THE ARCHAEOLOGICAL STANDARD METHOD OF MEASUREMENT

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# Who is this for?

This document provides advice on using a **Bill of Quantities (BQ)** approach to procuring archaeological work. While it has been produced primarily with reference to the UK development and construction sectors, it is adaptable to archaeological work in different settings and different countries.

This document is for people commissioning or undertaking archaeological work. Specifically, those involved in the tendering, commissioning, monitoring of contracts and paying for work – on either side of those tasks.

## Background knowledge required

This document is appropriate for users whose experience might range from never having heard of a Bill of Quantities, to those that regularly use them – if the latter is the case for you, you may find some sections cover topics with which you are already familiar.

Some knowledge of the process of archaeological work in the planning system would be helpful. A good concise resource to read is: [Historic England Advice Note 17: Planning and Archaeology](https://historicengland.org.uk/images-books/publications/planning-archaeology-advice-note-17/)[[1]](#footnote-2).

This knowledge does not need to be in-depth but an understanding of key concepts, such as how a **Written Scheme of Investigation (WSI)** will dictate some of the requirements of the work undertaken, is key.

# Introduction

Predicting the quality and quantity of archaeological discoveries is not possible. Any quotations for archaeological excavations can only ever be estimates, with a high likelihood that some form of variation to an archaeological project will be required. The Royal Institution of Chartered Surveyors (RICS) advises the use of an **approximate bill of quantities** when ‘…there is great uncertainty in certain elements, such as major **excavation** and earthworks’[[2]](#footnote-3).

A **bill of quantities** is a process where tendering and payment is based on per unit costs of outcomes/tasks. In archaeology these units might be interventions (boreholes, trenches, sample collection, etc.), or volumes of soil, or features investigated (walls, postholes, graves, etc.), or quantities of artefacts (ceramics, flints, bones, etc.) or even the weight of artefacts. An **approximate BQ** in when the tendering is based on initial, estimated, quantities of those units, but as the project progresses the quantities are revised – called **remeasurement** by surveyors - and payment(s) are made based on those revised/remeasured quantities, so negating the need to initiate a contract variation.

# Benefits of a BQ

Such an approach benefits all involved by:

* variations between the tendered and actual works undertaken are equitably adjusted thus ensuring the contractor is reimbursed accordingly, removing over-/under-estimating risks i.e. risk sharing;
* saving the time/money of preparing bespoke project designs/bids;
* presenting all tenders in a consistent manner, ensuring they are easy to compare, which saves tender commissioners the time/money spent trying to compare different bespoke proposals;
* provides consistency, clarity and recognisable measures of output which can be tracked and verified against a programme of work;
* reducing the risk of misinterpretation in pricing;
* building trust between clients and contractors, because there is a framework to understand any cost increases or decreases.

Essentially, it removes the guesswork from bidding, and conversely in analysing bids, together with decreasing opacity of project costs, while reducing risks and improving relationships/understanding.

## The Archaeological Standard Method of Measurement

The Archaeological Standard Method of Measurement (ASMM) is a framework by which archaeological works can be priced and paid for through the use of a BQ.

It is inspired by the RICS **new rules of measurement** (NRM)[[3]](#footnote-4). The ASMM is a suite of documents written to provide a set of measurement best practice methods that can be understood by anyone involved in an archaeological project. The text is accompanied by a Template BQ to support the process of creating and using an archaeological BQ.

# Terminologies

Some definitions have been taken directly from the RICS **new rules of measurement** (NRM) and the **CIRIA: Archaeology and construction: good practice guide**[[4]](#footnote-5)(CIRIA), to avoid creating confusion with different definitions and are referenced accordingly.

**Bill of quantities (BQ):** A list of items giving detailed identifying descriptions and quantities of the work comprising a contract. There are two types of BQ:

* firm (to obtain a lump sum price for a fully designed building project) or
* approximate (subject to remeasurement as built). (NRM)

**Costings**: the product of 'Quantity' multiplied by 'Rate/Unit', which gives the anticipated cost of that task.

**Desk-based Assessment:** Uses existing information to describe the nature, extent and significance of remains known or likely to be present on a site (the archaeological ‘baseline’) and how that significance might be affected by the impacts of the developments. (CIRIA)

**Early contractor involvement:** is a construction process/contract where the contractor is engaged at an early stage in a project to offer input into the design phase.

