

7.0 GEO-TECHNICAL CORES

7.1 Core Locations

After the completion of the archaeological test program a number of cores were taken for geo-technical purposes. A total of eleven cores were planned; seven are located at the George and Bridge Street intersection. One core was located in Bridge Street (core PC 01), one at the junction of Bridge Street and George Street (core PC 11), one in the roundabout (core PC 02) and the remainder were in George Street in the middle of the intersection and on either side of it.² Refer to Appendix 1 for the pavement core plan (SKM).

7.2 Profile

The results of the evidence from the cores within this project area may be summarised as follows:³

- Concrete pavers and bedding on the roundabout (core 2)
- Present asphalt concrete road surface along George and Bridge Streets and under the roundabout (cores 1, 2, 3, 4, 5, 11, 12)
- Bedding or base for Bridge Street surface (core 1)
- Older asphalt road surface on George Street (cores 2, 3, 4, 5, 11, 12)
- Road base for second George Street surface (core 3, 5, 12)
- Older aggregate concrete surface? (core 2, 4)
- Third road surface intersection of Bridge Street and George Street (core 11)
- Sandstone block at the intersection of George and Bridge Streets (core 11)
- Dark sandy silt classified as fill (cores 3, 4, 5, 12)
- Silty red clay at varying depths between 600-2000 below surface (cores 1, 2, 3, 4, 5, 11, 12)

Bedrock was not reached in any of the cores in this area.

It is worth comparing the results of these cores with those taken on the northern side of the river as part of the same program (cores 7 – 10). None of these cores revealed the same silty red clay that lies at

² SKM Geotechnics (2013); Windsor Bridge Replacement Detail design Pavement Core Log Report

³ Based on descriptions on the log sheets: Ibid

the base of all the cores taken at the Bridge and George Streets intersection.

7.3

Discussion

7.3.1

Sampling and Interpretation

The first and possibly most important observation to be made from these results, the same as that concluded in relation to the testing program for archaeology, is that the evidence of one or even a small number of samples will not provide a generic profile that can be applied to all of Thompson Square or its environs. There are, for example, great differences between the results of the archaeological test trenches in the pavements and the cores made in George Street. For example in Trench 11 located in the George Street pedestrian area bedrock was reached at approximately 600 mm. In core 3, a few metres to the north-east in George Street bedrock had not been reached at a depth of two metres. In trench 11 evidence of what appears to be a sandstone block road was revealed and this is missing in core 3. Equally the profile recorded in the three archaeological test trenches is completely different in each case.

The archaeological and geo-technical samples acquired in this program of work reinforce the conclusions from the first program of testing on the northern side of George Street. Thompson Square and its environs preserve an extremely complex and diverse cultural profile. It has evolved over a very irregular landform and has been subject to multiple works of varying scales designed to accommodate or change that landform. There are specific improvements in particular places (landscaping, drainage, structures etc) that have been implemented over a very long period of time. The impacts of later works on earlier improvements have removed, reduced or disturbed components of the archaeological profile but in doing so have added to the evidence that explains how, in the historic period, this area of land was used and managed to accommodate many different needs.

This observation has substantial implications for any intervention in Thompson Square or its near environs. Excavation for construction or as a mitigation measure requiring the removal of large portions of the profile in this area will fragment this resource and reduce the ability to interpret individual units and the profile as a whole. There is a high probability that the relationships between individual archaeological components will be obscured or only partly revealed because the excavation areas will have no relationship to any former historical landscape. This would be like cutting a trench through a room that revealed only parts of the furniture and décor and even cut some of the furniture in half; it would be very difficult to determine what the

room had been used for particularly if that room retained furniture and decoration that revealed several changes of use.

This also has the same implications for any part of the present cultural landscape that would be kept or retained as part of the proposed construction with respect to the loss of evidence. Even with comprehensive archaeological documentation of the areas removed the ability of what remained to be interpreted as part of the complex resource that is now preserved in Thompson Square would be adversely impacted by the work.

7.3.2

Land form

It is very clear that the topography recorded in the earliest European images of this place is accurate and that the original landform was sloped steeply from the ridge to the river. This fact alone is a major issue in understanding how the early settlement evolved as it responded to the challenges of that environment. This challenge and response creates the circumstances that lead to the development of an archaeological profile particularly in a place such as Thompson Square where there has been over two centuries of development.

The original landform is now becoming clearer from testing both for archaeological and geo-technical purposes. This evidence suggests that we might perhaps be able to predict or anticipate some aspects of settlement here if we acquire a closer understanding of the pre-settlement environment and topography.

For example, with respect to the present area of investigation, all of the nineteenth century surveys record the very distinctive splayed corner at the southern intersection of George Street and Bridge Street. This corner and its building allotments were certainly placed at least in part to accommodate the scale and angle of the Commissariat building. The information gained from the present work indicates that the position of that building might have been dictated entirely by the presence of bedrock close to the surface along the ridge and the presence of a break in that ridge. The western extent of the building appears to correspond to the westernmost extent of shallow bedrock on this portion of the ridge. Bridge Street may have been placed here to exploit a cleft in the ridge at that point via a gully through it. This early assessment is based on the identification of the presence or absence of bedrock close to the surface in the two test trenches and two cores.

The landform that exists today within Thompson Square and its environs is vastly different to what can be surmised of the original landform based on the small programme of archaeological test trenches, geo-technical cores and early images of the settlement.

This comparison highlights the complexity of the profile that must exist within this area; the extent of alteration or land-forming infers the presence of a deep cultural landscape.

