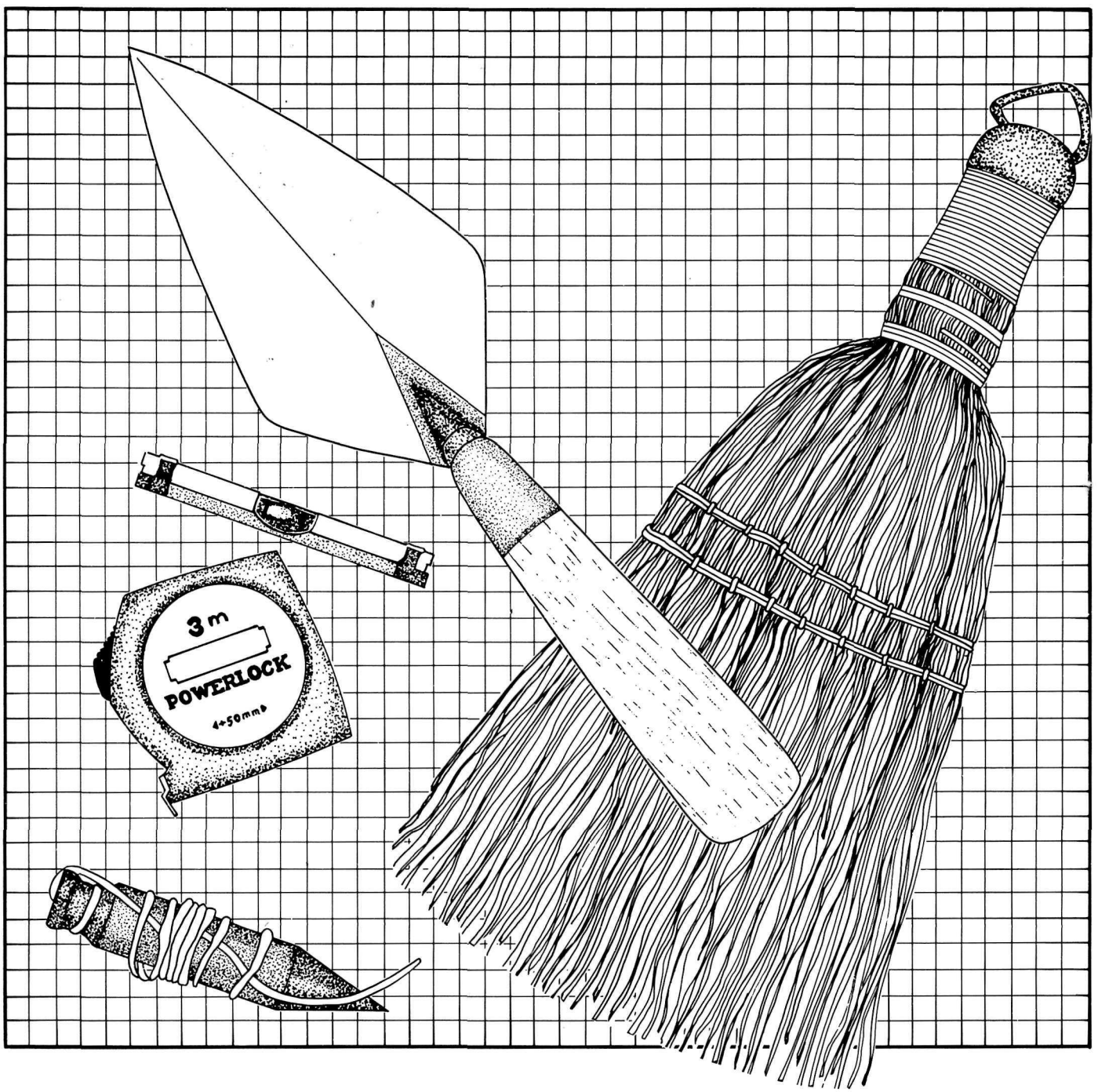
National Park Service Midwest Archeological Center

A REPORT ON ARCHEOLOGICAL INVESTIGATIONS WITHIN THE GRAND PORTAGE DEPOT (21CK6), GRAND PORTAGE NATIONAL MONUMENT, MINNESOTA: THE KITCHEN DRAINAGE PROJECT



A REPORT ON ARCHEOLOGICAL INVESTIGATIONS WITHIN THE GRAND PORTAGE DEPOT (21CK6), GRAND PORTAGE NATIONAL MONUMENT, MINNESOTA: THE KITCHEN DRAINAGE PROJECT

by

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Lincoln, Nebraska

1990

REPORT CERTIFICATION

I certify that "A Report on Archeological Investigations Within the Grand Portage Depot (21CK6), Grand Portage National Monument, Minnesota: The Kitchen Drainage Project" by Vergil E. Noble

has been reviewed against the criteria contained in 43 CFR Part 7 (a)(1) and upon recommendation of the Regional Archeologist has been classified as available.

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ABSTRACT

During late September, 1989, and again in mid-October, personnel from the Midwest Archeological Center conducted archeological investigations at Grand Portage National Monument. Those efforts were precipitated by the planned installation of a new drainage system within the reconstructed fur trade Depot. That drain would function to remove ground water from two replicated structures inside the Depot, namely, the Kitchen and the Great Hall.

Prior to installation of the drain, seven test units were excavated in a controlled manner along the proposed alignment. Investigations at that time concentrated on an area presumed to be the location of an eighteenth-century structure that was partially excavated in 1936. Other excavations were carried out in areas that were then archeologically unknown in order to determine whether any intact cultural resources might be present at those locations.

The efforts of late September failed to find any surviving evidence of a fur trade structure, or any other significant resources, within the drainage path. Deposits were found, however, that represent a circa 1920 fox farm that is known to have operated on this land before the Depot was reconstructed. Although potentially of interest, the archeological integrity of those deposits is dubious.

Later, during the week of October 16, the author monitored actual installation of the drainage line. All excavation related to that development was observed in order to guard against any possible damage to cultural resources in areas not examined prior to construction. No intact deposits were encountered in the course of those activities.

ACKNOWLEDGMENTS

Several persons deserve thanks for their respective roles in this undertaking at Grand Portage. Like all archeological projects, this was the product of many individuals working together to achieve a purpose.

Superintendent Dean Einwalter, in particular, showed great concern for the cultural resources in his charge. In addition, former Chief of Maintenance Melvin ("Bun") Gagnon and his Foreman, Duane Spry, also played important parts in facilitating our research efforts. Midwest Regional Historical Architect Mark Chavez and Regional Archeologist Mark Lynott were instrumental in coordinating the archeological field investigations with the actual construction project.

Archeological Technician Paul Stormberg performed the preliminary laboratory processing of materials collected at Grand Portage, and Carrol Moxham prepared the various illustrations for this report. Judy Pace edited the draft of this report, and Marie Johnson produced the final printer's copy.

Rock Cove Construction of Hovland, Minnesota, the National Park Service's Contractor, deserves appreciation for its full cooperation during installation of the drainage system. Stan Bauch, owner of the firm, and Noble R. Carlson, project foreman, both demonstrated an admirable desire to complete the project responsibly and in keeping with National Park Service preservation concerns.

Finally, I owe thanks to the field crew members who assisted me during the preconstruction investigations: Caven Clark, Forest Frost, and Paul Stormberg. Because of their hard work, despite the somewhat unpleasant climatic conditions of late Fall in northern Minnesota, we managed to accomplish a great deal during the short, two-week field session.

TABLE OF CONTENTS

LIST OF FIGURES

Figure

INTRODUCTION

Grand Portage National Monument, located approximately 5 mi (8 km) from the Canadian border in extreme northeastern Minnesota, consists of three distinct elements: the Lake Superior Depot area, the site of Fort Charlotte on the Pigeon River, and the 8.5-mile (13.6-km) portage that connects them. The primary developed area of the Monument, however, is the reconstructed Depot. Today, the Depot contains two reconstructed fur trade buildings, the Great Hall and the Kitchen, which are open to the public seasonally (Figure 1). The interpretive mission of Grand Portage National Monument emphasizes events and personages associated with the fur trade in this region during the years 1731-1802.

Since the time those two Depot buildings were reconstructed on their original sites, it has been known that ground water presented a threat to their structural integrity. Over the years, various attempts have been made to mitigate the water problems with only moderate success. Sump pumps beneath both structures served to remove some of the water, but certain problems persisted. This is especially true of the Kitchen structure, which has witnessed warping of its foundation and frost-heaving of its concrete crawlspace floor.

