically examining buildings and standing structures to provide information about the past has been increasingly recognised. The number of projects undertaken to record and analyse above-ground fabric has correspondingly grown. Investigation has encompassed a broad spectrum of places, covering buildings and structures of many different types, materials and chronological periods.

The provisions of the Heritage New Zealand Pouhere Taonga Act 2014 (HNZPTA) require an Archaeological Authority where a pre- 1900 building is being demolished or a pre-1900 structure is being modified or demolished. In relation to the HNZPTA (2014), archaeological recording is generally applicable:

a) where a building or structure or part of a building or structure is to be demolished (Note recording is not required under the HNZPTA (2014) for a pre-1900 building unless it is to be demolished in whole);

b) where a building is to be relocated without intent to reinstate and preserve it elsewhere or a structure or part of a structure is to be relocated or otherwise significantly modified.

These guidelines are intended as a technical guide, for use by archaeologists with training or experience in this field. However, they have also been developed to inform a broader network of heritage professionals with whom archaeologists might valuably collaborate during investigative work. Such professionals include conservation architects, architectural historians, historians, specialist materials analysts, surveyors and managers of heritage places. ICOMOS' *Principles for the Recording of Monuments, Groups of Buildings and Sites* (1996) emphasises the value of collaborative approaches that include buildings archaeologists and other relevant professionals.

2. Background

Much below-ground investigation has occurred through the Archaeological Authority process, however, awareness has also increased because the archaeological examination of above-ground fabric, more generally known as buildings archaeology[1], can provide a platform for improving heritage outcomes irrespective of whether authorities or other statutory consents are required. The *ICOMOS New Zealand Charter for the Conservation of Places of Cultural Heritage Value* (2010), for example, stresses the importance of investigating and recording physical fabric to inform and guide the conservation process and its planning. Internationally, ICOMOS' *Principles for the Recording of Monuments, Groups of Buildings and Sites* (1996) provides reasons for recording that include understanding the values and evolution of cultural heritage; promoting interest and involvement in the preservation of heritage; permitting the informed management and control of any change to heritage; and ensuring that the maintenance of heritage is sensitive to its physical nature and its significance.

An advantage of buildings investigation over some other forms of archaeological endeavour, such as excavation, is that significant information can be obtained through non-destructive means. Investigation can consequently make important contributions at many stages during the heritage management process, including as part of initial heritage identification and assessment.

The purpose of the current guideline is to inform investigation and recording in a variety of situations where it is important to retrieve and interpret evidence about the past from built fabric. These include, but are not restricted to:

i) satisfying the requirements of an Archaeological Authority or resource consent;

ii) assistance in the preparation and implementation of a conservation plan;

iii) the assessment of heritage significance; and

iv) research.

1 Wood, Jason (ed.), *Buildings Archaeology: Applications in Practice*, Oxford, 1994; Morris, Richard K., *The Archaeology of Buildings*, Stroud, 2000, p.10.

3. Heritage New Zealand Pouhere Taonga Act 2014

The *Heritage New Zealand Pouhere Taonga Act 2014* (HNZPTA) is administered by Heritage New Zealand Pouhere Taonga. The purpose of the HNZPTA is to promote the identification, protection, preservation and conservation of the historical and cultural heritage of New Zealand. The HNZPTA provides overarching protection for all archaeological sites and contains an Authority (consenting) process for the recovery of a range of archaeological material which can be analysed to provide information about the people, methods and materials used to create the site. An archaeological site is defined under the HNZPTA as-

(a) Any place in New Zealand, including any building or structure (or part of a building or structure), that-

  (i) Was associated with human activity that occurred before 1900 or is the site of a wreck of any vessel whether the wreck occurred before 1900; and

  (ii) Provides or may provide, through investigation by archaeological methods, evidence relating to the history of New Zealand; and

  (iii) Includes a site for which a declaration is made under section 43(1)

An Archaeological Authority is required to be obtained from Heritage New Zealand Pouhere Taonga to lawfully modify or destroy, or cause to be modified or destroyed, the whole or any part of a site if a person knows, or ought reasonably to have suspected that the site is an archaeological site. An Archaeological Authority is required whether or not an archaeological site is recorded in the New Zealand Archaeological Association Site File (Archsite), entered on the Heritage New Zealand List Rārangi Kōrero or the National Historic Landmarks list, scheduled in a district plan, subject to permitted works under a district plan or where resource consent for demolition has been granted.

3.1. Requirements under the HNZPTA for buildings.

For the purposes of the HNZPTA a building is defined as a "structure that is temporary or permanent, whether movable or not, and which is fixed to land and intended for occupation by any person, animal, machinery, or chattel". Demolition means the destruction or removal of pre-1900 elements of a building by one or a series of related actions causing such modification that the pre-1900 elements no longer exist in their context and as an integrated whole.

An Archaeological Authority is required to be obtained under the HNZPTA when a pre-1900 building will be demolished at one time or in stages over a period of time. An Archaeological Authority is not required for invasive work above ground or modifications to a pre-1900 building. An Archaeological Authority is not required where a building is to be relocated from a site so as to reinstate and preserve it elsewhere. However, where relocation is proposed, an Archaeological Authority is required to be obtained for any works that may affect subsurface archaeological remains associated with a pre-1900 building or previous pre-1900 occupation of the property, including the site to which the relocation of a pre-1900 building is to take place.

Structural/seismic strengthening of a building does not require an Archaeological Authority, unless the works have the potential to impact on subsurface archaeological material.

3.2. Requirements under the HNZPTA for structures

According to the HNZPTA 2014, a structure "a) means a thing made by people, whether movable or not, and fixed to the land; and b) includes equipment or machinery". Structures may include bridges, wharves, dams, culverts, railway tracks, fences, stamper batteries, water races, street furniture and grave markers, for example.

An Archaeological Authority is required to be obtained when a pre-1900 structure that meets the definition of an archaeological site will be modified or destroyed.