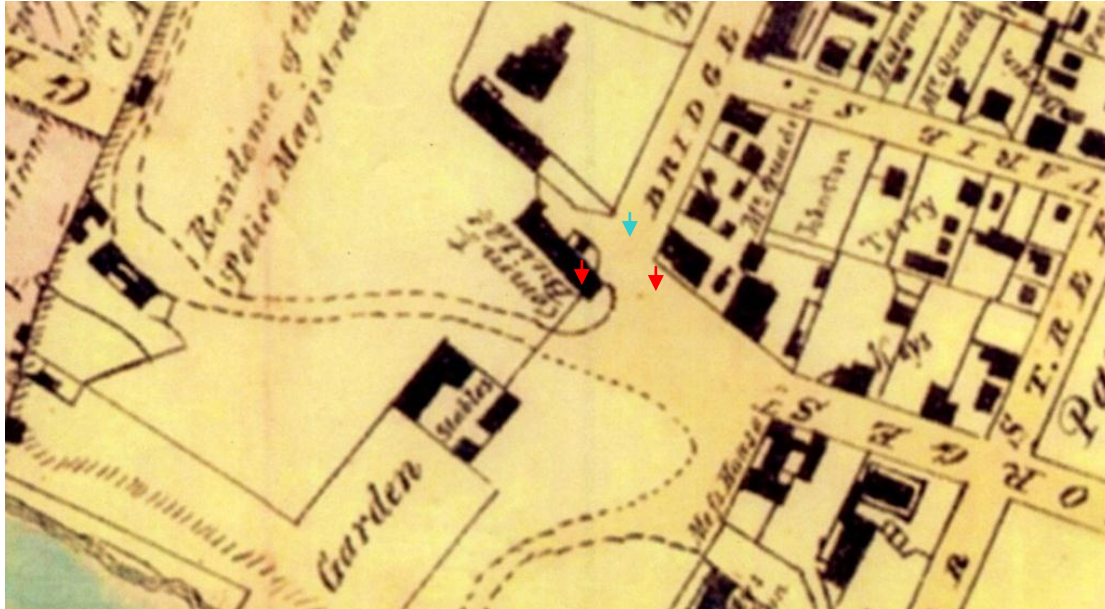


Plate 25: 1842 survey with the red arrows indicating the presence of bedrock close to the surface (archaeological test trenches) and deep deposits of fill and clay shown by the blue arrow recorded in a geo-technical core (detail of Peninsula Farm Auction 5 February 1842, Plan prepared by Surveyor Armstrong: source nla map f187 on line)

7.3.3

Land-forming

The evidence from the geo-technical cores compared with the results of the archaeological test trenches in this location also provides evidence for what appears to be substantial programs of land-forming.

The most obvious example of work of this type is found in cores 3, 4, 5 and 12. The cores are all located in the middle and northern sections of the present alignment of George Street. In each of these cores at the base of all the road surfaces was a consistent deposit of dark brown sandy silt with traces of sand and gravel used as fill. It ranged in depth from approximately 600 mm to well over a metre and lay above red clay. It was not found in cores 1 or 11 within Bridge Street and it does not appear to be consistent with any of the soils exposed in the indigenous archaeology test pits or historic period test trenches excavated on the northern side of George Street.

The evidence suggests that this soil was laid in a band to assist in the formation of George Street, either in the nineteenth or twentieth centuries; there is insufficient evidence to date the work accurately.

Its relevance is that it infers there was a drop down this hill at this point that might represent the edge of the bedrock on the ridge and/or an older cultural profile that needed to be modified for the later works. The soil is being used to modify that topography to facilitate the road.

A particularly important component of the profile in all test trenches and cores is the red clay that is found at the base of all those excavations. The red clay is a natural element in the local geological profile and has been found in situ in indigenous test pit A on the northern side of George Street. Exactly the same clay has been found in Trench 2 where it was used as fill to increase and level the ground surface. This was part of the work that was required to raise the level of the road when the height of the bridge was increased in 1894. There were no obvious differences between the in situ clay and the redeposited clay.

This has particular relevance for the clay exposed in the geo-technical cores and some of the clay exposed in archaeological trenches 10 and 11. This is discussed in the following section. Generally, what is becoming apparent is that the pre-settlement landform has been massively changed in places by land-forming works and much of this work appears to have no archival trace so that its nature and extent cannot be identified or predicted.

8.0

INTERPRETATION OF EVIDENCE

8.1

Topography and Geology

The test trenches and cores excavated on the ridge have provided more evidence for the original landform and how this has influenced European settlement. Test Trenches 10 and 11 are the locations on the southern side of the river in which bedrock has been reached; it is approximately 600 mm from the present surface. Excavations in the indigenous test pits and historic period test trenches on the northern side of George Street have reached depths of between 1 and 1.5 metres and rock has not been encountered in any. None of the geo-technical cores encountered bedrock up to depths of two metres.

The results confirm the accuracy of the earliest European images of this area from c.1810 that shows a high exposed ridgeline that drops steeply down to the river. The results from the excavations in this area suggest that it might have been a narrow ridge line before it commenced that steep drop; there is sandstone bedrock on the southern side of George Street at a depth of 500 mm [003, 010] but it is not encountered in a core just to the north only a few metres away (core 3).



Plate 26: View of the Green Hills settlement in 1809 by William George Evans showing the steep topography from the ridge line (ML PXD 388 V3 Folio 7).

It is possible that the ridge was broken or cut through by deep breaks or clefts; there was no evidence of bedrock in either of the cores in Bridge Street between the two archaeological test trenches where bedrock is revealed at shallow depths.

This evidence could explain the way in which the earliest settlement was built on the southern side of the river. The most substantial buildings used the exposed bedrock as a firm base for building and their position influenced the pattern of streets or paths. As well, if there were natural passages through rather than over the ridge this might have influenced the development of streets such as Bridge Street. Identifying and understanding the pre-settlement topography could add a layer of information about the way in which the settlement evolved and the decision-making behind that the configuration of the earliest settlement.

The excavation has also demonstrated that the ancient sand body revealed in the indigenous test pits and historic period test trenches on the northern side of George Street does not extend further south on or across that road. There was no evidence of any intact sand deposits in the test trenches excavated in this program or in the cores to at least two metres depth. The physical evidence confirms that this deposit has been formed on the steep sandstone bedrock on the northern side of George Street and have been scoured and added to over millennia of flooding.

With respect to occupation and management in the historic period, however, the more relevant fact raised by the current excavations is that there is little evidence to indicate the presence of much or any naturally occurring sand or soil on the ridge top. This evidence suggests that prior to European settlement it was an exposed rocky peak or plateau; at best there may have been a thin layer of sand or soil. The latter may have been deliberately removed to facilitate the first European use (refer Section 8.2).

All of the excavations revealed distinctive deposits of red clay. In the cores this material was encountered at approximately 400 mm below the surface and extended up to two metres depth without change. The same red clay is found in both trenches 10 and 11 lying immediately above bedrock at an approximate depth of 500 mm. It is possible that the clay in Test Trench 10 **[002]** is naturally occurring although the upper portion or has been disturbed or added to for later construction works. However, the same clay in Test Trench 11 must have been laid over the bedrock much later; it covers the excavation of a service trench and had not been cut through to lay that trench.

