

**ARCHAEOLOGICAL MONITORING OF
ADDITIONAL GEO-TECHNICAL
INVESTIGATIONS AT THE PROPOSED
ARENA LOCATION
(PORTAGE EAST SITE)**

Prepared for

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EXECUTIVE SUMMARY

In connection with the second phase of geo-technical investigations of the arena footprint location at the Portage East site, archaeological monitoring of the drilling operations was conducted. All monitored holes were drilled with a small (10 cm) diameter auger, with one exceeding a depth of 3.1 metres. The monitoring consisted of visual inspection of the auger cuttings. Through the examination of the auger cuttings, it was possible to determine the sub-surface stratigraphy at each location. The observed profiles provided data which replicated and confirmed that which had been recorded during the first geo-technical program (November, 1994).

Evidence of the recent Industrial Period was present at each location. The recent fill layers, deriving from activities since A.D. 1870, ranged in thickness from 1.25 to 3.6 metres. Most of the evidence relates to land modifications that have occurred in the last fifty years.

No evidence of archaeological horizons pre-dating the Industrial Period was observed. These horizons would occur in riverine sediments deposited by various floods over the last 9500 years. The zone closest to the Red River showed no evidence of riverine sediments and the soil horizons of the industrial period rested directly on top of the clays deposited when the entire Winnipeg region was submerged under Glacial Lake Agassiz.

While the limited monitoring program did not record any pre-Industrial Period cultural horizons, it was able to determine the portion of the area in which such resources could occur. The western portion of the area, adjacent to Pioneer Avenue and the railroad line, has the highest potential for archaeological resources of the Fur Trade and Pre-Contact Periods.

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1.0 Introduction

As the location for the proposed arena within the Portage East area has been determined, additional site-specific geo-technical investigations were required. Accordingly, geo-technical examinations were undertaken by AGRA Earth & Environment. Due to the potential for archaeological resources, Quaternary Consultants Limited was contracted to provide archaeological monitoring of the soil test drill holes as had been done for the first phase of geo-technical studies (Quaternary 1994). The operation was seen as a continuation of those investigations (Heritage Permit A57-94) and the subsequent hydro pylon caisson excavations (Heritage Permit A62-94). As the current operation fell within the location and timeframe of the latter permit (Quaternary 1995:Appendix A), it was conducted as part of that project.

The geo-technical study consisted of the drilling of thirteen holes to various depths. All were located within the area north of Pioneer Avenue and east of the CN Main rail line, either in the parking lot paralleling Pioneer Avenue or within the Winnipeg Hydro compound (Figure 1). Seven holes were drilled to bedrock (95-1 through 95-7) and the other six were drilled to a depth of ten feet (three meters). Four holes (95-1, 95-2, 95-3, and 95-4) were drilled with a large diameter (1067 mm) auger and the remainder were drilled with a small diameter (125 mm) auger.

The field engineer failed to notify the monitoring archaeologist of the onset of the drilling operations. As a result of this breakdown of communications, the drilling of the four large diameter holes and one small diameter hole was not monitored. These holes (95-1, 95-2, 95-3, 95-4, and 95-6) were located throughout the area and, with the exception of 95-3, were near holes which were monitored. Stratigraphic data has been abstracted from the drill logs provided by AGRA Earth & Environment. These can provide information on thick strata. However, the geo-technical engineer and the archaeologist are looking for different features within a soil column. The micro-horizons that indicate the development of a soil zone between riverine floods are important for the archaeologist to note when there was a potential for human occupation at the location, while the geo-technical engineer is concerned with the clastic quality of the soil in order to determine the degree of stability. Thus, many of the micro-features that would be recorded, if present, by a monitoring archaeologist would not be recorded by an engineer.

Archaeological monitoring of geo-technical drill holes cannot be considered as an archaeological impact assessment, *per se*. The potential for sub-surface examination is extremely limited—thirteen small diameter holes spaced across a large area. A geo-technical program is only an opportunity to gain a limited understanding of the soil stratigraphy and to identify the presence of former soil zones which have a potential for containing archaeological resources.

1.1 Study Team

The soil test monitoring was conducted by Sid Kroker (Senior Archaeologist). Documentation and analysis has been undertaken by Sid Kroker.