**Evaluation:** Aims to establish, as far as possible, the presence or absence of archaeological remains and their extent, nature, character, date, and significance. (CIRIA)

**Post-excavation:** Following site investigations, the results are analysed, interpreted and presented. (CIRIA)

**Quantity**: the quantity or number of those units allowed for in the BQ at tender stage, adjusted by measurement, such as '10 days' or '200 cubic metres' or '50kg' or '10 boxes'.

**Unit**: the measurable basis on which the task is charged for e.g. 'per day', 'per cubic metre', 'per kg’, etc.

**Unit rate(s):** the amount of money the Contractor proposes to charge for each of those units.

**Written Scheme of Investigation (WSI):** It is the design statement and the method statement for the archaeological elements of the project, prepared by the archaeologists, in some cases in responses to a brief issued by the regulatory authority. (CIRIA)

# Roles

**Archaeological advisors:** archaeologists working for the local planning authority, or national bodies, who are responsible for monitoring the quality of the archaeological work to discharge the planning, or other archaeological legal, conditions.

**Archaeological contractors:** The archaeologist or archaeological organisation contracted to undertake the archaeological work.

**Archaeological consultants:** Archaeologists that provide advice to individuals and organisations looking to commission archaeological work.

**Client:** The person or legal entity who pays for the works and services provided.

**Contract administrator:** the contract administrator is the individual responsible for administering the contract, or contracts, between the archaeological contractor and the client.

### Roles Not Titles

There may be little relation between job titles and the role they undertake in a BQ process e.g. while a contract administrator may have as their title ‘contract administrator’, their work title could be quantity surveyor, project manager, principal contractor, archaeological consultant, etc.

Similarly, different types of organisations/individuals may undertake any one of these roles e.g. archaeological advisors may be directly employed by a local authority or that role could be sub-contracted to a charity, a private company or a university.

There are no requirements for who undertakes these roles – though it is recommended they are suitably qualified/experienced to do so.

# Key Concepts

This section covers the key concepts for the successful use of BQ in archaeology. Not every possible topic is covered, just the major concepts that should be taken into account. The ASMM is flexible, and users are free to incorporate other concepts/ideas not listed here.

## Suitability

This method is suitable for projects when there is a recording system that can track the BQ method of measurement whether that is volumetric, by feature or intervention.

While not required, these actions can improve a project’s outcomes:

* the accuracy of tendered prices are better when the archaeology has been evaluated through a programme of pre-construction surveys/pre-start investigations and desk-based assessment[[5]](#footnote-6). Better assessment and evaluation will generally result in less financial uncertainty and unwelcome surprises;
* the review or construction of the draft BQ by a professional archaeologist – preferable in some sort of **early contractor involvement** capacity. The reports from trial works and desk-based assessments can require specialist knowledge to interpret – which as described above, helps create better BQs that are more accurate;

A BQ it is not specific to particular project size, spatial or financial, however, for some simpler or smaller projects the use of a BQ might be more than is needed or appropriate i.e. projects that might be agreed through less formal contracts – such as by exchange of letters (or emails).

## Variation Reduction, not Elimination

While trial works and desk-based assessment can improve the accuracy of expectations for what archaeological remains will be found, it is still possible that different elements may be encountered that will then require a contract variation to include them as new items in the BQ. It is not practical, or cost effective, to ask contractors to fill out a BQ with thousands or tens of thousands of entries in the hope that every possible element will be covered just to avoid such a variation.

## Quantities

How one counts quantities is called a **method of measurement**. There are several methods of measurement for archaeological work:

* by the number of:
  + interventions – boreholes, pit/post-hole half sections, samples taken, etc.;
  + features – postholes, burials, builds, etc.;
  + artefacts – flints, pottery, bone, etc.
* by the volume of materials;
* or, where appropriate i.e. bulk finds, by weight.