The implication of this small sample for interpreting evidence from the site is enormous. This clay has no visible difference from the clay

found in Test Trench 11 or from that described in any of the cores. It is also the same as that found in Test Trench 2 where it was used as fill. Clearly the naturally occurring clay is being sourced for use as fill and levelling material but in terms of these small sample areas identifying whether it is in situ above rock or brought in and compacted above a used surface depends at this time entirely on uncovering a feature below that clearly identifies an historic period of use and, thus, an introduced layer of clay.

This raises the question of whether any of the clay in the cores could be interpreted as an introduced material; for example in core 5 at the easternmost end of the samples in George Street two strata of this material are recognized from 300 to 1000 mm and then from 1000 mm onwards. The difference appears to be in relation to plasticity and texture; these are the same differences exhibited between the clay in Test Trenches 10 and 11. Does this mean that introduced clay has been laid over in situ clay to create a different level for some purpose? It would only be possible to address this issue through a larger area of excavation.

8.2

First European Land Use

There is some evidence exposed in the current excavations to suggest that the geology was put to use to assist the earliest settlement. There is the apparent relationship between the western end of the Commissariat building and the extent of shallow bedrock at the same point. Test Trench 11 revealed that the bedrock had been shaped; there is a deliberate straight line formed by apparently slightly cutting and smoothing the sandstone [010]. This feature extends both east and west beyond the boundaries of the trench. The feature is also likely to extend north into the road.

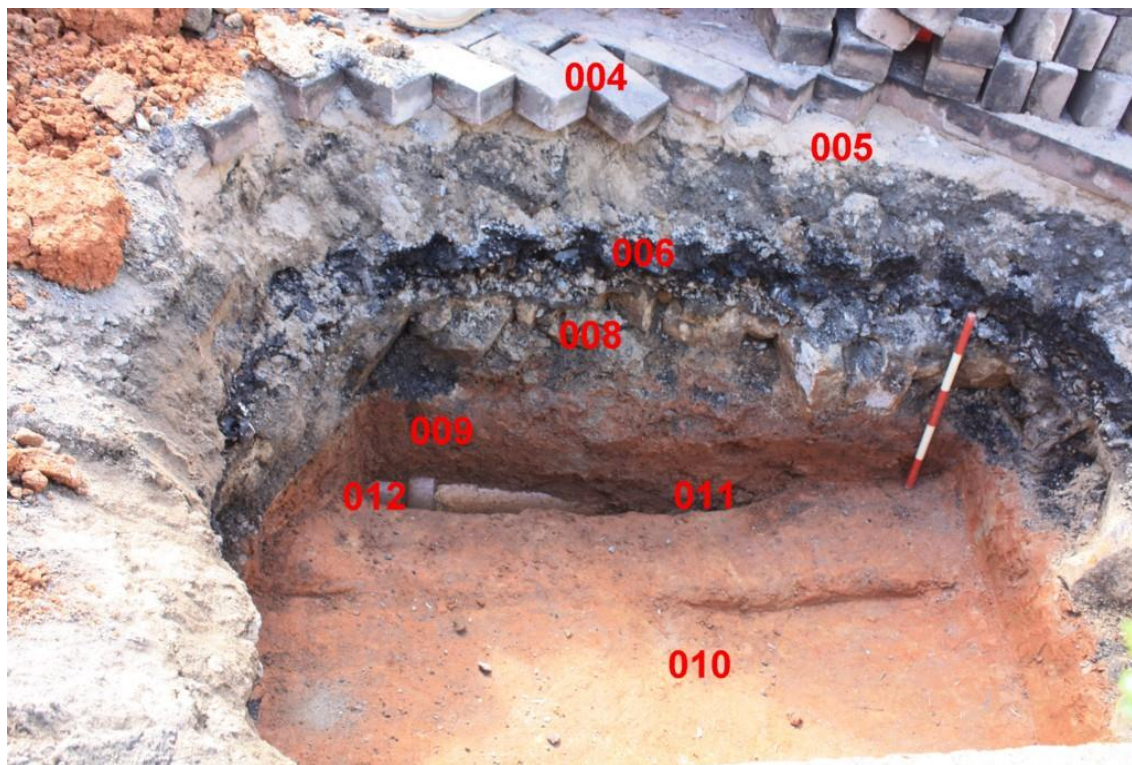


Plate 27: View north showing the shaped sandstone bedrock [010] in Test Trench 11; scale 500 mm.

It is impossible on the basis of the evidence in this small sample to precisely date this work but some general conclusions may be made. It predates the construction of a stone-built feature found in the same trench that is likely to be of later nineteenth century construction (refer Section 8.4). This means that the shaped bedrock was worked in the nineteenth century work. It lies within an area that was a road during all of the nineteenth century suggesting that if this rock-shaping was part of a structure or other feature it is likely to date to the very earliest years of the nineteenth century before the width of George Street was formalised. That bedrock was used in this way in the earliest years of settlement to form part of the foundations of buildings or as drains can be demonstrated on several archaeological sites from Sydney.

The sample of evidence is small so the conclusions drawn from it must be treated with caution; more physical evidence is required to make more certain attributions. However, it is possible that this feature represents a European work that utilised exposed bedrock for some form of structural improvement. It could represent a work from the earliest years of settlement, possibly pre-1810 when primary archival evidence demonstrates that there were numerous buildings located in this area for which we have no precise sites. If the bedrock was not exposed then it seems likely deliberate action was taken to remove whatever thin deposits of soil or sand lay here. This is also a

practice than can be demonstrated from nineteenth century archaeological sites in Sydney and Parramatta.

8.3

The Commissariat Stores of 1803

Test Trench 10 provided no positive evidence of the presence or absence of archaeological evidence relevant to the Commissariat stores building of 1803. The section of the footpath where a wall foundation was most likely to lie, if it remains, has been thoroughly disturbed by numerous service trenches and pits. The southern wall lies within an area disturbed by service trenches. The western wall would be within the area of the road and the evidence from cores suggests that all the archaeological profile here might have been removed or disturbed when the road was widened and/or resurfaced (*refer Section 8.6*). There was no evidence of construction or demolition debris in Test Trench 10, which lay close enough to the northern wall alignment to have been impacted by both. There was no evidence of wall trenches in any form.

This trench demonstrated that the impacts from the numerous services, pits, probably the construction of the School of Arts building and the construction of the footpath as well as the changes to Bridge Street have almost certainly removed most, if not all, of the archaeological profile here in the footpath and verges either side. All that was revealed in this trench was a deposit of clay with lenses of sand **[002]**. The clay appears at least in part to have been dug up and redeposited on this site although the sample is very small to make that conclusion in light of the evidence provided by the cores and the comparison with Test Trench 11.