Because of those continuing problems, planners designed a drainage system that they hoped would improve drainage about the Kitchen and convey excess water to the lake (Figure 2). The proposed system entailed installation of an interceptor drain on two sides of the kitchen. Perforated pipe bedded in gravels, which in turn would be encapsulated in a filter fabric, would be buried on the north and west sides of the structure. That line would continue past the Great Hall toward Lake Superior, effectively intercepting ground water near that structure, as well. Downslope from the Great Hall, however, the pipeline would be solid. Furthermore, in order to limit the amount of new ground disturbance, that segment of the alignment was to follow an existing drainage line that was installed in 1975 as part of a sump pump system. It also was believed that an earlier drain (circa 1940) had run through this general area soon after initial reconstruction of the Great Hall.

In addition to the interceptor drain, the new drainage system was designed to connect with existing sump pumps beneath the two reconstructed buildings. Short leaders of solid pipe would convey collected water from beneath the buildings to the installed line and thence to the lakeshore outlet. Thus, any water that might not be intercepted by the drain field could still be removed from the buildings by pumping it out.

INTRODUCTION

Figure 1. The reconstructed Grand Portage Depot as it looked during the 1989 drain installation.

Locational design for the drainage system reflects a conscious effort to place the necessary trenches in areas that were already known to be disturbed. The downslope conduit, for example, was to correspond to an existing drainage line, while the interceptor drains north and west of the Kitchen fell within the zone excavated prior to its reconstruction. It was not possible, however, to determine a path that would totally avoid areas that might contain previously unknown cultural resources. In fact, there was some possibility that the drainage line might pass through the remains of a fur trade era structure investigated by archeologists in 1936.

For those reasons, a team of archeologists directed by the author traveled to Grand Portage National Monument for a two-week field project at the end of September, 1989. The Midwest Archeological Center (MWAC) crew excavated a total of seven test units in areas through which the drainage alignment would pass. Four of those units sought to determine whether any remains of the known fur trade structure still survived in the path of the drain. The others were intended to examine areas that were unknown archeologically.

Subsequent to the preconstruction investigations, local and

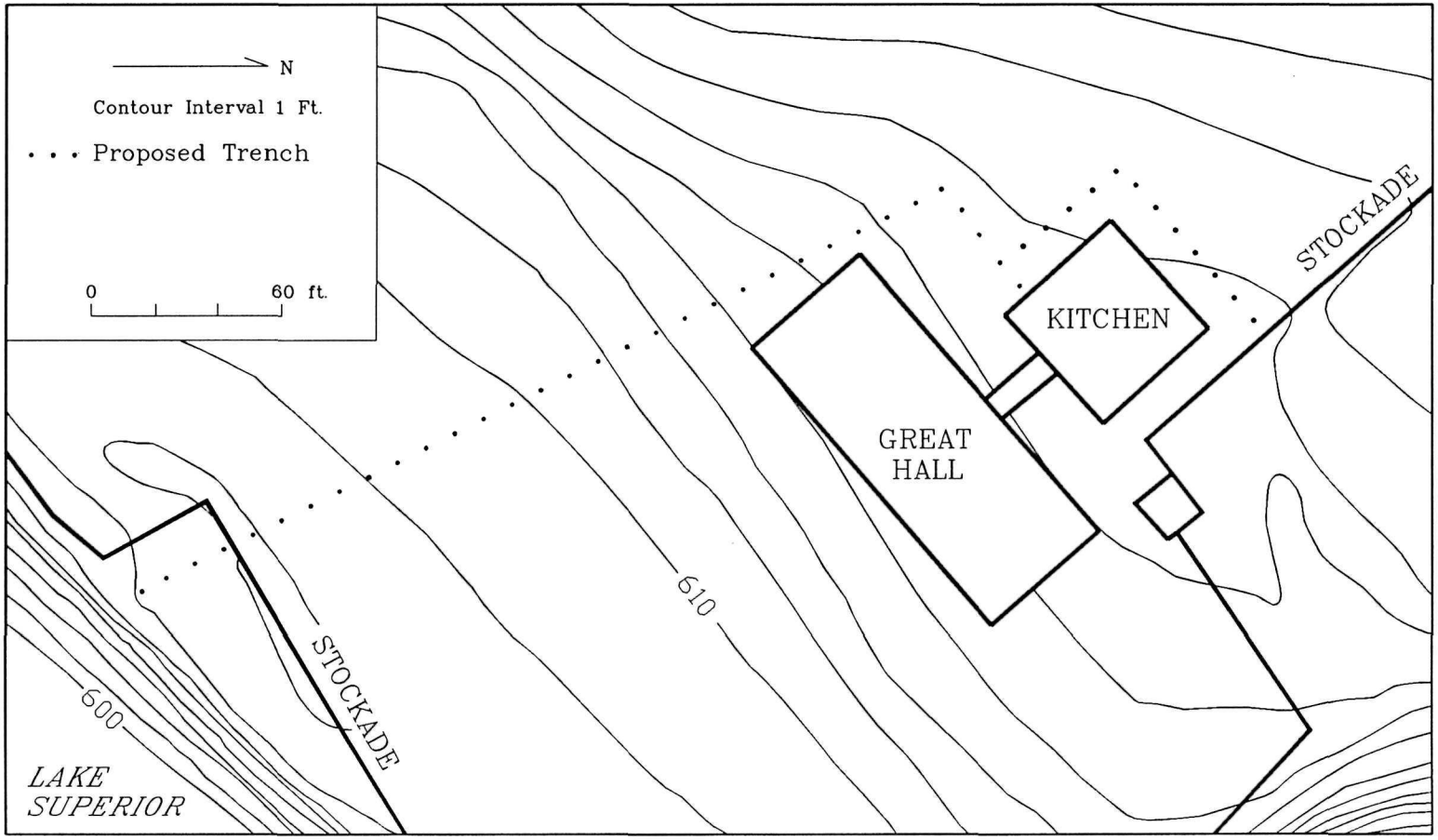


Figure 2. Plan of the proposed drainage system at Grand Portage.

regional National Park Service personnel were concerned that excavation of the drainage trench might still cause damage to resources that were undetected by the testing phase. Accordingly, the author was dispatched again to Grand Portage when the drain was installed in mid-October. All excavations for the drain, whether performed with heavy equipment or hand tools, were observed with an understanding that work would be halted temporarily if any intact archeological resources were noted in the process. The backfilling operation also was monitored in case a section of trench wall might collapse and possibly expose something of significance.

This report summarizes the methods and findings of all investigations carried out in conjunction with the drainage development. Background concerning previous archeological work within the Depot is provided, but more general information concerning the cultural and natural history of Grand Portage has been omitted from these pages. Adequate summaries of those topics already are available in other reports (e.g., Noble 1989; Woolworth and Woolworth 1982), eliminating the need to duplicate efforts.

The 1989 field investigations at Grand Portage resulted in the collection of artifacts representing virtually the entire human history of this region, from prehistoric times to the present. The potential of those objects to yield any significant archeological information, however, is diminished by the very high degree of disturbance at test unit locations. Since materials from various periods are mixed together in the same depositional contexts, it is obvious that they are redeposited and are not in an undisturbed state.

In view of the limited interpretive value of the artifact assemblage generated in 1989, the specimens will not be discussed as part of this report. The artifacts are inventoried in gross tabular format, however, in Appendix A. All materials and attendant field records are now curated at the Midwest Archeological Center facility in Lincoln, Nebraska, under MWAC Accession Number 335.

PREVIOUS ARCHEOLOGICAL RESEARCH

The site of the eighteenth-century fur trade Depot (21CK6) at Grand Portage has been subjected to intensive archeological investigation for over 50 years. Most of that work has been tied directly to the need for information to assist reconstruction of the palisade and associated buildings. Beginning in 1936, the Minnesota Historical Society conducted excavations to gather basic data on the structural arrangement of Grand Portage prior to the initial stages of development that followed (Woolworth 1963). Since that time, field research has continued intermittently in response to various interpretive and development needs (Woolworth and Woolworth 1982). In recent years, however, most of the archeological investigations that have been carried out at Grand Portage National Monument have fallen outside the confines of the reconstructed Depot (e.g., Noble 1989).

The reported investigations having the most relevance to the present development project are, in fact, those conducted by the Minnesota Historical Society in 1936. In that year, investigators excavated a major north-south exploratory trench through the Depot site west of the Great Hall, apparently through much of the same area scheduled for trenching in 1989. Unfortunately, the results of those investigations are today poorly understood. No comprehensive report of the findings was written at that time, and surviving documentation on the field project is scant.

