Chapter 4: Discussion

4.1 The development and current use of archaeological excavation methods and recording systems

In order to evaluate the development and current use of archaeological excavation methods and recording systems in the United Kingdom, Ireland, Australasia and North America 153 archaeological manuals and guidelines were analysed against a set of analytical criteria (Appendix B), the results from this analysis can be found in 'Chapter 7.1 Archaeological manual/guideline analysis results'.

General overview of archaeological manuals and guidelines

In terms of the sectors from which the manuals and guidelines that were analysed originated in the United Kingdom, 85% originated from the commercial sector and 15% came from the research sector (Graph 7.1.1). In Ireland, 56% came from the commercial sector, 22% came from the research sector and 22% came from the government sector (Graph 7.1.1). In Australasia, 67% came from the commercial archaeology sector, 17% came from the research sector and 17% came from the government sector (Graph 7.1.1). In North America, 44.3% came from the commercial sector, 34.9% came from the research sector and 20.8% came from the government sector (Graph 7.1.1). In terms of the overall sector distributions from which the manuals and guidelines originated, 54% of the total number of manuals and guidelines analysed originated from the commercial sector, 29% came from the research sector and 17% came from the government sector (Graph 7.1.2).

These results indicate that in current archaeological practice, it is the commercial archaeological sector that most often produce and use manuals and guidelines to dictate how archaeological investigations will be conducted. This result can be explained by the fact that commercial units are the archaeological sector that are most often conducting archaeological fieldwork and work on a number of different archaeological sites simultaneously and employ large numbers of staff. Therefore, in order to ensure consistency in the archaeological approaches that are used during such investigations, these companies produce archaeological manuals and guidelines.
The fact that the research sector produce the next highest volume of manuals and guidelines is because such institutions are often responsible for training students in archaeological practice. Consequently, they produce archaeological manuals and

guidelines to provide a reference document for students to use in order for the students to become familiar with the principals and practices of archaeological fieldwork.

The fact that the government sector produced the least number of manuals and guidelines is because government organisations are usually office based, and do not conduct archaeological fieldwork themselves. Rather, they are responsible for overseeing the archaeological investigations that are conducted by other archaeological organisations in their jurisdictional area. Those government departments that do produce archaeological manuals or guidelines do so in order to establish a model of archaeological practice for archaeological organisations working within their area, to ensure that such organisations are adhering to local legislation and guidelines.

It is evident from Graph 7.1.3 that not all organisations have their own archaeological manual or guidelines. Instead, some organisations use another organisation's manual/guideline, or alternatively, develop excavation and recording protocols on a project-by-project basis.

In the United Kingdom, 69% of the organisations have their own archaeological manuals/guidelines, and 31% use another organisation's archaeological manual/guideline (Graph 7.1.3). Similarly, in Ireland, 67% of organisations have their own manuals/guidelines and 33% use another organisation's manual/guideline (Graph 7.1.3). Both in the United Kingdom and Ireland, the organisations that don't have their own archaeological manuals/guidelines use the Museum of London Archaeology Service's (MOLAS) excavation manual. The reason why these organisations use the MOLAS manual is because this was one of the first archaeological organisations to formalise their archaeological practice and produce an archaeological manual with the aim of standardising commercial archaeological practice, and it was from this MOLAS manual that many other organisations formed their own archaeological manuals/guidelines. Those who chose not to develop their own archaeological manuals/guidelines used, and continue to use, the MOLAS manual as it provides an accepted approach to archaeological investigations and is available to download for free, thus saving those organisations who use this manual instead of creating their own both money and time in terms of production costs.

In Australasia, 17% of organisations sampled have their own archaeological manual/guidelines and 83% do not, out of the 83% of organisations that don't have their own manual/guidelines 30% use another organisation's manual, which again, is the Museum of London Archaeology Service's excavation manual, and 70% of Australasian organisations develop their excavation and recording protocols on a project-by-project basis (Graph 7.1.3). The reason why such a large percentage of organisations develop protocols on a project-by-project basis is due to the fact that these organisations are small and so cannot afford the costs associated with producing a manual. Moreover, due to the small size of the archaeological units such organisations tend to work on one project at a time and therefore the archaeological site director can instruct each archaeologist on what methodological approaches will be being used and thereby ensure that a consistent approach is used. In addition, by developing bespoke protocols that are determined by the site that they are excavating, they are able to be more flexible in terms of archaeological approaches than those organisations that follow a set archaeological manual/guideline.

In North America, 52.8% of organisations have their own archaeological manuals/guidelines and 46.4% of organisations do not (Graph 7.1.3). Of those organisations that don't have their own archaeological manuals/guidelines, 46% use another organisation's manual and 54% develop excavation and recording protocols on a project-by-project basis (Graph 7.1.3). The organisations that use another organisations archaeological manual/guidelines use the archaeological manuals/guidelines that have been produced by the State department in the State in which they are working. This ensures that archaeological practice is standardised in the State and that they meet the requirements of the local governing body. Those organisations that develop excavation and recording protocols on a project-by-project basis do so again, due to the size of their organisation and the flexibility that this gives them to adapt to the requirements of the archaeological site.

In terms of the time frames in which the archaeological manuals and guidelines analysed in this Project were either last updated or created, in the United Kingdom, 11% of the manuals/guidelines were either created or updated between 1990-1999, 83% between 2000-2009, and 6% between 2010-2013, although, 28% of the organisations are currently in the process of updating their manuals/guidelines (Graph 7.1.4). In Ireland, 83% of manuals were either created or updated between 2000-2009, 17% between 2010-2013, although, 17% of the organisations are currently in the process of updating their manuals/guidelines (Graph 7.1.4). In Australasia, 50% of the manuals were either created or updated between 2000-2009 and 50% were created or updated between 2010-2013 (Graph 7.1.4). In North America, 1.8% of manuals were either created or updated between 1970-1979, 1.8% between 1980-1989, 14.3% between 1990-1999, 71.4% between 2000-2009 and 10.7% between 2010-2013, although, 3.6% of organisations are currently in the process of updating their manuals/guidelines (Graph 7.1.4). In terms of overall time distribution, 1% of archaeological manuals were created or updated between 1970-1979, 1% between 1980-1989, 12% between 1990-1999, 75% between 2000-2009 and 11% between 2010-2013 (Graph 7.1.5).

These results show that the majority of organisations either updated or created their archaeological manuals/guidelines between 2000-2009 (Graph 7.1.5). The reason for this was in part because new technological advances had been made in the field of archaeology and therefore organisations had to incorporate these new technological practices into their archaeological manuals/guidelines to instruct the archaeologists using the archaeological manuals/guidelines in how such technology should be utilised during the course of an archaeological investigation. Furthermore, this period saw a significant growth in the commercial archaeology sector, particularly in the United Kingdom and Ireland, due to increased building development projects throughout these countries. As a result, archaeological organisations were employing more archaeologists and working on more archaeological sites simultaneously, therefore, in order to ensure consistency across all of their archaeological investigations, organisations either produced or updated their manuals to ensure that a standardised approach was being utilised by all of their employees.

Similarly, the creation or updating of manuals between 1990-1999 can also be attributed to the increased demand for archaeologists to conduct archaeological investigations prior to building works, and the tightening of legislation in relation to the preservation of heritage sites in all of the countries discussed in this Project. Moreover, the organisations that have updated or created archaeological manuals between 2010-2013 have done so in order to account for new technological advances in the field, primarily in relation to developments in total station and scanning technologies. Those organisations that created or updated their manuals between 1970-1979 and 1980-1989 are small units and believe that their manuals/guidelines provide enough data to instruct archaeologists on how to conduct archaeological investigations for their organisation. These organisations also stated that if new technology or techniques are to be used they, the organisation directors, can instruct their employees in their use whilst conducting the fieldwork and therefore do not need to update their manuals.

In terms of the archaeological manuals/guidelines general content, in the United Kingdom 19% of archaeological manuals/guidelines stated which excavation methods should be used and 81% suggested which excavation methods should be used, in regards to recording, 96% stated which recording systems should be used and 4% suggested which recording systems should be used (Graph 7.1.6). Similarly, in Ireland 11% of archaeological manuals/guidelines stated which excavation methods should be used and 89% suggested which excavation methods should be used, in regards to recording, 78% of the archaeological manuals/guidelines stated which recording systems should be used and 22% suggested which recording systems should be used (Graph 7.1.6). In Australasia, 92% of archaeological manuals/guidelines stated which excavation methods should be used and 8% suggested which excavation methods should be used, whereas 58% of the manuals/guidelines stated which recording systems should be used and 42% suggested which should be used (Graph 7.1.6). In North America, 65.1% of the archaeological manuals/guidelines stated which excavation methods should be used and 34.9% suggested which excavation methods should be used, in regards to recording, 75.5% of archaeological manuals/guidelines stated which recording systems should be used and 24.5% suggested which recording systems should be used (Graph 7.1.6). Overall, 56.2% of the archaeological manuals/guidelines stated which excavation methods should be used and 43.8% suggested which excavation methods should be used, in terms of recording, 77.8% of archaeological manuals/guidelines stated which recording systems should be used and 22.2% suggested which recording systems should be used (Graph 7.1.6).

It is clear from these results that the majority of organisations in the United Kingdom and Ireland suggest rather than state outright which excavation methods should be used during an archaeological investigation. This is because these organisations aim to give the site directors in charge of archaeological investigations the opportunity to adapt their excavation approaches to the demands of the individual archaeological site that is being excavated. Thus, if the excavation is taking place in a rural location that does not contain many complex archaeological features, the excavation approach will differ to excavations that are taking place on urban sites with complex intercutting stratigraphy. In comparison, in Australasia and North America the majority of organisations state which archaeological excavation methods should be used, rather than suggesting potential excavation approaches. This means that their excavation methods are less flexible than those of the British and Irish organisations and that they will apply the stated excavation approaches to an archaeological site despite the site type that they are excavating. This can be explained by the fact that a lot of the archaeological investigations that are conducted in Australasia and North America relate to Aboriginal or Native American rural heritage sites. In these sites the archaeological evidence for inhabitation is often widely dispersed and small in volume. Consequently, Australasian and North American archaeologists can apply the same excavation techniques to investigate these sites, as they do not have to be as flexible as British and Irish archaeologists, who deal with both rural, widely dispersed archaeological sites, and urban archaeological sites that have been continually inhabited for hundreds of years.

It is interesting to note that in terms of recording systems the majority of organisations stated specifically what recording systems should be used rather than suggesting which systems should be used. This is due to the fact that recording systems are more standardised than excavation methods within archaeological practice, and need to be, as the records that are produced are all that remains of the archaeological site once it has been excavated. Consequently, in order to ensure that a comprehensive set of records is obtained, all manuals provide blank copies of the recording forms that will be used and set strict guidelines regarding their use.

In terms of the overall objectives of the archaeological manuals and guidelines, apart from one organisation in the United Kingdom, all of the archaeological manuals and guidelines are designed to: instruct archaeologists in what excavation methods and recording systems should be used, explain how recording sheets should be completed, inform archaeologists of what should be recorded and when it should be recorded, and provide archaeologists with a default approach to the excavation and recording of archaeological sites (Graph 7.1.7). It is evident from these results that all of the archaeological organisations in the geographical regions under discussion are attempting to produce archaeological manuals/guidelines that standardise archaeological practice in order to ensure that the results that are produced are comprehensive and consistent.

In regards to the applicability of the archaeological manuals/guidelines on different types of archaeological sites, in the United Kingdom, 96% of manuals/guidelines are designed to instruct archaeologists on which excavation and recording techniques can be used for archaeological excavations conducted on both small and large scale sites, but only 92% are designed for rural sites and 96% are designed for urban sites (Graph 7.1.8). Whereas, all of the archaeological manuals/guidelines originating from Ireland, Australasia and North America are designed to instruct archaeologists in the excavation and recording techniques to use for small, large, rural and urban archaeological sites (Graph 7.1.8). The reason why one British archaeological manual/guideline was deemed to be unsuitable for use on rural sites is due to the fact that this manual/guideline was designed by an organisation that primarily works on urban archaeological sites with very complex stratigraphy, therefore, as they do not conduct archaeological work outside of this context they have not adapted their archaeological manual/guideline for use on rural archaeological sites. The reason why one British archaeological manual/guideline fails to instruct archaeologists on any of the aforementioned variables is due to the fact that this organisation has not stated in their archaeological guideline/manual the circumstances in which their archaeological manual/guideline should be used, and therefore, could not be analysed in the same manner as the other archaeological manuals/guidelines.

In relation to how the organisations have justified the excavation and recording techniques that they have advocated in their archaeological manuals/guidelines. In the United Kingdom, 4% of organisations stated that it was so that the most cost effective excavation and recording methods were used, 8% stated that it was so the most efficient excavation and recording methods are used, 100% stated that it was to ensure accuracy during the recovery and recording process, 100% stated that it was to ensure that a consistent and systematic process was used, 8% stated that it was to make sure that objectivity was maintained, 100% stated that it was so records can be reviewed by interested parties, 100% stated that it was to ensure that an ordered and systematic archive was created so that they are able to publish their findings, and 54% stated that it was to improve current practice (Graph 7.1.9).

Similarly, in Ireland, 11% stated that it was to ensure the most cost effective excavation methods and recording systems are used, 11% stated that it was to ensure that the most efficient excavation methods and recording systems were used, 100% stated that it was to maximise the accuracy of the recording and recovery process, 100% stated that it was to ensure that a consistent and systematic approach was used, 100% stated that it was so that records can be reviewed by interested parties, 100% stated that it was to ensure that an ordered and systematic archive was produced that would enable publications to be produced, and 56% thought it would improve current archaeological practice (Graph 7.1.9).

Alternatively, in Australasia, 100% of organisations thought the techniques stated in the manual would maximise the accuracy of the recovery and recording process, 67% said it would ensure a consistent approach was used, 100% stated that it would ensure a systematic approach was used, 100% stated that it was so that records could be reviewed by interested parties, 100% stated that it would result in the production of a consistent and structured archive from which they could publish their findings, and 42% thought it would improve current archaeological practice (Graph 7.1.9).

In North America, 5.7% of organisations stated that it would ensure that the most cost effective excavation methods and recording systems would be used, 4.7% stated that it would ensure that the most efficient excavation methods and recording systems would be used, 100% stated that it would maximise the accuracy of the recovery and recording process, 100% stated that it would ensure that a consistent and systematic approach would be used, 100% stated that it ensured that records could be reviewed by interested parties, 100% stated that it would result in the creation of a systematic archive from which they can publish their findings, and 93.4% stated that it would improve current archaeological practice (Graph 7.1.9).

It is evident from these results that all of the different archaeological organisations analysed in this Project believe that by using the excavation and recording approaches that they advocate in their archaeological manuals/guidelines, archaeologists will use a consistent and systematic archaeological approach that will maximise the accuracy of the recovery and recording process during an archaeological investigation. This in turn, will ensure that the users of this approach produce a systematic and ordered archive that will allow them to publish their findings and interested parties to review the data, and consequently, result in an improvement in the quality of the archaeological investigation. However, the fact that 153 different archaeological organisations have felt the need to produce or use archaeological manuals/guidelines suggests that such justifications cannot be true, as there cannot be 153 correct ways to investigate an archaeological site. Therefore, there is clearly not a universally accepted standardised approach to conducting archaeological investigations.

The identification, definition and recording of archaeological stratigraphy

In regards to who is responsible for identifying and recording archaeological stratigraphy during an archaeological investigation, in the United Kingdom, Ireland and Australasia the archaeologist who has conducted the excavation is responsible for identifying and recording archaeological stratigraphy (Graph 7.1.10). In North America, however, 16% of archaeological organisations state that specialist geoarchaeologists are responsible for identifying and recording archaeological stratigraphy (Graph 7.1.10).

The fact that some North American organisations employ specialist geoarchaeologists is at odds with archaeological practice in the United Kingdom, Ireland and Australasia, as being able to recognise, define and record archaeological stratigraphy is regarded as one of the fundamental skills of an archaeologist. The reason why some North American organisations feel that they need to employ specialist geoarchaeologists to identify and record archaeological stratigraphy is perhaps due to the fact that in North America archaeology is regarded as a subfield of Anthropology. Therefore, when students graduate from North American universities they have received little practical archaeological training in comparison to archaeology graduates in the United Kingdom, Ireland and Australasia and as a result aren't deemed to be competent enough to effectively recognise and record archaeological stratigraphy. Consequently, some North American organisations believe it is necessary for employees to receive further archaeological training in geoarchaeology (soil science) that in turn, will enable them to recognise and record the archaeological stratigraphy that is present at the archaeological site being investigated.

In terms of what the different archaeological organisations regard as archaeological stratigraphy there are some distinct differences. In the United Kingdom, a positive stratigraphic unit is deemed by 96% of archaeological organisations to be a fill, layer or structure (Graph 7.1.11). Likewise, in Ireland a positive stratigraphic unit is deemed by 100% of archaeological organisations to be a fill, layer or structure (Graph 7.1.11). Alternatively, in Australasia, a positive stratigraphic unit is deemed by 100% of archaeological organisations to be a fill or a layer, whereas only 8% of Australasian organisations regard structures as positive stratigraphic units with the remaining 92% defining structures as features rather than positive stratigraphic units (Graph 7.1.11). Similarly in North America, 74.5% of organisations regard positive stratigraphic units to be a fill or layer, whereas 4.7% of organisations regard structures as positive stratigraphic units with the remaining 79.8% of organisations defining structures as features rather than positive stratigraphic units (Graph 7.1.11).

In relation to negative stratigraphic units, in the United Kingdom a negative stratigraphic unit is defined by 100% of archaeological organisations as a cut that has resulted from the removal of material, 96% of British archaeological organisations define each cut that is identified as a separate stratigraphic unit and record them on separate paperwork (Graph 7.1.12). Similarly in Ireland, 100% of archaeological organisations regard a negative stratigraphic unit as a cut, and define and record each cut as an individual stratigraphic unit (Graph 7.1.12). In Australasia, archaeological organisations also define a negative stratigraphic unit as a cut, however only 8% of organisations define and record each cut as separate stratigraphic units and use separate paperwork for each, instead, the remaining 92% regard cuts as features rather than stratigraphic units (Graph 7.1.12). In North America, 74.5% of archaeological organisations define a negative stratigraphic unit as a cut, but only 38.7% of archaeological organisations define and record cuts as distinct stratigraphic units (Graph 7.1.12).