There are several possibilities for explaining its origin. First, the clay could have been brought to the site to form that footpath immediately over bedrock. Secondly it could have been an in situ deposit that was utilised for the footpath but has been disturbed during that construction process. Thirdly, it could encompass elements of both in situ and introduced clay of exactly the same composition. This is a far more likely scenario; it explains the disturbance to the upper part of the matrix and the similarity to the clay found in Test Trench 11. The date and associations of these features are discussed in Section 8.6. Although there is unlikely to be any evidence of additions made to the site for the stores building such as foundation walls, the evidence from Test Trench 11 with respect to what appears to be an early nineteenth century practice of using the underlying bedrock for building works, allows for the possibility that some evidence of this large building could survive as elements of worked sandstone. This is supposition and inference based on a small sample but it is not an unlikely conclusion. The only means of testing this possibility lies

outside the footpath in less disturbed areas, for example the School of Arts site.

8.4 George Street in the Nineteenth Century

8.4.1 Before c.1870

There is very little specific evidence for the development of George or Bridge Streets in the nineteenth century. The archaeological evidence from the current program of investigation suggests that George Street may have been no more than the exposed and possibly shaped ridge-top bedrock in the earliest period of settlement. Certainly the narrow street that existed at the southern end of what is now Thompson Square was widened during Governor Macquarie's regime to match the breadth of his new planned road. There appear to have been further alterations to the configuration in the 1830s or 1840s; the discussion of the archival evidence for these conclusions is contained in the historical analysis made for this project. The configuration of the road is best seen on an 1842 town survey.



Plate 28: Detail of Armstrong's plan of the town in 1842 showing the large open area on the ridge top with the Commissariat building providing a visual curtailment to the end of George Street. The distinct splayed corner at the Bridge Street intersection is also recorded here (detail of Peninsula Farm Auction 5 February 1842, plan prepared by Surveyor Armstrong: source nla map f187 on line).

The evidence recovered during the current program suggests that apart from responding to the position of buildings that had existed for many years the roads may have been sited to take advantage of the

original topography and natural contours as well as geology. There was nothing found in any test trench or core that could be certainly attributed to road formation in this period unless the cutting and shaping of bedrock seen in Test Trench 11 was part of a road alignment.

No primary archival evidence has been found to date to describe how the surface of the street was improved over the decades up to the 1870s. If the area of the road commenced as a bare sandstone ridge shaped here and there possibly for buildings no longer present after the square was redeveloped during the Macquarie regime, it had changed by the middle or slightly later years of the nineteenth century. There are two images that provide evidence that at the very least earth had been used to create surfaces. One image shows the land in front of the School of Arts around c. 1870 and a second shows the land around the southern end of Thompson Square into the area of George Street.

Both images show that if this area had been exposed bedrock in the first years of the nineteenth century by the c.1870s the ground had been covered and possibly raised in height. Neither image suggests that there were hard surfaces; both appear to show compressed earth used for both road and pedestrian areas. In fact, there is a slight indication in the Thompson Square view that the road surface of George Street adjoining the Macquarie Arms Hotel was lower and ended in a formed kerb and that the ground beyond it was open and the road was indistinguishable from the area of the square.

None of the trenches excavated for the present program revealed any profile of soil or earth that matches what is shown in these images unless the raised level of the footpath and land around the School of Arts building can be equated with the clay found in trench 10.

The absence of physical evidence infers that major changes were made to these roads later in the nineteenth century or in the twentieth century. The comparison between the archeological and archival evidence suggests that whatever developed profile existed here before that time was removed in this later period.



Plate 29: The School of Arts building in c. 1870; the land behind the picket fence is the area of the present footpath and part of Bridge Street (source ML GPO 1-06260.)



Plate 30: View of the southern end of Thompson Square after 1874 showing the Macquarie Arms Inn and the area of George Street in the foreground (source ML d1-06257)

8.4.2

The 1880s to c. 1900

Archival evidence for roads and infrastructure in this period is limited. Substantial road works appear to have commenced in the 1880s. In 1880 questions were asked in Council concerning funds that had been allocated to repair the roadway in Thompson Square. The Works Committee reported that an additional £5 had been allocated to the project.⁴ In the same month funds were allocated for fencing in Thompson Square and for stone kerbing.⁵ In November 1880 it was reported that an additional £10 be spent on improving the road leading from the Bridge to George Street. A question was asked in Council regarding £8 that had been granted to the repair of the road in the square. The money had been spent “on widening the road in the locality mentioned”.⁶ In 1881 a tender was accepted from W. Wood for gravelling the footpath in Bridge Street.⁷

By 1883 kerb stones were being introduced to the square; questions were asked in Council in August of that year why the stone had been laid down in the square ready to be fixed without Council approval although all noted that Thompson’s Square was a priority for kerbing.⁸ Reaction to the work was mixed particularly as the work took a long time to complete. In 1886 it was reported;

*“the forming of the road on the northern side of Thompson Square is a very good job in its way but there was certainly no necessity for it. On the other side of the Square where all the traffic is and where heavy rates are paid it was not considered good enough to kerb until recently.”*⁹

Earlier, in 1883 a local man complained that it took ten months to get “a bit of tar paving laid in George Street”¹⁰.

The roads in the square were still in a poor state in 1890; more money was voted to attend to “the bad state of road at Thompson Square”.¹¹ Council minutes record the vote of “a sum not exceeding £10” to be used for the repair of the street on the southern side of Thompson Square from George Street to the banks of the river where there was to be clearing.¹² Kerbing and guttering was still being undertaken in the later 1890s in the square.¹³

⁴ AWRH Advertiser 25 September 1880: 2

⁵ AWRH Advertiser 9 October 1880; 2

⁶ Ibid

⁷ AHWRH Advertiser 26 March 1881; 3

⁸ Hawkesbury Chronicle 18 August 1883; 2

⁹ Hawkesbury Chronicle 14 August 1886; 2

¹⁰ Hawkesbury Chronicle 4 August 1883; 2

¹¹ Windsor and Richmond Gazette 16 August 1890; 3

¹² Hawkesbury Council Minutes 30 July 1890 Council Records 1889-1902 Hawkesbury Library HAW (28)

¹³ Windsor and Richmond Gazette 14 August 1897; 4

In 1889 it was reported that the water supply for Windsor was proceeding rapidly; In October of that year reticulated pipes had been laid down George Street from Railway Street to the end of Thompson Square.¹⁴ At the same time the footpaths were being asphalted; the path in front of Stearn's premises was being asphalted in January 1889¹⁵ (this building is to the west of the investigation area).