A project does not need to use only one type of method of measurement for a BQ. For example, the removal of the overburden material above the archaeological deposits from a site could be measured by the volume (m3), the archaeological work could be measured by a combination of the number of interventions e.g. ditch slots, pit/post-hole half sections, etc. and the number of 'special' features e.g. burials, kilns, waterholes, buildings, etc while the post-excavation analysis could be measured per the number/weight/volume of artefacts cleaned, conserved and analysed.

## Conditions and Unit Costs

The costs for archaeological work, regardless of the method of measurement used, are affected by site conditions and the methods dictated by the specifications in the **WSI**, more so than other elements of construction work. This is not an extensive list but a few illustrative examples to highlight the range of conditions that affect costs:

* soil characteristics – it is significantly easier/quicker to excavate by hand loose soils with no rock inclusions than it is to excavate hard compacted soils with lots of rocks in them. The first can be done quickly with shovels/spades. However, the latter would require the use of mattocks/picks to first break up the soil before it could be removed. Moreover, archaeologists would have to determine whether the stones were natural deposits or part of a human-made feature such as a wall, a building, etc. which further slows down the process;
* water – sites that are waterlogged will need to be drained, sometimes by hand, which takes time i.e. increases costs; such sites may need special earthwork support;
* working around objects e.g. utilities or tree roots – if there are live utilities on a site then careful hand/vacuum excavation will usually be required. Similarly, if trees are to be preserved on a site, roots will need to be carefully excavated around;
* depth of the excavations – this can either increase costs through needing to excavate a larger area so the sides of trenches can be stepped and/or battered back, or through the need for temporary works to shore up the sides of those trenches;
* weather/winter working – frozen soil requires similar method to compacted soils i.e. it needs mattocks/picks to break up the soil before it can be removed;
* archaeological methods – it takes more time to sieve soil to find small artefacts than it does to simply excavate the soil;
* location/topography of site - can plant be used to mechanise some of the process?;
* programme timeline – running multiple shifts of archaeologist to meet a deadline can increase costs i.e. increased pay for overtime/night work.

The ASMM deals with these cost considerations by explicitly listing these conditions in BQ items and assigning them cost multipliers that are used to determine the final per unit costs (see the **Bill of Quantities Template** section for further details).

## Mixed Approaches

Not every stage of a project needs to be costed through a BQ methodology. Some stages could use fixed fees or could be calculated as a percentage of the total project/other stage costs. A BQ approach can be mixed and matched with other methods to provide the best project process.

## Specifying Measurement

To avoid measurement disputes, the BQ should specify the accuracy expected for the measurements as different techniques have different costs and levels of accuracy. General practice, is for quantities to be rounded to the nearest whole unit.

The cost of highly accurate measurements may not offset the costs involved in collecting them. For example, there many different ways to measure the volume of removed overburden, with a tape measure, with a GPS unit, a total station, through photogrammetry, LiDAR/laser scanning (which may be done with a drone), and those methods have different costs and accuracies. A laser scan may be more accurate than using a tape measure but the cost of the rental of that equipment may be far greater than the possible error encountered from using a tape measure. Methods of measuring are a condition that can increase the costs for a project.

## Specifying Method

In a BQ there are two types of specifications for each item:

* Prescriptive specifications: this prescribes the methods, and sometimes the tools that must be used to undertake a task to obtain one of the quantities;
* Performance specifications: this describes the requirements of a product in terms of the performance objectives or criteria.

A **WSI** may provide performative requirements or in might be prescriptive or a mix of both. For each item of the BQ, include specifications so that contractors will know if they will be required to undertake the work in a certain way or if they can choose the methods, this can affect the costs.

## Confirming Quantities

The results of work from a BQ in construction are usually easy to verify – there is an installed window, or door, or a completed building. Archaeology tends to remove materials instead of adding them to a site. However, the archaeological process necessitates collecting photographic records of the materials encountered. For item-based quantities, all items are also recorded and tagged. These records will be included in any final archive and/or reports produced, allowing a contract administrator to verify the photographic and physical evidence of the work undertaken.