It is clear from these results that both British and Irish archaeological organisations define archaeological stratigraphic units using the same criteria. They also record stratigraphic units in the same manner ensuring that each stratigraphic unit is analysed and recorded separately, and that if stratigraphic units share stratigraphic relationships these are collated in order to form feature or unit groups (Graph 7.1.11; Graph 7.1.12).

Unlike archaeological organisations in the United Kingdom and Ireland, the Australasian and North American archaeological organisations define stratigraphic units differently, although similar to each other. The difference is most noticeable in regards to how they define structures and cuts, as they view them as features rather than definable stratigraphic units and will record them on feature forms rather than archaeological stratigraphy forms (Graph 7.1.11; Graph 7.1.12). One of the most interesting differences in approaches to recording archaeological stratigraphy is that some of the North American organisations (4.7%) define positive stratigraphic units by using a pre-determined stratigraphic unit type designation system (Graph 7.1.11). When using such a system, if an archaeologist excavates a layer or fill that contains evidence of burning for example, they will refer to the list of strata codes and will allocate that layer the relevant strata code for burnt layer/fill from the archaeological manual/guideline.

In regards to how archaeological organisations record individual stratigraphic units, in the United Kingdom 96% of archaeological organisations allocate stratigraphic units and primary class (cut/fill/deposit etc.), 38% of archaeological organisations will then allocate stratigraphic units a secondary class that will give an indication of the contexts function, and 96% of archaeological organisations encourage their employees to write interpretive comments regarding the stratigraphic unit that has been excavated (Graph 7.1.13). Similarly, in Ireland, 100% of archaeological organisations allocate stratigraphic units primary classes, 44% then go on to allocate stratigraphic units secondary classes, and 100% of archaeological organisations encourage their employees to write interpretive comments relating to the stratigraphic unit that has been excavated (Graph 7.1.13). In Australasia, 17% of archaeological organisations allocate stratigraphic units primary classes, and 100% encourage their employees to write interpretive comments regarding the stratigraphic unit being dealt with (Graph 7.1.13). In North America, 3.8% of archaeological organisations allocate stratigraphic units primary classes and 74.5% encourage their employees to write interpretive comments about the stratigraphic unit that has been excavated (Graph 7.1.13). Moreover, in North America, some archaeological organisations will attach suffixes to a stratigraphic unit's identification code, which will indicate the stratigraphic unit's position and function within the stratigraphic sequence (Graph 7.1.13).

By reviewing these results it is evident that again, British and Irish organisations tend to adopt the same approaches to recording archaeological stratigraphy, with some archaeological organisations choosing to expand upon their description of a stratigraphic unit by allocating it a secondary class. The reason why the majority of Australasian and North American archaeological units do not record stratigraphy in the same manner as the British and Irish archaeological organisations is due to the fact that they define stratigraphic units in a different manner, as discussed above. Therefore, when recording stratigraphic units, as they do not regard cuts as a distinct unit of archaeological stratigraphy, they do not require recording sheets that will differentiate between cuts, fills and deposits. This also explains why some North American organisations use suffixes to outline the function of fills and layers as they do not allocate primary or secondary classes to the stratigraphic units they are excavating. The vast majority of archaeological organisations, do, however, encourage their employees to write interpretive comments regarding the archaeological stratigraphy present. This enables archaeologists to express their ideas about how a stratigraphic unit relates to the archaeological site and to other stratigraphic units present at the site or in the feature that they are excavating, and may help to explain the development of the archaeological site.

In regards to how archaeological organisations record the relationships present within the stratigraphic sequence, in the United Kingdom, 62% of archaeological organisations only record stratigraphic relationships, 4% only record physical relationships, and 31% record both the physical and stratigraphic relationships present (Graph 7.1.14). In Ireland, 100% of archaeological organisations record only the stratigraphic relationships present (Graph 7.1.14). Likewise, in Australasia, 100% of archaeological organisations record only the stratigraphic relationships present (Graph 7.1.14). In North America, 5.7% of archaeological organisations only record the stratigraphic relationships present, and 68.9% record both the physical and stratigraphic relationships present (Graph 7.1.14). Moreover, when British or North American archaeological organisations are using the Arbitrary Excavation method to excavate an archaeological site, 8% of British and 69.8% of North American archaeological organisations, will determine the stratigraphic accumulation of the archaeological site *post-facto* (Graph 7.1.14).

These results indicate that the majority of archaeological organisations in the United Kingdom, Ireland and Australasia only record the stratigraphic relationships present at an archaeological site. This is because it is only the stratigraphic relationships present at an archaeological site that will accurately inform archaeologists of the chronological sequence of events that occurred during the development of the site from its original inception to present day (Graph 7.1.16). This in turn, provides such archaeologists with reliable data from which to reconstruct the archaeological site and make informed interpretations regarding the archaeological site's history (Graph 7.1.16). The British archaeological organisation that states that only the physical relationships present at an archaeological site should be recorded, appears to be an anomaly amongst British archaeological organisations, and is perhaps due to a publication error, as by only recording the physical relationships present at an archaeological site this archaeological company will not be able to accurately interpret or reconstruct the sequence of events that lead to the formation of the archaeological site. It is interesting to note that some British and North American archaeological organisations choose to record both stratigraphic and physical relationships. This is due to the fact that by recording physical relationships as well as stratigraphic relationships archaeologists can determine if a stratigraphic unit has become contaminated with artefacts from the stratigraphic units above it due to bioturbation (Graph 7.1.6). Additionally, recording physical relationships can also help archaeologists determine the function that a particular archaeological feature served on the archaeological site (Graph 7.1.16). The fact that some British and North American organisations record the stratigraphic accumulation of the site *post-facto* after using an Arbitrary method of excavation, is due to the fact that if archaeologists are using this technique they have no alternative option, as the process of Arbitrary Excavation destroys the dimensions of stratigraphic units and therefore it is not possible to record stratigraphy as the excavation proceeds. Instead, archaeologists must rely on examining the section faces of the excavation units that they have excavated in order to attempt to retrieve stratigraphic data.

In relation to how archaeological organisations represent stratigraphic data, in the United Kingdom, 96% of archaeological organisations use a stratigraphic matrix to represent the stratigraphic sequence, 100% of Irish archaeological organisations use a stratigraphic matrix to represent the stratigraphic sequence, 17% of Australasian archaeological organisations use a stratigraphic matrix to represent the stratigraphic sequence, and 4.7% of North American archaeological organisations use a stratigraphic matrix to represent the stratigraphic sequence (Graph 7.1.15). These results indicate that the majority of British and Irish organisations use a stratigraphic matrix to represent stratigraphic data, this is unsurprising as the Harris Matrix, or variations of this matrix system, have been integrated into archaeological investigations in these countries since the mid 1970s, and are now regarded as standard practice. The fact that barely any archaeological organisations in Australasia or North America use a matrix system to represent stratigraphic data is rather concerning, as this suggests that archaeological organisations operating in these areas are behind in archaeological methodological developments by at least 30 years. A possible reason why archaeological organisations operating in these areas have yet to adopt this approach to representing archaeological stratigraphy is because the majority of archaeological investigations that these organisations undertake take place in rural locations in which the archaeological evidence is widely dispersed, small in volume and lack complex stratigraphic sequences. Therefore, as these organisations are not dealing with sites that contain complex stratigraphic sequences that need a logical and structured system in order to represent and interpret them, they are able to understand and reconstruct the stratigraphic sequence by reading the descriptions of the stratigraphic units contained in their recording sheets. Whereas, those archaeological organisations in Australasia and North America that do use a matrix system to represent stratigraphic data are organisations that work on urban sites and need to use the matrix system in order to understand the complex stratigraphic relationships present.

In regards to how the archaeological organisations that use stratigraphic matrices to represent stratigraphic data verify the stratigraphic sequences that they have created and use this data to interpret the archaeological site, in the United Kingdom, 100% of archaeological organisations use spot dates/other dating material to verify the stratigraphic sequence, 96% use spot dates/other dating materials to then determine the phase activity of the site, 76% of archaeological organisations will then divide the stratigraphic matrix into phases, and 68% of archaeological organisations will subsequently divide the stratigraphic matrix into defined periods (Graph 7.1.15). In Ireland, 100% of archaeological organisations use spot dates/other dating material to verify the stratigraphic sequence, 100% of archaeological organisations use spot dates/other dating material to determine the phase activity of the site, and 67% of archaeological organisations will then divide the stratigraphic matrix into phases and periods (Graph 7.1.15). In Australasia, 100% of archaeological organisations will use spot dates/other dating materials to verify the stratigraphic sequence, 100% of archaeological organisations use spot dates/other dating material to determine the phase activity of the site, and 50% of archaeological organisations will then divide the stratigraphic matrix into phases and periods (Graph 7.1.15). In North America, 100% of archaeological organisations use spot dates/other dating materials to verify the stratigraphic sequence, 74.5% will use spot dates/other dating material to divide the site into phases, and 80% of archaeological organisations will divide the stratigraphic matrix into phases and periods (Graph 7.1.15).

These results indicate that all of the archaeological organisations that use stratigraphic matrices to represent stratigraphic sequences verify this sequence and phases of activity present at the site by using spot dating and other dating evidence. The majority of organisations then edit their stratigraphic matrices in order to represent phases of activity evident at the site and subsequently split the matrix into periods of inhabitation and abandonment. The fact that not all archaeological organisations choose to phase their matrices or divide them into distinct periods is down to the preferences of that particular organisation, as some organisations feel that as long as they discuss the phases of activity present in the site within their archaeological reports, there is no need to edit the matrix to reflect this.

Recording strategies

In terms of when archaeological organisations use section drawings to document archaeological data, in the United Kingdom 54% of archaeological organisations will only use section drawings when single context planning cannot be used, 4% will create running sections across the archaeological site, 92% will use section drawings to document the long sections of any trenches that have been excavated but only 4% of these organisations will only create long section drawings of trenches if archaeological evidence is present, 96% will use section drawings to record the walls of any test excavation units that have been excavated, and 96% will use section drawings to record any features present at the archaeological site that have been sectioned (Graph 7.1.17). In Ireland, 33% of archaeological organisations will only use section drawings if single context planning cannot be used, 100% will record long sections of any trenches that have been excavated regardless of whether archaeological evidence has been identified within them, 100% will record section drawings of the walls of any test excavation units that have been excavated, and 100% will record section drawings of any archaeological features that have been sectioned (Graph 7.1.17). In Australasia, 8% of archaeological organisations will only use section drawings if single context planning cannot be used, 100% will record long sections of any trenches that have been excavated regardless of whether archaeological evidence has been identified within them, 100% will record section drawings of the walls of any test excavation units that have been excavated, and 100% will record section drawings of any archaeological features that have been sectioned (Graph 7.1.17). In North America, 3.8% of archaeological organisations will only use section drawings if single context planning cannot be used, 74.5% will record long sections of any trenches that have been excavated regardless of whether archaeological evidence has been identified within them, 74.5% will record section drawings of any test excavation units that have been excavated, and 74.5% of archaeological organisations will use section drawings to record any features that have been sectioned (Graph 7.1.17).

These results indicate that the majority of archaeological organisations use section drawings to document the formation sequence of trenches or excavation units that have been excavated, or archaeological features that have been sectioned in order to document the deposition sequence present. This is because the excavation process used to cut trenches, excavation units, or to section archaeological features results in the deposition sequence present at an archaeological site or in the archaeological feature being cut through, and therefore, the only way in which to record the deposition sequence is to record section drawings, either in the form of a long section or a half section drawing.

The reason why the majority of archaeological organisations in the United Kingdom (54%) and some organisations in Ireland (33%), Australasia (8%) and North America (3.8%) only use section drawings when single context planning cannot be used, is because these organisations prefer to excavate archaeological sites using a Stratigraphic Excavation approach, which is an excavation method that is closely tied with the Single Context Recording system, as a result, these organisations excavate individual stratigraphic units in their entirety and plan each unit as they proceed, that in turn, means that section drawings are unnecessary (Graph 7.1.17). This also explains why some organisations choose not to use section drawings at all during the course of an archaeological investigation, as can be seen by the 96% response rate of some British archaeological organisations to section drawing related criteria (Graph 7.1.17).

The reason why some British archaeological organisations also only record long section drawings of trenches if they contain archaeological evidence is a money and time saving exercise, as such trenches are not of archaeological interest and so such archaeological organisations deem it to be a waste of resources. The reason why 4% of British archaeological organisations record running section drawings of archaeological sites is because they wish to have additional records available from which they can validate the single context plans that they have created (Graph 7.1.17). However, the fact that no other archaeological organisations use this approach indicates that this is not a very common validation practice.

Of those archaeological organisations that do use section drawings to record archaeological data, it is apparent that the data that is included in section drawings is rather generic (Graph 7.1.18). All British, Irish, Australasian, and the majority of North American archaeological organisations' section drawings will be photographed and have a unique identification number, they will also contain: a site code and site name, date, scale, cardinal points, datum points, illustrator's name, elevations, keys, section line, artefacts present, disturbances present and grid co-ordinates (Graph 7.1.18). The reason why only 82.4% of North American archaeological organisations' section drawings contain the aforementioned data is because not all of the North American organisations that use section drawings stated what data should be included on section drawings (Graph 7.1.18). Presumably, however, as the majority of archaeological organisations record the same data, the remaining 17.6% of North American organisations will follow the same approach (Graph 7.1.18).

The one area in which the archaeological organisations varied was in whether they included a stratigraphic relationship matrix on the section drawing (Graph 7.1.18). In the United Kingdom, 46% of archaeological organisations recorded a stratigraphic relationship matrix on the section drawing, 22% in Ireland, 8% in Australasia, and 4.7% in North America (Graph 7.1.18). The reason why some archaeological organisations choose to include a stratigraphic relationship matrix on their section drawings is due to the organisation's aesthetic preferences, and also because recording this data on the section drawing acts as a back-up procedure, just in case the recording forms associated with the feature being drawn are accidentally lost. In addition, the reason why some Australasian and North American archaeological organisations do not record this data on section drawings is because they do not use a stratigraphic matrix system to record stratigraphic relationships.

There is also a difference between the section drawing conventions that archaeological organisations use (Graph 7.1.19). In the United Kingdom, 100% of archaeological organisations' section drawings will illustrate both negative and positive stratigraphic units, that in turn, will illustrate the edge of the cut feature, and 8% will label the section drawing with a specific code that will indicate the feature type/number (Graph 7.1.19). In Ireland, 100% of archaeological organisations' section drawings will illustrate both negative and positive stratigraphic units, that in turn, illustrate the edge of the cut feature (Graph 7.1.19). In Australasia, 8% of archaeological organisations' section drawings will illustrate positive and negative stratigraphic units, 100% will illustrate each positive stratigraphic unit and the edge of its associated feature, and 92% will label the section drawing with a specific code that will indicate the feature type/number (Graph 7.1.19). In North America, 26.8% of archaeological organisations' section drawings will illustrate both negative and positive stratigraphic units, 74.5% will illustrate each positive stratigraphic unit and the edge of its associated feature, 70.5% will label the section drawing with a specific code that will indicate the feature type/number, 69.8% will annotate their section drawing describing the stratum's composition, 44.3% will annotate the stratigraphic boundaries that have been drawn with descriptions of their distinctiveness and topography (Graph 7.1.19).

It is evident that in the United Kingdom and Ireland, section drawings will illustrate both positive and negative stratigraphic units. However, in Australasia and North America the majority of archaeological organisations will not illustrate both positive and negative stratigraphic units, but will illustrate the positive units and the edge of the feature that has been excavated. This difference is caused by philosophical differences in what archaeological organisations in the United Kingdom, Ireland, Australasia and North America regard as a stratigraphic unit, as the majority of Australasian and North

American archaeological organisations consider ‘cuts’ to be features rather than negative units of stratigraphy. In the end, however, such differences in terminology make little difference to the production of a section drawing, as all of these archaeological organisations will draw the boundaries of the cut/feature and the fills within.

The inclusion of a separate code relating to the feature number/type by some British, Australasian and North American archaeological organisations is due to the fact that these organisations allocate features specific codes that relate to the feature’s function, thus by including this code on the section drawing, individuals who are looking at the section drawing can see what function the feature served without referring to additional data.

The fact that some North American archaeological organisations annotate their section drawings with descriptions of a stratum’s composition and a stratigraphic boundary’s distinctiveness and topography, is so that individuals looking at the section drawing can understand the feature without having to look through other recording forms. In addition, it also acts as a back up tool, in case the recording forms relating to the feature are lost accidentally.

In terms of when archaeological organisations will produce plan drawings, in the United Kingdom, 96% of archaeological organisations will produce a plan before a positive stratigraphic unit is excavated, 96% will also produce a plan of a negative stratigraphic unit, 12% will produce a plan before an arbitrary level is excavated, 100% will create a site plan that will indicate the location of any excavation and recording activity that took place at the archaeological site (Graph 7.1.20). In Ireland, 100% of archaeological organisations will produce a plan before a positive stratigraphic unit is excavated, 100% will also produce a plan of a negative stratigraphic unit, and 100% will create a site plan that will indicate the location of any excavation and recording activity that took place at the archaeological site (Graph 7.1.20). In Australasia, 100% of archaeological organisations will produce a plan before a positive stratigraphic unit is excavated, 100% will also produce a plan of a negative stratigraphic unit/feature, 92% will produce a plan before an arbitrary level is excavated, and 100% will create a site plan that will indicate the location of any excavation and recording activity that took place at the archaeological site (Graph 7.1.20). In North America, 73.6% of archaeological organisations will produce a plan before a positive stratigraphic unit is excavated, 72.6% will produce a plan of a negative stratigraphic unit/feature, 68.9% will produce a plan before an arbitrary level is excavated, and 73.6% will create a site plan that will indicate the location of any excavation and recording activity that took place at the archaeological site (Graph 7.1.20).

These results indicate that the majority of archaeological organisations will create archaeological site plans that illustrate the locations in which any excavation and/or recording activity has taken place. This is unsurprising, as such plans will demonstrate to individuals reading the archaeological site report where archaeological evidence was found. The fact that not all North American archaeological organisations produce plans is at odds with the majority of archaeological organisations, the reason why they do not produce plans in this manner is probably due to the requirements of the State in which they are working and whether the State recommends that archaeological site plans are produced.

The results also show that the majority of archaeological organisations complete plan drawings of all positive stratigraphic units and negative stratigraphic units/features present, again this is unsurprising as such plans will illustrate how the archaeological site formed. The fact that not all British and North American archaeological organisations choose to plan positive and negative stratigraphic units/features individually is due to the fact that they tend not to excavate using the Stratigraphic Excavation method, and prefer to use alternative excavation approaches that rely on sections rather than plans.