3.3. Approval of a person to carry out an activity relating to buildings archaeology evaluation, recording and analysis under the HNZPTA

Heritage New Zealand Pouhere Taonga must approve the person proposed to undertake any archaeological work associated with an Archaeological Authority. In doing so, Heritage New Zealand Pouhere Taonga must be satisfied that the person has sufficient skill and competency to undertake the activity under such an Authority. Buildings archaeology is not a subject taught at a professional graduate level in New Zealand, which limits access to qualified skilled practitioners in this field. It is important to ensure that the person commissioned to undertake archaeological works for a particular project is suitably skilled and experienced in archaeological evaluation, recording and analysis of built fabric.

Similarly, a wider range of archaeological skill sets beyond buildings archaeology may be required on larger scale proposals involving earthworks that have the potential to affect possible subsurface archaeological features associated with historic or Maori occupation of the property. In most such instances, an integrated approach to archaeological investigation is likely to be necessary.

As with all Archaeological Authority applications, Heritage New Zealand Pouhere Taonga recommends that prospective applicants consult directly with regional Heritage New Zealand Pouhere Taonga staff at the initial planning stage for any proposal involving the potential demolition of a building, or modification or destruction of a structure and for subsequent development. This will enable targeted advice as to statutory HNZPTA requirements and ensure that appropriate competencies and scope of works are considered.

It should also be noted that consultation will be required with the relevant iwi/hapu where the building is a site of value or significance to Mana Whenua.

4. Principles of buildings archaeology

Buildings archaeology is the physical investigation of buildings and standing structures to obtain information about the past. As an established discipline in modern archaeology, it uses approaches and techniques that are shared with the investigation of in-ground material, effectively treating buildings and structures as above-ground archaeological sites. It is wide in outlook: all types of buildings/structures, activities and time periods are potentially of interest. As with perspectives on archaeological material, buildings and structures are also seen as integral parts of their surrounding landscapes.

Fig 2. The Armargh Street Bridge, Christchurch, an example of a built structure undergoing work (HNZPT IMG010)

The main reason that buildings and structures can have archaeological value is that they have been created and used by people in the past. Investigation can consequently reveal significant evidence about a range of previous human activities and attitudes, and contribute to better knowledge of New Zealand's history. The precise nature of the matters that can be examined will depend on a variety of factors, which include the particular composition, functions and history of each individual place. Importantly for archaeological approaches, the physical investigation of buildings and structures provides information that is not normally retrievable through other means.

The types of places that can be investigated extend from small individual buildings or structures such as grave enclosures and walls, to much larger edifices and complexes, for example jetties, bridges, homesteads and factories. Archaeological approaches generally require a consideration of all aspects of human activity linked with a building or structure, including its preparation, construction, development and use. They also incorporate an awareness of all material that contributes to the chronology of the site, not just original fabric, potentially encompassing structural elements, fixtures and fittings, decorative material, layers of accretion and loose artefacts of many periods. The issue of chronological change and phasing is usually central to any archaeological enquiry.

Fig.3. Recording a grave enclosure and marker (Martin Jones, HNZPT IMG003).

With regard to setting, buildings and structures do not exist in isolation and therefore should not be studied as such: they relate directly to their surroundings, and both influence and are influenced by their context. Contextual study is particularly important when a building or structure forms a component of a larger archaeological site that is being investigated. Visible features such as associated buildings and structures, including walls, fences, paths and roads. Plantings and curtilage should be considered in relation to the standing structure and its function. Similarly, evidence from in-ground archaeological material needs to be taken into account, and integrated into a broader understanding of the site.

Buildings archaeology is a specialist field, which requires specific experience and understanding of the topic. Specialist assistance and advice from other disciplines is invaluable in enabling holistic analysis.

5. The Investigative Process

The process of investigation can be divided into three stages: evaluation, recording and analysis. For most work involving Archaeological Authority and resource consent conditions, conservation plans and research, all three stages will apply.

5.1. Evaluation

Evaluation is an integral first stage in the assessment of a building or structure so as to identify and assess the potential of a building or structure to provide information of value about the past, based on an objective assessment of historical research into its historical development and context and a detailed initial examination of its physical fabric.

Parsing is a term used for the initial process of physical evaluation. Parsing requires a systematic and thorough visual inspection of the building or structure by a person skilled in the identification and assessment of buildings and structures. A site visit is necessary to fully evaluate the structure. A state of dilapidation, including where a building is run down, in poor condition, dirty, re-clad or relined, does not mean that its archaeological values and the significance of the information contained within it have been diminished.

Parsing requires a full knowledge of, or to be completed in conjunction with specialist historical research about the place. Historians and architectural historians may be required to contribute to the parsing process. This knowledge will include a summary of evidence about the ownership, construction, occupation and use of a building or structure, as well as sufficient contextual background to inform initial physical examination. Historical research should be based on primary records wherever they exist, such as land records, rate and valuation rolls, street directories, photographs, plans and maps, architects' specifications and contemporary newspaper accounts.

> *If evaluating a nineteenth-century sawmill, for example, it would be useful to have information about relevant sawmilling processes and techniques, and knowledge of typical sawmill layouts so that the structure could be assessed in relation to these aspects. General background about the broader site, the company that operated the plant, and social matters relating to the sawmilling industry would also assist greater understanding of the fabric at the parsing stage.*

A useful approach in parsing is to move from macro to micro observation, first looking at a place within its landscape setting before examining exterior parts of the structure, and then any interior spaces (including details). All accessible parts of a structure, both inside and out, should be viewed. Where possible and safe, examination should include any sub-floor and attic spaces, which often contain important information not visible in other parts of the structure. In this respect, it is important to be aware that many elements and finishes can be concealed behind later plasterboard, wallpaper, and other coverings. Sometimes, these earlier components can be seen in concealed or lesser-used spaces such as cupboards. Basic stratigraphic observation should also be undertaken at this stage to obtain a broad outline of the chronological development of the building or structure.