If sub-contracting is taking place it is recommend that agreed records are part of any subcontract – detailing plant, labour, materials, etc. to aid the measurement.

## Subcontracting and Outside Services

An advantage of a BQ approach is the ease in which sub-contracts are handled. In most cases, a sub-contractor or service provider, will be responsible for a single element e.g. analysing radiocarbon (C14) samples, soil morphology analysis, etc. and their rates can be added directly into the BQ without needing to provide any additional information.

## Cost Limit / Project Budget and Delays

Archaeology is an inconsequential cost to the construction sector, making up less than 0.13%[[6]](#footnote-7) of what is spent on construction each year in the UK. However, on an individual project, it might constitute a larger percentage of costs, especially if there are delays to other aspects of the programme of works. In cases where an **approximate BQ** is being used and not a **firm BQ**, the archaeological contractors should be in regular contact with the **contract administrator** to update them on changes to the expected quantities and any potential delays to other aspects of the project, where costs can be the most significant. This could be daily, weekly, or monthly - essentially, at a time scale that is appropriate to the scale and timeline of the project.

## Inflation

A BQ should be prepared using current rates and prices, but, if needed, inflation should be taken into account. There are many models to calculate inflation, for example:

* rates automatically change to match the CPI at the end of the financial year;
* quarterly reviews of specific CPI indicators;
* set yearly increases i.e. rates go up 2% each year;
* etc.

These are purely illustrative examples, and the client and archaeological contractors will need to agree on how they will handle this. Some of the contracts listed below account for this.

## Contracts

The BQ forms part of a contract and additional needs must be specified, for instance, how arithmetical or pricing errors are dealt with, which stages the BQ is applied to, payment stages, etc. Template contracts that have been used for BQ projects are:

* various NEC4 contracts:
  + Engineering and Construction Contract Option B;
  + Engineering and Construction Short Contract;
  + Engineering and Construction Contract Option D;
* JCT Standard Building Contract With Quantities (SBC/Q);
* JCT Intermediate Form of Building Contract With Quantities (IFC/Q)
* FIDIC Red Book.

However, archaeologists have found that, while usable, these contracts are not always ideal for archaeological work, instead, the prefer to use bespoke contracts.

The ASMM is contract neutral, so participants should use what works best for their project.

## Archaeology’s differences

### Different measurements

While traditional construction BQs have very defined measurements, archaeology has some additional items not normally seen in a construction setting. Some examples:

* Per box – archives/museums sometimes charge per box of a defined dimensions (but not always) for storage;
* Public engagement – sometimes part of the planning conditions will include public engagement aspects not normally found in construction work.

### Range of measurements

Moreover, they have a wide range of measurements for materials i.e. counts or tons for pottery, m2 to km2 for some surveys, etc. Especially when dealing with bulk artefacts where it may be more cost effective to measure by buckets (of defined litres) or even weight, than counting every item. Weight can be easier to use for materials of similar density but irregular shape, than volume. There will be a wider range of methods of measurements that what is found in a traditional method of construction measurement for archaeological materials and activities.

### Costs Variability

The costs of archaeology quantities can vary greatly because many times the same materials/features can have different research and educational value depending on their age, location, etc. For example, five pieces of prehistoric pottery may be excavated more carefully, subjected to a range of tests and sent to a museum, while two tonnes of 1920s ceramic from a kiln site may not even receive any testing and most of it is discarded before it makes it to an archive. The difference being the existing knowledge of those time periods and materials.

### Features - Archaeological vs Natural

If the BQ is using features as a type of measurement then all investigated features need to be counted, regardless of whether they are found to be human made or not. Features such as pits and trenches can be made by other natural activities such as animal disturbance, tree flip, etc. However, that cannot be determined until fully investigated, and even then it is not always possible to determine. Thus the cost of the investigation has occurred, regardless of the outcome, and needs to be paid for.