The fact that some British, Australasian and North American archaeological organisations produce plans before excavating an arbitrary level is because when such organisations use the Arbitrary Excavation method arbitrary-level plans are expected to be drawn. The small percentage of British archaeological organisations that stated that they create plans before excavating an arbitrary level is due to the fact that very few British archaeological organisations use the Arbitrary Excavation method, and therefore, do not discuss arbitrary level planning in their archaeological manuals/guidelines. Conversely, the high percentage of Australasian and North American archaeological organisations that stated that they produce plans before an arbitrary level is excavated is due to the fact that the Arbitrary Excavation method is commonly used by Australasian and North American archaeological organisations.

In relation to what data is recorded on plan drawings by archaeological organisations it is evident that it is very consistent between different archaeological organisations (Graph 7.1.21). The majority of British, Irish, Australasian and North American archaeological organisations will photograph their plans and allocate them a unique identification number (Graph 7.1.21). The plans will also contain: a site code and site name, date, scale, cardinal points, datum points, illustrator's name, elevations, keys, sampling locations, plan description, artefacts present, disturbances present, grid co-ordinates and strata labels (Graph 7.1.21).

The areas in which the archaeological organisations varied in terms of what data was included on plan drawings, included: whether the plan included a stratigraphic relationship matrix, whether stratigraphic units were labelled, and whether the plan included a feature number/type.

The reason why 54% of British archaeological organisations, 22% of Irish archaeological organisations, 8% of Australasian archaeological organisations, and 4.7% of North American archaeological organisations include a stratigraphic relationship matrix on their plan drawings is again due to the organisation's aesthetic preferences, and also because recording this data on the plan acts as a back-up procedure, just in case any of the recording forms associated with the feature or stratigraphic unit being planned are lost (Graph 7.1.21). The reason why some Australasian and North American organisations do not record this data is, as stated before, due to the fact that they do not use a stratigraphic matrix system to record stratigraphic relationships.

The notable differences between whether archaeological organisations label stratigraphic units or feature number/types on their plans is again, down to philosophical differences between how archaeologists operating in these different areas define cuts (Graph 7.1.21). As British and Irish archaeological organisations regard cuts as units of archaeological stratigraphy and Australasian and North American archaeological organisations regard them as features. Therefore, when recording plans, British and Irish archaeologists will record the cuts with stratigraphic unit labels and

Australasian and North American archaeologists will label them with predetermined feature numbers/types that will give an indication of the feature's function at the archaeological site. Moreover, as found before, some British archaeological organisations also include feature numbers/types on their plans in order to give individuals reading the plan drawing an idea of what function the archaeological unit being planned served at the archaeological site.

In relation to whether or not archaeological organisations use pro-formas to document archaeological data, it is evident from Graph 7.1.22 that all archaeological organisations do, and therefore it can be stated that pro-formas are a standard recording tool used during archaeological investigations. However, the type of pro-forma that a particular archaeological organisation uses to document archaeological data varies according to their own methodological preferences and the type of archaeological site they are excavating. For example, if an archaeological organisation is excavating an archaeological site using the Arbitrary method of excavation they will use a unit level recording form to document each arbitrary level removed, whereas, if they were using the Stratigraphic method of excavation they would use a context recording form to document each stratigraphic unit that was uncovered (Graph 7.1.22). However, despite these differences in when a particular type of pro-forma will be used, each archaeological organisation will have a particular pro-forma available to them to deal with the type of archaeological site that they are working on, and the methodological approaches that they will be using. The only variation is in relation to what these forms are called and the terminology used within them.

Excavation strategies

In regards to excavation sampling strategies, in the United Kingdom, 85% of archaeological organisations will excavate a representative sample if a large number of archaeological features are identified, 85% will excavate all archaeological features present if only a small number of archaeological features are identified, and 12% will excavate all units of archaeological stratigraphy present at the site (Graph 7.1.23). In Ireland, 89% of archaeological organisations will excavate a representative sample if a large number of archaeological features are identified, 89% will excavate all archaeological features present if only a small number of archaeological features are identified, and 11% will excavate all units of archaeological stratigraphy present at the site (Graph 7.1.23). In Australasia, 100% of archaeological organisations will excavate a representative sample if a large number of archaeological features are identified, and 100% of archaeological organisations will excavate all of the archaeological features present if only a small number of archaeological features are identified (Graph 7.1.23). In North America, 67% of archaeological organisations will excavate a representative sample if a large number of archaeological features are identified, 67% will excavate all archaeological features present if only a small number of archaeological features are identified, and 8.5% will excavate all units of archaeological stratigraphy present at the site (Graph 7.1.23).

It is evident from this data that the majority of archaeological organisations will adopt a sampling strategy when excavating an archaeological site, which is determined by the time, number of staff, number of archaeological features present, resources and government requirements imposed upon the archaeological investigation. Those that excavate all archaeological stratigraphic units present at the site are either required to by the governing body overseeing the archaeological investigation, or are research organisations that have the time and resources available to do so.

In terms of how archaeological organisations sample archaeological features, in the United Kingdom, 96% of archaeological organisations will excavate a representative slot through the fills of large features, 96% will excavate representative slots through curvilinear features, 8% will use baulks when excavating large or complex structures, and 8% will use test excavation units to sample the site and excavate and record these units individually (Graph 7.1.24). In Ireland, 100% of archaeological organisations will excavate a representative slot through the fills of large features and 100% will excavate representative slots through curvilinear features (Graph 7.1.24). In Australasia, 100% of archaeological organisations will excavate a representative slot through the fills of large features, 100% will excavate representative slots through curvilinear features, 92% will excavate shovel test pits in areas which lack surface evidence of archaeological inhabitation, 92% will use test excavation units to sample the site and excavate and record these units individually, and 92% will establish feature excavation units when archaeological evidence is found (Graph 7.1.24). In North America, 71.7% of archaeological organisations will excavate a representative slot through the fills of large features, 74.5% will excavate representative slots through curvilinear features, 4.7% will use baulks when excavating large or complex structures, 67% will excavate shovel test pits in areas which lack surface evidence of archaeological inhabitation, 69.8% will use test excavation units to sample the site and excavate and record these individually, 59.4% will sample structures using test excavation units prior to excavating the structure in its entirety, and 61.3% of archaeological organisations will establish feature excavation units when archaeological evidence is found (Graph 7.1.24).

The results indicate that the majority of archaeological organisations will excavate representative slots through either large or curvilinear features, either by using rectangular or L shaped slots. This enables archaeologists to determine the sequence of deposition of the features without spending long lengths of time excavating them in their entirety. Moreover, in some cases, this approach is used to determine the chronological relationship between two intercutting features. Usually, when using representative slots in this manner, several slots are excavated at various intervals, in order to confirm that the deposition sequence or chronological relationship that has been identified, is consistent throughout the entire feature, if this is found to be the case then the archaeologists need not excavate the remaining unexcavated sections of the feature.

The results also show that 8% of British archaeological organisations and 4.7% of North American archaeological organisations use baulks when excavating complex or large structures (Graph 7.1.24). Such archaeological organisations use this approach, in order to be able to create a section drawing of the stratigraphic sequence present within the complex or large structures, which can then be compared to the plan drawings created of the area being excavated. By using this approach several archaeologists can excavate in different units or grid squares across the structure at their own pace. They can also confirm, through looking at the section, that the layers that they have identified are the same as their colleagues working on the other sides of the baulks.

The reason why 92% of Australasian and 67% of North American archaeological organisations use shovel test pits in areas that lack evidence of archaeological inhabitation is due to the fact that these archaeological organisations often work on archaeological sites with very sparse archaeological evidence (Graph 7.1.24). Therefore, in order to rapidly assess if a site does in fact contain any archaeological evidence, they will excavate shovel test pits, using a shovel, to determine if the site is of archaeological importance.

The fact that 8% of British, 92% of Australasian and 69.8% of North American archaeological organisations use test pits during an archaeological investigation is unsurprising (Graph 7.1.24). Such test pits are used to determine whether or not an area has any archaeological evidence present. The fact that the majority of British and Irish, and some Australasian and North American archaeological organisations do not use test pits is due to the fact that these organisations are commercial archaeological organisations, therefore, they are called in to investigate large swathes of land and use alternative approaches, such as mechanical stripping or large evaluation trenches to determine if there is any archaeological evidence present.

The use of test excavation units to sample structures prior to excavating them in their entirety by 59.4% of North American archaeological organisations is merely a sampling strategy adopted by these organisations (Graph 7.1.24). Such test excavation units enables them to gauge the dimensions of the structure that is to be excavated and its complexity. Once such a test excavation unit has been excavated they are then able to adapt their excavation and recording strategies according to what was identified within the test excavation unit.

The results show that 92% of Australasian and 61.3% of North American archaeological organisations use feature excavation units after archaeological evidence has been found (Graph 7.1.24). Feature excavation units are shovel test pits or test excavation units that have tested positive for archaeological evidence. Therefore, once archaeological evidence has been found in either a shovel test pit or test excavation unit, the unit or pit is then referred to as a feature excavation unit and the unit is expanded in order to locate any additional archaeological evidence present. Subsequently, any archaeological evidence that is identified from this area is then linked to it by the given feature excavation unit reference number and associated feature excavation unit paperwork, rather than the shovel test pit or test excavation unit reference numbers and paperwork.

In regards to the use of different excavation techniques by archaeological organisations, in the United Kingdom, 12% of archaeological organisations will excavate using fixed arbitrary levels, 96% will excavate using identifiable stratigraphic units, and 58% of

archaeological organisations will excavate cut features using the Demirant or Quadrant Excavation methods (Graph 7.1.25). In Ireland, 100% of archaeological organisations will excavate using identifiable stratigraphic units and 92% will excavate cut features using the Demirant or Quadrant Excavation methods (Graph 7.1.25). In Australasia, 92% of organisations will excavate using fixed arbitrary levels, 100% will excavate using identifiable stratigraphic units, and 68.9% of organisations will excavate cut features using the Demirant or Quadrant Excavation methods (Graph 7.1.25). In North America, 47.2% of archaeological organisations will excavate using fixed arbitrary levels, 70.8% will excavate using identifiable stratigraphic units, and 68.9% of archaeological organisations will use the Demirant or Quadrant Excavation methods to excavate cut features (Graph 7.1.25).
These results indicate that the majority of archaeological organisations will use a variety of different excavation methods to excavate an archaeological site. The overall decision regarding which excavation method to use will be determined by - the type of archaeological site that is to be excavated and the type of archaeological features present.

It is interesting to note that British and Irish organisations tend not to use the Arbitrary Excavation method to excavate archaeological sites. The British archaeological organisations that stated that they do use the Arbitrary Excavation technique use it as well as the Stratigraphic, Demirant and Quadrant Excavation methods, and only use the Arbitrary Excavation approach if the archaeological site that they are dealing with has particularly thick stratigraphic units or they are unable to define the boundaries of individual stratigraphic units. In comparison, in Australasia and North America it is evident that a larger percentage of archaeological organisations use the Arbitrary method of excavation, this is because they are often excavating at archaeological sites that have particularly thick deposits through which they must excavate. Therefore, in order to efficiently deal with such archaeological sites these organisations utilise the Arbitrary Excavation method.

Despite the large percentage of Australasian and North American archaeological organisations stating that they do use the Arbitrary Excavation approach, the majority of these archaeological organisations as well as the British and Irish archaeological organisations, state that they excavate according to identifiable stratigraphic units, using the Stratigraphic Excavation method. There is a distinction to be made, however, between what British and Irish archaeological organisations and some Australasian and North American archaeological organisations would regard as excavating according to identifiable stratigraphic units or 'stratigraphically'. In the United Kingdom and Ireland, such stratigraphic units include: fills, layers, structures and cuts, whereas, some Australasian and North American archaeological organisations state that stratigraphic units only include: fills and layers. Therefore, when excavating according to stratigraphic units, some of the North American and Australasian organisations will only maintain the boundaries of any fills or layers that they identify, and will excavate through feature boundaries (cuts) as they do not regard them as stratigraphic units, although, they do record the dimensions of such boundaries as they excavate through them, so that a plan/section of the feature/cut can be reconstructed *post-facto*.

The fact that 58% of British, 67% of Irish, 92% of Australasian and 68.9% of North American archaeological organisations choose to section cuts/features using the Demirant or Quadrant Excavation methods is due to the fact that these approaches allow archaeologists to rapidly assess the stratigraphic sequence present. In Australasia and North America, however, there is a difference in how some organisations undertake the sectioning and excavation of a cut/feature. Rather than identifying the cut's/feature's limits, sectioning it, and excavating each section separately, some Australasian and North American archaeological organisations will turn the area in which the cut/feature is present into a feature excavation unit. They will then divide this unit, which includes both the cut/feature and the surrounding sterile soil, into two halves or four quarters, and then excavate both the fills/layers of the cut/feature and the sterile soil within each quarter or half, until the base of the cut/feature has been reached, after which they will record the half section/long section of the cut/feature that they have exposed.

Overall, in terms of the development and current use of archaeological excavation methods and recording systems it is apparent that there are several differences in how the different archaeological organisations evaluated in this Project conduct archaeological investigations.

The most significant differences are between the British and Irish archaeological organisations and the Australasian and North American archaeological organisations. The data analysed in this Project reveals that both British and Irish archaeological organisations adopt similar, if not the same, approaches to conducting archaeological investigations in regards to the recording systems and excavation methods that they use, and in terms of how they define, record and excavate archaeological stratigraphy. Whereas, the majority of Australasian and North American archaeological organisations utilise different excavation methods and recording systems, and define, record and excavate archaeological stratigraphy differently to the British and Irish archaeological organisations, although, use similar approaches to each other.

One reason why the strategies adopted to conduct archaeological investigations differ between archaeological organisations in the United Kingdom and Ireland and in Australasia and North America is because of fundamental differences in how these archaeological organisations define archaeological stratigraphy, as such differences result in these organisations adopting different excavation and recording approaches in order to capture the stratigraphic data that they deem to be significant.

Another reason why is because of the different types of archaeological sites that these different archaeological organisations investigate. In the United Kingdom and Ireland, archaeological investigations are conducted on both urban sites with complex archaeological stratigraphy and rural sites with widely dispersed archaeological evidence with very few complex stratigraphic units present. Consequently, archaeological organisations operating in the United Kingdom and Ireland must ensure that the methodological approaches that they advocate in their archaeological manuals/guidelines can be used and/or adapted for use on both of these archaeological site types.

In comparison, those archaeological organisations operating in Australasia and North America whom adopt different archaeological approaches to the archaeological organisations in the United Kingdom and Ireland tend to conduct archaeological investigations on rural Native American or Aboriginal archaeological sites. Such sites contain widely dispersed archaeological evidence and deep stratigraphic deposits, and as a result, such archaeological organisations have developed different archaeological approaches to cater to such sites, and have subsequently published these approaches in their archaeological manuals/guidelines.

Those archaeological organisations in Australasia and North America that do adopt similar archaeological approaches to the archaeological organisations in the United Kingdom and Ireland are archaeological organisations that have begun to excavate colonial historic sites, which are comparative to the urban sites investigated by British and Irish archaeological organisations. Consequently, such organisations have had to adapt their archaeological approaches to cater to the complex stratigraphy present at these sites, and in turn, have looked to British and Irish archaeological publications and investigative strategies to ensure that the methodological approaches that they use will maximise the archaeological evidence that is recovered.

4.2 Justifications for archaeological excavation methods and recording systems used in archaeological investigations

The third objective of this Project was to determine how archaeologists excavate, and why and when archaeologists choose to use particular excavation methods and recording systems. In order to obtain data to answer these questions each experimental participant completed an interview in which they answered questions relating to how they conduct archaeological investigations and the factors that influence their choice of excavation method. The participants were also asked to choose an excavation method and to select the recording techniques that they would use to investigate the grave simulation, and to justify their reasons for doing so. The results of these interviews can be found in ‘Chapter 7.2 Interview results’.

Archaeological investigations

Through analysing the data obtained through interviewing the participants who excavated the grave simulation, 92% of the participants stated that they followed a set of established archaeological guidelines when conducting archaeological investigations (Graph 7.2.1). Such guidelines provide recommendations as to how an archaeological investigation should be undertaken, and outline which archaeological excavation methods and recording systems should be used. However, 8% of participants stated that they do not follow a set of archaeological guidelines. These archaeologists determine how archaeological investigations will be conducted on a site-by-site basis forming bespoke excavation and recording protocols depending on what the site that is being investigated requires (Graph 7.2.1). This provides the archaeologists with the flexibility to adapt their approaches to the site's needs, rather than being restricted to the methodological approaches advocated in the guidelines. However, such flexibility is only possible in small commercial archaeological units who are working on small-scale archaeological investigations one at a time, as large commercial archaeological units, who are working on multiple sites at the same time, and are dealing with large-scale sites and managing large volumes of staff, many of whom will be rotating between the different archaeological investigations, need to ensure that the methodological approaches utilised are consistent, and that all members of staff are recording and excavating in the same manner, and therefore need archaeological guidelines in place. When participants were asked whether they are required to report the findings of an archaeological investigation to a governing body 77% of the participants said that they were, and 23% of participants said that they were not (Graph 7.2.2). The participants who said that they were required to report their findings to a governing body tended to work in the commercial archaeological sector. When investigations are conducted in this context, local government representatives such as the County Archaeologist, set recommendations as to how the archaeological investigation of a site within their jurisdiction should be conducted, and, as a consequence, the commercial unit dealing with the site are required to report their findings back to the appropriate government representative. The participants who stated that they were not required to report their findings to a governing body tended to conduct most of their archaeological investigations in research or academic contexts. Such archaeological investigations are conducted on private land with the permission of the landowner and therefore the archaeologists are not required to report the findings of the archaeological investigation to a governing body. Instead, archaeologists working on such archaeological investigations tend to disseminate the findings of the project through publishing them in archaeological journals, speaking at local archaeology society meetings, and writing summary reports for interested parties.

In terms of having a specific excavation manual, which outlines which excavation methods should be used during archaeological investigations 87% of the participants stated that they do, and 13% said that they do not (Graph 7.2.4). Similarly, when participants were asked whether they had a specific recording manual, again 87% of participants said that they do, and 13% said that they do not (Graph 7.2.8). Interestingly, when one compares the results of these two questions against the results of whether the participants followed a set of archaeological guidelines when conducting archaeological investigations, it is apparent that there was a 5% increase in the number of participants who did not have an excavation or a recording manual available to them. This may be due to the fact that the archaeological guidelines that these participants use do not have detailed excavation methods or recording systems sections within them. Rather, they provide generalised approaches to conducting archaeological investigations, without setting strict rules as to which methodological approaches should be used. Leaving decisions regarding how the site will be excavated and recorded to the discretion of the archaeologists at site and the site's director.