It is known that the 1936 archeological project encountered the remains of a rectangular structure a short distance southwest from the Great Hall (Figure 3). The small building, which measured 18 ft x 30 ft, is alternately called "Structure 1" or "Feature 12" in various documents on the site (Woolworth 1963:76-78; Woolworth and Woolworth 1982:225-226, Inventory Form 12). Built of upright posts set in the ground, the structure was sited approximately 6 ft east of an interior palisade line connecting Corner A and Corner Y of the Depot. The structure also appeared to parallel that palisade wall. Records indicate that much of Structure 1 was exposed and excavated in 1936, but it is not clear how much of the feature remains undisturbed (Figure 4).

Other pertinent excavations are those conducted during 1970-1971 (Woolworth 1975). At that time, investigations were carried out in and around the Great Hall, as well as the Kitchen structure. The Great Hall, which was reconstructed in the years 1938-1940, had been ravaged by fire in 1969. Accordingly, archeological investigations were undertaken in conjunction with its demolition and second reconstruction. At that same time, excavations were initiated in the

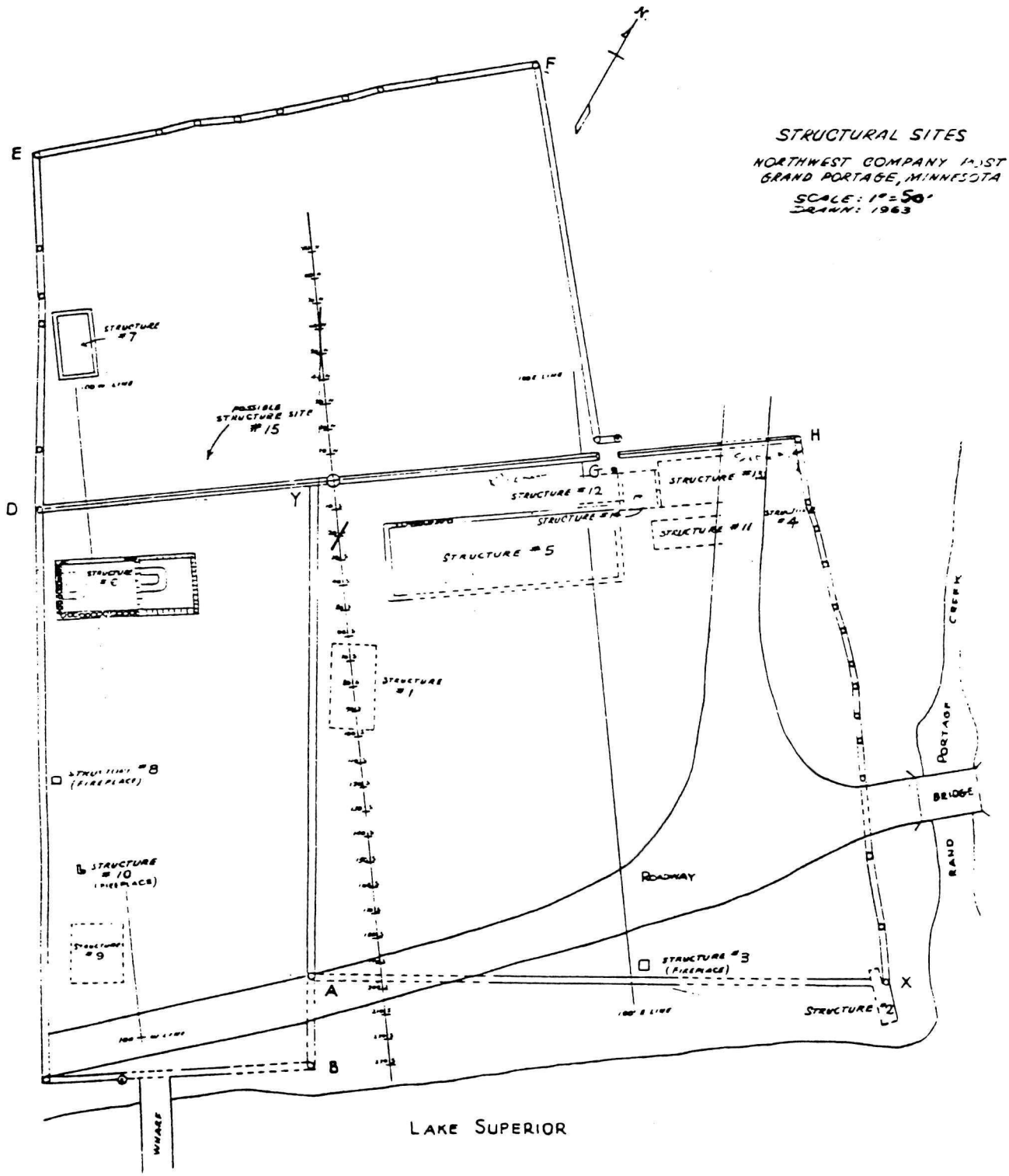


Figure 3. Location of Structure 1 relative to the Great Hall (Structure 5) and grid baseline (Woolworth 1963:Map 11).

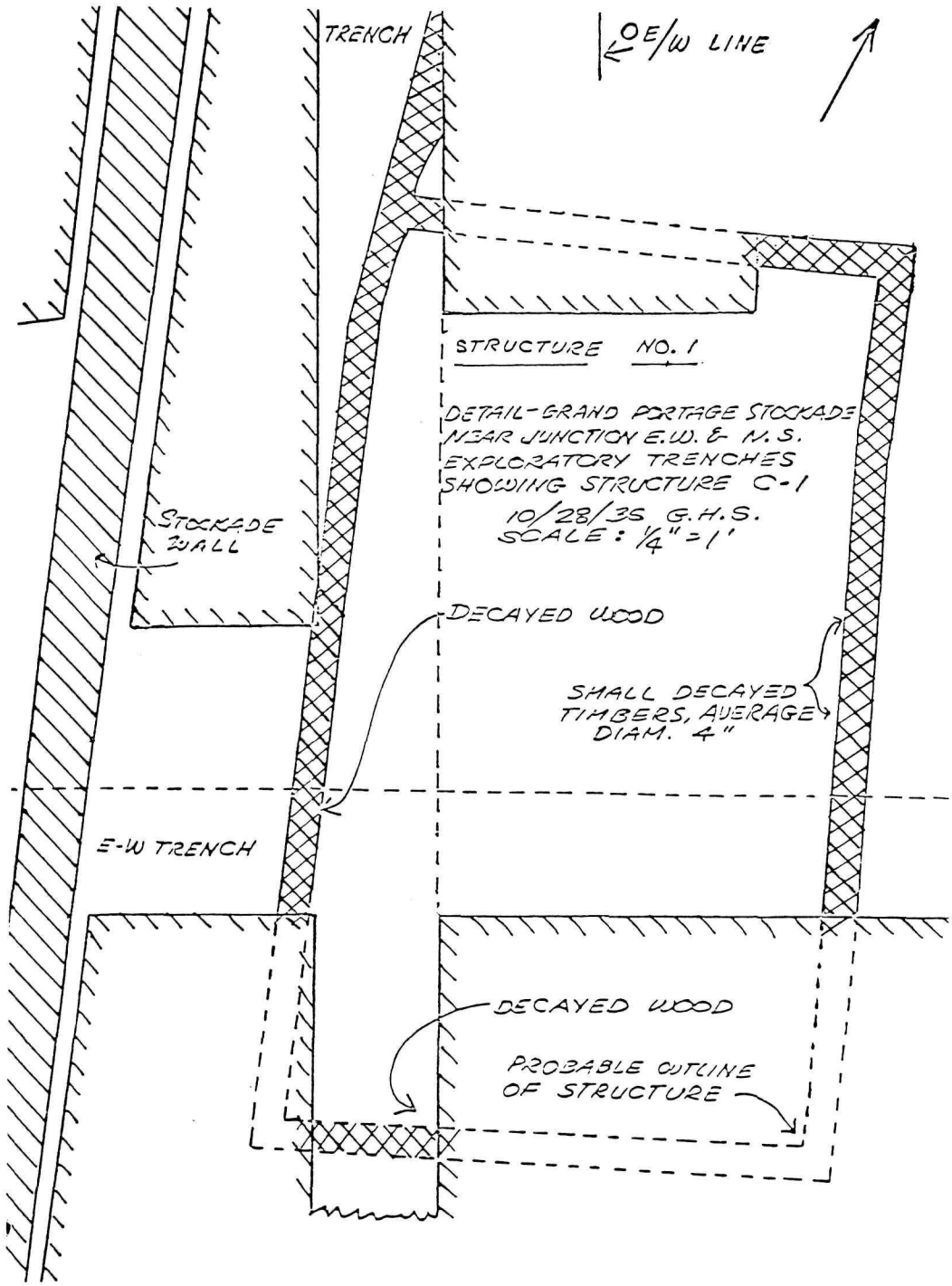


Figure 4. Detail of Structure 1 area based on 1936 excavation records (Woolworth 1963:Map 1b).

area of the Kitchen to provide information for its eventual reconstruction.