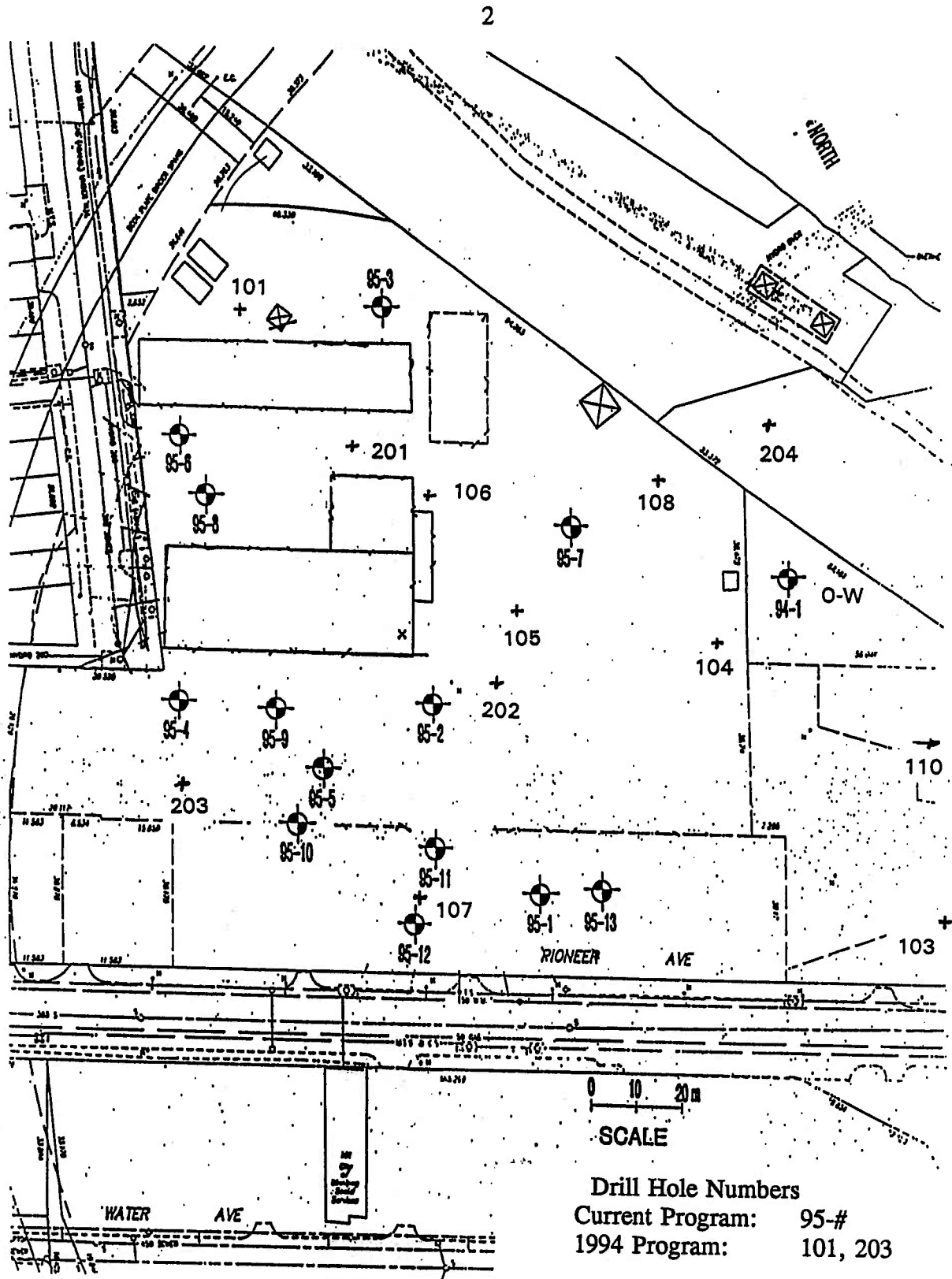


Figure 1: Map of Investigation Area showing Drill Sites

2.0 Monitoring of Soil Test Drilling

The soil test operations were conducted by AGRA Earth & Environmental, utilizing the services of Paddock Drilling and Subterranean Drilling. Archaeological investigations consisted of visual inspection of the moderately disturbed soil column observed from the auger cuttings. Inasmuch as the soil strata within the investigation area consist of riverine sediments, there is a considerable variation in thickness and/or presence across short distances. A similar situation can occur with regard to archaeological deposits—occupational evidence may be localized or fairly widespread.

Given the plasticity of the soil and the resultant deformation of the soil column by the 125 mm auger, only thick (more than 1 cm) soil layers are readily observable. Thin horizons tend to become 'smeared' and, if observable, cannot be accurately placed in vertical context.