### Professional archaeologists and early contractor involvement

The evidential value is a significant driver of costs for archaeology, on top of conditions such as weather, soil characteristics, etc. Because evidential value depends on a range of factors like the age of the materials, types of materials, uniqueness of the materials for that area, etc. we recommend that an archaeologist reviews the BQ. They will be able to understand the evidential value of the expected materials and the research questions that are being asked in the WSI and ensure the BQ is fit for purpose. We would also recommend the employment of early contractor involvement in a project.

# Full Process

A BQ can either be initially created by the contract administrator, or by another organisation or individual that they contract to do this. Or if a contractor has already been appointed, that contractor may produce the BQ.

For the preparation of the BQ, it is recommended, though not required, that the experience and specialist knowledge of the various archaeologists e.g. **consultants, advisors, contractors**, are employed for the purpose of reducing uncertainty. Using any preliminary evaluation and the results of desk-based assessments, these archaeologists can advise on what the likely archaeological resources will be i.e. indicative volumes of archaeological remains and quantities of artefacts, samples etc. Any limitations to the data used to inform the quantities should also be clearly identified and recorded.

If the archaeological work is going to be put out to tender, the creator of the BQ would then provide a working BQ with indicative quantities against which the **archaeological contractors** tender. These steps of consulting and tendering may be repeated multiple times through a project for different stages of the work.

Following a tendering process, the **contract administrator**, or client/client agent, will review the BQ submissions and appoint a contractor. The ASMM does not specify the criteria for appointment i.e. price, quality, etc, that is the responsibility of the client to decide but selection criteria should be included in the tender information.

The contract is then agreed, and work commences under the direction/coordination of the **contract administrator**. Payment to the **archaeological contractors** will be based on the quantities actually encountered during the work and at the rates entered in the tendered BQ. The contract administrator should monitor the costings during the project work to ensure that the archaeological work does not exceed the **cost limit** for the project. A good contract should specify the outcome(s) if the cost limit is breached. Depending on what is found, remeasurement to the BQ might be required to include unanticipated items.

# Bill of Quantities Template

## Entry Layout

The template is provided with the following layout for a Bill of Quantities:

The multipliers for each condition

the amount of money the contractor proposes to charge for each of those units.

The conditions that will affect the cost of the element.

The specification for the item, either prescriptive or performative.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Reference | Item specification | Unit | Conditions | Condition multipliers | Estimated  Quantity | Rate/Unit | Costings |
| D2.2 | Bulk excavation of overburden | m3 | TYPE 3 SOIL | 1 | 100 | £600 | £60,000 |
|  | | | TYPE 2 SOIL, <25 artefacts | 1.1, 1.1 | 50 | £726 | £36,300 |

the measurable basis on which the task is charged for, such as 'per day' or 'per cubic metre' or 'per Kg' or 'per box'.

the product of 'Quantity' multiplied by 'Rate/Unit', which gives the anticipated cost of that task.

the anticipated quantity (in numbers of Units) tender stage.

Additional columns could include a ‘notes’ entry or an accuracy entry that outlines the margin of error for the measurements.

## Item design

As described, archaeology is affected by conditions and specified methods more than many other areas of construction and this needs to be reflected in a BQ. However, to avoid having thousands upon thousands of entries to account for every possible condition/method that could be applied, the ASMM template is set up with each item having a base condition. Then, if there are anticipated additional conditions, new rows can be added below that item to account for the changes. Each condition will have an accompanying multiplier for the costs that is applied to the base condition.

In the hypothetical example above, the base condition is moderately firm soil with no artefacts. However, it is anticipated that part of the site will have harder soils with a scattering of artefacts, conditions that will increase the costs by 10% each, so a new row this those additional costs is created, along with the anticipated quantities.

This presentation ensures transparency in costings and allows the flexibility to accommodate different conditions and methods, while at the same time stopping the template BQ from growing into an unwieldy document.