Interestingly, however, 92% of the participants stated that the excavation methods that they use vary according to the archaeological site that they are working on, and only 8% said that they do not (Graph 7.2.3). This flexibility in the methodological approaches that may be used during archaeological investigations is due to a number of variables which include: the scale of the site that is to be excavated, the time available to conduct the excavation, the type of archaeological site that is being excavated, the number of archaeologists that are available, and the sampling strategy that has been set by the director, each of which will determine which excavation methods will be used. The fact that 92% of participants stated that excavation methods change on a site-by-site basis and 87% of participants stated that they referred to an excavation manual when conducting archaeological fieldwork is not at odds, as excavation manuals provide a variety of excavation approaches to use depending on the impact that the aforementioned variables have been deemed to have on the archaeological investigation (Graph 7.2.3 and Graph 7.2.4).

Despite excavation manuals proffering a variety of excavation methods to use for different types of archaeological investigation only 72% of participants stated that they followed the excavation methods outlined in the excavation manual, whereas 28% said that they do not, and excavate the site according to their own methodological preferences (Graph 4.2.5). The reasons why some participants stated that they do not follow the methods outlined in the manual are, firstly, that not all participants have an excavation manual to follow, as the results in 'Graph 4.2.4' highlight. Secondly, some participants consider themselves to have sufficient experience to determine which excavation methods they should use and do not find the excavation manual useful in this respect.

When participants were asked whether or not the recording techniques that they use varied according to the type of archaeological site they were working on 85% said that they do, and 15% said that they do not (Graph 4.2.7). It is interesting to note that the archaeologists adapt their recording approaches to a lesser degree than they do their excavation methods, which were adapted according to the type of site in 92% of cases (Graph 4.2.3). This is most likely due to the fact that the majority of archaeological units conducting fieldwork have set pro-formas in place that are used to record archaeological data (Graph 4.2.10). Therefore, when an archaeological investigation is undertaken, the same set of pro-formas are used regardless of the type of archaeological site that is being excavated (Graph 4.2.10). The participants who stated that they do adapt their recording techniques on a site-by-site basis are again, as with the excavation methods, doing so in accordance with the following factors: the size of the site that is to be recorded, the time available to conduct the recording, the type of archaeological site that is being recorded, the number of archaeologists that are available, and the equipment and resources that are available to complete the recording. This approach, therefore, gives these archaeologists the flexibility to record what is necessary according to the impact that the aforementioned factors have been deemed to have on the archaeological investigation. This reasoning may also explain why when the participants were asked whether or not they follow the recording procedures outlined in the recording manual 80% said that they do and 20% said that they record according to their own methodological preferences (Graph 4.2.9). Furthermore, as stated earlier, not all of the participants had a recording manual available to refer to as the results in ‘Graph 4.2.8’ show.

Factors that influence excavation method selection

Participants were asked to rank the following factors by the extent to which they influence their choice of excavation method: literary sources, previous archaeological training, the requirements of the local governing body, research aims and objectives, field experience, communication with other archaeologists, site type, and the recording method that will be used. The results from the analysis of this data are displayed in 'Graph 4.2.6'.

The results show that the most important factor that influences the participants' choice of excavation method was the aims and objectives of the project. This is perhaps not unsurprising, as the aims and objectives of the project will dictate which archaeological features will be excavated and recorded, and in turn, will state which methodological techniques will be used.

The second most influential factor in determining which excavation methods would be used was the site type that was to be excavated. This is understandable as if an archaeologist was dealing with an urban site with complex, intercutting stratigraphy, they would need to use a different approach than they would if they were dealing with a rural site that had a variety of archaeological features that were vastly spread out from one another.

The third most influential factor in excavation method selection was field experience. This factor was deemed important as through conducting archaeological investigations on a variety of different site types and by excavating a variety of different archaeological features, archaeologists have tried and tested a number of different excavation methods on the same type of feature. This experience then enables the archaeologists to decide which excavation method would be most suitable to use for a particular type of archaeological feature.

The fourth most influential factor in excavation method selection was communication with other archaeologists. Understandably, as with any large-scale project in any industry, discussions amongst team members regarding what approach should be taken to deal with a specific issue, or in the case of archaeology, a specific archaeological feature, contributes greatly to the methodological approach that is eventually taken.

The factor that was ranked fifth was previous archaeological training. Archaeological training provides archaeologists with the knowledge of how each excavation approach is deployed. This knowledge can then be combined with the aforementioned factors to determine which excavation method is best able to deal with the archaeological feature that is to be excavated.

The factor that was ranked sixth was the requirements of the local governing body. Although this factor was ranked as one of the lowest influences on which excavation method will be used, the requirements of the local governing body, especially in commercial archaeological investigations, will be integrated into and help to determine the aims and objectives of the archaeological investigation.

The factor that was ranked seventh was literary sources. It is perhaps unsurprising that this factor was deemed to be one of the least influential factors, as literary sources, apart from archaeological manuals and guidelines, are rarely used in the field to help assess which excavation method should be used. Rather, literary sources tend to be used during the desktop assessment phase and the post-excavation phase of archaeological investigations, to provide some contextual background to the data that could be or was obtained during the course of the excavation.

The factor that was ranked as the least influential factor on excavation method selection was the recording system that was to be used. It is apparent that the participants did not appear to think that recording systems had any impact on how excavations were to be conduct. In fact, it would seem that the participants think that the excavation methods used will determine what recording systems will be used, rather than the other way around.

Excavation method selection

Prior to conducting the excavation experiment participants were asked to choose between four excavation methods to excavate the grave simulation. These methods were: the Stratigraphic Excavation method, the Demirant Excavation method, the Quadrant Excavation method, and the Arbitrary Excavation method. Each method was selected by a total of 10 participants. The participants were then asked to justify their choice of excavation method. These justifications are discussed below.

Justifications for the use of the Stratigraphic Excavation method

Participants who chose to use the Stratigraphic Excavation method to excavate the grave simulation justified their selection of this approach by stating the following: the method is widely used in commercial practice, employers expect them to use the

Stratigraphic Excavation method, it is what institutions (universities, colleges etc.) and employers have trained them to do, the method allows archaeologists to investigate the archaeological feature of interest in a controlled manner, and, the method enables archaeologists to document and interpret the formation sequence/stratigraphic sequence of the archaeological feature being excavated and the archaeological site as a whole, in a logical manner.

The statement that the Stratigraphic Excavation method is widely used in commercial practice, and as a consequence, is required to be used by employers and also taught in archaeological training institutions, is most likely due to the creation of the Museum of London's Archaeological Site Manual in 1980. This manual introduced a protocol for the excavation and recording of archaeological sites and was the first of its kind to state that the Stratigraphic Excavation method and its associated Single Context Recording system should be used for archaeological investigations, particularly those that are dealing with sites with complex stratigraphy. Since its creation this particular manual has formed the basis for almost all commercial archaeological site manuals in the United Kingdom and Ireland. This has led employers, such as those of the participants, to state that this methodological approach should be used for archaeological investigations. Furthermore, as this is the methodological approach that is widely advocated by the British and Irish archaeological industry, archaeological training institutions train their students to use this method in order to ensure that their pupils are able to find employment after the completion of their courses.

The statement that this method enables archaeologists to investigate the archaeological feature of interest in a controlled manner, and that it allows archaeologists to document and interpret the formation/stratigraphic sequence of archaeological features and archaeological sites in a logical manner, stems from the fact that this method allows archaeologists to excavate and document each stratigraphic context present at a site individually, and as a result, record its relationship both with other contexts present at the site in general, and within any archaeological features being excavated. This provides archaeologists with control over the excavation process, as they focus on a single context at a time, thus ensuring that a full understanding of each context is gathered before moving on to the next, this results in the site's formation sequence being constructed context-by-context, that in turn, enables archaeologists to identify any discrepancies in the formation sequence immediately, rather than attempting to do it *post-facto*, as other methods do. Thus, leading participants to select this method and highlight the fact that it is both a controlled and logical approach to use in archaeological investigations.

Justifications for the use of the Demirant Excavation method

Participants who chose to use the Demirant Excavation method to excavate the grave simulation justified their selection of this approach by stating the following: this method is the default method used by commercial units on sites where speed of excavation is important, the presence of the half-section allows for the best ratio between information gathered and time spent on the feature, it's the method that the participants have been trained to use, the method enables archaeologists to understand what's happening in the feature rapidly without having to remove all of the fills, and it results in the production of a section drawing that enables one to easily demonstrate the feature's formation process.

The reason why participants stated that the Demirant Excavation method is the default approach in commercial excavations when time is a critical factor, and that the half section provides the best ratio between information gathered and time spent excavating, stems from the fact that many commercial excavations have a limited time frame in which to investigate an archaeological site. Under such circumstances, archaeologists tend to sample archaeological features rather than excavate them in their entirety. This means that when archaeologists are excavating a pit, for example, they will only excavate half of the pit rather than excavating it in its entirety. This sampling procedure, results in the production of a half section drawing, which archaeologists state, will demonstrate how the pit was constructed – the fills and the cut, and will therefore be sufficient for interpretive purposes, leaving archaeologists with more time to excavate other archaeological features present at the site. This reasoning may also explain why some participants stated that it is the method that they are trained to use for cut features, as this is the methodological approach that they apply on a day-to-day basis during commercial archaeological investigations.

Participants also stated that this methodological approach enables archaeologists to understand what is happening within the archaeological feature rapidly without having to remove all of the fills. This justification stems from the fact that this method requires that half the fill of the feature be removed first. This then enables the archaeologist to view the half section which exhibits the remaining half of the feature's fills in situ, allowing the archaeologist to check the findings of the excavation of the first half by inspecting the half section face to see if the fills that were recorded during the excavation of the first half are present in the half section. This approach, however, relies on the fills of the feature extending into the half section face, which is not always the case. Although, if the fills match the findings from the excavation of the first half, and all extend into the section face, the archaeologist then has a clear understanding of how the feature was formed, and can then, if required, rapidly remove the second half of the feature as they already know the composition of the fills within the feature, and can subsequently update their existing recording forms with any new data gained.

The final justification for the use of this excavation method is that it results in the production of a half section drawing that will demonstrate the formation process of the feature. Again, this justification relies on each fill extending to the point at which the archaeologist set up their section line. However, if they do, the half section drawing displays all of the fills and their relationships with one another at one particular point in the feature, in one drawing, whereas other approaches rely on the production of multiple plans, or profile drawings, which take time to produce and can be confusing to interpret if they are not correctly labelled, or are being read by layman, such as the general public, or in forensic cases, lawyers and jury members. Thus, having one drawing that can be used to explain how a feature was formed makes it easier to interpret and to explain archaeological findings to interested parties, as long as the section drawing is accurate and each fill within the feature is present in the drawing.

Justifications for the use of the Quadrant Excavation method

Participants who chose to use the Quadrant Excavation method to excavate the grave simulation justified their selection of this approach by stating the following: It's the method that the participants have been trained to use, it provides a highly detailed and clear visual record of the stratigraphic sequence, it allows one to understand the stratigraphic sequence across the length and width of the feature, it allows one to rapidly assess the stratigraphic sequence without disturbing the entire feature, and it captures the most data about the feature's formation process.

The reason why participants stated that this excavation method was the one which they had been trained to use for cut features, is most likely due to the fact that in commercial archaeology, when dealing with certain types of cut features, such as pits, many archaeologists either excavate them using the Demirant Excavation approach or the Quadrant Excavation approach, depending on the amount of time they have available to dig the feature, the complexity of the feature that is to be excavated, and the preferences of the site director. The Quadrant Excavation method tends to be used on larger cut features, as dividing small features, such as post holes, into four quarters does not allow the archaeologist enough room to remove the fills from within it. This method also allows for multiple archaeologists to excavate opposing quadrants, and thus save time, enabling archaeologists to investigate more features within the time constraints of the commercial archaeological investigation.

The justifications that this method allows one to understand the stratigraphic sequence across the length and width of the feature, and that this method allows one to rapidly assess the stratigraphic sequence without disturbing the entire feature is due to the fact that the method requires that the feature is divided into four quarters, each of which are excavated and recorded separately. If only one archaeologist is working on the archaeological feature, the removal of the first quarter enables the archaeologist to assess the complexity of the stratigraphic sequence, as half of the fill across the length and width of the feature is left in situ. This means that there is minimal disturbance to the archaeological feature as a whole, and that the archaeologist also knows what fills are present within the archaeological feature, from which they can then determine how best to continue the excavation. Having removed the first quarter, the excavation of the opposing quarter then reveals the remaining halves of the feature. This then allows the archaeologist to record the long section of the feature and the half section of the feature. Such data can then be used to reconstruct the stratigraphic sequence across the entire length and width of the archaeological feature, thus ensuring that the dimensions of each fill within the feature are recorded in their entirety, unlike with the Demirant Excavation approach.

This reasoning also accounts for the justifications that this method results in the creation of a highly detailed and clear visual record of the stratigraphic sequence, and that this method captures the most data about the feature's formation process. As the method leads to the creation of two drawings, one which displays the half section and the other which displays the long section of the archaeological feature, which together, demonstrate the formation sequence of the entire archaeological feature. This visual record again, makes it easier for laymen to understand how the feature was formed, and shows how the archaeological feature was formed across its entirety, rather than at one section, thus resulting in a clear and detailed record of the feature's formation process.

Justifications for the use of the Arbitrary Excavation method

Participants who chose to use the Arbitrary Excavation method to excavate the grave simulation justified their selection of this approach by stating the following: it is easy to use, it provides good spatial control of artefacts recovered, it allows for excellent photographs to be taken of artefacts in situ by placing them on pedestals, it's a fast and efficient technique, and it is applicable on archaeological features that lack complex stratigraphy.

The reason why participants stated that this method is an easy, fast and efficient technique to use is because the method itself is simple, all archaeologists need to do is to either define an excavation unit around the archaeological feature of interest, or define the boundaries of the archaeological feature, and then remove spits of 5cm, 10cm, or 15cm, continuously until the base of the feature is reached. This means that no time is spent on defining the boundaries of individual fills contained within the archaeological feature, and individuals with very little archaeological knowledge or training can complete the entire process with ease.

However, as many of the participants stated, this method is only applicable on sites that lack complex stratigraphy, as the method itself destroys the dimensions of individual fills and cuts as the excavation progresses. Despite this, the participants who chose to use this methodological approach stated that as graves usually lack complex stratigraphy, and are normally composed of a singular backfill, the Arbitrary Excavation approach would be suitable, as they presumed that the grave simulation would mimic the composition of 'normal' graves.

Participants also justified their use of this technique by stating that the method provides good spatial control of artefacts recovered, and allows for excellent photographs to be taken of artefacts due to the use of soil pedestals. The argument that the method provides good spatial control of artefacts recovered is justifiable if the archaeological feature that is being excavated only has one fill, as the spits allow for a spatial deposition sequence of artefacts found to be formed within the one fill. However, if the archaeological feature has multiple fills, this argument is invalid, as the archaeologist will be able to state that an artefact was found at a certain depth in a certain spit, but will be unable to determine or explain how the artefact came to be in that position, as the contextual information, the fills/deposits of the archaeological feature, have been destroyed during the excavation process. The claim that soil pedestals allow for excellent photographs of artefacts to be taken is due to the fact that the act of pedestalling places each artefact that is found on a soil platform that stands out from the surrounding soil matrix. This ensures that each artefact is visible at a distance and up-close and highlights the artefacts position within the archaeological feature that is being excavated. This platform also enables archaeologists to inspect an artefact in detail before it is lifted, which is useful in the case of fragile artefacts that may become damaged as they are transferred to finds trays or bags.

Recording system selection

Prior to conducting the excavation of the grave simulation each participant was asked to select the various recording techniques that they would choose to use to record a negative archaeological feature, such as a grave. They were then asked to justify their choice of recording techniques.

The results relating to which recording techniques were selected to be used, or at least were made available to be used, by the participants for the excavation of the grave simulation can be found in 'Graph 4.2.11'.

The results indicate that all participants thought that plans, section drawings and photographs should be used to record negative archaeological features. However, only

95% of participants thought that context sheets would be of use. Those who chose not to use them preferred to document their findings in journal format. In total, 92.5% of the participants thought that sketches should be used as an aide-memoire as the excavation progressed. In terms of using journals, 65% of the participants advocated their use, stating that using journals enabled them to keep track of their thought processes and aid in the interpretation stage of the investigation. Unit level forms were thought to be important by 30% of the participants and 12.5% of the participants thought excavation unit forms should be used. These two recording techniques tend to be used by archaeologists using the Arbitrary Excavation approach and so the reasonably high percentage of participants choosing these two recording techniques can be explained by the fact that 10 participants chose this method to excavate the grave simulation. Finds quantification sheets, digital records, voice notes and video recordings were selected by 2.5% of participants. These results suggest that these types of recording techniques are not deemed to be of critical value for documenting the findings of the excavation of a negative archaeological feature.

It is interesting to note, however, that a number of the participants chose not to use all of the recording techniques that they had said that they would have used when they went on to excavate the grave simulation. Instead, the participants used the recording techniques that were associated with the excavation method that they had chosen to use. Participants who selected to use the Stratigraphic Excavation method used plans, context sheets, photographs, sketches and journals to document their findings. Similarly, the participants who chose to use the Demirant Excavation method and the Quadrant Excavation method used context sheets, section drawings, photographs, sketches and journals to document their findings. Whereas, the participants who chose to use the Arbitrary Excavation method used, excavation unit forms, unit level forms, photographs, sketches and journals to document their findings as can be seen in 'Chapter 5: Excavation experiment results'.

Justifications for the selection of recording techniques

The reasons given by the participants for the selection of the aforementioned recording techniques were as follows: they are the techniques that the participants have been trained to use and are expected to be used by the companies that they work for, they are standard practice for archaeological investigations, using these techniques enables a variety of detailed data to be collected that allows the site to be reconstructed, interpretations to be formed, and interested parties to reinterpret the archaeological site at a later date, it provides a structured approach to recording that results in a comprehensive and standardised archive being created.

The fact that a number of participants stated that the recording techniques that they selected were those that they had been trained to use and were those that are expected to be used by the companies that they work for can be explained by the fact that the recording techniques that were chosen are the techniques that are most often recommended both in the archaeological literature and archaeological guidelines. Hence, archaeological training institutions train their archaeology students in the use of these methods to ensure that their students are able to find employment within the archaeological industry after graduating. Furthermore, this reasoning may also explain why many of the participants stated that these recording techniques were standard practice.