2.1 Observations

The visual inspection of the soil recoveries during the drilling program enabled the determination of the sub-surface stratigraphy of the holes. The profiles of the test holes are described below. Separate layers within each of the three main components—recent fill, riverine sediments, and Lake Agassiz clays—are noted where relevant. Materials in the recent fill horizon are varied: cinders, gravel, non-local silts and clays used as fill, and sawdust. The riverine sediments were deposited during the numerous floods and high water stages that have inundated the area. Most layers are silty clay with occasional occurrences of sand, sandy silt, or clay strata. The colours of these layers range from pale yellow brown to dark black brown, reflecting the parent material and post-depositional alteration through soil formation. The Lake Agassiz clays are a grey to dark grey plastic sediment which was deposited while the Winnipeg area was covered by this massive post-glacial lake. These clays became exposed when Glacial Lake Agassiz drained approximately 9500 years ago (Last and Teller 1983). Often a buried soil zone or an oxidization horizon occurs at the top of the Lake Agassiz clays.

Test Hole 95-1 was located in the parking lot adjacent to Pioneer Avenue. The location is near Test Hole 107 (Quaternary 1994:2). The following data has been abstracted from the drill log. The upper 2.4 metres were recent fill, consisting of sand and gravel mixed with clay. Wood fragments, brick fragments, and windowpane sherds were present. Riverine sediments commenced at 2.4 metres. The upper layer consisted of a tan clayey silt, overlying a silty clay stratum at 3.9 metres. A sand layer extended from 4.2 to 4.8 metres, resting on a silty clay stratum. The drill log does not note the colour of the silty clay stratum, although the underlying silty sand (6.5 metres depth) and sand (8.5 metres depth) layers are grey. In comparison with Test Hole 107, the sand horizon is deeper and thicker (4.2-4.8 metres as opposed to 3.05-3.45 metres). In Test Hole 107, Lake Agassiz clays were encountered at 5.9 metres which could be comparable to the base of the silty clay horizon at 6.5 metres.

Test Hole 95-2 was located in the parking lot, slightly south of the southeast corner of the Winnipeg Hydro building. The location is slightly west of that of Test Hole 202 (Quaternary 1994:4). The drill log notes that the upper 2.4 metres were fill consisting of clay and silt with an admixture of glass, wood, and coal ash. A layer of wood shavings occurred at 1.8 metres. As was

the case in Test Hole 202, Lake Agassiz clays were encountered at a minimal depth below surface (2.4 metres). A layer of tan sand was present between 5.1 and 6.0 metres, followed by grey clays to glacial till. Thus, it would appear that the height of the Agassiz clays observed in the 1994 excavation is not an isolated anomaly, but is indicative of a raised clay feature, i.e., hillock or mound, that stood at a higher elevation than the surrounding terrain after the drainage of Glacial Lake Agassiz.

Test Hole 95-3 was located to the north of the second Winnipeg Hydro building, east of Test Hole 101 (Quaternary 1994:4). It is recorded in the drill log that the upper 1.85 metres was clay fill with traces of coal ash, bricks, and wood. A top soil layer was present between 1.85 metres and 2.0 metres and rested on a grey silty clay. This profile is quite similar to that which was observed in Test Hole 101.

Test Hole 95-4 was located in the parking lot at the south end of Mill Street, near the southwest corner of the Hydro Building and close to the location of Test Hole 203 (Quaternary 1994:2). Data from the drill log indicates that a layer of clay mixed with fragments of brick, wood, and glass lay immediately below the gravel surface. This layer extended to a depth of 60 cm and rested upon a black, organic clay which contained no structural debris. The black clay terminated at 1.6 metres and overlay a thin (20 cm) horizon of brown silty clay, representing riverine sediments. The clay horizon rested on a tan silty sand layer which extended from 1.8 metres to 2.4 metres at which point repeated sequential layers of clay, sandy silt, and silty clay continued until grey Lake Agassiz clays were encountered at a depth of 6.1 metres. The drill log does not indicate if any relict soil horizons were observed at any of the interfaces between the different horizons.

Test Hole 95-5 was drilled in the parking lot, approximately halfway between Test Holes 107 and 203. The upper metre consisted of gravel and sand with increasing amounts of dark clay towards the bottom. From 1.0 to 1.8 metres, the sediments were primarily dark grey to black clay with some sand, probably representing a combination of relocated top soil fill overlying a disturbed *in situ* top soil which had developed upon the grey Lake Agassiz clays which began at 1.8 metres. The profile is more similar to Test Hole 202 (Quaternary 1994:4) than either Test Hole 107 or Test Hole 203 (Quaternary 1994:2) which showed extensive riverine deposits between the recent fill and Lake Agassiz clay horizons.