The objective of evaluation is to develop a full understanding of a structures history, change through time and significance. This information should be discussed with clients and owners, as it informs the level of mitigation and recording that will be required under the HNZPTA (2014) and the RMA (1991).

In most cases the evaluation will form the foundation of a research strategy, which guides the aims and parameters of any further investigative work. Most importantly, the evaluation stage assists the buildings archaeologist to consider the scope of the recording required, including what level of recording is appropriate,

what techniques might be used and what additional specialist input may be necessary. It may be that on any given structure or building several levels of recording may be required.

Where the building or structure is part of a larger archaeological site that is being investigated, it is anticipated that the research design will encompass consideration of any additional buildings or structures, curtilage (including plantings, paths, gardens) and in-ground deposits, ensuring that the overall work programme is integrated in relation to both any future works and the research questions being asked.

Understanding the chronological phasing of a building or structure through archaeological means is considered an essential part of any archaeological investigation. Additional aims, however, will vary according to the type and historical context of each building or structure, and other factors. Research designs may adopt a multi-faceted approach acknowledging the varied potential of archaeological fabric. For example, the investigation of a church might include questions about how its changing layout, access arrangements and ornamentation illuminate shifting attitudes to religious identity and worship; or how the finish and source of its materials reflect historical production techniques and trading patterns; or how its construction methods indicate the ethnic origins, craft organisation or other influences of its designers and builders. Other aims may also be adopted, such as those involving the establishment of chronological sequences for artefact types such as nails, roofing tiles, colour schemes or wallpaper.

Some of the basic questions that can be asked, and which should be borne in mind both during initial parsing/ evaluation and the formulation of a research design to inform appropriate recording include:

1. What does/did the building or structure look like?
    - What architectural style is it
    - What form does it have
    - What types or styles of decoration does it contain
    - What was the original colour scheme and or finishes[2]

2. What is the building or structure made of?
    - What do the materials consist of (i.e. composition)
    - Where did the material come from (i.e. origins)
    - How was the material created (i.e. manufacture)

3. How was the building or structure created/put together?
    - What are the construction methods, techniques used
    - Are these used consistently throughout the building or structure
    - How were other contributing fabric affixed e.g. wallpaper, paint, fixtures and fittings etc.

4. How was the building or structure used?
    - Layout of rooms, spaces, features (e.g. fireplaces), etc.
    - Access arrangements (e.g. location of doors and staircases)
    - Elements indicative of activity and use (e.g. cupboards, appliances, dados, light fittings, wear marks, mechanisms etc.)

2 Locating and systematically recording paint and wallpaper samples is an important factor to consider in the recording process, as buildings archaeology often provides the primary source of information about early colour schemes, whether it be to inform a restoration project or as part of general recording of changes over time. A useful guide for the identification of paint colour schemes and wallpaper samples can be found in: Arden, Stuart and Ian Bowman, The New Zealand Period House: A Conservation Guide, Wellington, 2004, pp.203-11.

5. How did all of the above alter or change through time, and what is the evidence of this change?

These questions (and others), can assist in addressing a variety of higher-level issues, such as those linked with:

- Technological development
- Organisation of industry/labour
- Spread of ideas
- Trade
- Social relations
- Identity
- Environment
- A variety of issues linked with usage, depending on the function(s) of a place

Figure 5. Wallpaper layering at Bedggood Cottage, Waimate (HNZPT IMG011)

For further information about developing research strategies refer to NZHPT Guidelines Series No.3 Guidelines for Research Strategies. It should be emphasised that a research strategy should take the impact of any works being proposed into account. For example, proposed demolition of an entire structure is likely to entail a different approach to that carried out purely for research purposes where no modification is proposed.

The Heritage New Zealand Pouhere Taonga Building Recording Levels have been developed so that the level of building and structure recording can be appropriately quantified. They exist so that practitioners and regulatory agencies can refer to a standardised expectation of what will be recorded under Archaeological Authorities issued by Heritage New Zealand Pouhere Taonga. The archaeological value of the structure will inform the level of building recording that is required.

Building recording level requirements may vary across a structure or structures depending on the archaeological value of the parts. A building or structure that has developed or been modified at different chronological stages may not all have the same value. The degree of archaeological value can also be affected by the quality of preservation, rarity of the building/structure and its fabric and the extent to which their investigation can fill previously unexplored gaps in recorded information or knowledge about the past, including everyday activities that could be considered typical or representative within its locality or among a broader population. It is anticipated that if a building or structure, or part of a building or structure is of particular significance then the level of recording shall be increased to capture the appropriate amount of information.

Health and safety issues can also have a direct effect on the consideration of appropriate recording. In particular, risk assessments, access issues and hazardous materials may influence how a structure or building is recorded and to what level. Any issues that may limit recording should be identified at the evaluation stage and appropriate recording approaches identified.

Fig. 6. Coastwatcher Hut works on Auckland Islands (HNZPT IMG005)

5.2. Recording

Recording involves the capture of information about physical fabric and related aspects of a building or structure. This occurs through the transformation of on-site evidence into a portable archive. It will generally involve the creation of drawn, written and photographic records, and may also include the collection of samples and loose artefacts. Recording should be both descriptive and analytical, encompassing interpretation of what is being recorded.

The recording process may document information about successive layers of fabric exposed as a result of controlled removal. It may include the creation of stratigraphic diagrams or matrices to map chronological development and change. It is important that recording should serve the aims set out in the research strategy, although such aims may be modified when new and unexpected evidence is encountered. Especially when undertaken in conjunction with demolition or modification work, recording work will need to be carefully programmed. Recording should be carried out before alteration takes place, as well as during (and sometimes after) subsequent modification. From an archaeological perspective, recording during the modification process can be especially productive.

Standards of recording need to be consistent to enable comparisons at both a local, regional and national level to highlight regional variations and facilitate contextual analysis that may contribute toward broader frameworks for archaeological interpretation.