In March 1893 complaints were made concerning the state of the roads and the work of Council to address those issues. It was stated that *"to this day George Street is a disgrace to the town and a reproach to its alderman past and present. George Street should have been paved from Mr Moses' corner to Dight Street at least and the kerbing renewed"*¹⁶. The reference suggests that the street was still unpaved in any way at this time.

The state of the streets provided a means in the early 1890s to combat unemployment caused by the severe recession that gripped the country. It was stated in 1893 that George Street was repaired from Thompson Square to Baker Street; *"the gutter is being taken up and lowered on account of the road not being level. Some fourteen men are at work employment having been found for Windsor's unemployed"*.¹⁷

The reference to reticulated pipes being laid in George Street provides the best evidence for interpreting the physical evidence found in the test trenches. Test Trench 11 revealed the presence of a service pipe [011] on the extreme northern side of the trench. The service trench had been cut into the underlying bedrock [010] and the pipe [012] laid at a shallow depth.

It is possible that this service trench was excavated when some or all of the soil visible in the earlier images was still present. There was a deposit of soil in the base of the trench [013] that appeared to be different from the clay above it [009] but the area was too small to investigate properly. Even so the shallow depth of the pipe in this trench suggests that the clay above it [009] was laid at the same time and was intended to be the capping to these works.

If these associations between archival and archaeological evidence can be accepted this would put a date of approximately 1889 or later (the 1893 road works used for depression era employment) on the introduction of pipes and the new clay deposit recorded in Test Trench 11. This might also date the same or similar clay deposit recorded in Trench 10 [002]. The evidence infers that this program of

¹⁴ Windsor Richmond Gazette 5 October 1889; 4

¹⁵ Windsor and Richmond Gazette 26 January 1889; 2

¹⁶ Windsor and Richmond Gazette 11 March 1893

¹⁷ Windsor and Richmond Gazette 4 November 1893; 3

work carried out in the later 1880s and early 1890s was far larger and involved more intervention in the existing fabric of the square than the impression gained from the archival references. Effectively it suggests that apart from the construction of the infrastructure all the older road surfaces or accumulated soil seen in the earlier nineteenth century images were removed at this time.

This raises the question of what was used to surface the roads after that time. There is a stone cobbled feature found above the clay in Test Trench 11 **[008]**. This was an extremely well constructed feature; there are several similar examples from Sydney and Parramatta that date to the same later nineteenth century period or early years of the twentieth century where this form of construction was used for a road or laneway surface. In this case it is clear that the clay was used as a bedding deposit for this feature and that the two formed one program of improvement at about the same time as the introduction of the service pipes.

The red clay found in Test Trench 2 **[Trench 2: 028]** was used as a means of raising the level of the ground apparently in association with the work required to increase the height of the roads in Thompson Square when the bridge was raised in 1894. It provides a second example of this material used for earth-works. The close period in time between the two programs, c.1889-1893 and 1894 and the similarity of the materials might infer that the use of this naturally occurring local clay was a common and cost effective method employed in the area at that time for large infrastructure works.

The evidence against interpreting this cobbled feature as a road is that other instances of its occurrence, with the single exception of a substantial sandstone block found in core 11 have not been discovered. Core 11 is in the middle of Bridge Street almost in a direct line east from Test Trench 11. It suggests that whatever this feature is it runs in a straight line east-west at this point. It certainly extends north of the location of the test trench and core but appears not to be present in the middle or northern side of George Street.

This absence of evidence allows for several possibilities; that it was never built the full width of the street, that it is not a road surface but a narrow linear feature or that at least half of the surface was removed after it was laid. With respect to the latter this portion of the road also corresponds to the deposits of dark silty fill recorded in the cores and it is possible to interpret the introduction of the fill as a means of building up the road surface where the stone paving had been removed; there is no way to demonstrate or prove this to be the case based on the evidence available.

If it is a linear feature there is no identifiable explanation for it. It is certainly not a building and highly unlikely to have been used as a cap for the services that lie under it. It is also unlikely to have been a gutter. There is a reference in 1877 to a “boulder gutter” being built in Catherine Street¹⁸ however, the location of the feature in Test Trench 11 in relation to the street alignment of the time puts it several metres from the path on George Street. It could have been some form of drainage feature but at this time there is insufficient evidence to make a certain identification of its use.

In conclusion the construction technique suggests that it could have been a road surface. The use of the clay (evidenced in Test Trench 2 as a land-forming medium agent used in the 1890s) and the relationship to the service trench below it in association with primary archival evidence suggests a date of the early 1890s for this work, probably after 1893. The absence of any deposits between the clay and the bedrock, despite nineteenth century images showing built up deposits in this location prior to the 1890s infers that the impact of the work removed any archaeological profile prior to the construction of the road (or gutter or drain). The absence of evidence of this type on the northern side of George Street where there is a different profile of soil could suggest that, if this was a road surface it was largely removed when more substantial program of road works were carried out in George Street.

8.4.3

In the Twentieth Century

It raises the question of how long this possible surface may have remained in use. It certainly does not appear to have been evident in the later 1920s. There is an aerial view of Thompson Square in 1929 and George Street in that image appears to be earth-covered. This could coincide with the deposit of silty soil [007] found in Test Trench 11 lying directly over the stone-built feature.