That research bears upon the drain installation project in two respects. First, the interceptor drain planned for two sides of the Kitchen was designed to fall within the block that was excavated in 1970-1971. Therefore, it was not likely that any cultural resources would be disturbed in that area. Second, those excavations provided data on areas adjacent to other proposed segments of the drainage. That information would prove useful toward the interpretation of any cultural resources that might be encountered during our investigations of 1989.

It is also worth noting that the 1970-1971 excavations showed that ground water about the Kitchen is not a new problem; it challenged the eighteenth-century traders who built the original structure, as well. Woolworth (1975:65-68) reports that he examined two fur trade era drain trenches in association with the Kitchen, one on its north side and the other in front of the structure to the south. The former had been known from the initial investigations of 1936, whereas the latter was a new discovery made in 1970.

FIELD INVESTIGATIONS

METHODS

Since numerous excavation projects had been carried out by various investigators, it seemed most prudent to pattern the 1989 research methods after those that had been used in previous years. Accordingly, certain departures were taken from the usual Midwest Archeological Center field practices. Most notably, excavations were performed using the English system of measurement, rather than metric linear units.

The first order of business in 1989 was to establish an excavation grid conforming to that followed since 1936. Records relating to the early excavations at Grand Portage, however, are sketchy and at times conflicting. In fact, the primary authority on Grand Portage archeology, Alan R. Woolworth, provides two different accounts of where the East-West baseline was located.

In his summary of the 1936-1937 excavations, Woolworth (1963:36) first states that the East-West baseline "was parallel to and about 23.7' west of the western wall of the Great Hall." Later in that same report, however, while discussing Trench No. 1, Woolworth (1963:49) writes (emphases added):

> This N-S trench was four feet in width. It was located parallel to the E-W baseline, but *five feet west of it.* It was also parallel to the western wall of the Great Hall, but about *23.5' west of it.*

Given those figures, simple arithmetic concludes that the East-West baseline should be located 18.5 ft from the Great Hall foundation.

Examination of plan maps reproduced in Woolworth's report suggest that the former figure (23.7 ft) must be incorrect and may refer to the location of Trench No. 1, rather than the East-West baseline. Unfortunately, no precise directional bearing is given for the line, other than the statement that it ran parallel to the western Great Hall foundation. Measurement of the angle shown on Woolworth's (1963) Map 11, however, indicates an approximate bearing of 142° east of magnetic north.

In light of those data, we established a grid line 18.5 ft from the western foundation of the Great Hall and 142° east of north. All east and west Cartesian coordinates used in 1989 are relative to that baseline. This proved to be a convenient referent for our excavations, since it trended in the same general direction as the existing drainage line installed during 1975. Furthermore, the original 1936 East-West baseline, which we believed this line replicated, passed directly through the center of the fur trade structure presumed to lie now in the path of the proposed drain.

FIELD INVESTIGATIONS

It was not possible in the time allotted to re-establish the North-South baseline with any confidence. Although its position is described by Woolworth (1963:35-36), an accurate survey of the Depot with its present interior structures could not be readily achieved in the brief time available. The probable position of the former "center wall" that corresponded with the baseline could have been approximated, but since it would have been an approximation another arbitrary point was chosen as the referent. That zero point is the southwest corner of the Great Hall's front porch. For purposes of our 1989 investigations, all grid measurements north and south are made relative to that fixed feature.

The standard excavation unit employed in the 1989 field investigations was a 5 ft x 5 ft square. Although smaller units would have enabled more extensive coverage of the construction zone, they would be more likely to miss exposing cultural features. Furthermore, since the trench was to be as much as 8 ft wide at its top, five-foot squares could be positioned in such a way as to examine slightly more than half of the impact zone at any given location.

It should be noted here that initial field examination of the project area revealed a discrepancy in the project plans. Although the downslope conduit was to be located along the same path as an existing 1975 drain, its location was not correctly plotted on the plans. Comparison of the drawings with the drain's obvious linear surface depression indicated a difference of some 15 ft where the line met the lakeshore palisade. Test excavations, as a result, were placed with respect to the intended location of new construction, not the alignment shown on the plans.

Previous research within the Depot demonstrated that approximately 1 ft of relatively recent fill covered much of the area, particularly in front of the Great Hall. The thickness of the fill zone, of course, might vary considerably from that average, but the interface would be clearly recognizable when reached. Accordingly, the fill layer, regardless of its depth below surface, was excavated as a single level. Furthermore, the matrix was not systematically screened, owing to the fact that the fill contained a great deal of modern debris. A sample of materials, however, was collected from each of those initial levels.

After removal of the fill zone, each unit was excavated in arbitrary four-inch levels. Vertical control was maintained by reference to the ground surface at each unit's southwest corner stake. That corner also was employed as the designator for horizontal control; all grid coordinates identifying excavation units refer to the southwest corner stake.

Each level was documented with measured drawings and, if deemed appropriate, with photographic images. Soils removed from the units were screened through quarter-inch hardware cloth in order to facilitate

ware cloth in order to facilitate collection of archeological materials. All artifacts recovered were bagged according to provenience for subsequent laboratory processing and analysis. At times, soil anomalies of possible significance dictated collection of discrete zones within levels.

Excavations continued systematically through each unit until no artifacts or soil anomalies were noted. At that point, each unit was declared culturally sterile. Representative unit walls were then photographed and drawn to record their soil profiles. Each unit was backfilled after coring the unit floor with a soil auger to check for deeply buried cultural deposits.

RESULTS

During the two-week field project, seven test units were excavated within the Depot (Figure 5). Four of those, however, fell upon the area where Structure 1 was believed to have been located and partially excavated in 1936. Since little or nothing of real consequence was found in the 1989 excavations, it should not be necessary to dwell upon their contents in any detail. Rather, they will be discussed in more general terms with respect to the three areas represented: the Structure 1 area, the palisade area, and the Kitchen/Great Hall area.

Structure 1 Area

As noted earlier, the remains of a fur trade era structure were a primary concern of the 1989 investigations. Evidence of that building, which is known alternately as Structure 1 and Feature 12 in the archeological literature, was partially excavated during the initial Grand Portage investigations of 1936. Field records from those earliest excavations indicate that the structure was located a short distance southwest of the Great Hall. Those records, however, do not make clear how much of the structure was left intact by the excavators. Nor are the archeological base maps of a scale that enables precise pin-pointing of the structure's location relative to other features.

According to Woolworth (1963:76-78), Structure 1 was discovered at the intersection of two large exploratory trenches (Trench No. 1 and Trench No. 2) excavated under the direction of G. Hubert Smith. A grid was laid out over the structure later in order to excavate it systematically. Upright posts representing the structure's walls, when delineated, indicated a rectangular form measuring approximately 18 ft x 30 ft with its long axis trending north-south. Associated artifacts suggested that Structure 1 was not a later intrusion within the fur trade Depot, but they did not allow a definitive determination of its age or function.

In fact, Structure 1 has been interpreted differently in at least two separate reports by the same authority. In his summary of the 1936-1937 Grand Portage investigations, Alan R.