It is also important to record to a standard that provides a permanent record of the building or structure that can be used by future researchers. This is of particular importance where demolition or destruction of heritage fabric is proposed, as the archive is all that will survive of the site. The collected data therefore has to be thorough, accurate, accessible and reusable to all. All records should consequently be of archival quality, and capable of permanent or long-term storage.

5.3. Heritage New Zealand Pouhere Taonga levels of building recording

Recording levels are commensurate with the archaeological value of a building or structure and can be applied as a minimum standard for the recording of a range of buildings or structures identified as worthy of recording irrespective of legislative requirements. In relation to the HNZPTA (2014), archaeological recording is generally applicable:

a) where a building or structure or part of a building or structure is to be demolished (Note recording is not required under the HNZPTA (2014) for a pre-1900 building unless it is to be demolished in whole);

b) where a building is to be relocated without intent to reinstate and preserve it elsewhere or a structure or part of a structure is to be relocated or otherwise significantly modified.

Level I

This level is applicable as a minimum for recording for a building or structure of high archaeological value. The recording shall include:

- Measured drawings of all interior and exterior elevations.
- Recording of the internal timber frame of the building or structure (as necessary).
- Measured drawings of overall building/structure, including where relevant, all floor plans, ceiling plans and roof plans
- Subfloor plans, including floor joists, bearers, wall footings or piles.
- Plans and sections (as necessary) to record ceiling joists and roof structures.
- Cross sections to show interaction of building elements and spaces (as necessary).
- Comprehensive written description of the structural elements.
- Comprehensive written description of the exterior.
- Comprehensive written description of each room.
- Comprehensive written description of the building's /structure's development over time (potentially including a full stratigraphic matrix).
- Comprehensive photography.
- Extensive sampling of historic fabric.

Level II

This level is applicable as a minimum for recording of a building or structure of medium archaeological/ heritage value. The recording shall include:

- Measured drawings of all principal interior and exterior elevations.
- Recording of the principal parts of the internal timber frame of the building or structure (as necessary).
- Measured drawings of overall building/structure, including where relevant, all floor plans, ceiling plans and roof plans
- Subfloor plans, including floor joists, bearers, wall footings or piles.
- Plans and sections (as necessary) to record ceiling joists and roof structures.
- Cross sections to show interaction of building elements and spaces (as necessary).
- Detailed written description of the structural elements.
- Detailed written description of the exterior.
- Detailed written description of each room.
- Detailed written description of the building's/structure's development over time (potentially including a stratigraphic matrix or matrices).
- Extensive photography.
- Selective sampling of historic fabric.

Level III

Level III is a low level of building recording. This level is applicable as a minimum for recording of a building or structure of low archaeological value. The recording shall include:

- Outline measured drawings or sketches
- Written annotation on measured drawings or sketches
- Written description of the building or structure
- Limited photography
- Limited sampling of relevant historic fabric

5.4. Analysis

The analysis phase of a recording project examines physical evidence relating to chronology and other research aspects collected during recording and combines it with evidence from artefact and sample analysis, comparative work and further documentary research. Discrepancies between different forms of evidence (e.g. stratigraphic, typological, scientific and documentary) should be noted and discussed.

Where building recording forms part of a broader archaeological investigation, it is expected that analysis will also integrate the results of this investigation and the recording of any subsurface features associated with the context of the building(s) or structure(s) to provide an overall history and interpretation of the site and its components. Analysis should encompass the evidence provided by all site components.

> *As an example, chronological phasing and analysis of the dendrochonological wood samples from timbers on the western end of the original building taken during deconstruction of the Scott House in Mangere, identified a discrepancy of 11 years between the original felling date of timbers and issue of title to the land. Combined with evidence of cuts in the framing and modifications to the top plate in this section, the evidence indicated a strong possibility that original part of the building had been relocated from elsewhere and reused, and had not been constructed entirely on site in 1865 as first thought. This conclusion also took into account evidence from in-ground investigation, where an absence of nails beneath the relocated structure and other factors supported this conclusion.*[3]

3 Furey, Louise, 'Excavations at Scott Farmstead, Ihumatao', Report to the New Zealand Historic Places Trust and Auckland International Airport Ltd, May 2011.

6. Recording techniques and standards

The following subsections provide a range of appropriate techniques and standards for recording buildings and structures as part of standard best practice. Recording techniques include the production of drawn, written and photographic records. Each technique has its own merits although they are best used in combination.

Measured drawings offer an effective means for systematically gathering evidence about a structure or building and conveying accurate visual information about its appearance. Written records enable more detailed evidence to be captured, including the composition and finish of materials, the configuration of stratigraphic relationships (such as through stratigraphic matrices) and other aspects of chronological development. Photographic recording is a rapid way of capturing descriptive information and usefully conveys aspects of visual appearance. However, it is less valuable in terms of archaeologically analysing a structure or building. The techniques included in the following sub-sections must be within the capabilities and experience of the archaeologist involved with the project.

Depending on the specifics of the project not all of these techniques may be appropriate. Some may not be suitable or possible due to the local conditions, and the approach to recording may have to be modified. It is entirely acceptable that several different methods be employed to record aspects of a building or structure, however, in all cases recording should be carried out at a level that is appropriate to the project, dependant on factors such as the archaeological and other value of the material being investigated, and the nature and impact of the works being carried out.

6.1. Measured drawings

Measured drawings should be produced as plans, elevations and sections. The basic principle is to transform the three dimensional object into a series of two dimensional orthographic drawings. Further illustration in the form of isometric, axiomatic or reconstruction drawings can be valuable for the presentation of information in a final report, but will not normally be required as part of the recording process.