¹⁸ Sydney Morning Herald 9 June 1877; 3

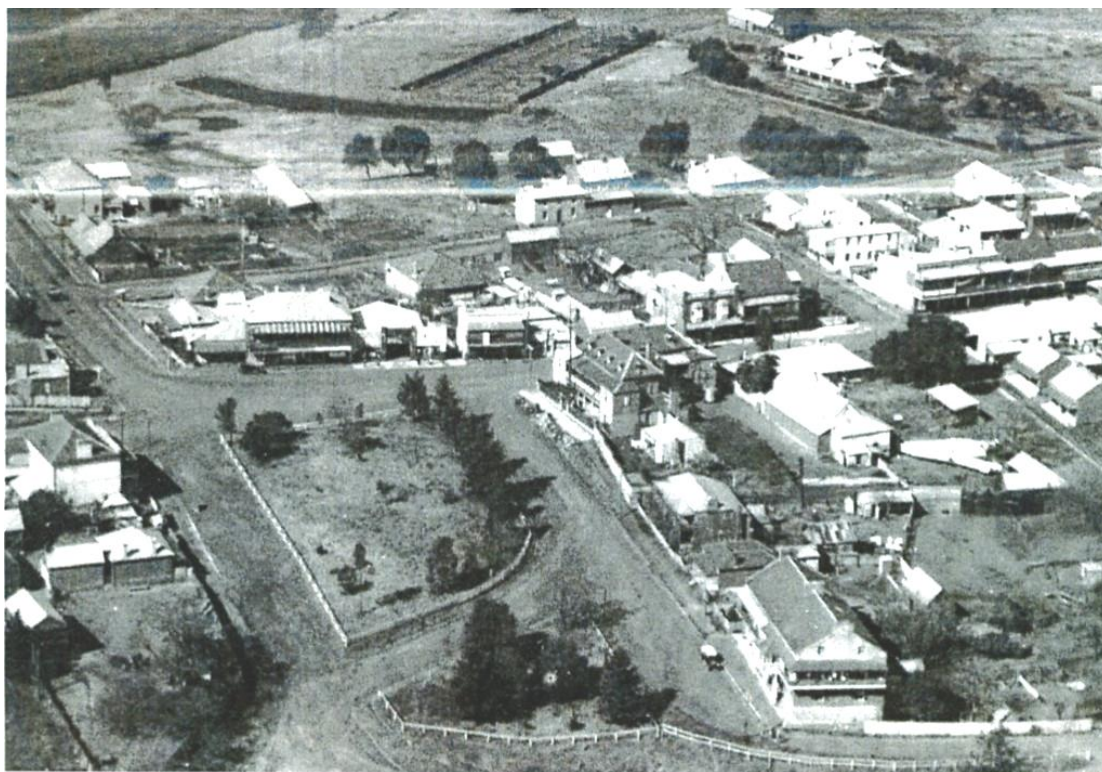


Plate 31: Thompson Square in 1929 showing what appears to be a compacted soil surface along George Street (JHHS 2011 No 2: 21).

Every core reveals at least two or three layers of asphaltic concrete road and up to two were recorded in Test Trench 11 [006]. The earliest of these layers is likely to date from the later 1930s. In 1935 the *Windsor and Richmond Gazette* reported that Windsor Council had decided to approach the Department of Main Roads to commence a program of concreting George Street. The work would involve the removal of water pipes in the centre of the road and relaying them in the sides of the street. It was a decision hailed by the residents; it was noted that the convex surface of the street was at best a handicap and could be a danger to heavily laden vehicles. The request to the Department was to concrete the road from Bridge Street to the picture theatre.¹⁹ The works were carried out in 1938.

The exact scale of that work is unknown but the reference to the convex nature of the centre of the road and the physical evidence of the cores on the northern side of the road might indicate that a substantial part of the work entailed cutting down the road. This could have led to the loss of the stone-built surface or feature here. However, unless more work is undertaken in this area particularly with respect to the northern edge of the stone cobbling it is impossible to be more precise.

¹⁹ *Windsor and Richmond Gazette* 29 November 1935; 10

The cores show that successive layers of asphaltic concrete have been laid, some with bedding and some directly on the surface below to bring the level of George Street to its present height.



Plate 32: View of street works in 1938 looking west down George Street from the Bridge Street intersection (ML GPO 1-32538).

8.5

Footpaths

8.5.1

Bridge Street

There is even less archival evidence for the development of paved footpaths in Windsor. There is an archival reference to the path in front of Stearn's premises (west of the project area) being asphalted in January 1889.²⁰ There are other newspaper references that describe tar paving of footpaths in Windsor.

The land on the eastern side of Bridge Street encompassing Test Trench 10 was originally included within the School of Arts site, demonstrated by the c. 1870 image of the site. The test trench would lie behind the picket fence; Bridge Street has been widened. If the red clay found in Test Trench 10 [002] or part of it may be shown to have been used as the clay in Test Trench 11 [009] as part of a road works program then it would infer that the formation of this footpath would in its initial stages, have been in the later years of the nineteenth century. If that was the case there is no evidence within

²⁰ Windsor and Richmond Gazette 26 January 1889; 2

the test trench that reveals what surface if any was formed at that time. The upper levels of this deposit have been disturbed, possibly even reduced to accommodate the construction of the present paved path **[001]**.

The 1938 image on the preceding page shows what appears to be a cement paved footpath along the southern side of George Street. It is very similar in appearance to the pavement that presently exists on the eastern side of Bridge Street. This was the slab moved aside at the top of trench 10 **[001]**. The footpath on Bridge Street could date to that time or be a later replacement.



Plate 33: View of the School of Arts in c. 1870 showing the wider property boundary; test trench 10 would lie on the other side of the picket fence within the boundaries of the School (source ML GPO 1-06260.).

8.5.2

George Street

The evidence in Test Trench 12 before it was backfilled and made good does raise some possibilities for a footpath that adjoined George Street on its southern side before the present brick paved pedestrian area and garden was created over part of the former road. The bitumen surface in this trench **[016]** was very thin and unlike any of the deposits recorded in Test Trench 11 or the cores. It is not associated with any of those twentieth century road surfaces. The position of the trench was within the road until the later years of the twentieth century and therefore, the bitumen could represent a tar-paved surface that predated those roads. If so it would have to predate the stone surface (if that is a road) or date from the same period if the stone cobbling **[008]** is a linear feature and not a road. The materials and style and method of construction would suggest

that this is too early a date for the paved surface but it remains a possibility. The relationship to the stone cobbling cannot be determined; there are no common archaeological deposits between this trench and those in Test Trench 11 and the excavation of Test Trench 12 stopped at the paved surface.

The alternative date for this feature in Test Trench 12 is that it is a late twentieth century surface developed after 1978 and before the creation of the pedestrian area as it now exists. The evidence for this is a view along George Street in 1978. This shows at the corner of George and Bridge Streets a grass covered strip that runs from the footpath to George Street encompassing the area of the test trench at its northern end. There was no evidence of this feature in the test trench. That strip of grass was still present in 1981 so if the paved surface revealed in the test strip has replaced this grassed area then it must have done so in the later 1980s. At this time there is insufficient archival and physical evidence to more accurately date this feature.

