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## **INTERDEPARTMENTAL COMMUNICATION**

Acton Board of Health - Telephone 978-264-9634 - Fax 978-264-9630

October 29, 2004

**TO:** Don Johnson, Town Manager  
**FROM:** Doug Halley, Health Director  
**SUBJECT:** Pine Hawk Curatorial Display  
Community Preservation Plan Submittal

Attached with this memo please find a submittal for the Pine Hawk Curatorial Display to the Community Preservation Committee. Within the submittal you will find a Project Application Form, Narrative and Itemized Scope. In addition, a Management Abstract and Discussions and Conclusions of the Pine Hawk Archaeological Project is attached, as well as, back-up information on the supplies required to complete the proposed project. We are still working with the Professional Archaeology Lab (PAL) to further define the project elements and sub-costs but have been given assurances that the project will not exceed the anticipated \$32,000 request.

## PROJECT APPLICATION FORM

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**Applicant:** Doug Halley **Submission Date:** 10/31/04

**Applicant's Address, Phone Number and Email** **Purpose (Please select all that apply)**

472 Main Street, Acton, MA 01720  
(978) 264-9634  
dhalley@town.acton.ma.us

- Open Space
- Community Housing
- Historic Preservation
- Recreation

**Town Committee (if applicable):** Board of Selectmen

**Project Name:** Pine Hawk Curatorial Display

**Project Location/ Address:** 472 Main Street, Acton, MA 01720

**Amount Requested:** \$32,000

**Project Summary:** In the space below, provide a brief summary of the project.

During the course of design and construction of the Middle Fort Pond Brook Sewer Project the Town conducted archaeological investigations of areas the project would disturb. These investigations identified an area adjacent to the Assabet River, off Adams Street, which had archaeological potential. An intensive archaeological dig of this area brought to light artifacts showing Native American occupation on the site from 4,000 to 8,000 years ago. Numerous projectile points, stone tools, charcoal fragments and stone shards were recovered. These materials, being federally protected and controlled, are now in the guardianship of the Professional Archaeology Lab (PAL) in Rhode Island.

Given the historical significance of these artifacts the Town is seeking to create a permanent display at the Town Hall where the artifacts can be viewed by residents and be protected in a protected environment.

Development of a climate and security controlled curatorial display on the Pine Hawk Site, using artifacts from the Pine Hawk Site, either on temporary loan or in Massachusetts Historical Commission approved custody. Consulting services will be provided by PAL. They will advise and assist the Town in acquiring the archaeological materials from the Pine Hawk Site and create/ develop a curatorial facility that would meet the standards of the Massachusetts Historical Commission.

**Estimated Date for Commencement of Project:** January 1, 2005

**Estimated Date for Completion of Project:** December 31, 2005

**Narrative**  
**Proposal for Additional Public Education Services**  
**Pine Hawk Curatorial Display**

During the planning phase of the Middle Fort Pond Brook sewer project the Town was required to investigate the possibility of archaeology artifacts within the project limits. This investigation revealed an extraordinary record of Native American habitation, uncovering a record extending back over 7,000 years. Acton is fortunate to have the "Pine Hawk" site, which is now recognized as one of the most significant Native American sites in New England.

Unfortunately the artifacts that were recovered from the Pine Hawk Site are remotely stored and maintained at the Public Archaeology Laboratory (PAL) in Rhode Island. PAL was the non-profit firm that conducted the archaeological dig and as a Federally Licensed Repository retained the artifacts at their Lab. At this location in Providence they are not accessible to Acton's citizen and students. Presentations in the past few months regarding the site have been extremely well received by students and adults with everyone expressing a strong interest in actually seeing the artifacts.

Based on this response it is clear that the presence of the Native American artifacts within Acton is desired and beneficial. Their availability will expand the opportunity to communicate the results of the data recovery program on the Pine Hawk Site, increase public awareness of cultural resources in Acton and initiate the establishment of a town-wide museum or curation facility for all eras of the Town's archaeological and historical past.