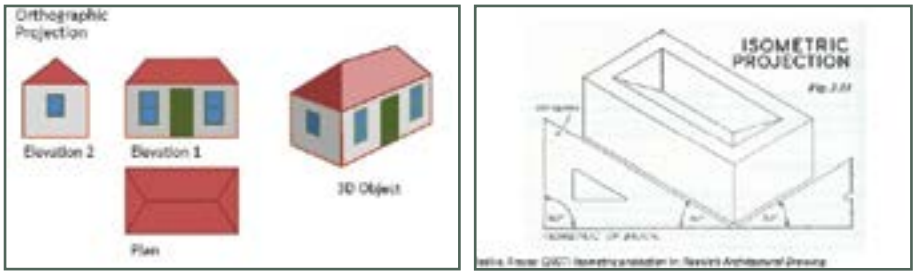

Fig. 7. Examples of two dimensional drawing method (Wesley Maguire IMG006 and IMG007).

Plans, elevations and sections should incorporate all relevant elements that contribute to an understanding of the design, construction, development and use of the structure or building, including structural material, decorative elements, and information relating to alteration and wear. There are multiple methods which can be used in the production of measured drawings. These are generally split into two groups: direct recording and indirect recording.

Direct recording	Indirect recording
Hand drawing	Rectified photography
	Orthophotography
	Photogrammetry
	Laser scanning

Direct recording involves the production of the measured drawing while on site. This method encourages the recorder to interact directly with the subject so that they consider and interpret what they are recording while capture is taking place.

Indirect recording involves the capture of information on site with the actual measured drawings being produced afterward from the obtained information. Indirect methods are valuable for the mass capture of data, but do not require as much direct interaction with the subject and do not make up for primary observation and interpretation.

There are advantages to each approach and the individual techniques have specific uses. This guideline does not intend to discuss each individual technique in detail, but guidance is included for hand drawing as this technique will be the most familiar to archaeologists. The use of the other methods will require specialist experience, but they have some advantages over hand drawing in terms of accessing some unreachable parts of structures and in terms of speed of data capture. Lack of experience should not determine which technique is used. The appropriate method should be utilised to capture the appropriate level of detail.

6.2. Hand drawing

In most instances, it is important that the measured drawings accurately depict the material that exists rather than display an idealised version through the use of artificially straight lines, level planes or exact right angles. Survey equipment will ensure appropriate levels of accuracy. In some lower-level recording, artificially level planes (such as from a top plate or base plate) may be appropriately employed, providing significant information is not overly distorted.

All drawings should be of archival quality – normally 4H pencil on Permatrace (waterproof draughting film) – with a title and indications of scale, orientation, date of illustration and author. The drawing be produced from the field drawing for inclusion within final reporting can be made using hand draughting or the use of vector drawing software or CAD software.

6.3. Recommended scale for field drawings

Floor plans	1:50 or 1:20
Roof and ceiling plans(showing disposition of roof/ ceiling timbers)	1:50 or 1:20
Elevations (interior/ exterior)	1:50 or 1:20
Sections (across and along building or structure)	1:50 or 1:20
Joinery details	1:20 or 1:10
Other significant details	1:20 or 1:10
Moulding profiles	1:2 or 1:1
Phased plans and elevations	Scale flexible, as appropriate

With the exception of standard hand drawn recording, the other recording methods will require the production of measured drawings using a computer software programme which translates the digitally captured data. Both indirect and direct recording of structures using equipment such as a total station, photogrammetry and laser scanning capture the data in three-dimensional (3D) space. In order to generate useful measured drawings a software programme also functioning in 3D must be used. CAD or computer-aided design is a class of programme which is designed to deal specifically with 3D data.

There are many different software manufactures of CAD programmes. Irrespective of which one is used, all measured drawings that are to be included in a final report must contain certain standard elements (see 6.4). These elements are less important when illustrating particular features in detail drawings. It is necessary to indicate where features in detail drawings are located on the smaller scale drawings, so that their context can be easily understood. It is expected that an overall site plan will be included within the report to show the building or structure within its original context.

6.4. Final report drawing

Final report drawings must include the following:

Plans	Elevations and sections
North arrow	Legend or annotation
Legend or annotation	Descriptive title
Descriptive title	Scale
Scale	Ground levels - both external and subfloor
Ceiling heights and floor height may also be included	

When producing measured drawings to be included in a final report, it is important to be consistent in the presentation and layout of the drawings so that they are easily understandable and easy to interpret. It is also necessary that these drawings be provided at a standard metric scale e.g. 1:20, 1:50 or 1:100, depending on the scale of the subject. Although it is acknowledged that the drawing may not be fully legible at either A4 or A3, it is expected that they will be included within the final report at these sizes and supplementary drawings will be supplied at larger scales on larger paper. A bar scale should also be included, as plans are often copied or reproduced in new formats and it can be difficult to determine if they are at the same size as the original. Depending on the complexity of annotation that has to be included on the drawing it may be advisable to include un-annotated versions of the drawings to clearly show the subject.

Irrespective of what technique is used to produce the measured drawing, it should be noted that the building/ structure should be recorded in its current condition. If desired, a reconstructed drawing can be included within the final report as part of the presentation and interpretation. For standardised drawing conventions, a useful reference is by English Heritage on Understanding Historic Buildings (for further details see suggested further reading) although other conventions may be used if an appropriate legend or key is included.

6.5. Benefits and limitations of laser scanning and photogrammetry

3D laser scanning is a useful technique for capturing large amounts of data about a structure, and producing three dimensional representations. However, it should be noted that the final outcome should be to generate measured drawings from the captured data (a 3D point cloud) in the form of orthographic plans, elevations and sections. Unless these line drawings are produced there is no way to adequately include the three dimensional data in a conventional report. In addition, capturing a dense point cloud does not mean that all relevant information will be obtained. Some fabric can, for example, be inaccessible to or concealed from the scanner, and require recording using alternative methods. Also, it is still necessary to observe the building first hand to determine stratigraphic relationships, and to interpret and understand how elements of the structure relate to modification over time.

For further information on 3D laser scanning refer to the Historic England publication - *3D Laser Scanning for Heritage*.