The statement made by the participants that these recording techniques will enable a variety of detailed data to be collected that allows the site to be reconstructed, interpreted, and interested parties to reinterpret the archaeological site at a later date, makes sense, as this response matches the underlying ethos of archaeological investigations – preservation by record. Thus by using a variety of different techniques, that capture all data, even if it is deemed irrelevant at the time of recording, the site is preserved so that future archaeologists can interrogate the data at a later date and develop new explanations for what was found.

The final justification for the selection of the recording techniques was that it provides a structured approach to recording that results in a comprehensive and standardised archive being formed. This reasoning ties in with the previous justifications, as through using a set of standardised recording techniques to document the findings at the site other archaeologists will be able to interpret the findings, as they will be familiar with the recording techniques that were used. Additionally, the individuals who are working on the post-excavation analysis of the archaeological site under investigation will then have an organised data set from which to form the site’s archive and create the end of investigation report.

Overall, it is evident from these results that archaeologists use a variety of different archaeological excavation methods and recording systems during the course of an archaeological investigation. The selection of a particular excavation method or recording system is largely determined by the excavation methods and recording systems that are advocated in the archaeological manuals/guidelines that an individual archaeologist has been trained to use, the aims and objectives of the archaeological investigation, and the archaeological site type that is to be excavated. Although, it is interesting to note, that despite the fact that the aims and objectives and site type that was to be excavated during the grave excavation experiment was the same for all participants, different groups of participants chose to utilise different excavation methods and recording systems to complete the experiment. Each group justified their selection by stating that the methodological approach that they chose was one that they had used in the past, that it would recover the stratigraphic units and material evidence present within the grave simulation, and would provide accurate records of the formation sequence of the grave. This finding indicates that there is no standardised archaeological approach to excavating and recording negative archaeological features, such as graves, and that methodological approaches are largely determined by the methodological preferences of individual archaeologists.

4.3 The selection of archaeological excavation methods and recording systems for forensic investigations

Material evidence found using the Stratigraphic Excavation method

An average of 71.11% of material evidence was recovered using the Stratigraphic method of excavation (Table 8.151; Graph 8.4; Graph 8.3), although the total material evidence retrieval rate varied between 44.44% and 100% amongst each of the participants (Table 8.16; Table 8.22; Table 8.28).

Each of the participants identified material evidence both in and out of situ. Material evidence that was identified out of situ was recovered either by the participants when sieving the extracted spoil, or whilst they were transferring spoil to tarpaulins. An average of 18.75% of material evidence was found out of situ, although, the percentage of material evidence found out of situ varied from 0% and 44.44% (Table 8.7; Table 8.16; Table 8.22; Table 8.25; Table 8.28; Graph 8.2). Despite finding material evidence out of situ, due to the participants using the Stratigraphic Excavation approach, the participants were able to reassociate the material evidence recovered with the individual contexts they had defined, and were thus able to place these items within a stratigraphic sequence and determine their relative depositional chronology. However, as Archaeologist 003, Archaeologist 006, and Archaeologist 007 failed to define all 10 contexts present within the grave structure, they subsequently associated some of the recovered material evidence with incorrect contexts, making their reconstruction of the stratigraphic sequence and overall interpretation of the material evidence deposition sequence incorrect (Table 8.156). However, the extent to which their reconstructions were incorrect varied in accordance to the number of contexts each participant identified. Therefore, Archaeologist 003 who identified 9 contexts correctly was able to define the material evidences' relative depositional sequence the most accurately, then Archaeologist 006 and Archaeologist 007 both of whom identified 8 contexts correctly (Table 8.8; Table 8.17; Table 8.20).

Some material evidence failed to be recovered whilst utilising the Stratigraphic Excavation method. The percentage of evidence not recovered averaged at 28.89%, however, between participants the percentage of evidence not recovered varied from 0% and 55.56% (Table 8.16; Table 8.22; Table 8.28; Table 8.151; Graph 8.3; Graph 8.4). The failure of Archaeologist 006 and Archaeologist 008 to identify the two pence coin, and Archaeologist 006, Archaeologist 007 and Archaeologist 008 to identify the fake nail can be explained by the fact that these participants chose not to sieve during the excavation experiment. However, 90% of the participants failed to identify the curby grip and 60% of participants failed to identify the earrings placed into the grave (Table 8.151; Graph 8.1). The reason why the majority of participants did not find these items can be attributed to the size of these items, which made them difficult to identify whilst excavating and sieving the soil. Although, as all of the graves contained exactly the same evidence and contexts, each participant had an equal chance of retrieving the material evidence present, particularly the six participants that chose to sieve as they excavated, as Archaeologist 010 demonstrated by recovering all of the material evidence placed into the grave. Therefore, the failure of these participants to retrieve all of the material evidence present cannot be attributed to the method, as all of the contexts removed from the grave were sieved by these participants, therefore, any evidence not retrieved in situ, should have been retrieved whilst they were sieving. Consequently, the failure of these participants to retrieve material evidence must be attributed to the individual archaeologist and the care and attention they paid whilst excavating and sieving.

Material evidence found using the Demirant Excavation method

An average of 73.33% of material evidence was recovered using the Demirant method of excavation (Table 8.152; Graph 8.4; Graph 8.3), although the total material evidence retrieval rate varied between 44.44% and 88.89% amongst each of the participants (Table 8.31; Table 8.34; Table 8.37; Table 8.43; Table 8.46; Table 8.52; Table 8.55; Table 8.58).

As found in the Stratigraphic Excavation experiments, material evidence was recovered both in and out of situ whilst participants were using the Demirant Excavation method (Table 8.152; Graph 8.2; Graph 8.3). As with the Stratigraphic Excavation experiments, material evidence that was found out of situ was found either when the participants were sieving the extracted spoil, or whilst they were transferring spoil to tarpaulins. An average of 12.12% of material evidence was found out of situ, however, the percentage of material evidence found out of situ varied from 0% and 25% (Table 8.152; Table 8.34; Table 8.37; Table 8.40; Table 8.43; Table 8.46; Table 8.52; Table 8.55). As with the Stratigraphic Excavation method, despite participants finding evidence out of situ, because the Demirant Excavation method ensures that individual contexts are excavated and recorded separately, the participants were able to reassociate the material evidence that was recovered with the contexts from which they had originated. However, Archaeologist 014 and Archaeologist 020 failed to identify all 10 contexts correctly, each missing one (Table 8.41; Table 8.59; Table 8.157). Therefore, as with the participants who missed contexts in the Stratigraphic Excavation experiments, these individuals' reconstructions of the stratigraphic sequence and material evidence deposition sequence were incorrect (Table 8.41; Table 8.59).

As was found with the Stratigraphic Excavation experiments, some material evidence failed to be recovered during the Demirant Excavation experiments (Table 8.152; Graph 8.3; Graph 8.4). An average of 26.67% of material evidence was not identified during the experiments, although the amount of material evidence not recovered varied between 11.11% and 55.56% (Table 8.152; Graph 8.1; Graph 8.4; Graph 8.3; Table 8.31; Table 8.34; Table 8.37; Table 8.43; Table 8.46; Table 8.52; Table 8.55; Table 8.58). As was found in the Stratigraphic Excavation experiments, the failure of Archaeologist 014, Archaeologist 019, and Archaeologist 020 to find items such as the two pence coin, the fake nail and the packet of cigarette papers is due to the fact that these participants did not attempt to sieve the spoil during the excavation process (Table 8.40; Table 8.55; Table 8.58). Again, however, there was a trend amongst participants, even amongst those who sieved, for smaller material evidence items such as the earrings and the curby grip not to be located (Table 8.152; Graph 8.1). This is likely to be due to the care and attention that individual participants paid whilst excavating and sieving.

Material evidence found using the Quadrant Excavation method

An average of 71.11% of material evidence was recovered using the Quadrant Excavation method (Table 8.153; Graph 8.4; Graph 8.3). Although, the recovery rate of material evidence varied between 44.44% and 88.89% (Table 8.64; Table 8.67; Table 8.70; Table 8.73; Table 8.79; Table 8.88).

As with both the Stratigraphic Excavation and Demirant Excavation experiments, participants identified material evidence both in and out of situ, and such evidence was found whist the participants were sieving or when they were transferring spoil to the tarpaulins. An average of 6.25% of evidence was found out of situ, but the percentage of evidence found out of situ varied between 0% and 25% (Table 8.61; Table 8.64; Table 8.67; Table 8.70; Table 8.73; Table 8.79; Table 8.82; Table 8.85; Table 8.88 Table 8.153; Graph 8.2; Graph 8.3). As with both the Stratigraphic and Demirant methods of excavation, because this methodological approach ensures that each context is defined and recorded separately, the fact that material evidence was found out of situ was irrelevant, as the participants were able to reassociate these items with the contexts from which they had originated and determine the material evidence deposition sequence. However, as with the Stratigraphic and Demirant Excavation experiments, some contexts were not identified. Archaeologist 023 only identified 8 out of the 10 contexts present in the grave, and therefore, this participant’s reconstruction of the grave's stratigraphic and material evidence deposition sequence was incorrect (Table 8.68; Table 8.158).

As with the Stratigraphic and Demirant Excavation experiments, some participants failed to identify items of material evidence during the Quadrant Excavation experiments (Table 8.153; Graph 8.3; Graph 8.4). On average, 28.89% of material evidence failed to be found (Table 8.153; Graph 8.3; Graph 8.4). The amount of material evidence that was not found varied between 11.11% and 55.56% (Table 8.64; Table 8.67; Table 8.70; Table 8.73; Table 8.79; Table 8.88). The failure of Archaeologist 025, Archaeologist 027 and Archaeologist 028 to recover items such as the two pence coin and the fake nail can be attributed to the fact that these participants failed to sieve the spoil (Table 8.73; Table 8.79; Table 8.82). However, seven out of the ten participants did not sieve the spoil, and yet, the majority managed to locate these items, so the fact that these participants failed to locate these items is probably due to these participants not being particularly observant. Moreover, as was found with the Stratigraphic and Demirant Excavation experiments, the material evidence items that were not located tended to be small in size, such as the earrings and the curby grip, however, as some of the participants did manage to find these items even when they did not sieve, one must again, attribute the participants' failure to locate such items to the participants' lack of attention when excavating and sieving the soil (Table 8.153; Graph 8.1).

Material evidence found using the Arbitrary Excavation method

Using the Arbitrary Excavation method an average of 51.11% of material evidence was recovered (Table 8.154; Graph 8.4; Graph 8.3; Graph 8.4). The total material evidence retrieval rate varied between 22.22% and 77.78% (Table 8.91; Table 8.100).

As with the previous excavation experiments, material evidence was recovered both in and out of situ whilst the participants were using the Arbitrary Excavation method. As not one of the participants using the Arbitrary Excavation method sieved the spoil, material evidence items that were found out of situ were identified as the participants were transferring the spoil to the tarpaulin. On average, 4.35% of material evidence was found out of situ, however, the amount of evidence found out of situ varied between 0%

and 50% (Table 8.154; Graph 8.2; Graph 8.3; Table 8.91; Table 8.94; Table 8.97; Table 8.100; Table 8.103; Table 8.106; Table 8.109; Table 8.115; Table 8.118). Although, unlike in the previous excavation experiments, all of the participants who used the Arbitrary Excavation method failed to identify all of the 10 contexts present in the grave, and therefore, reassociated some of the recovered material evidence with incorrect contexts, making all of the Arbitrary Excavation participants' reconstructions of both the stratigraphic sequence and material evidence deposition sequence incorrect (Table 8.159; Table 8.92; Table 8.95; Table 8.98; Table 8.101; Table 8.104; Table 8.107; Table 8.110; Table 8.113; Table 8.116; Table 8.119).

As with the previous excavation experiments, some material evidence failed to be recovered by participants using the Arbitrary Excavation method (Table 8.154; Graph 8.1; Graph 8.3; Graph 8.4). An average of 48.89% of material evidence failed to be identified, although the percentage varied between 22.22% and 77.78% (Table 8.91; Table 8.100). The type of evidence that tended to be lost was again small in size, such as the earrings and the curby grip (Table 8.154). Although, participants using this method also failed to recover larger items, such as the cigarette papers, two pence coin, fake nail and ID card (Table 8.154). The failure to recover both the smaller and larger items can be attributed to the fact that not one of the participants attempted to sieve the spoil. Furthermore, the participants using this method rapidly removed the fills contained within the grave, removing hand shovelfuls of spoil at a time, and made barely any attempts to inspect the spoil for the presence of material evidence, and so this too may account for the failure of these archaeologists to recover as much material evidence as the other methodological approaches did.

Material evidence found by the Control participants

An average of 66.67% of material evidence was recovered by the Control participants (Table 8.155). Although, this varied between 44.44% and 100% (Table 8.127; Graph 8.4; Graph 8.3; Graph 8.4; Table 8.133; Table 8.139; Table 8.142).

As with all of the previous excavation experiments, participants found evidence in and out of situ. An average of 28.33% of evidence was found out of situ, although this varied between 0% and 57.14% (Table 8.155; Graph 8.2; Graph 8.3; Table 8.121; Table 8.127; Table 8.133; Table 8.142). As was found in the Arbitrary Excavation experiments, all of the Control participants failed to identify all of the 10 contexts present in the grave, and therefore, reassociated some of the recovered material evidence with the wrong contexts, resulting in all of the Control participants' stratigraphic sequences and material evidence deposition sequences being incorrect (Table 8.160; Table 8.122; Table 8.125; Table 8.128; Table 8.131; Table 8.134; Table 8.137; Table 8.140; Table 8.143; Table 8.146; Table 8.149).

During the experiment, some material evidence failed to be located. On average 33.33% of the material evidence was not found, although, this varied between 0% and 55.56% (Table 8.155; Table 8.127; Table 8.133; Table 8.139; Table 8.142; Graph 8.1; Graph 8.3; Graph 8.4). As was found in all of the previous excavation experiments, it was smaller items such as the earrings and the curby grip that were not found (Table 8.155). Although, as with the Arbitrary Excavation experiments, some participants failed to find larger items such as the cigarette papers, two pence coin and the fake nail (Table 8.155). In part, this can be attributed to the fact that not all of the Control participants sieved the spoil, but also again, like with the Arbitrary Excavation experiments, many participants used hand shovels, spades and shovels to remove the fills of the grave and did not attempt to inspect the spoil for the presence of material evidence, resulting in them failing to find many of the items. Nevertheless, as with the Stratigraphic, Demirant, and Quadrant Excavation experiments some of the participants who sieved the spoil still failed to recover all of the material evidence items, therefore, their failure to find some of the material evidence placed into the grave must be due to the fact that they did not pay enough attention when excavating and sieving (Table 8.155).

By comparing the results of each of the excavation methods it is clear that the Demirant Excavation method recovered the most material evidence, with an average result of 73.33% of the material evidence being found. However, the Stratigraphic and Quadrant Excavation methods were close behind both recovering an average of 71.11% of the material evidence. Statistically, the differences between the Demirant Excavation method, Quadrant Excavation method and Stratigraphic Excavation method material evidence recovery rates were not significant (Table 8.1.5; Table 8.1.6; Table 8.1.8). As expected, the Control participants recovered less material evidence than these three methods, having found an average of 66.67% of the material evidence, however, this difference was found not to be statistically significant (Table 8.1.1; Table 8.1.2; Table

8.1.3). The descriptive statistical difference between the results of the Control participants and the three other excavation methods results can be explained by the fact that these participants had no archaeological training or archaeological experience. However, what is surprising is that the Arbitrary Excavation approach recovered the least amount of material evidence, finding an average of 51.11% of the material evidence present, these results were also found to exhibit statistically significant differences from those obtained by participants using the Stratigraphic Excavation method, Demirant Excavation method and Quadrant Excavation method (Table 8.1.7; Table 8.1.9; Table 8.1.10). The differences exhibited between the Control participants and the participants using the Arbitrary Excavation method were found not to be statistically significant (Table 8.1.4).

When comparing the range of variation in the overall amount of material evidence recovered by participants using each of the excavation methods, it is apparent that the Demirant and the Quadrant Excavation methods had the smallest amount of variability in their results, both having a range of 44.45%. In comparison, the Stratigraphic Excavation method, the Arbitrary Excavation method, and the Control participants had the largest variation range, totalling 55.56%.

In terms of in situ recovery of material evidence, the Arbitrary Excavation method had the highest in situ recovery rate, with 95.65% of material evidence being found in situ. The Quadrant Excavation method then followed, with an average of 93.75% of material evidence being found in situ. The Demirant Excavation method was third, with an average of 87.88% of material evidence being found in situ. The Stratigraphic Excavation method found the least items of material evidence in situ out of the archaeological methods tested, recovering an average of 81.25% of material evidence in situ. Finally, the Control participants found an average of 71.67% of material evidence in situ, which again, is not unexpected as these participants had no archaeological training or archaeological knowledge whatsoever. However, the differences between the Stratigraphic Excavation method, Demirant Excavation method, Quadrant Excavation method and Arbitrary Excavation method were found to have no statistical significance (Table 8.1.15; Table 8.1.16; Table 8.1.17; Table 8.1.18; Table 8.1.19; Table 8.1.20). The only statistically significant results found when in situ material evidence recovery was examined were between the results of the participants using the Demirant

Excavation method and the Control participants, and the participants using the Quadrant Excavation method and the Control participants (Table 8.1.12; Table 8.1.13). This is due to the fact that participants using the Demirant Excavation method and Quadrant Excavation method recovered a large number of material evidence items and found them in situ, in comparison to the other methodological approaches tested.

However, despite the Arbitrary Excavation method recovering the highest percentage of material evidence in situ, all participants using this method failed to correctly identify the complete set of contexts present in the grave. This means that the participants using this method, despite finding the highest percentage of material evidence in situ, associated such material evidence items with incorrect contexts, and therefore, incorrectly reconstructed both the stratigraphic sequence and the deposition sequence of the material evidence. This criticism is also relevant to Archaeologist 003, Archaeologist 006 and Archaeologist 007 using the Stratigraphic Excavation method, Archaeologist 014 and Archaeologist 020 using the Demirant Excavation method, Archaeologist 023 using the Quadrant Excavation method and all of the Control participants. However, for all of the Stratigraphic Excavation method, Demirant Excavation method, and Quadrant Excavation method participants who did correctly identify all of the contexts present in the grave, the fact that they failed to recover all of the material evidence in situ is irrelevant, as they identified, defined, excavated, and recorded each of the separate contexts present in the grave individually, and therefore, any material evidence that was found out of situ whilst excavating any one of these contexts could be put back into its place within both the stratigraphic sequence and material evidence deposition sequence of the grave.