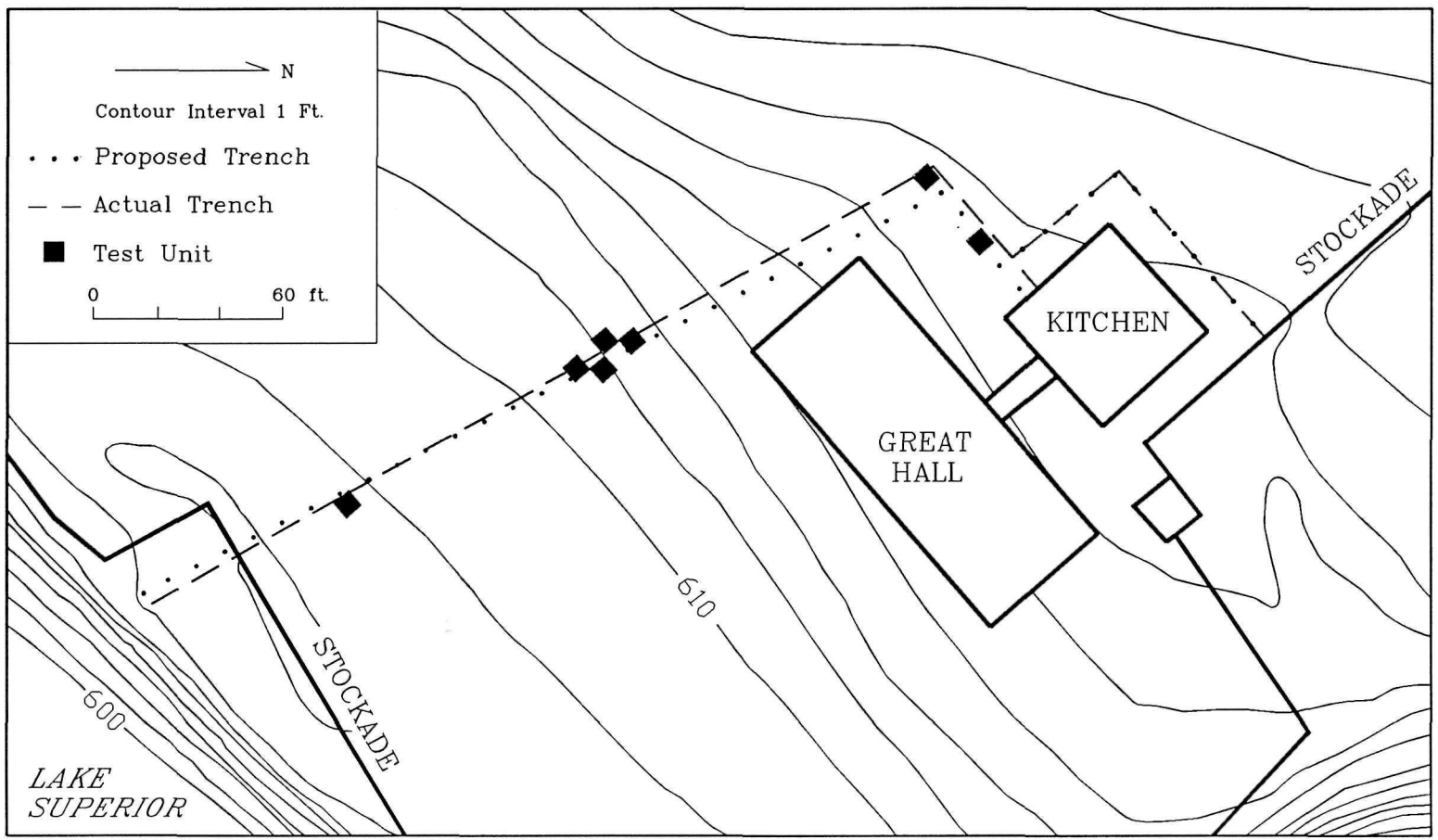


Figure 5. Actual trench placement and locations of 1989 test excavations.

"western wall of this building was six feet east of and parallel to the course of the interior palisade trench." He logically concludes, therefore, that Structure 1 "might have been associated with this palisade line and contemporaneous or later in time." That former palisade is believed to represent the original western wall of the Depot, built circa 1768 (Woolworth 1975:69-70). Therefore, if Structure 1 in fact was erected with reference to that palisade, as its orientation suggests, then the building could not have been constructed before that year.

In his later overview written in collaboration with Nancy L. Woolworth, however, quite a different view is expressed (Woolworth and Woolworth 1982: Vol. 2, Form 12): "It is possible that this is the oldest building at the site, and it is possibly associated with the French fur trade which operated here from c. 1731 to 1760." That line of reasoning is apparently drawn from the fact that the walls of Structure 1 were formed of upright posts set in the ground. Although not exclusive to the French, that manner of construction is certainly typical of their eighteenth-century building practices on the frontier of North America.

Obviously, both interpretations cannot be true. It was hoped that the 1989 investigations might shed greater light on this problem, through the examination of surviving parts of the structure and associated artifacts. But that was not to be. None of the four test units excavated in the vicinity of Structure 1 revealed any evidence of that problematic feature.

Examination of the 1979 Cultural Resource Management Base Map (Woolworth and Woolworth 1982: Map 12, Sheet 2) indicates that the 30-foot long Structure 1 should lie within an area approximately 20 ft to 50 ft southwest of the Great Hall. Further, the East-West baseline re-established in 1989 should pass nearly through the center of the feature. The proposed drainage trench, however, would trend southward some 10 ft west of the baseline in that area.

Four 5 ft x 5 ft test units were excavated in the vicinity of Structure 1: S25/W5, S30/W10, S35/W5, S40/W10. Together, the four units formed a checkerboard pattern that enabled the investigators to examine, in effect, a 10 ft x 20 ft area (Figure 6). That was deemed sufficient to sample the direct impact zone of the drain installation and large enough to encounter any remains of Structure 1 that might survive in its path.

It was found, however, that the area already was badly disturbed, and no evidence of the feature was discerned in the soils. The most obvious disturbance was a north-south trending trench that proved to contain the existing 1975 drainage line. The edge of the trench could be seen passing through the foot-thick fill layer immediately below the thin sod layer, indicating that it was of more recent origin. At the top, the trench

Figure 6. Testing the Structure 1 Area.

appeared to be nearly 5 ft wide, narrowing to approximately 3 ft at its base. The four-inch diameter, solid PVC pipe was set at 3.5 ft below the ground surface.

The angle of the drainage line was such that it touched upon each of the four test units, though only the western edge of the trench appeared in unit S30/W10 and the eastern edge in S35/W5. Only in the first unit where it was detected, S25/W5, was the trench totally excavated to expose the drainage conduit. Excavators merely pedestalled the fill zone in the other three units, since there was little point in expending additional time and energy on the recent intrusion.

Additional disturbances noted in the soils at this location seemed to have been the result of earlier archeological investigations. A clear soil unconformity made a straight line parallel with our excavation grid in the southern third of unit S35/W5. This appeared to represent the edge of a former excavation that had been backfilled with sterile sand. Given its orientation, it seems likely that the excavation may have been part of the Structure 1 excavation grid or, perhaps, the ghost of Trench No. 2. Whatever its origin, the disturbance effectively obliterated any evidence that might otherwise have been recovered at the location in 1989.

The only deposits noted in this area that appear to represent an intact cultural feature were discovered in unit S30/W10. They probably relate, however, to the operation of a fox

farm that stood on the Depot site before its reconstruction in the late 1930s. As Woolworth (1975:35, 38-39) reports, Samuel Crawford raised foxes near the ruins of the Great Hall in the early decades of this century. In fact, his fox pen and surrounding run apparently employed one of that building's foundations in their construction. Built about 1910, the fences continued to stand until they were eliminated by reconstruction of the Great Hall.

It is worth noting that the Samuel Crawford homestead appears in a circa 1920 photograph apparently taken from atop Mount Rose (Thompson 1969:Fig. 4). Not only is the domicile shown within the area now surrounded by the reconstructed palisade, several associated outbuildings also are evident. North of the house, at its rear, are two smaller structures some distance apart. Although vegetation in the foreground obscures that corner of the photograph, the structures seem to be joined by a linear, fenced enclosure. It is likely that those are elements of the Crawford fox run.

In his 1970 excavations about the Great Hall after the first reconstruction burned, Woolworth (1975:38, Figs. 5 and 7) found that the fox run probably had been square, measuring approximately 26 ft on each side. The enclosure was formed by a fence of woven wire supported by cedar posts. Further, the fence stood in a trench that measured some 2 ft deep and 1 ft wide. In order to keep the foxes from digging their way out, large stones were placed in the trench alongside the fence before backfilling. The fox pen, which measured only about 6 ft x 11 ft, was located within the run. That fence, too, was set well into the ground.

The evidence in S30/W10 related to those features consisted of a mass of corroded wire surrounded by large, rust-stained cobbles. They appeared at a depth of approximately 18 in below the ground surface. The materials and their positions in the ground are consistent with Woolworth's description of the fox run. Further, the location of this 1989 feature relative to the Great Hall is in keeping with elements of the run exposed by Woolworth in 1970.

Artifacts associated with the wire and cobbles also are consistent with our understanding that the fox farm was in operation during the first quarter of the current century. Modern wire nails and glass fragments dominate the collection from that area of the unit, though some fur trade era materials also were recovered. Such items as white clay pipestems, however, doubtless would have been present in the ground prior to construction of the fox run sometime around 1910 and are likely to have been redeposited when the fence line trench was backfilled.