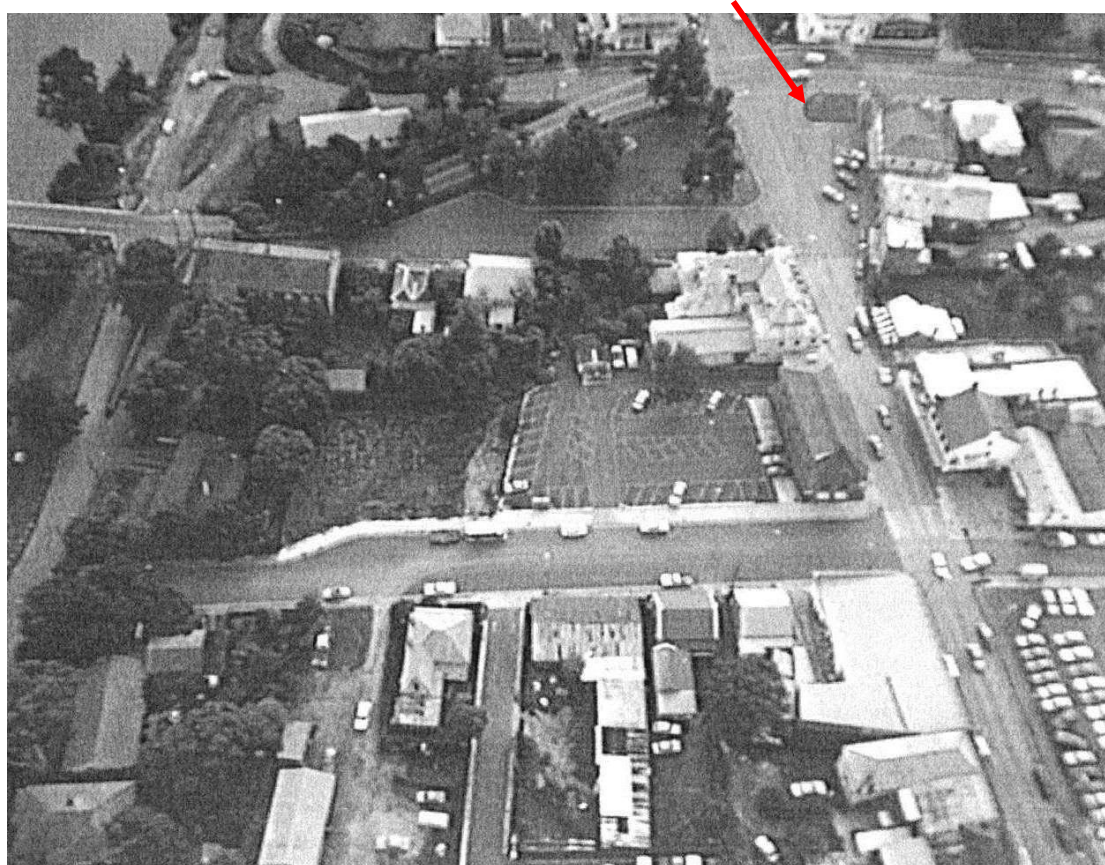


Plate 34: Oblique aerial view of Thompson Square. What appears to be a grassy area in front of the former Hawkesbury Stores is indicated by the red arrow. Source: Hawkesbury Images Local Studies Library Photographic Collection "Aerial view of North Richmond Bridge during floods, March 1978 [sic]. This is clearly an aerial photograph of Windsor with Thompson Square visible at the top of the image.



Plate 35: A view of the former Hawkesbury Stores in 1981; view of the grassy verge in front of the single storey building. Source: Fisher Lucas 1981.

The 400 mm of topsoil at the surface of test trench 12 **[014, 015]** extends beyond the area of the grass strip recorded in the images of 1978 and 1981. It has been introduced as part of the present configuration of this corner created in the last twenty years.

8.6 Bridge Street

The southern portion of Bridge Street has been in existence since the early years of settlement but until 1855 it stopped at the southern side of the George Street intersection. The extension of the road on the northern side of George Street was made in that year to create a direct connection to the wharf. The historical evidence for this event has been presented in the historical analysis prepared for this project.

Evidence of the work that accompanied the creation of this road was revealed during the excavation of Test Trench 2 in Bridge Street in the earlier program of archaeological investigation. It showed that a slicing cut had been made down the hill to form the road and that it has been resurfaced several times although the original macadam surface had been lost through the impact of later improvements.

Archaeological investigation in the road surface of Bridge Street at its southern extension has not been possible but the two cores (cores 1 and 11) provide some information. The southernmost core in the

centre of the road shows the present road surface lying over half a metre of road base and this is laid directly over more than a metre of red clay. There is no evidence at all from this core that any earlier road surfaces have survived the formation of the most recent road surface.

Core 11 is at the junction of Bridge Street and George Street and it reveals the stratigraphy of multiple asphaltic concrete road surfaces (three) lying above the sandstone block that may be evidence of the extension of the stone cobbled feature **[008]** found in Test Trench 11. This lies above red clay.

The difference in survival of older surfaces and features in core 11 and Test Trench 2 to what is revealed in core 11 in Bridge Street strongly suggests that the construction of the present road surface and/or the widening of the street has removed any archaeological evidence that may have been preserved here; this might include evidence of the westernmost extent of the Commissariat building that would lie within the road corridor.

8.7

Conclusions

The conclusions that may be drawn from the evidence recorded in this program of work in conjunction with that from the earlier program of investigation are as follows:

- That the topography recorded in the earliest nineteenth century images of the Green Hills settlement is accurate in its depiction of a high exposed ridge line stepping down steeply to the river; it may have been more extreme than those images suggest with gullies cutting through the ridge line and uneven outcrops of rock;
- That the ancient sand body recorded in test pits on the northern side of the road do not appear to have covered the peak of the ridge or extended further south than the northern side of George Street;
- That this peak or ridge, the later alignment of George Street, may have been exposed bedrock or only thinly covered with sand or soil. It may have been cut through by a gully at the line of present day Bridge Street;
- That this thin soil cover, if it existed, may have been removed in the earliest days of settlement to provide a hard and impervious surface for both pedestrian traffic and construction projects;