Photogrammetry has some advantages over laser scanning both in relation to cost and ease of access to appropriate equipment and software. Some of the caveats that exist for laser scanning also apply to photogrammetry. For example, capture may include data that is not relevant to the investigation, while conversely not all relevant information will necessarily be obtained. As with laser scanning it is also important to ground-truth, and sift or add to the information using direct, on-site examination. In many cases, combining photogrammetry with other techniques, including hand drawing, may be appropriate.

6.6. Written accounts

Written notes and related information should be of archival quality, which will include a copy in non-digital format. They will usually be compiled in conjunction with detailed scale drawings, and should include the clear and systematic labelling of all information portrayed on such illustrations. In complicated instances or when dealing with fabric of high significance, a full stratigraphic record of a structure – or part of a structure – may be of value, with pro-forma sheets for the description of each appropriate component part and a stratigraphic matrix detailing their chronological order. In many cases, an intermediate approach is likely to be sufficient, with separate descriptions and preliminary interpretations supplementing the other records. Accurate architectural terminology must be employed.

Figs. 8 and 9. A written summary of stratigraphic units or 'events' (above) and a phased, stratigraphic diagram illustrating the chronological relationships between these events (below) (Martin Jones IMG008 and IMG009).

Generally, written notes fall under two categories: descriptive and interpretive.

Descriptive

- General relationship between the building/structure and its setting
  - e.g. other buildings/structures, curtilage layout, curtilage boundaries, gardens, access roads, streetscape etc
- General description of building/structure exterior
  - Including general materials, methods of construction, dimensions, overall shape and form
- General description of building/structure interior
  - Including overall layout
- Systematic description of each room/ space
  - Including architectural elements, decorative schemes, fixtures and fittings, evidence of use/ wear and alteration. Information should include the description of materials, construction methods, visual appearance and dimensions as appropriate. Note: the attic and subfloor each count as a space, as does the exterior
- Index of all drawings, photographs, finds and samples.

Primary interpretation

- Evidence for overall chronological development, including stratigraphic relationships, typological information and artefactual evidence
- Evidence for original and changing use
- Initial comparison of original plans (if available) with the structure as built
- Initial comparison of evidence with that from other known documentary sources e.g. photographs, sketches and written accounts
- Summary account of the preliminary phasing (incorporating plan, form, function and age), based on all of the above.

6.7. Photography

Photography for archaeology has traditionally been undertaken using 35mm cameras with black and white print and colour slide film. Medium or large format film cameras can also be used for higher quality photographs, but will likely require specialist assistance as they are beyond the capabilities of the average user. The advantage of using black and white film is that, subject to particular development processes being followed, it is recognised as being archivally stable.

With the growth of digital photography, the use of 35mm photography has become less common and digital images have become widely accepted as the standard in archaeology, offering some significant advantages over analogue photography, including cost. Problems with equipment, incorrect exposure or focus, blurred images, cluttered edges and poor depth of field can all be detected during the course of a project and corrected. It is also possible to backup images at any time during a project. With analogue photography there is no way to guarantee a quality record has been produced, or that a set of images are safe, until the film has been developed. However there are some caveats to the use of digital photography.

A digital SLR with good lenses and a high megapixel count (10+ MP) should be used for recording work so that high quality images are acquired. In addition to this the camera should be set to record using a raw file format. This raw file should not be modified – it should be considered to be the 'digital negative'. Many authorities recommend that these images be converted to uncompressed baseline v.6 TIFF for archiving.[4] All images should have accompanying metadata specifying: photo ID, capture device, converting software, colour space, bit depth, resolution, date of capture, photographer, caption, and any alterations made to the image.

Jpegs can be taken at the same time, and be used to both disseminate images and include in produced reports. They are also valuable as 'aides-memoires'. Jpeg files should not be used for long term storage as they involve compression of the image data which can lead to a reduction in image quality.

The following table sets out what needs to be photographed for the adequate recording of a building or structure. It is anticipated that a photographic scale will be included in all images with the exception of contextual shots and photographs of difficult-to-access details. It is also expected that elevation photographs should be taken as square to the subject as is possible. Detail photographs can be taken from an angled viewpoint to illustrate features that do not show in square on photographs. It is common practice within conservation architecture to prepare a site or building plan which contains the viewpoints for each of the photographs marked. This should be included within the archaeological report.

4 Wessex Archaeology, Photographic Policy, Draft, Feb 2014; Historic England, *Digital Image Capture and File Storage: Guidelines for Best Practice*, Jul 2015, p. 6.

6.8. Photographic recording

Photographic recording should generally consider the following perspectives:

Context: Broad views showing relationship to setting, other buildings/structures or significant viewpoints (e.g. streetscape, yards, gardens, boundary walls)
Exterior: Tighter views of building/structure Principal elevation (frontage) Other elevations Roof Typical elements (chimneys, doors, windows, eaves, fixtures and fittings etc.) Significant features (steps, verandahs construction evidence, finishes, wear marks and other evidence of use, evidence of modification etc.)
Interior: General views of interior layout Individual rooms/spaces (including roof space, attics, subfloor areas, basements) Interior elevations, floors and ceilings Typical elements (doors, architraves, windows, fixtures and fittings etc.) Significant features (staircases, fireplaces, décor, construction evidence, wear marks and other evidence of use, evidence of modification etc.) Relevant chattels and artefacts

6.9. Sampling and artefact collection

The collection of sample material from a building or structure depends on the project strategy, including the research aims and level of recording. Materials that may be sampled include wood, mortar, plaster, brick, glass, ironwork, wallpaper and paint. Sampling can occur for various reasons. For example, it can be used to address specific issues linked with construction and use. Alternatively, it may be carried out to create reference collections. Some materials can be sampled for more than one purpose. Wood, for instance, can be sampled to provide basic identification of tree species used in construction. In the case of kauri, it can also be sampled for dendrochronological purposes, to provide felling dates for individual timbers. Specialist advice from materials analysts should be obtained prior to samples being taken.