Remaining areas within the four unit cluster are unremarkable. Several other smaller disturbances were found that can only be defined as "modern" in their origins. The soils and randomly distributed cobbles

outside those disturbances appeared natural in character, having been left there by lacustrine or glacial processes. Artifacts include several types representing the fur trade period, such as white clay smoking-pipe fragments, but most are typical of the late nineteenth and early twentieth centuries.

Palisade Area

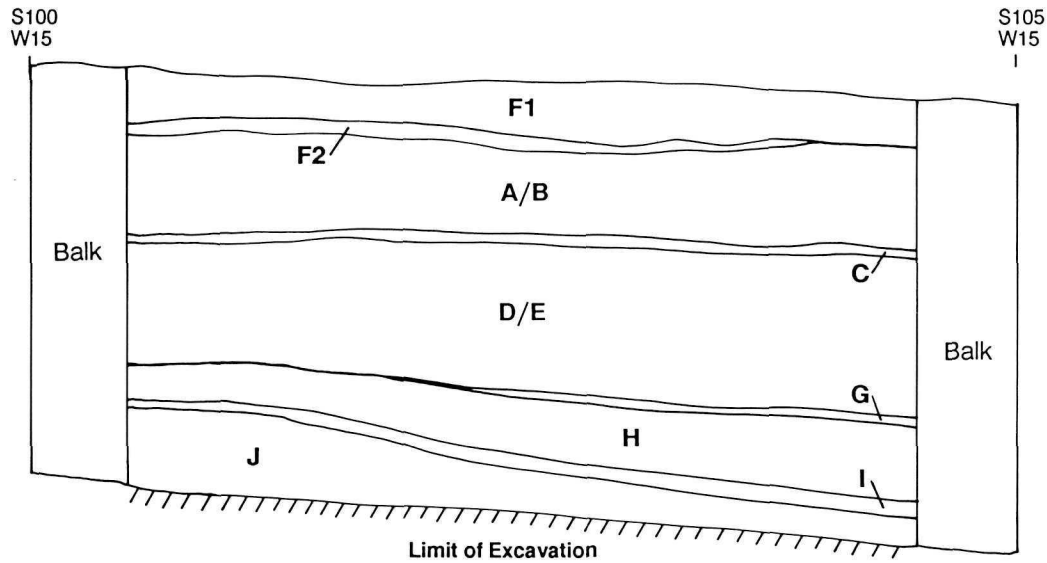
A single unit, designated S105/W20 in grid coordinates, was excavated near the terminus of the proposed downslope conduit some 30 ft north of the lakeshore palisade line. The area, which is comparatively flat, also appears to lie just below the path of a dirt road that still crossed the Depot site in the early part of this century. That conclusion is reached by comparative examination of a high-angle photograph taken circa 1920 (Thompson 1969:Fig. 4), when the road was still in use, and a 1962 aerial photograph of the reconstructed Depot (Thompson 1969:Fig. 5), which shows subtle traces of the roadway relative to fixed features still standing.

The unit was laid out so as to expose only the extreme eastern edge of the existing drainage trench. The 1975 disturbance became evident in the soil matrix immediately below the sod layer. Since it was easily delineated and clearly modern, that foot-wide zone of fill paralleling the west wall of the test unit was not excavated after the removal of the uppermost 10 in of overburden.

Excavations taken level-by-level through the remaining 80% of the unit revealed no cultural features. Indeed, the unit exhibited a remarkable paucity of artifacts. Most of the materials occurred in the first 4 inches of soil (8"-12" below surface) immediately below a thin black lens of sand. Beyond that point, artifact yield became increasingly sparse. Throughout the unit, the materials encountered at this location represented a mixture of nineteenth- and twentieth-century debris. A few items, such as glass seed beads, may derive from the fur trade, but since they are intermixed with later artifacts they provide little archeological information.

The most remarkable aspect of unit S105/W20 was its column of soil strata. Inspection of the east unit profile showed that each layer slopes downward gently toward the lakeshore and consists of well-sorted sands and gravels (Figure 7). The north profile, on the other hand, exhibits essentially level bedding of the soil layers. The configuration and content of those deposits, therefore, both point toward the conclusion that the column represents a natural beach sequence built up over the course of time.

It is interesting to note that most of the artifacts derived from deposits nearly a foot below the present ground surface. Further, those materials were primarily of late nineteenth-century origins; few items representing the fur trade era appeared at this location. Those facts suggest that the



A Brown Sandy Loam with Small Particles of Yellowish Brown Coarse Sand

B Yellowish Brown Coarse Sand

C Thin Lens of Black Sand

D Brown Loamy Sand with Large Patches of Yellowish Brown Sand and Sparse Pea Gravels

E Homogeneous Brown Loamy Sand

F Homogeneous Yellowish Brown Coarse Sand with Streaks of Gray Sand
F1 - Overburden, Clay Silt
F2 - Overburden, Red Clay and Pea Gravel

G Thin Layer of Fine Gravels

H Homogeneous Yellowish Brown Coarse Sand

I Pea Gravels and Black (Iron-Rich) Sand

J Homogeneous Yellowish Brown Coarse Sand

Figure 7. East Profile, Test Unit S105/W20.

lakeshore area probably has been subject to successive stages of scouring and aggrading, which may have removed evidence of early occupations while deeply burying items that are relatively late in Grand Portage's history. This is not to say, however, that such dynamics have been exclusively natural. The uppermost deposits, for example, may be the result of purposeful ground leveling action. Nevertheless, most of the soil column is without a doubt the product of natural beach development.

Great Hall/Kitchen Area

The 1989 investigations within the Depot at Grand Portage included the excavation of two test units between the reconstructed Great Hall and Kitchen on a rather level bench that may represent an old beach ridge. It was in this area that a section of drain conduit would be run west from the Kitchen before turning south toward the lake. Since no previous investigations had been carried out in that particular area, the two 5 ft x 5 ft units sought to determine whether any significant archeological deposits might lie in the proposed path (Figure 8).

Unit N60/E10 was situated near the drain's probable turning point, a short distance from the Great Hall's northwest corner. The other unit, N60/E30, was 20 ft farther east, approximately half way to the Kitchen structure. Location of the latter test unit was dictated, in part, by a desire to expose a utility line believed to be buried in the general area.

Neither of the units yielded any remarkable information. Both exhibited a layer of recent fill in their uppermost reaches, no doubt deriving from activities related to reconstruction of the two buildings. Beneath the fill, the units were littered with numerous large glacial cobbles that appeared to have lain unmolested since their original deposition during the last Ice Age. A dense clay zone also occurred in both units at an approximate depth of 3 ft below the ground surface.

Artifacts yielded by these two test units were unremarkable. They represent practically the entire range of historic occupation at Grand Portage, from the fur trade era through its development as a public park. Further, since they were not associated with any discrete cultural feature, those materials have limited utility toward drawing archeological interpretations.

The only information of great importance gleaned from the Great Hall/Kitchen area concerned the location of an active utility line. Although the Monument maintenance files contained a schematic map of the buried telephone line, it was not felt that the drawing was accurate enough to ensure avoidance of the line during trenching. Excavations in N60/E30 exposed the active line approximately 1 ft below the ground surface. Another line that had been abandoned in place also was discovered. The locations of both were marked on the surface for later reference.

Figure 8. Excavations begin at the Kitchen/Great Hall Area.

PROJECT MONITORING PHASE

While the field investigations of late September were still continuing, the National Park Service identified a Contractor to install the new drainage system. Subsequent to completion of our archeological work the Contractor received notice to proceed, initiating construction on October 16, 1989. As the supervising archeologist for the earlier research, I was called upon to monitor installation of the drain while ground disturbing activities were under way. All work requiring direct observation was complete by the end of that week (Figure 9).

Trenching began at the lakeshore on the morning of October 16, a large section of reconstructed palisade having been removed previously by the Monument staff. That particular stretch of lakeshore had been stabilized some years earlier, and trenching for the drain outlet necessarily disturbed the integrity of that system of rip-rap and filter fabric. No buried cultural deposits, however, were revealed by the initial backhoe cut.

Immediately inside the palisade line the backhoe encountered what appeared to be remains of a former septic system. Several thick-sawn boards were turned up near the ground surface, and mortared stones were exposed in the east profile of the trench (Figure 10). It was known that an early visitor facility had stood near this general location when portions of the Depot were first reconstructed some 50 years ago. Although the structure was later removed as a modern intrusion on the historic scene, associated amenities below grade were abandoned in place.