When these results are paired with those of Tuller and Đurić (2006), Pelling (2008) and Evis (2009), each of whom tested two of the excavation methods evaluated in this Project – the Stratigraphic Excavation method and the Arbitrary Excavation method, their findings correlate with those of this study. They found that the Stratigraphic Excavation method recovered more material evidence than the Arbitrary Excavation method, and that the Stratigraphic method of excavation enabled the archaeologists to reconstruct the deposition sequence of material evidence more accurately than the Arbitrary Excavation method (Tuller and Đurić 2006; Pelling 2008; Evis 2009). However, not one of these aforementioned studies tested the Demirant Excavation method or the Quadrant Excavation method. The results obtained for material evidence recovery using these two previously untested methods indicate that the Demirant method had the highest material evidence recovery rate of all of the methods tested, although, the Quadrant Excavation method did achieve the same recovery rate as the Stratigraphic Excavation method. Additionally, both the Demirant and the Quadrant Excavation methods had the most consistent rate of evidence recovery amongst all of the excavation methods. Furthermore, as discussed earlier, as these two methods ensure that individual context's boundaries are defined, maintained, and recorded throughout the excavation process, they, as with the Stratigraphic Excavation method, ensure that the material evidences' deposition sequence is more accurately recorded than with the Arbitrary Excavation method. The Quadrant Excavation method also recovered the second highest percentage of material evidence in situ, followed by the Demirant Excavation method, whereas the Stratigraphic Excavation method came last out of the excavation methods tested. Therefore, on the basis of the data gained in this Project, the Demirant and Quadrant Excavation methods proved to be more productive, in terms of material evidence recovery, than both the Stratigraphic and Arbitrary Excavation methods.

Contexts identified using the Stratigraphic Excavation method

When using the Stratigraphic Excavation approach, each of the participants proceeded to remove individual fills, defined by differences in texture, composition, volume, compactness and colouration in the reverse order in which they were deposited, from the latest to the earliest. Each participant would define and remove individual fills in their entirety, and would then complete context forms and draw plans of each of the fills that they had identified. Through maintaining the boundaries of the individual fills within the grave, the participants also preserved the grave cut, and as a result, at the end of the excavation, were able to plan and photograph its dimensions. Through following this approach, it ensured that the participants were able to define the different stages of the feature's formation process.

An average of 95% of the contexts present in the grave were correctly identified by the participants using the Stratigraphic Excavation method (Table 8.156; Graph 8.5; Graph 8.6). However, the number of contexts that were correctly identified varied from 8

(80%) to 10 (100%) (Table 8.2; Table 8.5; Table 8.11; Table 8.14; Table 8.17; Table 8.20; Table 8.23; Table 8.26; Table 8.29). Although, 7 out of 10 participants successfully identified all of the contexts present in the grave. The three participants who failed to identify all of the contexts present were Archaeologist 003 who identified 9 (90%) contexts correctly, Archaeologist 006 who identified 8 (80%) contexts correctly, and Archaeologist 007 who again identified 8 (80%) contexts correctly (Table 8.8; Table 8.17; Table 8.20).

The reason why Archaeologist 003 failed to identify context 8 (fill 4) was due to the rapidity with which context 9 (fill 5) was removed. The participant presumed, based on previous experience of excavating graves, that the grave would lack complex stratigraphy and therefore proceeded to excavate context 9 (fill 5) rapidly, using both a hand shovel and trowel, this resulted in the participant intermixing context 8 (fill 4) and context 9 (fill 5) whilst excavating, resulting in the participant failing to identify or record context 8 (fill 4).

The reason why Archaeologist 006 failed to identify context 8 (fill 4) and context 5 (fill 5) can again be attributed to the way in which this archaeologist chose to excavate the grave. Having started the excavation of context 9 (fill 5) using a trowel, the participant adapted their approach, approximately half way through context 9's (fill 5) excavation, and used a hand shovel and spade to remove the fills within the grave. This resulted in the participant digging straight through context 8 (fill 4). However, having noticed the presence of context 7 (fill 3), the participant went back to using a trowel, and was then able to successfully document context 7 (fill 3) and context 6 (fill 2). However, when excavating context 6 (fill 2), which was constructed of sand, the participant went back to using a spade to excavate the fill, this resulted in the participant failing to identify that, despite context 6 (fill 2) and context 5 (fill 1) being constructed of the same type of fill (sand), these two contexts were stratigraphically distinct, and were not joined in any way. Therefore, by using the spade to excavate context 6 (fill 2), the space between these two contexts became contaminated with sand, thus making the stratigraphic distinctness of these two contexts difficult to discern, and resulted in the participant classifying context 6 (fill 2) and context 5 (fill 1) as being one and the same.

The reason why Archaeologist 007 failed to identify context 8 (fill 4) and context 6 (fill 2) can again be attributed to the manner in which this participant excavated the grave.

This participant decided to use a mattock and a shovel to remove the fills of the grave, stating that this was the approach that the participant had been taught to use when excavating cut features in commercial contexts. Through using a mattock to excavate context 9 (fill 5) the participant dug straight through context 8 (fill 4). However, as with Archaeologist 006, the participant noticed that there was a change in fill composition and so began to use a trowel and therefore successfully identified context 7 (fill 3). The participant then identified context 5 (fill 1) and having uncovered a portion of context 6 (fill 2) after the removal of context 7 (fill 3) presumed, like Archaeologist 007 had done, that these two separate contexts were one and the same. The participant then decided to revert back to using a shovel and a mattock to remove these fills and therefore failed to define the space between these two contexts, as they had become intermixed and their boundaries conjoined, leading to the participant recording these two contexts as one.

Therefore, the failure of some participants to successfully identify all of the contexts present in the grave using the Stratigraphic Excavation method should not be attributed to the methodology itself, as 70% of the participants managed to identify all of the contexts successfully. Consequently, the failure of some participants to identify the contexts present in the grave must be attributed to individual archaeologists and their ability to choose the right equipment for the job, their rushed approach, their lack of attention to detail and visual skills.

Contexts identified using the Demirant Excavation method

When using the Demirant Excavation approach, each of the participants defined the boundaries of the grave, set up a section line across the middle of the grave, and then proceeded to excavate the first half of the grave, then record the half section and complete context sheets, and then remove the remaining half of the grave. Individual fills were defined by differences in texture, composition, volume, compactness and colouration, and were excavated in the reverse order in which they were deposited, from the latest to the earliest. However, as the majority of the participants divided the grave across its width, the contexts in the base of the grave context 5 (fill 1) and context 6 (fill 2) which sloped downwards, often did not reach the point at which the participant had set up their half section, resulting in the participants having to plan and complete context forms for these contexts, as these contexts did not appear in the half section.

Despite this, by defining, maintaining, and recording individual contexts during the excavation of the first half of the feature, and then confirming their presence in the half section, and then again, whilst excavating the second half of the grave, participants were able to preserve the boundaries of the grave cut and were able to define the different stages of the grave's formation process.

An average of 98% of the contexts present in the grave were correctly identified by the participants using the Demirant Excavation method (Table 8.157; Graph 8.5; Graph 8.6). However, the number of contexts that were correctly identified varied from 9 (90%) to 10 (100%) (Table 8.32; Table 8.35; Table 8.38; Table 8.41; Table 8.44; Table 8.47; Table 8.50; Table 8.53; Table 8.56; Table 8.59). Although 8 out of 10 participants successfully identified all of the contexts present in the grave. The two participants who failed to identify all of the contexts present were Archaeologist 014 who identified 9 (90%) contexts correctly and Archaeologist 020 who also identified 9 (90%) contexts correctly (Table 8.41; Table 8.59).

The reason why Archaeologist 014 failed to identify context 5 (fill 1) was due to the fact that when the participant was excavating the first half of the feature, context 6 (fill 2) didn't reach completely into the half section, sloping down to millimetre thickness at the half section point. Therefore, when the participant was excavating the second half of the grave, and came upon context 5 (fill 1), composed of the same sand as context 6 (fill 2), the participant mistakenly thought that they had accidentally dug through the sand that had connected these two deposits, as the participant could not recall the exact point to which context 6 (fill 2) had reached. This resulted in the participant misclassifying these two different contexts as one.

The reason why Archaeologist 020 failed to identify context 6 (fill 2) was due to the fact that when this participant excavated the grave they chose to divide the grave in half across its length. Although this meant that context 5 (fill 1) and context 6 (fill 2) were preserved in the half section, when the participant was removing these two contexts in the first half of the grave they moved the sand, of which both of these contexts were composed, across the space between these two contexts and across the half section. As the participant failed to clean the half section properly, this meant that these two contexts appeared to be connected, and therefore the participant misclassified these two separate contexts as being one context.

Therefore, the failure of these two participants to successfully identify all of the contexts present in the grave using the Demirant Excavation approach should in part be attributed to the method, as through dividing the grave in half it meant that all of the contexts present in the grave could not be seen or analysed in their entirety individually, increasing the possibility for participants to miss certain contexts during the excavation. However, as 80% of the participants successfully identified all of the contexts present in the grave, the major factors leading to the two participants missing the contexts was their failure to record all of the contexts in sufficient detail to determine each context's boundary, and also, their failure to follow procedure, and clean the half section face prior to recording.

Contexts identified using the Quadrant Excavation method

When using the Quadrant Excavation approach, each of the participants defined the boundaries of the grave, set up a section line across the length and width of the grave, and then proceeded to excavate the first quadrant of the grave, they then recorded the long section and half section of the grave and completed context sheets. The participants would then excavate the opposing quadrant and updated and completed the long section and half section drawings and updated their context sheets. Each participant would then excavate the remaining two quadrants and add any new data to their context sheets. Individual fills were defined by differences in texture, composition, volume, compactness and colouration, and were excavated in the reverse order in which they were deposited, from latest to earliest. One problem noted by participants using this technique, was the tendency for the quadrants to crumble if they were left standing with a sharp vertical edge, however, this problem was resolved by slightly angling the edges of the quadrants, which provided them with more stability. Despite this issue, through the participants being careful to define, record, and maintain individual contexts during the excavation, they were able to maintain the grave cut and accurately determine the formation sequence of the grave, and by completing both the long section and half section drawings, had a visual record of the grave's formation sequence too.

An average of 98% of the contexts contained within the grave were identified by the participants using the Quadrant Excavation method (Table 8.158; Graph 8.5; Graph 8.6). However, the number of contexts that were correctly identified varied from 8

(80%) to 10 (100%) (Table 8.62; Table 8.65; Table 8.68; Table 8.71; Table 8.74; Table 8.77; Table 8.80; Table 8.83; Table 8.86; Table 8.89). Although, 9 out of 10 participants successfully identified all of the contexts present in the grave. The participant who failed to identify all of the contexts was Archaeologist 023 who identified 8 (80%) contexts correctly (Table 8.68).

The reason why Archaeologist 023 failed to identify context 7 (fill 3) and context 8 (fill 4) is due to the fact that the participant chose to use a hand shovel to remove context 9 (fill 5). This resulted in the participant excavating straight through context 8 (fill 4) and context 7 (fill 3), as the participant believed that these contexts represented a mixed singular backfill. Even when the participant was excavating the three other quadrants, they still continued to use the hand shovel resulting in the removal of large volumes of soil and the participant's continual failure to define these two additional contexts. It was only when the participant reached context 5 (fill 1) and context 6 (fill 2) that they chose to use a trowel, and as a result, successfully determined that these two contexts were two stratigraphically distinct contexts.

Therefore, the failure of this one participant to identify all of the contexts contained within the grave cannot be attributed to the excavation method, as all of the other participants successfully identified and recorded all of the fills contained within the grave. Instead, this participant's failure to identify all of the contexts within the grave is due to the fact that they chose to use the wrong equipment to excavate the grave.

Contexts identified using the Arbitrary Excavation method

When using the Arbitrary Excavation approach all but one of the participants maintained the boundaries of the grave. One participant, Archaeologist 031 chose to create an excavation unit instead, which meant that both the grave and the 1m x 1.5m excavation unit surrounding it were excavated. Each of the archaeologists excavated the grave by removing 10cm spits at a time, after which, they would draw a plan of the grave and complete a unit level recording form. This process was then repeated until the participants reached the base of the grave.

Through excavating the grave in this manner, the participants identified an average of 69% of contexts correctly (Table 8.159; Graph 8.5; Graph 8.6). However, the number of contexts that were correctly identified varied from 6 (60%) to 7 (70%) (Table 8.92; Table 8.95; Table 8.98; Table 8.101; Table 8.104; Table 8.107; Table 8.110; Table 8.113; Table 8.116; Table 8.119). All participants failed to identify all of the contexts within the grave correctly. With 9 out of 10 of the participants only identifying 7 of the contexts (Table 8.92; Table 8.95; Table 8.98; Table 8.101; Table 8.104; Table 8.107; Table 8.110; Table 8.113; Table 8.116; Table 8.119). The participant who failed to identify the additional context, the grave cut, was Archaeologist 031, the participant who chose to create and excavate an entire excavation unit, and as a result destroyed and failed to define the grave cut (context 4) (Table 8.92).

Due to the fact that not one of the participants using the Arbitrary Excavation approach managed to identify all of the contexts present in the grave, and that there was little variation in the number of contexts that were successfully identified using this method, it would appear that the inability of the participants to define all of the contexts within the grave is attributable to the methodology itself. This is due to the fact that by excavating in 10cm spits, the participants unwittingly introduced artificial divisions in the formation sequence of the grave. This, in turn, meant that the participants were only able to record three of the fills within the grave, as only three spits had to be excavated to reach the base of the grave. The fills that were recorded were those that corresponded to the base of the spit that had been excavated. By excavating in this manner the participants intermixed the various contexts within the grave, and in turn, also failed to accurately define the angled dimensions of each of the fills within the grave. Consequently, this led to all of the participants failing to accurately excavate and interpret the formation sequence of the grave.

Contexts identified by the Control participants

Although the Control participants had no archaeological training or archaeological knowledge whatsoever, they successfully identified an average of 74% of the contexts within the grave (Table 8.160; Graph 8.5; Graph 8.6). However, the number of contexts that were correctly identified varied from 7 (70%) to 8 (80%) (Table 8.122; Table 8.125; Table 8.128; Table 8.131; Table 8.134; Table 8.137; Table 8.140; Table 8.143; Table 8.146; Table 8.149).

Similarly to the Arbitrary Excavation participants, not one of the Control participants managed to correctly identify all of the contexts present in the grave. This is not unsurprising as not one of the Control participants had any archaeological training or archaeological knowledge. Therefore, they had not been trained to detect and define different contexts. What is perhaps most surprising is that Control 004, Control 005, and Control 010 all correctly established that context 5 (fill 1) and context 6 (fill 2) were separate contexts and classified them as such, which several of the trained archaeologists failed to do (Table 8.131; Table 8.134; Table 8.149). Another explanation for why the Control participants failed to detect all of the contexts within the grave was due to the equipment that they chose to use, with the majority using hand shovels, spades and shovels to remove the fills of the grave. This resulted in large volumes of soil being removed from the grave at a time, making all but the boundaries of the most obvious fills - context 5 (fill 1) and context 6 (fill 2), the sand deposits, hard to differentiate.

When comparing the results of each of the excavation methods against one another, it is apparent that the Quadrant Excavation method was the most successful at identifying contexts, as on average it correctly identified the most contexts, with only one participant failing to recover all of the contexts within the grave. However, on average, the Demirant Excavation method recovered the same number of contexts as the Quadrant Excavation method, but due to the fact that two participants failed to accurately define the stratigraphic sequence, rather than one, it would suggest that this method has an increased potential for archaeologists to miss contexts whilst excavating. The Stratigraphic Excavation method proved to be the third most successful technique at recovering contexts within the grave structure, with three participants failing to identify all of the contexts. This result would suggest that this technique is, again, more susceptible to errors whilst excavating when compared with the two aforementioned techniques. However, as discussed earlier, if the right methodological approach is taken when using these three techniques it is possible for archaeologists to recover and document all of the contexts present successfully. This is supported by the statistical analyses of these three techniques against each other, which found that there was not a statistically significant difference between the numbers of contexts identified (Table 8.1.25; Table 8.1.26; Table 8.1.28). The least successful technique for identifying contexts was the Arbitrary Excavation method, and considering that even the Control participants results exceeded those of this method, it would suggest that this method is highly unreliable, and leaves the archaeologist unable to accurately reconstruct the stratigraphic sequence of an archaeological feature. This finding is supported by the statistical analyses of the results, which found that the participants who used the Arbitrary Excavation method produced results that were significantly different, and in this case, poorer than those participants using the other methodological approaches (Table 8.1.27; Table 8.1.29; Table 8.1.30). Furthermore, the statistical analyses of the number of contexts that were identified also indicated that the Stratigraphic Excavation method, Demirant Excavation method, Quadrant Excavation method and Arbitrary Excavation method recovery rates were significantly different to those of the Control participants (Table 8.1.21; Table 8.1.22; Table 8.1.23; Table 8.1.24). This indicates that the Stratigraphic Excavation method, Demirant Excavation method and Quadrant Excavation method were significantly more successful at identifying contexts than both the Control participants and participants using the Arbitrary Excavation method (Table 8.1.27; Table 8.1.29; Table 8.1.30; Table 8.1.21; Table 8.1.22; Table 8.1.23; Table 8.1.24). Moreover, it indicates that the Control participants results were significantly different, and in this case, better than participants using the Arbitrary Excavation method (Table 8.1.24).

Such findings correlate with the results of Tuller and Đurić (2006), Pelling (2008) and Evis (2009) each of whom found that the Arbitrary Excavation method resulted in less contexts being identified than the Stratigraphic Excavation method.

Identification of the formation sequence of the grave

The formation sequence of the grave was broken down into 24 different stages. Each stage represented an activity that occurred when creating the grave, for example, the placement of an artefact would represent one stage, and then the deposition of a fill on top of that artefact would represent another stage. By breaking the formation sequence of the grave down into these different stages it was possible to determine the overall accuracy or score for each of the excavation methods tested in the Project.