Test Hole 95-6 was located between the two Hydro buildings, near Mill Street. The drilling log notes that the surface is gravel with a clay fill layer mixed with sand and gravel extending to 1.8 metres. Below the fill, brown clay with traces of silt extended until glacial till was encountered at a depth of 12.8 metres. The log does not note the presence of relict soil horizons within the brown clay stratum.

Test Hole 95-7 was drilled at the eastern end of the Hydro compound, approximately midway between Test Holes 105 and 108. The fill horizon extended to a depth of slightly more than 3.6 metres. The upper 80 cm consisted of sandy gravel and clay fill mixed with the gravel. The lower portion of the fill layer consisted of black and dark brown clay which contained cinders, brick fragments, and ash. Medium dark brown silty clay was encountered below the fill layers and continued until grey Lake Agassiz clays were observed at a depth of 4.3 metres.

Test Hole 95-8 was located between the Hydro buildings, closer to the main structure than Test Hole 95-6 and slightly more to the east. A thick layer (45 cm) of concrete was encountered at a depth of 2.0 metres. The material above the concrete consisted of gravel, clay fill mixed with coal dust and brick fragments, and relocated Lake Agassiz clay. The concrete slab rested directly upon grey Lake Agassiz clays. This profile is considerably different than that observed in Test Hole 95-6, approximately 12 metres to the northwest. It also shows the height of the Lake Agassiz clays to be considerably higher than those observed in Test Hole 201 (Quaternary 1994:4) which was forty metres east. At Test Hole 201, riverine sediments began at a depth of 0.6 metres and extended to 5.6 metres.

Test Hole 95-9 was drilled in the parking lot, ten metres south of the Hydro building. This hole was excavated to 3.1 metres below surface. The upper metre consisted of sand and gravel with coal cinders and fragments of wood. A black clay fill stratum extended to 1.8 metres. This layer contained wood fragments throughout, although between 1.2 and 1.5 metres the material was primarily wood chips. A light brown silty clay stratum occurred below the fill and extended to 2.1 metres, overlying a medium brown clay horizon which continued to the base of excavation. Thin layers of silty sand were present in the bottom 0.5 metres.

Test Hole 95-10 was located south of 95-9 and west of Test Hole 107 (Quaternary 1994:2). The fill layers extended to a depth of 1.2 metres and consisted of an upper component of gravel, overlying black clay with cinders, which rested on a second layer of gravel with limestone fragments. This, in turn, rested on a second black silty clay stratum. Riverine sediments, consisting of medium brown silty clays with thin sandy silt lenses extended to the base of the excavation at a depth of 3.1 metres.

Test Hole 95-11 was drilled in the parking lot, east of Test Hole 95-10. The upper 0.8 metres consisted of gravel with some admixture of black cinders at the top. The lower portion of the fill stratum consisted of dark brown to black clay with some gravel. At 1.3 metres, riverine sediments were encountered. The profile consisted of layers of medium brown silty clay with a thin organic relict soil horizon (5 cm thick) at 1.8 metres. A thick sand layer (15 cm) occurred at 2.3 metres, with medium brown silty clay continuing to base of excavation at 3.1 metres.

Test Hole 95-12 was located in the parking lot south of Test Hole 95-11, near Pioneer Avenue. Fill extended to a depth of 2.1 metres and consisted of several layers: oiled gravel (0 - 0.2 metres); gravel with black clay (0.2 - 0.4 metres); black clay with wood fragments (0.4 - 0.8 metres); black clay with structural debris—brick fragments, wood fragments, and pink foam material (0.8 - 1.5 metres); and black clay with gravel (1.5 - 2.1 metres). A stained medium brown silty clay of riverine origin was present at 2.1 metres and extended to 2.3 metres. This stratum overlay a light brown silty clay with very thin silty sand lenses which continued to the base of excavation at 3.1 metres.

Test Hole 95-13 was drilled in the parking lot, near Pioneer Avenue. This hole is between Test Hole 107 and Test Hole 103 (Quaternary 1994). The fill layer, consisting of sand and gravel (30 cm), mixed relocated Lake Agassiz clays and gravel (45 cm), and black clays, extended to a depth of 1.25 metres. At this point, riverine sediments were encountered. Several moderately defined

layers of medium brown silty clay, interrupted by thin bands of differing texture, extended to base of excavations at 3.1 metres. A very thin relict A horizon occurred at 1.4 metres. A light brown sandy silt layer was present at 2.1 metres and several very thin hematite bands occurred in the basal metre of the profile.