It was near this point where the backhoe operator also intersected the existing 1975 drainage line. Having exposed that line, which was to be the main path for the new installation, the operator straddled it with his machinery and proceeded northward to the Great Hall/Kitchen area. No substantial archeological deposits were revealed by the progression up slope, though a few isolated items occasionally came to light. In each case but one, however, the artifacts were of no earlier age than the turn of the last century. The single exception was a small white clay pipestem fragment, a rather ubiquitous artifact of the fur trade period.

Careful scrutiny of the trenching operations increased as they neared the presumed location of Structure 1. Although our investigations undertaken in late September yielded no surviving evidence of that fur trade era feature, there was still reason to be concerned about the possible presence of intact remains within the direct impact zone. Inspection of the trench profiles, however, did not provide any hint that a structure ever stood at this

Figure 9. Workers check grade of trench near the Kitchen.

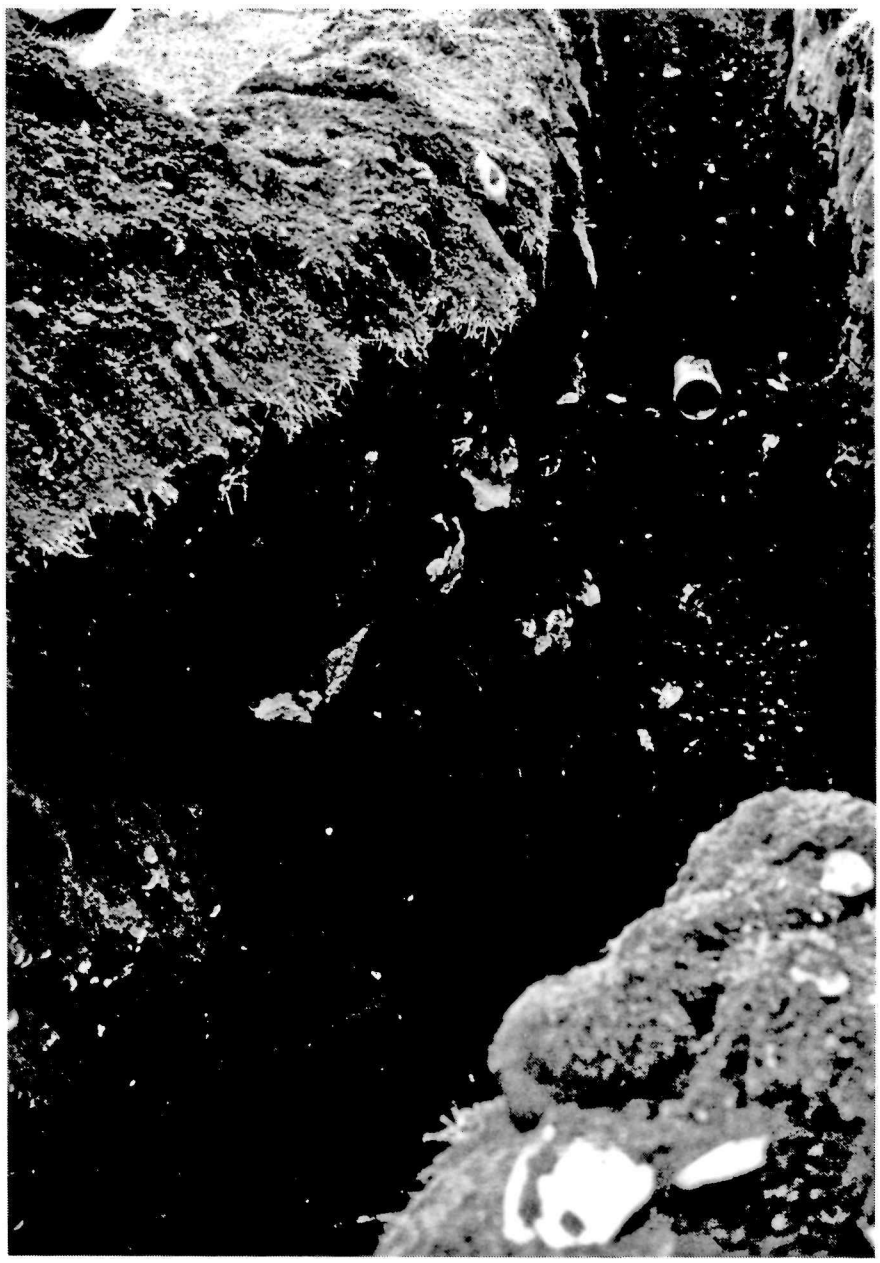


Figure 10. Mortared stones representing former septic system are exposed in trench profile near palisade.

location. Either the new drainage line must have passed through a section of the structure excavated in 1936, or the trench missed the remains of Structure 1 altogether. The latter alternative is perhaps the more probable, given the fact that the trench was excavated a few feet west of the line shown on project plans and the possibility that Structure 1 may not be precisely plotted on the Grand Portage archeological base map. Regardless, no apparent damage to that feature resulted from the 1989 drain installation.

Trenching continued past the south side of the Great Hall, at which point the alignment shifted east toward the Kitchen. Progress was slower in this area, since the drainage conduit had to be set deeper relative to the prevailing ground surface. Further, the earth was rockier on this level bench, and the dense basal clay occurred higher in the soil column. Both geological factors offered greater resistance to the backhoe operator.

The two interceptor drains placed parallel to the north and west foundations of the Kitchen structure were designed to fall within a block excavated prior to the reconstruction. That fact notwithstanding, the width required at the top of the trench meant that some ground disturbance outside the block might occur. Thanks to the skill of the backhoe operator, however, new ground disturbance was kept to a minimum, and no cultural resources were exposed or damaged.

The east-west segment connecting the Kitchen drain elements to the downslope segment also was excavated without encountering any significant archeological remains. Only the short segment of conduit running under the Kitchen foundation to the crawlspace sump is worthy of remark, though not in reference to any cultural resources. Excavation of that trench released a large volume of water that had collected underneath the structure. Literally hundreds of gallons flooded into the trench, dramatically underscoring the need for a new drainage system.

In addition to monitoring the backhoe excavations, it was also deemed prudent to have the archeologist present while the open trenches were backfilled after installation of the conduit. It was entirely possible, of course, that a trench wall collapse during that process might expose cultural resources in adjacent areas. Those fears proved to be unfounded, however, as the backfilling took place without incident.

CONCLUSION

Archeological efforts carried out in conjunction with the installation of a new site drainage system within the Grand Portage Depot took place in two phases. The initial two-week phase, scheduled prior to construction, sought to determine the potential damage that might be caused to cultural resources by the proposed development. The second phase of investigations entailed monitoring actual installation of the drainage system a few weeks later.

A particular archeological concern was the possibility that the drainage alignment might pass through the remains of a fur trade era structure discovered and partially excavated in 1936. No evidence of that feature was found during the first phase of investigations, however, nor were any remains encountered at its presumed location during subsequent trenching for the drain. The location did yield evidence of the circa 1920s Samuel Crawford fox farm, though such data are of limited utility. Excavations carried out elsewhere within the Depot in 1989 similarly encountered no deposits that could be considered archeologically significant. Accordingly, it appears that the drainage system development resulted in no substantial damage to the cultural resource base at Grand Portage.

Despite the fact that no significant archeological remains were brought to light during our 1989 investigations at the Grand Portage Depot, the research should not be viewed as a fruitless effort. To the contrary, it means that the development planning process was successful. The exchange of ideas and discussion of concerns among regional and field personnel resulted in the "least cost" solution that ultimately was implemented at Grand Portage. Preconstruction archeological investigations supportedthe designed drain location, and subsequent monitoring of the installation confirmed the absence of significant cultural resources within the alignment. Therefore, the project review procedure worked, and the preservation ethic was served.

It should be noted, in conclusion, that the site of the Grand Portage Depot remains a rich archeological resource. Although much of the site has been disturbed by later nineteenth- and twentieth-century activities, including archeological investigations, many areas of the Depot still harbor intact cultural deposits from the fur trade era. Thus, planners of future developments here, and elsewhere in the Monument, should continue to be mindful of the possible effects their actions might have upon the cultural resource base at Grand Portage.

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APPENDIX A

PROJECT ARTIFACT ASSEMBLAGE

Over 1,500 items were collected during the 1989 archeological testing at Grand Portage National Monument in conjunction with installation of a new drainage system. Totals are summarized by artifact type and test unit in Table 1. Although the items were collected from distinct levels and areas within each unit in the course of excavations, the data sets were collapsed for purposes of this report.