The Stratigraphic Excavation method had an overall accuracy rate of 75.83%, however, the overall scores of participants varied between 50% and 100% (Table 8.161; Graph 8.8; Graph 8.9). In comparison, the Demirant Excavation method had an overall accuracy rate of 78.75%, although, the overall scores of participants varied between 50% and 91.67% (Table 8.162; Graph 8.8; Graph 8.9). The Quadrant Excavation method had an overall accuracy rate of 75.83%, however, the overall scores of participants varied between 58.33% and 91.67%. Whereas, the Arbitrary Excavation method had an overall accuracy rate of 39.58%, but the overall scores of participants varied from 20.83% to 50% (Table 8.163; Table 8.164; Graph 8.8; Graph 8.9). Finally, the Control participants had an overall accuracy rate of 52.50%, although, the overall scores of participants varied between 37.5% and 66.67% (Table 8.165; Graph 8.8; Graph 8.9).

By comparing the overall accuracy scores for each of the excavation methods, it is evident that the Demirant Excavation method had the highest overall score. The Stratigraphic and Quadrant Excavation methods came next, both achieving the same overall score. The Control participants came in fourth, and then, finally, the Arbitrary Excavation method came in last achieving the lowest overall score. Although, when these results were subjected to statistical testing, the overall scores of the Stratigraphic Excavation method, Demirant Excavation method and Quadrant Excavation method were found to not be statistically different from one another (Table 8.1.35; Table 8.1.36; Table 8.1.38). There were, however, significant differences in the results of participants using the Stratigraphic Excavation method, Demirant Excavation method, Quadrant Excavation method, Control participants and those of the participants who used the Arbitrary Excavation method (Table 8.1.31; Table 8.1.32; Table 8.1.33; Table 8.1.34; Table 8.1.35; Table 8.1.36; Table 8.1.37; Table 8.1.38; Table 8.1.39; Table 8.1.40). This finding indicates that those participants who used the Arbitrary Excavation method during experimental testing produced significantly poorer overall scores than those participants using the other methodological approaches (Table 8.1.31; Table 8.1.32; Table 8.1.33; Table 8.1.34; Table 8.1.35; Table 8.1.36; Table 8.1.37; Table 8.1.38; Table 8.1.39; Table 8.1.40). Furthermore, the statistical analyses of the overall scores indicated that the Stratigraphic Excavation method, Demirant Excavation method, Quadrant Excavation method and Arbitrary Excavation method overall scores were significantly different to those of the Control participants (Table 8.1.31; Table 8.1.32;

Table 8.1.33; Table 8.1.34). This indicates that the Stratigraphic Excavation method, Demirant Excavation method and Quadrant Excavation method were significantly more successful techniques than both the Control participants and participants using the Arbitrary Excavation method (Table 8.1.31; Table 8.1.32; Table 8.1.33; Table 8.1.34; Table 8.1.35; Table 8.1.36; Table 8.1.37; Table 8.1.38; Table 8.1.39; Table 8.1.40). Moreover, it indicates that the Control participants overall results were significantly different, and in this case, better than participants using the Arbitrary Excavation method (Table 8.1.34).

However, as the overall scores of the Stratigraphic, Demirant and Quadrant Excavation methods were relatively close – 75.83% and 78.75%, and showed no statistically significant differences, it is important to compare the consistency of these three methods by reviewing the variation in the overall scores achieved using these three methods. By analysing these three methods in this manner, the Quadrant Excavation method proved to be the most consistent with a variation rate of 33.33%. The Demirant Excavation method was the next most consistent with a variation rate of 41.67%, and finally, the Stratigraphic Excavation method was the least consistent with a variation rate of 50%. These findings are supported by the results shown in 'Table 8.1.41', 'Table 8.1.42', 'Table 8.1.43', 'Graph 8.1.1', 'Graph 8.1.2' and 'Graph 8.1.3'. This data suggests that the Quadrant Excavation method was the most consistent of these three methods, and therefore, the most reliable in terms of recovering the most accurate record of the formation sequence of the grave simulation.

The Single Context Recording system

Whilst excavating using the Stratigraphic Excavation method, the participants used a recording system known as the Single Context Recording system to document their findings. When using this recording system, as each new context was identified and defined a participant would allocate this context a context number, plan it, and then excavate it. Both during and after the excavation of an individual context, the participant would also complete a context form. This form provided each of the participants with prompts to describe the context, note down any material evidence that was located, and take note of any photographs or samples that were taken. Participants tended to take photographs at the start and end of the excavation of an individual context and also when a piece of material evidence was found. The participants would also complete a Harris Matrix on each of these context forms. This matrix documented the stratigraphic relationships that the context that was being documented had with those contexts that stratigraphically preceded it and succeeded it.

In addition, some participants also documented their findings in a journal. The participants would use this journal to note down their theories relating to how the grave was created and what evidence was found. They would then use the notes that were written down in this journal to form their interpretations and construct their narrative of the grave simulation's formation process.

Some participants also created long section drawings of the contexts within the grave by either measuring the dimensions of the different contexts that had adhered to the grave walls, or, by measuring the dimensions of the individual contexts as they were excavated. This resulted in the participants not only having plans of the individual contexts, but also an overall diagram of how the contexts related to one another in the grave.

Overall, the Single Context Recording system provided a comprehensive set of records for each of the contexts that were identified. Although, one disadvantage of this method was the amount of time that was spent on planning each context as it was excavated. Furthermore, for the participants who only planned the individual contexts and did not create long section drawings of the grave's contexts, it could be argued that it was difficult to interpret how the grave was constructed by merely relying on the plan drawings, particularly for those individuals with no archaeological training, as such plan drawings merely depicted a rectangular box with hashers and level measurements on it, making it hard to visualise how the grave was constructed in its entirety. Therefore, this recording system would require participants to spend extra time, in comparison to the other methods, on reconstructing the grave structure after the excavation, by manually or digitally, superimposing each plan drawing on top of one another to create a depiction of the grave in its entirety.

The Standard Context Recording system

Whilst excavating using the Demirant Excavation method and the Quadrant Excavation method, the participants used a recording system known as the Standard Context Recording system to document their findings, although its application varied according to which of the two methodological approaches was being used.

When the participants were using the Demirant Excavation method to excavate the grave simulation, the participants divided the grave in half, and would then excavate one half. Whilst excavating this half they would allocate each new context that was identified a context number and then complete a context form. This context form is the same form as the one used in the Single Context Recording system, and contains the same prompts. However, due to the fact that only one half of the grave is removed at a time, the context form is not completed until both halves and the entirety of each context has been excavated. Some participants would use a different approach, however, and would record separate context forms for each half of the grave that was excavated, and would record the two halves of a singular context using different context numbers, but would record them as the ‘same as’, the first half of the context that was excavated during the removal of the first half of the grave.

Some participants also decided to use a journal in order to document their findings in a more casual manner. Such journals helped participants keep track of which contexts individual pieces of material evidence were found in across the two halves of the feature, and prevented participants from incorrectly associating material evidence with incorrect contexts. In addition, the journal provided a space in which the participants could jot down theories about how the grave was constructed as they were excavating, which in turn, helped the participants create their narrative of the grave’s formation sequence.

In addition to completing the context forms, participants would also record a half section. This half section was drawn once each participant had completed the excavation of one half of the grave and would display the formation sequence of the grave at the point at which they chose to set up their section point. This half section provides a good visual aid to interpreting the stratigraphic sequence of the grave, as it shows how each context relates to one another in a singular drawing. However, in the case of this experiment, due to the fact that context 5 and context 6 sloped down and did not reach the mid-point of the grave at which the majority of the participants set up their half section, participants using the Demirant Excavation method found that, these contexts did not extend into the half section face, and consequently, did not appear in the half section drawing, meaning that the participants had to record a separate plan drawing of these contexts in order to document their presence. In addition, as the half section drawing only displays the stratigraphic sequence of the grave at one given point in the grave, this type of recording, on its own, fails to document the shape and dimensions of any contexts that slope or vary in shape across the grave structure. Therefore, any individuals wishing to accurately reconstruct and visually depict the formation sequence of the grave must refer to all of the records completed during the excavation, and as with the Single Context Recording system, reconstruct the grave's structure, either manually or digitally, after the excavation using the drawings and the measurements taken during the excavation process, thus taking up more time and resources than other recording approaches.

When the participants were using the Quadrant Excavation method to excavate the grave simulation, the participants would divide the grave into four quadrants and excavate each separately. When excavating the first quadrant as each new context was identified it would be allocated a context number and a context form would start to be filled out. As stated earlier, with the Standard Context Recording system, the context form is the same as the one used in the Single Context Recording system, however, as with the Demirant Excavation method, participants would not complete an individual context form until all of the quadrants and the entirety of each context had been excavated. Again, similarly to the Demirant Excavation approach, some participants would record separate context forms for each of the four quadrants that were excavated, and would record the four quarters of a singular context using different context numbers, but would document them as being the 'same as' one another.
In addition to recording data using context forms some participants also used journals. Through using a journal the participants were able to keep track of what material evidence was found where and take note of theories relating to how the grave was constructed, that in turn, helped them to form their narrative of the grave's formation process at the end of the investigation.

Participants would also record a half section and long section drawing of the grave's structure. These drawings would be completed after a participant had excavated two opposing quadrants and demonstrated how the grave was constructed across its length and across its width. This ensured that the dimensions of each of the contexts within the grave structure were recorded, and that even if such contexts sloped and did not reach the half section point, as was the case in this experiment, their presence and dimensions would still be captured in the long section drawing. Through recording the grave structure in this manner it meant that the participant was able to determine and demonstrate immediately after the completion of the investigation, how the grave was constructed visually in two diagrams, and subsequently, the participants were not required to spend additional time after the excavation to reconstruct the grave's formation sequence in accurate diagrammatical form. This recording approach also presented the findings in a way that interested parties, such as police officers in the case of a forensic investigation, could easily understand and interpret with very little explanation being required.

The Unit Level Recording system

Whilst excavating using the Arbitrary Excavation method the participants used the Unit Level Recording system to document their findings. Similarly to the Single Context Recording system and the Standard Context Recording system, the Unit Level Recording system relies on the use of pro-formas and plans to record data during an excavation. When using the Unit Level Recording system as each 10cm spit of soil was removed the participants would complete a unit level recording form, on which they would describe any deposits, fills, artefacts, or disturbances that they had come across during the excavation of that spit. They would also record any samples and photographs that were taken during the excavation of that particular spit on the unit level recording form.

The participants also drew plans of the excavation unit after each spit was removed, which in the case of this experiment was delineated by the grave walls by nine participants with only one participant choosing to establish an excavation unit outside the boundaries of the cut. On this plan of the excavation unit, the participants would draw the spit that was excavated, and record any artefacts, fills, or deposits that were present.

The participants also recorded their findings using journals. Within these journals they would describe what had been found, in terms of material evidence and the different contexts, and write down theories relating to how the grave was constructed in an informal manner. The participants then used this journal to help create their narratives at the end of the investigation.

Although this recording system is systematic in its approach to documenting findings, the fact that the excavation method that is associated with its use results in the destruction of individual contexts as it progresses, particularly those contexts which have any gradient in their deposition, means that the data that is recorded in this system has no use in terms of constructing or understanding the formation sequence of an archaeological feature, or in the case of this experiment, the grave. The recording system results, basically, in the creation of a list of artefacts and the spatial location in which they were found, with no contextual information surrounding it. This is acceptable if the individual conducting the investigation is wishing only to recover material evidence, but if they wish to understand the sequence of events that resulted in that piece of evidence ending up in that location this approach is unsuitable.

The Control participants recording system

The Control participants did not use a standardised approach to document their findings. Instead, the choice of how to record their findings was left to the discretion of individual participants. The majority of participants documented their findings using a journal. Within this journal they would draw sketches of the different contexts that were identified and would also write down the location of any material evidence that was found. As these participants had no archaeological training, their emphasis whilst recording was on the material evidence rather than the stratigraphic sequence, and so they would not draw accurate plans of the different contexts contained within the grave. Nevertheless, the participants did take photographs as their excavations progressed, although these photographs tended to be of material evidence items rather than of the contexts from which these items derived. This is unsurprising as these participants had no formal archaeological training and therefore couldn’t be expected to know how the recording of grave features should be conducted.

In terms of deciding on which excavation method and which recording system is most suitable for use in forensic archaeological investigations, the methodology of this Project stated that it would be determined on the basis of: which excavation method was the most productive and consistent in terms of evidence recovery (including material evidence and stratigraphic contexts), and which recording system provided the most consistent and informative record of the evidence and deposition sequence present in the grave.

When considering these variables it is apparent that the Quadrant Excavation method proved to be the most productive and consistent in terms of evidence recovery as it identified the second highest amount of material evidence, had the lowest variation range in the rate of material evidence recovery, it found the second highest amount of material evidence in situ, it successfully identified the most contexts, it had the second highest overall accuracy score and the highest consistency rate for the overall accuracy score. In addition, the Standard Context Recording system that was applied whilst using the Quadrant Excavation method produced the most consistent and informative record of the deposition sequence of the grave simulation, as it accurately recorded all of the contexts and their dimensions in two diagrams in a clear and understandable manner, which, in forensic contexts, is advantageous as it means that lay jurors will be able to easily understand the formation sequence of the grave under investigation. Furthermore, as such recording can be done in the field, it requires less time than the other recording systems in terms of editing, and therefore saves the investigation both time and money, both of which are crucial variables to be taken into consideration during a forensic investigation. The Quadrant Excavation method is also the most applicable in forensic contexts as the method enables an archaeologist to excavate a single quarter of a suspect feature first. By excavating this quarter the archaeologist is then able to determine if the suspect feature is of forensic interest much quicker than by excavating the feature in its entirety as would be done using the Stratigraphic Excavation method, or in half as would be done using the Demirant Excavation method. Thereby saving archaeologists more time in terms of investigative hours.

Having stated that the Quadrant Excavation method is the most suitable method for forensic archaeological investigations, the Demirant Excavation method was also highly productive in terms of evidence recovery, ranking in as equal first in terms of excavation methods. However, due to the aforementioned weaknesses of the Standard Context Recording system associated with the Demirant Excavation technique, and the increased tendency for people to fail to identify contexts whilst using this excavation method, it would suggest that this method should only be used in situations in which the Quadrant Excavation method is unable to be applied, for example, when archaeologists are investigating particularly small grave structures such as those of children, or when dealing with particularly loose soils, as the quadrants have a tendency to collapse in such situations.

The Stratigraphic Excavation method and Single Context Recording system was also reasonably successful in terms of evidence recovery, being the only technique in which a participant successfully located all possible evidence contained within the grave. However, this method was less consistent in terms of evidence recovery than the previous techniques and proved to have a greater tendency for contexts to be failed to be identified in comparison to the previous techniques. Furthermore, the Single Context Recording system that is used in conjunction with this technique was much more time consuming than the previous excavation methods and requires much more extensive post-excavation work in order for the data obtained during the archaeological investigation to be presented in court. Therefore, in terms of methodological preference for forensic investigations, this method should only be used in situations in which the two aforementioned techniques are unable to be applied.

Although the three aforementioned techniques could each be used in various circumstances during the course of a forensic archaeological investigation, as statistically, there was no significant difference between recovery rates for each of these methods. The one excavation method and recording system that should not, under any circumstances, be used is the Arbitrary Excavation method and the Unit Level Recording system. This method proved to have an extremely poor evidence recovery rate and achieved the lowest overall accuracy score of all of the approaches tested, coming behind the Control participants who had no archaeological training and did not follow any advocated archaeological approaches. Furthermore, as this method failed to accurately record any of the contexts contained within the grave, and destroyed the stratigraphic sequence within the grave as the excavation progressed, this technique must be deemed as highly unreliable and therefore should not be used during forensic investigations, as the data that it captures will be inaccurate and misleading, and therefore, potentially lead to a miscarriage of justice if utilised in forensic archaeological contexts.

4.4 The impact of archaeological excavation methods and recording systems on the formation of interpretation-based narratives

One of the objectives of this Project was to evaluate how excavation methods and recording systems influence the formation of interpretation-based narratives, and to determine which excavation and recording method provided the most consistent narrative of the grave's formation process. In order to obtain data to complete this objective, each experimental participant was instructed to compose a narrative of the grave's formation sequence after they had completed their excavation of the grave simulation. The participants' narratives can be read in 'Chapter 5: Excavation experiment results'.

In terms of the impact that excavation method and recording system selection had on the formation of the participants' narratives of the grave's formation sequence, the major impact was in relation to determining what was found and therefore discussed by the participants in their narratives. Those participants who used the Stratigraphic, Demirant and Quadrant Excavation methods recovered the greatest number of contexts and material evidence therefore; their narratives were the most accurate. Whereas, the Control participants and the Arbitrary Excavation participants recovered the least number of contexts and material evidence and so their narratives were the least accurate in terms of describing the grave's formation sequence, as they had failed to recover the majority of the stages associated with the grave's creation. Therefore, in terms of which excavation method and recording system produced the most accurate and consistent narrative of the grave's formation sequence, it was the Quadrant Excavation method and the Standard Context Recording system, as this methodological approach proved to be the most productive and consistent when all criteria were taken into consideration during the excavation experiment results analysis.

Despite the fact that excavation method and recording system selection determined the accuracy of the narratives produced. It is interesting to note that excavation method and recording system selection had little impact on the way in which the participants structured their narratives. There was little consistency in the structure and content of the narratives between participants using the same excavation and recording methods or between participants in general. There were two definable approaches that the participants took in order to describe the formation sequence of the grave.

The first approach was to provide a description of the sequence of deposition of the contexts and material evidence in the chronological order in which they were deposited, and was the approach that was used by the majority of participants. By breaking the formation sequence down into the different stages of deposition, the narratives produced by these participants explained the formation of the grave step-by-step making the entire formation process easy to understand. Although, the level of detail provided by the participants using this approach varied. Only 20 of the participants discussed the dimensions of the grave. This is rather concerning as the dimensions of the grave is an essential part of the formation sequence. The participants who failed to describe the grave's dimensions presumably thought that their recording sheets would provide such data if needed. In terms of discussing the contexts within the grave, the level of detail again varied, some participants would describe the contexts' dimensions and composition whereas others would not. The reasoning behind this lack of detail is again, presumably due to the fact that the participants thought that readers could refer to their recording sheets to obtain more data if required.

However, it was when the participants that were using this approach were discussing the material evidence that was found that their narratives varied the most. The majority of participants would merely list the material evidence that was found and the context or spit from which each piece was recovered, but others would attempt to analyse the material evidence and provide explanations and scenarios to account for its presence within the grave.

Archaeologist 003, Archaeologist 013, Control 001 and Control 002 stated that the individual within the grave was female due to the presence of a dress. Although one might assume that the dress was indicative of a female occupant, stating so in forensic contexts is dangerous as it is presumptive and may be proven incorrect at a later stage in the investigation.