## Template ordering – by Archaeological Project Work Tasks

BQ elements can be laid out in any manner of ways – thematic, costs (high to low, low to high), and so on. This template has been laid out by the typical stages encountered in archaeological projects. Those stages of tasks are:

1. Preliminaries
2. Excavation/Investigation
3. Processing of recovered materials
4. Post-excavation assessment
5. Post-excavation analysis and dissemination
6. Public engagement
7. Deposition

Not all stages will be relevant to every site, while some sites might require additional stages. Some stages may run concurrently. The stages are procurement neutral, recognising that the appointment of different contractors can occur before or during any of the stages e.g. one contractor is appointed to undertake an excavation and a different one is appointed to undertake the post-excavation work.

Most of the stages are made up of classes of tasks i.e. A1, A2 etc. Those preparing a BQ are free to add or remove tasks as they see fit.

## Sub-classing on complex sites

For complex contracts with multiple site areas and/or stages of work, the classes should be broken down into sub-classes that relate to those site areas and stages i.e. A1, A2 etc.

**Example:** a linear infrastructure project has multiple site areas with different archaeological characters and site constraints requiring bespoke project designs. In such a project, A2 would be broken down into multiple sub-divisions A2.1, A2.2 etc. for each work area.

## 'A' PRELIMINARIES

Preliminaries are the section in the BQ which provides details of and specific requirements for the project, definition of the site, its location, access, location of compound as well as the proposed form of contract and contract information. It also groups together priceable items which are necessary for the archaeological contractor to undertake the work e.g. site welfare, site security, site management, office administrative overheads etc., but will not actually become part of the works e.g. excavations, analysis, etc. Some of these activities may be handled by the Principal Contractor and thus not required or the archaeologist could be asked to provide them. Specific requirements and constraints should be identified and could include access routes, temporary gates, a secure compound, temporary protective or security fencing (e.g.Heras). For some sites, provision of safe storage for recovered materials (artefacts, ecofacts, samples) may need to be considered in the BQ.

There can be substantial differences in requirements in site establishment requirements between:

* + 1. archaeological investigations executed as a stand-alone project where the archaeology contractor is responsible for the entire site establishment and services and site management; and
    2. archaeological investigations undertaken on a construction site, under the control of a ‘Principal Contractor’ who is responsible for provision of all services, accommodation and management.

The template has mostly adopted the RICS new method of measurement top level components to make it easier to incorporate this archaeology BQ into construction planning. However, some of the preliminaries have been moved to the conditions section as they are likely to contribute to per-unit costs of investigations, they can be moved back to this section, if required/preferred.

## 'B' EXCAVATION/INVESTIGATION

Excavation/investigations is the core stage. Excavation descriptions need to reflect the complexity of the activity. On a large site with variance in soil types, there will be a need to identify separate items.

It is critical to consider soil conditions at this stage in order to consider what is then needed. A primary consideration must be to split works above or below known ground water levels – as this then impacts pumping and dewatering and earthwork support. A further consideration is the differences between starting and total excavation depths, as a factor in the cost of removing material from the excavation(s).

## 'D' PROCESSING OF RECOVERED MATERIALS

Processing means the cleaning, stabilisation and cataloguing of artefactual and ecofactual materials prior to assessment or, if a formal post-excavation assessment is not required, analysis. Artefactual assemblages, for instance, cannot be assessed until they are processed. It is therefore part of the 'data recovery' stage of an archaeological project and, irrespective of whether it is done on- or off-site, it is classed as part of 'Site Operations' under the **Infrastructure Conditions of Contract** and NEC suite of contracts.

## 'E' POST-EXCAVATION ASSESSMENT

This is the step in the archaeological process where a comprehensive stage-gate review and update of the budget, programme and all future work and deliverables in light of actual findings occurs. Essentially, a review of the materials found in the investigations to determine the quantities that will be examined in the next stage, post-excavation analysis and dissemination.

Exactly what constitutes post-excavation assessment (PXA) or the circumstances in which it is undertaken is defined in the WSI.

The ASMM does not assume that PXA will be done. Some work may be split into two different projects, at this point in the archaeological process. With one project using an **approximate** BQ for the investigation and then one project using a **firm** BQ, once the quantities of artefacts/samples are known, both being tendered for separately. Or some projects may tender for both work at once and make most of this step redundant. The ASMM is process-agnostic on this point, and it is up to those commissioning the work to decide what works best for their circumstances.