- That the exposed bedrock in this location may have been cut and shaped in places to be used in the construction of building foundations, drains or other structural works. If this is the case then evidence of this work could be found in the roads; the work would have been undertaken before the formalisation of those road corridors;
- That there is no clear evidence of the Commissariat building of 1803 and the impact of road works, paving and the introduction of services in the footpath on the eastern side of Bridge Street make it unlikely that much or any remains here. However, if the technique of cutting and shaping bedrock was used in the construction of this building then some evidence of this work could survive at the face or the bedrock. It is unlikely that evidence of the building will be found in the road because of the impact of road widening and the formation of the most recent road surface;
- That by the mid-nineteenth century the alignment of George Street had been altered at least twice and soils had been imported to build up this area possibly higher at the southern end of Thompson Square than the street level immediately adjacent to the Macquarie Arms Hotel; this conclusion is based on archival evidence;
- That these accumulated soils were comprehensively removed in c. 1893 to allow for a major program of infrastructure that entailed laying service pipes in the street and possibly creating a new road surface comprised of a bedding deposit of locally sourced clay topped with a cobbled stone road. If this is not a road then it might be a linear drainage feature. If so a tar paved surface found in Test Trench 12 might be evidence of an associated road surface. The evidence suggests that the latter is more likely to be later twentieth century in origin but there is insufficient physical evidence to make connections between the features in Test Trenches 11 and 12;
- The same locally sourced clay found under the stone cobbling in Test Trench 11 may have been used to create a pedestrian area along Bridge Street adjoining the School of Arts but there is no evidence for how it was finished or paved and the sample is too small to make a positive identification;
- By the 1920s the surface of George Street appears to have comprised silty soil that was laid or accumulated over the stone cobbling;

- Asphaltic concrete footpaths were laid in George Street from 1938 onwards and the physical evidence suggests that the work entailed cutting down the existing road, possibly removing much of the stone cobbling if it was a road surface and any later surfaces and introducing fill along the northern side of the road to help level it for the new concrete surface although this fill could have been introduced for an earlier program of works on the road in the nineteenth century; there is insufficient evidence to date it;
- Three separate resurfacings of this road are shown in the cores along George Street. Test Trench 11 also records layers of asphalt concrete; until the c. 1990s this land was within the street;
- The paved footpath along Bridge Street might date from this same period of the 1930s or it is a later replacement;
- The bitumen paved surface in Test Trench 12 could be a remnant road surface of the later nineteenth century but its form and evidence from archival sources suggests that it could be a very late pavement surface from the 1980s that immediately predated the development of the present alignment and garden at this south-western corner of the George and Bridge Street intersection;
- The 400 mm of topsoil in Test Trench 12 was introduced for the development of this pedestrian area in the c. 1990s;
- The introduction of services in the footpaths has made a substantial impact on the preservation of archaeological evidence.
- The results of this archaeological testing program are consistent with the conclusions of the testing program conducted in April/May 2012. The resource on the ridge has multiple phases of development, and impacts of several programs of work have created a complex profile.

9.0

RESPONSE TO THE RESEARCH DESIGN

The investigation was undertaken with specific objectives to be met; these were the research design questions. The information gained from the present project has been applied to these questions in this section.

Will the depths of excavation required for the traffic signals and trenching impact on archaeological resources?

Yes, the depth of the archaeological profile on the ridge top is shallow, little more than half a metre in places and all the works required for this project extend beyond that depth. This evidence will certainly encompass that of construction programs for earlier road surfaces and pedestrian areas as well as evidence of those finished roads and paths. There is the potential for evidence to be found anywhere within this area of modifications made to the bedrock to facilitate construction in the earliest years of settlement. However, the evidence for this practice is from a very small sample and it needs to be corroborated by more examples of the same practice.

Is it possible to determine the chronological span of information preserved within the project area and can this be related to the principal phases of development defined by the historical analysis?

To a certain degree; if the evidence in Test Trench 11 can be interpreted as a deliberate modification of the bedrock for building purposes it is most likely that this relates to the pre-1810 period of development. The association of archival and archaeological evidence makes a strong case for identifying much of the profile to date from c.1893 and onwards. What occurred in the period between c. 1810 and 1889 can be inferred from archival sources and the absence of physical evidence. It is possible to develop a reasonably consistent and feasible pattern of development for this area from a combination of evidence, lack of evidence and archival sources.

Is it possible to identify specific processes or features that survive within this profile; for example, road surfaces of a particular period, the 1803 stores building?

Yes, for infrastructure however, the excavation did not provide any evidence for the presence of the Commissariat Store of 1803. This absence is likely to be a product of the impact of later nineteenth century and twentieth century works undertaken to develop footpaths and widen Bridge Street but there is still a possibility of intact evidence outside these roads and paths and some changes to the

bedrock that might provide clues to its location but this requires further investigation.

Is it possible to determine the likely impact of twentieth century and later road works, footpath development and the installation of services over the entire project area (of this investigation)?

The largest impact on the nineteenth century profile occurred in the later years of the nineteenth century when roads and services were substantially improved; in doing so it appears that the entire developed profile for the years preceding this work was removed from the ground. Twentieth century works appear also to have had a substantial impact on developed profiles on the northern side of George Street and in Bridge Street. Despite this impact there are features and evidence of land-forming that survive from the later nineteenth century.

It is impossible to determine the impact of construction for the paved area and garden at the south-western corner of the George and Bridge Street intersections in the last approximately twenty years although the evidence from Test Trench 11 suggests that it has not been great.

Is it possible to determine a level of cultural significance for the features and/or profile and its relationship to Thompson Square?

Any features that can be positively attributed to the earliest settlement of Green Hills and of the Macquarie period town would be of state significance. At this time the only possible feature exposed by the present work is the evidence of modifications to the bedrock; this would require additional work to make a positive attribution to this phase of development.

Archaeological evidence of later nineteenth and early twentieth century infrastructure, the creation of roads and footpaths would be of local significance for what it can document about the growth of the town.

The paved area and garden created at the south-western corner of the intersection in approximately the last thirty year period would have at best local significance but it is a tenuous evaluation.

What are the likely impacts of the specific works proposed for this project area on the archaeological resource and its significance?

On the basis of the available evidence the principal impact will be through the fragmentation of large units such as road surfaces and bedding. It is unlikely to completely remove all evidence because these are large areas of work that probably extend beyond the areas of impact.

More difficult to assess is the potential for impacting modifications that may have been made to the bedrock to facilitate early buildings works. In the first instance this is a practice that is yet to be positively confirmed in this location; the test result provides an indication but other examples would have to be found to make this a reliable identification. Further, because of the random and largely undocumented location of many of the early structures it is impossible to determine if the proposed works will impact any improvement of this type until it is uncovered.