Archaeologist 006, Archaeologist 013, Archaeologist 036 and Control 001 stated that the perpetrator or the victim was a smoker due to the presence of smoking paraphernalia. Such statements are valid as the lighter and cigarette papers both support this theory. Nevertheless, Control 001's and Archaeologist 006's statements that the presence of a disposable lighter, cigarette papers and a Primark dress is indicative of low status represents conjecture, as such statements cannot be supported by any of the other evidence contained within the grave.

Archaeologist 003 stated that the lighter, ID card and fake nail had been thrown into the grave, however, did not explain what evidence there was to support this. Moreover, Archaeologist 020 stated that the fake nail and lighter had been tossed into the grave, and again, failed to explain what evidence there was for this. Archaeologist 023 stated that a pair of stud earrings had been accidentally deposited but again failed to provide any supporting evidence to justify this statement. The fact that these three archaeologists did not provide any supporting evidence for making such statements means that their theories are unsubstantiated and in forensic contexts would be dismissed.

The most concerning narrative that discussed material evidence was that of Archaeologist 036 who stated that a small body had been placed into the grave. Presumably this statement was based on the fact that there was clothing along the base of the grave and the graves small dimensions. However, seeing as no human remains of any kind were placed in the grave this statement is invalid and highly concerning. In forensic contexts, such exaggerative statements could reduce the credibility of the archaeologist's work and be used by the defence to criticise the integrity and accuracy of the entire forensic archaeological investigation.

The second approach that was used by Archaeologist 010, Archaeologist 020, Archaeologist 031, and Control 003 was to describe how they had excavated and recorded the grave, and to discuss what they had found during this process. These narratives were much more informal in structure and tone than those participants who used the first approach to describe the grave's formation process. Due to the fact that these participants had attempted to discuss their excavation and recording techniques as well as the material evidence and contexts that they had found, their interpretations of the formation sequence of the grave were particularly difficult to discern, as these participants had provided so much extraneous data.

Unlike some of the participants who used the first approach to construct their narratives, the participants using this approach did not over interpret the material evidence present in the grave; rather, they remained constrained, listing what was found rather than theorising about its implications. As a result, these narratives lacked the conjecture that was present in some of the other approaches participants' narratives.

When one compares the two approaches against one another it is evident that the participants who used the first approach to construct their narratives tended to produce narratives that were much more structured and logical, enabling readers to understand the formation sequence of the grave clearly. This is because the participants who used the second approach overloaded their narratives with irrelevant information, such as the methodological approaches that they had used. Therefore, when a forensic archaeologist is writing a narrative of a grave's formation sequence within a forensic archaeological report, it is recommended that the first approach be used, as this will produce a narrative that is easy for jurors and legal practitioners to understand. Moreover, any descriptions of the methodological approaches that were used by the forensic archaeologist should not be discussed within the narrative, but in a separate methodology section. It is also advised that if the forensic archaeologist wishes to discuss the material evidence within the grave that such discussions are limited to describing what was found and the location in which it was found, as any further interpretations are not within the remit of the forensic archaeologist's expertise.

Overall, it is apparent that excavation method and recording system selection does dictate what material evidence and contexts will be identified, and consequently, determines how accurate an archaeologist's narrative will be. Therefore, given that the Quadrant Excavation method and Standard Context Recording system was proven to be the most effective technique at recovering all types of evidence from the simulated grave this method should be used during forensic archaeological casework, as it will ensure a high evidence recovery rate, and in turn, a more accurate narrative of the grave's formation sequence. In terms of how narratives should be structured, narratives should provide a description of the sequence of deposition of the contexts and material evidence in the chronological order in which they were deposited. Such narratives should be interlinked with the recording forms and drawings that were produced during the excavation process. As the Quadrant Excavation method and Standard Context Recording system is the recommended approach for forensic archaeological casework and results in the production of a long section and a half section drawing of the graves entire structure, it is suggested that archaeologists use these drawings as illustrative tools and interlink their narratives with them. This will allow lay jurors and legal practitioners to visualise what is being discussed in the narrative, and enable them to understand the findings of the forensic archaeological investigation more clearly.

4.5 The influence of time on archaeological investigations

Although time was not noted as a factor for consideration in the objectives of this Project, variance in the length of time that it took individual participants to excavate and record the grave simulation, and differences in the average time spent excavating and recording using each of the different excavation methods and recording systems was analysed. This data was then used to determine what, if any, impact time might have on the overall quality and quantity of evidence recovered from an archaeological investigation.

The reason why this analysis was deemed to be important was due to research conducted by Scherr (2009) and Landry (2012). These researchers used experimental grave simulations, such as the one used in this Project, to evaluate the impact that time constraints had on the overall quality and quantity of evidence recovered. Both Scherr (2009) and Landry (2012) found that there was a significant reduction in the overall quality of the excavation when less time was spent on excavating their grave simulations. The results of these studies affirms what is generally assumed in archaeological practice – the longer one spends excavating an archaeological feature, the greater number of finds will be identified and a greater understanding of the feature's formation process will be obtained. Therefore, this Project sought to further test this assumption, with the hypothesis that there would be a linear relationship between the length of time spent excavating and overall score, with the greater amount of time that a participant spent excavating and recording the grave simulation resulting in a higher overall score. The results from the analysis of time are displayed in 'Table 8.166', 'Graph 8.10', 'Graph 8.11' and 'Graph 8.12'.

The hypothesis was found not to be supported by the data analysed during this Project. There appears to be minimal correlation between the length of time that a participant spent excavating and recording the grave simulation and their overall score, with participants who spent 2, 3 ½, 4, 5 ½ and 6 hours excavating and recording the grave achieving the same overall score, 91.67%. The participant who achieved the highest score of 100% spent 4 hours excavating and recording the grave, and the participant who attained the lowest score of 20.83% spent 3 hours excavating and recording the grave. Although, when one compares the results of the participants who spent the longest time excavating and recording the grave, 14 hours, who achieved overall scores of 70.83%, 75.00%, and 83.33%, against the results of the participants who spent the shortest time excavating and recording the grave, 2 hours, who achieved overall scores of 29.17%, 33.33%, 37.50%, 41.67%, 50.00%, and 91.67% it is possible to discern an improvement in the participants' overall scores with the greater length of time that was spent excavating and recording the grave simulation.

However, the lack of a significant linear relationship between the length of time that a participant spent excavating and recording the grave simulation and their overall score is most apparent in 'Graph 8.12', which displays the results of a linear regression analysis. The data provided an R^2 value of 0.10344. This indicates that there is a minimal to slight relationship between the length of time that a participant spent excavating and recording the grave simulation and their overall score. Moreover, this result indicates that the length of time that an archaeologist spends excavating a grave can only be used to predict an archaeologist's ability to achieve a higher rate of evidence recovery, or in the case of this experiment, overall score, in 10% of cases.

In terms of comparing the average length of time that it took for the participants, both the archaeologists and controls, to excavate and record the grave simulation using the different archaeological techniques tested in this Project, the results indicated some slight differences. The Stratigraphic Excavation participants took an average of 5 ½ hours, the Demirant Excavation participants took an average of 5 hours, the Quadrant Excavation participants took an average of 4 ½ hours, the Arbitrary Excavation participants took an average of 2 ½ hours, and the Control participants took an average of 2 ½ hours to excavate and record the grave simulation. The differences in the rate at which the excavation and recording of the grave simulation was completed using these different techniques can be attributed to the methodological approaches themselves. As the Stratigraphic Excavation method, the Demirant Excavation method and the Quadrant Excavation method required the participants to spend greater lengths of time delineating the boundaries of individual contexts contained within the grave, and required more in depth recording, including, the completion of context sheets, plans, and section drawings. Whereas, the Arbitrary Excavation method required no such skill, as the fills contained within the grave were removed in set 10cm spits with no attention paid to the presence of multiple fills or such fills' dimensions. Furthermore, the Unit Level Recording method required a basic plan of each spit, which would appear as a rectangle with a brief description of - the location of any material evidence items that were found, and the composition of the spit that was excavated. This argument can also be applied to the Control participants, as the majority of the participants used hand shovels rather than trowels to remove the fills of the grave, and only spent a minimal amount of time logging artefacts in their journals, and creating sketches of what was found and the different fills that they had identified, rather than completing comprehensive recording forms.

The fact that the various methods of excavation and their associated recording systems, particularly the Stratigraphic Excavation, Demirant Excavation, and Quadrant Excavation methods showed little variation in the length of time that it took for participants to excavate and record the grave simulation, suggests that the utilisation of any one of these methods during the course of a forensic archaeological investigation will not require a significant increase in the amount of time needed to complete the excavation. Therefore, when forensic archaeologists are deciding on which methodological approach to use, time should not be used as an exclusionary factor during this decision making process.

Furthermore, as the length of time spent excavating and recording the grave simulation proved to have a minimal correlation with the overall score of participants, it can be stated that time scarcely effects the quality and quantity of evidence recovered during an archaeological investigation. Therefore, other variables, such as the excavation method and recording system used, and the ability of certain participants to be more observant and careful than others when excavating are likely to be the factors that impact the overall quality of the archaeological investigation the most. This explanation parallels with the findings of the researchers Tuller and Đurić (2006) and Evis (2009) who found that these two variables were the major contributors in determining the overall quality of an archaeological investigation, irrelevant of the amount of time that was spent excavating and recording.

4.6 The impact of archaeological experience on archaeological investigations

In any industry, there is a presumption that as an individual's level of experience increases, so too will their ability to conduct the job that they specialise in. This is no different in the field of archaeology. Most commercial archaeological organisations regard archaeological excavation experience as a key factor from which to determine the rank to which to assign a particular archaeologist within a company, with six months commercial experience being regarded as the most basic level required for the lowest fieldwork position. Likewise, as discussed earlier, although no set experience level requirements exist in order to participate in a forensic archaeological investigation, scholars such as Sigler-Eisenberg (1955), United Nations (1991), France *et al*., (1992) Spennemann and Franke (1995), Crist (2001) Hunter *et al*., (2001), Wright *et al*., (2005) Cox *et al*., (2005), and Cheetham and Hanson (2009) state that experienced field archaeologists should be employed for forensic archaeological work, furthermore, Scott and Connor (2001) specifically state that such casework should only be conducted by archaeologists with a minimum of "3 years full time fieldwork experience" (Scott and Connor 2001: 104). This, they argue, will ensure that the participating archaeologist will be competent and fully capable of conducting a forensic archaeological investigation, and will be recognised by the courts as an expert, and be deemed competent by the courts to provide an expert opinion regarding the findings of a forensic archaeological investigation.

This presumption, that a higher level of archaeological experience will increase the quality and quantity of evidence recovered from an archaeological investigation, was tested during this Project. The results of which are displayed in 'Graph 8.13' and 'Graph 8.14'. The hypothesis was that there would be a linear relationship between the overall score of individual participants and their level of archaeological experience, with participants with higher levels of archaeological experience having the highest overall scores.

This hypothesis, however, was disproved. There appears to be no correlation between archaeological experience and overall score, with participants of 3, 4, 5, 7, 9, 12, 15, 18, 28 and 30 years of archaeological experience achieving the same score, 91.67%. The participant who achieved the highest overall score of 100% had 19 years of archaeological experience, and the participant who attained the lowest overall score of 20.83% had 6 years of archaeological experience. If the hypothesis was correct, the participants with only one year of archaeological experience should have attained the lowest overall scores, and the participants with the highest level of archaeological experience, thirty years, should have achieved the highest overall scores. However, some of the most experienced participants had overall scores that were lower than individuals with only one year of archaeological experience, for example, a participant with 4 years experience achieved 29.17%, a participant with 5 years experience achieved 37.50%, a participant with 12 years experience achieved 41.67%, a participant with 13 years experience achieved 41.67%, and a participant with 30 years experience achieved 33.33%, whereas the participants with only 1 year of experience achieved at worst 45.83% and at best 75.00%.

The lack of a linear relationship between years of archaeological experience and overall score is further emphasised in ‘Graph 8.14’, which displays the results of a linear regression analysis. The data from this analysis provided an R^2 value of 0.04298. This indicates that there is a minimal relationship between a participant’s level of archaeological experience and their overall score. Furthermore, this data indicates that archaeological experience can only be used to predict an archaeologist’s ability to achieve a higher rate of evidence recovery, or in the case of this experiment, overall score, in 4% of cases.

Consequently, these results contradict statements made by scholars that archaeological experience will ensure a higher quality of forensic archaeological investigation. One might explain the variation in the aforementioned results by stating that the archaeologists with higher levels of archaeological experience are likely to be in more senior roles and therefore do not conduct fieldwork on a regular basis, as their focus will be on managing archaeological projects and post-excavation work, whereas the archaeologists with lower levels of archaeological experience are more likely to be conducting the practical fieldwork aspect of archaeological investigations. However, in the case of this Project, all participants conducted fieldwork on a regular basis, particularly those with the higher levels of experience. Therefore, this explanation is not valid.

Another explanation for the significant variation in overall scores might be complacency and over confidence. As archaeologists with higher levels of archaeological experience tend to consider themselves to have gained sufficient experience to excavate and record archaeological features as second nature, and have experience in excavating a variety of different archaeological features. Such archaeologists thus have a large reference collection from which to predict what one might expect to find in a particular type of archaeological feature, such as a grave. This predictive capability may bias experienced archaeologists, as they will use their previous experiences and knowledge of excavating archaeological features to predict what a particular feature, such a grave, may contain and how it may be constructed. Therefore, when excavating a feature, such as the grave used in this Project, the experienced archaeologists may well have assumed that the grave structure and its contents would mimic the types of graves that they had previously excavated, and led to a complacent attitude and approach to excavating the grave. That, in turn, may well explain why such archaeologists failed to identify certain contexts and material evidence items contained in the grave, as these did not adhere to their pre-determined expectations.

In comparison, archaeologists with lower levels of archaeological experience are less likely to be confident in their abilities to excavate and record archaeological features, such insecurities result in a tendency for less experienced archaeologists to be more cautious and considerate when excavating and recording archaeological features, or in the case of this Project, the grave, resulting in these archaeologists achieving higher overall scores than one might have expected them to.

The findings of this Project clearly demonstrate that the employment of archaeologists on the basis of their archaeological experience is not a sufficiently reliable criterion upon which to judge an archaeologist's ability to participate in archaeological fieldwork, be it in a commercial, academic or forensic investigatory setting. In terms of a forensic context, as the consequences of such investigations can be so impacting on the victims' families, the accused individual(s), and individuals and societies effected by atrocities such as genocide, war crimes, crimes against humanity, and crimes of aggression, the selection process whereby archaeologists are chosen to participate in forensic investigations must be stringent, and ensure that the investigation is undertaken to the highest possible quality attainable.

In order to achieve such an objective, it is clear that merely relying on an individual's archaeological experience will not guarantee a high quality of excavation. Therefore, in order to counter such problems, it would be advisable for potential forensic archaeological investigation team candidates to participate in a skills test, which would rely on the candidate excavating and recording a controlled simulated grave, such as the one used in this Project. Such competency tests are already used in the discipline of forensic anthropology with the American Board of Forensic Anthropology being responsible for examining and accrediting competent forensic anthropological practitioners (American Board of Forensic Anthropology 2013). Through reviewing the results of such a test, the selection committee would then be able to determine which individuals would produce the highest quality of archaeological investigation, and therefore be most suitable for forensic casework. Due to the fact that there appears to be no definitive link with archaeological experience and overall score, it would also be advisable that such tests were repeated, for example, every five years, to ensure that the highest archaeological standards are being maintained. The threshold for deeming a potential team candidate capable is debateable, as there is not currently a forensic archaeology competency test standard in place, however an overall score of 80% or higher would seem sufficient, as this is the standard used by the American Board of Forensic Anthropology in their competency tests (American Board of Forensic Anthropology 2013). If a potential candidate failed to meet such a standard, a re-take or focused training scheme would, in theory, raise the individual's abilities to the desired standard.

4.7 The establishment of error rates for archaeological excavation methods and recording systems

As discussed in 'Chapter 2.3 Legal concerns: How international legislation and admissibility regulations impact forensic archaeological investigations', there are five requirements that must be considered by the court to determine if the expert testimony and the evidence retrieved by the forensic archaeologists during the course of an investigation can be deemed as reliable. These include: empirical testing, peer review, professional standards, widespread acceptance, and error rates.

The two major requirements that were yet to be satisfied by the archaeological community, prior to this study, were the lack of empirical testing and the establishment of error rates for archaeological excavation methods and recording systems.

The requirement for archaeological excavation methods and recording systems to be empirically tested has now been satisfied as a result of the excavation experiments conducted and discussed in this study, and the work of other scholars including: Tuller and Đurić (2006) and Pelling (2008) whose findings correlated with those discussed in 'Chapter 4.3 The selection of archaeological excavation methods and recording systems for forensic investigations'. This body of work has demonstrated that there is variability in the suitability of different archaeological excavation methods and recording systems to forensic archaeological casework and that the Quadrant, Demirant and Stratigraphic Excavation methods and their associated recording systems, on average, produce more accurate results than lay persons and archaeologists utilising the Arbitrary Excavation method and Unit Level Recording system, when tested using grave simulations of known properties.

In regards to the establishment of error rates for each archaeological excavation method and recording system, it is unfortunate that this particular requirement cannot be met. This is due to the fact that there is great potential for variability in how individual clandestine graves are constructed, and in turn, what evidence they may contain. Therefore, any error rates generated using simulated graves, such as the one used in this study, will not be arbitrarily applicable to clandestine grave excavations, as there are too many variables that may differ from the simulated grave used to establish these error rates.

Another factor that prevents error rates from being established for individual excavation methods and recording systems is the variability in the evidence recovery rates between individual archaeologists. This study demonstrated that recovery rates varied greatly, between archaeologists in general with archaeological experience proving to have little bearing on evidence recovery, and within individual methodological approaches. Thus, at present, as there are no skills tests to prove that an individual forensic archaeological practitioner is competent and that they produce consistent results, an error rate established using averages from simulated grave excavation experiments such as those used in this study, may not be applicable to a forensic archaeologist excavating a clandestine grave, as their recovery rates may in fact be less productive or more productive than the rates used to establish the error rate for the methodological approach that they used.

Therefore, in light of these two issues, the sub-field of forensic archaeology is unable to meet this requirement for admissibility. However, the results of the grave excavation experiments indicate how each of the archaeological excavation and recording methods perform against one another in a control setting. These results can be used by both court personnel and archaeological practitioners as a guide to determine which archaeological excavation methods and recording systems are the most productive and reliable, and thus suitable to use during a forensic investigation.