## 'F' POST-EXCAVATION ANALYSIS AND DISSEMINATION

Analysis and dissemination, through reports, article(s), monograph(s), video(s), etc., are key to fulfilling the purpose of undertaking archaeological work and its principal public benefit – providing knowledge. The key measurement for is evidential value, the evidence that this site can contribute to known questions, or indeed raise significant new ones. Assemblages of material and evidence relevant to those questions could have a higher evidential value, and therefore deserve higher priority.

Exactly what is done for the analysis and dissemination stage is defined in the WSI, which may be updated/revised at a PXA stage.

## 'G' PUBLIC ENGAGEMENT

If a need for public engagement is anticipated then there needs to be defined, measurable requirements (e.g. accompanied visits, access walkways, viewing platforms, protective barriers).

Sometimes public engagement requirements might change mid-project if the ongoing results of works come to public attention and this prompts so much interest that different requirements become necessary.

## 'H' DEPOSITION

The final task of project is the deposition of the project archive, which is made up of both physical and digital archives. Depending on the final receiving repositories, the physical and recorded archives may need to be separated out as different items.

## CONDITIONS

The final section in the BQ is a conditions section. This is where conditions and their multipliers can be listed. It is recommended this is fully completed, or as much as possible. If unexpected conditions are encountered then instead of issuing a variation, that condition(s)’ multiplier can be applied to an item without needing a variation to the project.

# Appendix A: Calculating Costs for Archaeologists

Given that BQs are not widespread in archaeology, it is likely that many in that sector will not be familiar with calculating BQ unit costs. This appendix presents a methodology to do so based on day rates, as most archaeologists will be familiar with calculating day rates and there is a simple method to convert day rates to unit rates.

Create a charge rate for the worker undertaking that element of the BQ – to include all employment costs, overheads and profit, but not costs itemised in the BQ such as site welfare facilities, etc. Estimate the time it will take them to complete a BQ element i.e. undertake an intervention, excavate a certain volume, record a number of artefacts, etc. Then multiple that time by their day rate and that is the unit cost.

**day rate x (time to complete / working hours in day) = unit cost**

**Examples:**

Using a base day rate of £200.

Element 1 – takes 4 hours.

£200 \* (4 hrs / 7.5 hrs) = £106.67 per unit.

Element 2 – takes 15 minutes.

£200 \* (0.25 hrs / 7.5 hrs) = £6.67 per unit.

Element 3 – takes 27 hours.

£200 \* (27 hrs / 7.5 hrs) = £ 720 per unit.

**Note** – some BQs list profits, insurance, etc. as items in a BQ. While not as optimal for quickly calculating unit rates, this can still be done. The BQ needs to be clear what overhead and profit costs are line items and which ones need to be covered by unit costs. Given most archaeologists will have already calculated day rates that include profit and traditional overhead items it is recommend that they be kept as such and not made into separate BQ lines. This will greatly aid in the archaeologists’ ability to provide BQ quotes.

1. <https://historicengland.org.uk/images-books/publications/planning-archaeology-advice-note-17/> [↑](#footnote-ref-2)
2. RICS 2021. New Rules of Measurement 2: Detailed Measurement for Building Works, p17. <https://www.rics.org/content/dam/ricsglobal/documents/standards/october_2021_nrm_2.pdf> [↑](#footnote-ref-3)
3. <https://www.rics.org/profession-standards/rics-standards-and-guidance/sector-standards/construction-standards/nrm> [↑](#footnote-ref-4)
4. https://www.ciria.org/CIRIA/CIRIA/Item\_Detail.aspx?iProductcode=C799&category=BOOK [↑](#footnote-ref-5)
5. <https://www.archaeologists.net/sites/default/files/CIfAS%26GDBA_4.pdf> [↑](#footnote-ref-6)
6. Archaeology in Development Management – ALGAO:UK. <https://doi.org/10.5281/zenodo.10909054> [↑](#footnote-ref-7)