All materials were cleaned, sorted, and analyzed at the Midwest Archeological Center laboratory in Lincoln, Nebraska. They are curated at that facility, along with attendant field records, under MWAC Accession Number 335.

Table 1. Artifact types by provenience unit.

ARTIFACT TYPE	EXCAVATION UNITS 1	2	3	4	5	6	7	TOTAL
Glass								
window, clear	33	29	72	31	8	25	2	200
window, grn tint	0	5	0	0	0	0	0	5
bottle, clear	5	29	24	18	22	42	0	140
bottle, amber	7	1	6	1	1	97	5	118
bottle, cl, sol	0	5	0	0	3	0	0	8
pressed, clear	1	0	0	0	0	9	0	10
melted, clear	0	0	0	0	0	3	0	3
mirror frag	0	0	0	2	0	0	0	2
seed bead, wh,c,t	0	20	2	13	3	0	0	38
seed bead, wh,c	0	0	2	0	0	0	0	2
seed bead, wh,w	0	1	0	0	0	0	0	1
seed bead, blu,c,t	0	3	0	0	0	0	0	3
seed bead, r,c,t	0	1	0	0	0	0	0	1
neck bead, agate,w	0	1	0	0	0	0	0	1
neck bead, CdA,c	0	0	0	0	0	1	0	1
Ferrous Metal								
wrought nails/fr	40	25	54	36	7	10	3	175
cut nails	0	26	19	1	14	0	4	64
unident sq nails	0	24	0	0	0	0	0	24
wire nails	8	2	13	2	2	4	4	35
U-shaped staples	0	1	1	0	0	1	0	3
scaffolding nail	0	1	0	0	0	0	0	1
finishing nail	0	0	0	0	0	2	0	2

APPENDIX A

Table 1, continued

ARTIFACT TYPE	EXCAVATION UNITS 1	2	3	4	5	6	7	TOTAL
wire	6	7	8	2	0	2	0	25
barbed wire	1	2	0	0	0	0	0	3
woven fence wire	0	32	1	0	0	2	0	35
punch	0	0	0	0	0	1	0	1
cast hardware	1	0	3	0	1	0	0	5
kettle frag	1	0	0	0	0	0	0	1
rivets	0	4	0	0	0	0	0	4
buckle frame	0	1	0	0	0	0	0	1
buckle, small	0	1	0	0	0	0	0	1
clasp knife handle	0	1	0	0	0	0	0	1
clasp knife blade	0	0	1	0	0	0	0	1
barbed harpoon	0	0	1	0	0	0	0	1
offset awl	0	0	1	0	0	0	0	1
door lock mech	0	1	0	0	0	0	0	1
stove eye lifter	0	0	0	0	1	0	0	1
barrel strap	0	0	0	0	1	0	0	1
perforated strap	0	0	2	0	0	0	0	2
boot heel plate	0	0	1	0	0	0	0	1
rod, small	0	0	1	0	0	0	0	1
bracket, small	0	0	0	0	0	1	0	1
connecting rod	0	0	0	0	0	0	1	1
coil spring	0	0	0	0	0	0	1	1
electrical comp	0	0	0	0	0	1	0	1
socket fastener	0	0	0	0	0	1	0	1
crown cap	0	0	0	0	0	1	1	2
can frags	0	0	0	0	5	0	0	5
beverage can	0	0	0	0	0	1	0	1
scrap	0	25	32	2	0	0	0	59
<u>Cuprous Metal</u>								
cuff button	1	0	0	0	0	0	0	1
finger-ring	1	0	0	0	0	0	0	1
tinkling cone	0	1	0	0	0	0	0	1
wire	0	3	1	0	0	0	0	4
jewelry chain	0	0	1	0	0	0	0	1
Indian hd ct, perf	0	0	1	0	0	0	0	1
susp chain for ct	0	0	1	0	0	0	0	1
ctr-fire cartridge	0	0	1	1	0	0	0	2
harmonica reed	0	0	3	0	0	0	0	3
rheostat knob	0	0	0	0	0	1	0	1
sheet scrap	0	0	0	1	2	0	0	3
<u>White Metal</u>								
finger band (?)	0	1	0	0	0	0	0	1
vessel rim	0	0	1	0	0	0	0	1
2-pc button	0	0	1	0	0	0	0	1

Table 1, continued

ARTIFACT TYPE	EXCAVATION UNITS 1	2	3	4	5	6	7	TOTAL
stamped sheet	0	0	1	0	0	0	0	1
scrap	0	1	0	0	0	0	0	1
lead splatter	1	1	2	1	0	0	0	5
lead sprue	0	1	0	0	0	0	0	1
Ceramics								
creamware	0	3	0	0	0	0	1	4
whiteware	25	11	32	6	12	3	0	89
whw, blu tp	1	1	0	0	0	0	0	2
whw, bl tp	0	1	0	0	3	0	0	4
whw, blu pt	0	1	0	0	0	0	0	1
whw, blu edge	0	0	0	0	0	0	1	1
whw, poly (spr)	0	1	0	0	0	0	0	1
whw, exfol	0	1	0	0	0	0	0	1
pearlw, blu ptd	0	1	0	0	0	0	0	1
yellowware	0	0	2	0	0	0	0	2
course ew, brn lg	0	1	0	0	0	0	0	1
stnw, grey sg	0	0	0	0	1	0	0	1
stnw, grey sg, Al	0	0	0	0	1	0	0	1
stnw, brn	0	0	1	0	0	0	0	1
porcelain	0	2	1	0	1	0	0	4
porc, gilt rim	0	1	0	0	0	0	0	1
porc, poly enam	0	1	1	0	0	0	0	2
porc, brn insul	0	0	0	0	0	1	0	1
porc tile	0	0	0	0	0	1	1	2
drain tile, brn lg	0	0	0	0	0	1	0	1
wh clay pipestem	8	27	71	21	1	4	1	133
wh clay pipebowl	5	11	36	1	0	0	0	53
wh clay pipespur	1	0	5	1	0	0	0	7
brick rubble	0	0	8	2	0	0	0	10
Lithics								
gunflint	1	0	1	0	0	0	0	2
corner notch pt	0	1	0	0	0	0	0	1
chert flake	0	4	1	4	0	0	0	9
blade flake	0	1	0	0	0	0	0	1
jasper taconite	0	1	0	0	0	0	0	1
slate	0	0	1	0	0	0	0	1
hammerstone	0	0	0	1	0	0	0	1
Fauna and Flora								
mammal	2	16	6	6	1	0	0	31
mammal, calcined	5	10	11	2	1	1	4	34
mammal, saw-cut	1	0	0	0	0	0	0	1
beaver tooth	0	1	0	0	0	0	0	1

APPENDIX A

Table 1, continued

ARTIFACT TYPE	EXCAVATION UNITS 1	2	3	4	5	6	7	TOTAL
mammal tooth	0	1	3	0	0	0	0	4
bird	1	0	0	0	0	0	0	1
fish, calcined	0	1	0	0	0	0	0	1
seed pit (cherry)	0	14	0	0	0	0	0	14
Miscellaneous								
pencil lead	0	0	1	0	0	0	0	1
hard rubber pipe	1	0	0	0	0	0	0	1
plastic	0	1	38	0	0	0	0	39
boot parts	0	3	1	0	0	0	0	4
concrete/wire	0	1	0	0	0	0	0	1
lime mortar	0	0	1	0	0	0	0	1
string	0	0	1	0	0	0	0	1
linoleum tile	0	0	0	0	0	5	0	5
TOTAL	157	377	483	156	93	225	30	1521

Excavation Unit designations used in Table 1:

1: S25/W5 2: S30/W10 3: S35/W5 4: S40/W10

5: S105/W20 6: N60/E10 7: N60/E30

Abbreviations used in Table 1:

Al = Albany (brn) slip decorated
bl = black
blu = blue
brn = brown
c = cane method of construction
CdA = Cornaline d'Allepo bead
comp = component
ct = cent
ctr-fire = center-fire
enam = enameled
ew = earthenware
exfol = exfoliated
frag/fr = fragment
grn = green
hd = head
insul = insulator (electrical)
lg = lead-glazed
mech = mechanism
pc = piece
pearlw = pearlware
poly = polychrome
porc = porcelain
pt = point
ptd = painted
r = red
t = tumbled
sg = salt-glazed
sol = solarized
spr = sprig
sq = square
stnw = stoneware
susp = suspension
wh = white
whw = whiteware
w = wound construction
Note: white seed beads are compound construction consisting of an opaque white core and clear exterior veneer