Attention should similarly be paid to loose artefacts found behind linings, in roof spaces, subfloor areas etc. These items will frequently have been deposited during the occupation of the building and can yield valuable information about the occupants of buildings, and the use of space within the structure. At Winstone's Stables in Auckland, for example, preserved material behind linings included grain for feeding horses as well as items such as alcohol bottles that may have been illicitly concealed by members of the workforce. Outbuildings, roof spaces and basement/subfloor areas were often used to store elements removed from a main building over time.

All samples and artefacts should be bagged, numbered and labelled to ensure stratigraphic information is retained. Details and (where appropriate) photographs of each sample should be included within the final archaeological report as appendices so that the collected samples are accessible for future research.

7. Steps in Buildings/Structure Recording Project

CONSULTATION

Discussions with Heritage New Zealand Pouhere Taonga Regional staff re scope

Contracting professionally skilled buildings archaeologist

EVALUATION

Outline of scope of works

Documentary and other historical research

Parsing/investigation& assessment of observed physical fabric

Formation of research design

Identification of appropriate recording methods and levels.

Written assessment for statutory consents

Obtain necessary consents

RECORDING

Field drawings

Photographic images

Written information

Stratigraphic diagrams or matrices (as appropriate)

Sampling of materials and artefact collection

ANALYSIS

Compile results of physical evidence, including sample and artefact analysis

Integrate with results of broader investigation, additional historical research

Interpretation

Final report & archive.

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9. Glossary

Abutment: The part of a building or structure receiving and supporting the thrust of an arch, vault or strut.

Arch: A curved construction which spans an opening or space and is designed to support a vertical load.

Architrave: A moulded or decorative band surrounding a door or window opening.

Ashlar: Finely dressed building stone which is squared on all faces.

Baluster: One of the closely spaced upright supports for a railing or **Coping**.

Balustrade: A railing with supporting **Balusters**.

Banister: The hand rail at the top of a **Balustrade**.

Barge Board: A board attached to the projecting end of a gable or lean-to roof which covers the ends of the roof members.

Base Board: A board on the exterior of a building which covers the gap between the ground and the cladding of the building.

Bay Window: A window, or series of windows, which project outward from a room to form an alcove within the room. A bay window which does not reach the ground and is supported by Corbels or Brackets on the exterior is called an **Oriel Window**.

Bearer: A structural member, resting directly on the foundations, which carries the joists.

Blocking: Sections of timber secured between **Joists** to stabilise a floor. Also known as strutting.

Board and Batten: Cladding made up of wide boards and narrow battens, to cover the joints between the boards. Often used vertically as exterior cladding, but can also be used internally as decorative ceilings.

Bottom Plate: The bottom horizontal member of a timber framed wall to which the vertical Studs are generally attached. Also referred to as a base plate or soleplate.

Bow Window: Similar to a **Bay Window**, but the window units are set in a curved arrangement.

Boxed Corner: A method of covering the corners of a weatherboard structure where cover boards are attached over the weatherboards, so that corner is weathertight. Commonly found in conjunction with **Scribers**.

Brace: a subsidiary member that is set diagonally to add strength to a frame.

Bracket: A structural or decorative piece which projects from a wall and provides support for other features.

Brick: A masonry unit of uniform size manufactured from fired clay.

Brickwork: A form of **Masonry Construction** using **Bricks** and mortar in a variety of bonding patterns with a variety of mortar joints.

Casement: A window unit hinged at one side.

Chamfer: A 45° bevelled corner on a timber or masonry element.

Cob: Walling material made of mixed water, clay and other components, including straw or similar vegetation.

Collar: A horizontal timber connecting two opposing **Rafters**, usually attached to the upper half of the rafters. Also referred to as a collar tie.

Conduit: Tubing used to contain electrical or telephone wires.

Coping: A cap or covering on the top of a wall, which may be either flat or sloping to throw off water.

Corbel: A structural piece of brick, stone, wood or other material that projects from a wall and acts as a support for other features.

Corner Stop: A method of forming the corners of a weatherboard structure where the weatherboards butt against a solid corner piece. Also referred to as an angle stop corner.

Cornice: An ornamental moulding around the edge of a ceiling which covers the join between the ceiling and the wall. Also a continuous moulded projection on the exterior of a structure that crowns a wall and divides the wall from the roof. Also referred to as a crown moulding.

Cover Board: Any board used to cover a joint.

Cripple Stud: A short section of Stud used within a timber framed wall, below or above a framed opening such as a window.

Cross Bridging: Sections of batten placed in an "X" formation between Joists. Cross Bridging performs the same function as **Blocking**. Also referred to as herringbone strutting.

Dado: The lower part of a wall, below the **Dado Rail** and above the **Skirting Board**. This portion of the wall often receives special treatment for decorative effect.

Dado Rail: A moulded rail at the top of the **Dado** which was originally intended to protect the wall from damage and wear particularly from the backs of chairs. Also referred to as a chair rail.

Dormer Window: A vertically mounted window housed in a projection built out from the plane of a sloping roof.

Double Hung Window: A window with two vertically sliding **Sash** units.

Dry Masonry: A form of **Masonry Construction** that eschews the use of mortar, as in the case of drystone walling. Also referred to as dry set masonry.

Eaves: The lower edge of a roof which overhangs the face of a wall.

Eaves Bracket: An ornamental **Bracket** used on the underside of **Eaves**.

Encaustic Tile: Ceramic tiles where the colour of the tile comes from the body clay and not the glaze. These type of tiles became popular during the Gothic Revival period and were commonly used in entranceways and hallways arranged in tessellated patterns.

Fanlight: A semi-circular or elliptical window placed above a doorway or other window. Can also refer to any small window above a door or larger window. The latter is also referred to as a transom window.