3.0 Discussion

Cultural evidence of the recent period was present at all of the drill hole locations (Figure 1). The depth of the recent fill deposits varied from 1.25 metres at Test Hole 95-13 to 3.6 metres at Test Hole 95-7. In most cases, the evidence consisted of stratigraphic sequences of land modification and fill, i.e., sand and gravel layers overlying relocated clay strata. At Test Hole 95-8, a buried concrete basement floor was encountered. This, in addition to the concrete layers encountered in Test Holes 106 and 108 (Quaternary 1994:2), is indicative of former placements of the Winnipeg Hydro structure.

The small diameter of the drill used for the test holes largely precluded the recovery of artifacts. In several of the test holes, small portions of yellow brick, fragments of sawn lumber, and sherds of windowpane were present. These non-diagnostic artifacts were not curated. The presence of the sawdust layer at Test Hole 95-2 and Test Hole 202 (Quaternary 1994:4) would relate to the various lumber-based industries located in this area in the latter part of the nineteenth century. These firms included Macauley Lumber Mill (1872-1890?), Dick & Banning Saw Mill (1872-1885?), Sash & Door Factory (1876-1890?), and Jarvis Saw Mill (1876-1890?) (FRC 1988). In addition to these businesses, the McMillan Grist Mill (established 1877) and McArthurs' Warehouse (built 1885) were nearby. Due to the use of river steamboats to transport materials, many industries chose to locate adjacent to the Red River, while still remaining close to the centre of Winnipeg. Accordingly, this riverbank location became Winnipeg's first industrial area.

It is unknown if there are any intact structural remains from these businesses, as most of the structures were probably totally eradicated during demolition and subsequent land-levelling activities. By the time of the drafting of the 1905 Winnipeg Fire Insurance Atlas, only isolated, small, one-story, frame buildings are noted at the end of Post Office (now Lombard) Avenue. The debris from lumber production and demolition of the buildings would account for the presence of wood fragments observed in the drill holes throughout the area. Archaeological evidence of the early industrial period will be present throughout the area, although it appears to be incomplete and highly disrupted.

No evidence of Fur Trade or Pre-Contact occupations was observed during the archaeological monitoring of the geo-technical drilling program. The activities of people using the area would be indicated by artifacts such as ash and charcoal horizons from fires, faunal remains such as fish or mammal bones deriving from food sources, or discrete artifacts such as ceramic sherds or lithic tools. Cultural strata containing these artifacts would occur within the riverine sediments deposited since the drainage of Glacial Lake Agassiz. There was minimal evidence of buried soil horizons which would indicate sufficient time between fluvial depositions for the development of an active top soil. As previously noted (Quaternary 1994:7), this could be explained by more frequent floods which deposited less sediments. In this scenario, the thin silt/clay layer would be incorporated into

the active soil zone and only major depositions would result in sufficient burial of the A horizon to produce a relict soil zone. Alternatively, the topographical characteristics of the riverbank and the character of the river flow may not have been conducive to sedimentary deposition during high water stages.

The eastern portion of the area adjacent to the Red River and an area at the southeast corner of the main Hydro structure had no evidence of riverine deposition so that the recent fill horizons rest directly upon Lake Agassiz clays. Based upon the soil profiles observed during the geo-technical drilling programs, these two portions of the Portage East site will not contain any archaeological material pre-dating the industrial period.

The data obtained during this geo-technical program, to a large extent, replicates the information which derived from the earlier study (Quaternary 1994). The entire area is covered with a fill horizon which will contain archaeological resources deriving from the industrial and recent periods (A.D. 1870 to present). The degree of disruption and secondary deposition through land modification activities appears to be high. The south and southwestern portion of the area, bounded by Pioneer Avenue and the rail line could contain Fur Trade (A.D. 1737 to 1850) and Pre-Contact (at least 6000 years ago to A.D. 1737) archaeological horizons which could be continuations of the archaeological horizons recorded south of Water Avenue during other projects (Quaternary 1988, 1989, 1990). Within this zone, approximately one-fifth of the area is known to have had some degree of disruption through excavation for basements of former and existing structures as well as sub-surface services (sewer, water). It is probable that as much as one-third of the area has had some disturbance as there will have been unrecorded basements under many of the residences, rooming houses, and businesses that lined the north side of Pioneer Avenue. The geo-technical monitoring program did not record the presence of Pre-Contact archaeological resources at any of the drilling locations, but was able to delimit the zones of potentiality for the occurrence of Fur Trade and Pre-Contact cultural horizons.

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