Fascia Board: A board on the outside of a building which runs just below the edge of the roof and caps the end of rafters. The Fascia Board is commonly used to hold a gutter and can also be referred to as a gutter board.

Finial: A narrow decorative element attached to the apex of a gable.

Fretwork: Decorative timber elements with cut out patterns which were often applied to **Verandahs** and **Eaves** during the Victorian period.

Frieze: On the exterior of a building a frieze is part of Classical architecture and forms part of the entablature of a building. In reference to the interior of a building the frieze of a room is the section of wall above the **Picture Rail** but below the **Cornice**. This term also applies to any internal decoration applied in this location.

Joist: One of a series of parallel structural beams used to support ceilings and floors.

Lath: A thin timber strip, often attached to larger members and clad with wall or ceiling plaster.

Ledged and Braced Door: A type of door formed from planks and battens with a characteristic "Z" pattern of battens on the rear.

Light: An individual pane of glass within a window sash. Early windows were made up of multiple lights within an individual **Sash** unit.

Lintel: A horizontal beam that bridges the top of an aperture or opening. In timber framing, also referred to as a window header or door header.

Masonry Construction: The method of construction where units of natural or manufactured material are used. The most common materials used for masonry construction are stone, brick and concrete block. Masonry construction is usually, but not always, mortar-bonded (see **Dry Masonry**).

Matchlining: **Tongue and Groove** boards which are specifically used to line the interior walls and ceilings of a structure. The edges of the boards commonly have a beaded detail along their joints. Matchlining is often used in kitchens, bathrooms and the interiors of shops.

Mortice Lock: A lock set into the thickness of a door. Also referred to as a mortise lock.

Moulding: Shaped pieces of timber which have been given a decorative profile to be used for **Skirting Boards**, **Architraves**, **Cornices** etc.

Mullion: A vertical support between the individual **Lights** of a window unit.

Newel Post: The post which supports the end of the **Banister** at the top or bottom of a staircase.

Nog: Short length of timber between **Studs** to stabilise a wall and/or facilitate lining materials to be attached. Also referred to as a dwang.

Oriel Window: Similar to a **Bay Window**, but the window does not reach ground level and is supported on the exterior by **Corbels** or **Brackets**.

Pile: Supporting element beneath a Bearer or **Bottom Plate** that allows a timber building or structure to sit off the ground, usually of timber but sometimes of **Masonry Construction**, ceramic or other material. Also referred to as a stump.

Plinth: A continuous projection which runs across the base of a wall.

Purlin: A longitudinal element of a roof structure which runs between the **Rafters**.

Quoin: Alternating blocks at the corners of masonry buildings. These can be structural or decorative elements.

Rail and Stile Door: The typical method for making a panelled door. The door is constructed from vertical rails and horizontal stiles which are joined together to contain the wooden panels of the door.

Rafter: One of a series of parallel structural beams used to form the slope of a pitched roof.

Register Grate: A cast iron fire grate which has an adjustable plate above the fire to control the draught in the flue.

Ridge Piece: A horizontal member along the apex of a ridged roof, which may consist of a ridge board or another type of longitudinal piece.

Rim Lock: A lock mounted on the interior face of a door rather than being set into the thickness of the door.

Riser: The vertical face of a step on a staircase.

Sarking: Close fitted lining boards applied to internal walls or to the external face of rafters in a roof. These boards are commonly left rough sawn as they are not intended to be seen in the finished structure.

Sash: The framework of a window which supports the **Lights** of the window.

Scriber: A thin piece of wood with one edge shaped to match the wall cladding, often associated with **Boxed Corners** or exterior **Architraves**.

Shake: Roofing material similar to a **Shingle**, but shakes were split from timber bolts rather than sawn. Can also refer to a defect in a piece of timber.

Shingle: A thin section of timber which was sawn from a larger bolt of timber. Shingles were applied to the roof, or sometimes walls, of a building in an overlapping manner to provide a waterproof layer.

Sill: A horizontal member at the base of a window or door opening. Also referred to as a cill.

Skirting Board: Decorative moulded board used within a building's interior to cover the join between the floor and the wall and to protect the wall from wear.

Soffit: The horizontal board which forms the underside of the **Eaves**. The term also refers to the underside of any architectural element.

String: The sloping board on the side of a staircase which supports the **Treads** and **Risers**.

Stud: The vertical timber elements in a timber framed wall.

Tongue and Groove: A method of joining timber boards together so they fit closely edge to edge. Each piece has a groove cut into one edge and a thin projecting tongue on the opposite edge, which allows multiple boards to be joined together. **Matchlining** and floor boards commonly have Tongue and Groove joints.

Top Plate: The upper horizontal member of a framed wall to which the vertical **Studs** are attached.

Transom: A horizontal support between the individual **Lights** of a window unit.

Tread: The horizontal surface of a step on a staircase.

Verandah: A roofed porch, supported by posts, which extends across the front, sides or rear of a building. Also referred to as a veranda.

Vermin Plate: Where the floor boards of a room project into the wall cavity and seal it off from the underfloor space. An independent horizontal timber beam or plate may also perform the same function.

Vernacular Building: "A building designed by an amateur without any training in design; the individual will have been guided by a series of conventions built up in his locality, paying little attention to what may be fashionable. The function of the building would be the dominant factor, aesthetic considerations, though present to some small degree, being quite minimal. Local materials would be used as a matter of course, other materials being chosen and imported quite exceptionally." Brunskill, R.W. *Illustrated Handbook of Vernacular Architecture* (4th ed.), Faber and Faber: London: 2000.

Wattling: Method of wall construction made up of woven wattles that are clad with mud, clay or plaster.

Wainscotting: Wainscotting has come to refer to the use of wood panelling on the lower portion of an interior wall, below the **Dado Rail** and above the **Skirting Board**. **Tongue** and **Groove** boards are commonly used for this purpose.

Weatherboard: External timber cladding or sheathing board, usually arranged horizontally on a wall.

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10. Acknowledgements

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