In order to take advantage of this opportunity it is proposed that the Town develop a limited curation facility to display artifacts on loan from PAL to the Town at the Town Hall or Memorial Library. In this proposal PAL would assist the Town in obtaining MHC approval to make a loan of the Pine Hawk Site materials to the Town, design a climate controlled secure display and construct the display at the chosen location.

The cultural materials from the Pine Hawk Site that were recovered by PAL were done so under a State Archaeologist's permit. Any transfer of archaeological material and supporting documentation from PAL to the Town will require the approval of MHC and the State Archaeologist. To take possession of the Pine Hawk Site collection, the Town would need to demonstrate that it could provide a repository that meets MHC standards for secure, long-term curation of archaeological materials and supporting documentation. In addition to storing the archaeological materials from the Pine Hawk Site, the curatorial facility could potentially also serve as a repository or museum for other artifacts and items of historic value that are in the Town's possession.

This project will preserve historic resources previously unknown and unidentified. The display of the artifacts will enhance the social, cultural and historical resources and their diversity by exposing the inhabitants of Acton today to the culture and people that inhabited this area 4,000 to 8,000 years ago. The development of the community in the past 200 years has likely threatened, disturbed or destroyed the historical evidence of the past occupations of this area. It is likely that resources similar to the artifacts found will continue to be lost as the Town develops further. Display of these artifacts can be vital in reminding the community of the value in protecting artifacts yet to be found.

**Itemized Project Scope  
Pine Hawk Curatorial Display**

**Pre-Project Publicity**

Public Presentation/ lecture series (3 meetings) \$1,500.00

Subtotal \$1,500.00

**Technical Advice**

Massachusetts Historical Commission Request (80 hrs.) \$6,000.00

Evaluate Other Historic Resources for Display (20 hrs.) \$1,500.00

Design of Curatorial Display (60 hrs.) \$4,000.00

Preparation and Placement of Artifacts (40 hrs.) \$3,000.00

Subtotal \$14,500.00

**Construction Materials and Work**

Curatorial Display Case Components \$8,000.00

Construction of Curatorial Display \$4,000.00

Artifact Display Materials \$4,000.00

Subtotal \$16,000.00

**Total \$32,000.00**

## Proposal for Additional Public Education Services

### Middle Fort Pond Sewer Project Data Recovery Program Pine Hawk Site Acton, MA

The Town of Acton and Woodard & Curran, project engineers for the Middle Fort Pond Brook Sewer project, have requested that PAL prepare a proposal to provide additional public education and consulting services. These additional services will supplement the public education program currently being implemented as part of the archaeological data recovery investigation recently completed on the Pine Hawk Site (19-MD-793).

PAL is pleased to participate in this opportunity to communicate the results of the data recovery program on the Pine Hawk Site, increase public awareness of cultural resources in Acton and initiate evaluation of the potential for a town level museum or curation facility for archaeological and historical collections.

The three types of proposed programs or services are:

- A public presentation /lecture on the archaeological data recovery program for the Pine Hawk Site. The cost for this task is \$511.
- Development of a display on the Pine Hawk Site, using artifacts on temporary loan from PAL to the Town of Acton. The cost for this task is \$3572.
- Providing advice and assistance to the Town of Acton and Acton Historical Commission in acquiring the archaeological materials from the Pine Hawk Site and creation/development of a curatorial facility that would meet standards of the Massachusetts Historical Commission. The cost for this task will depend on the extent of facility proposed by the Town and level of effort to be determined; PAL would undertake this task at a rate of \$75.00 per hour.

The presentation/lecture would be done by PAL and Woodard & Curran staff involved in the engineering, design, environmental permitting and cultural resource management studies for the Middle Fort Pond Brook Sewer project.

To carry out the second and third tasks, PAL would assist the town of Acton in obtaining MHC approval to make both temporary loan and permanent long-term transfer of the Pine Hawk Site materials to the town.

The cultural materials from the Pine Hawk Site were recovered under a State Archaeologist's permit. Any transfer of archaeological material and supporting documentation from PAL to the Town of Acton will require the approval of MHC and the State Archaeologist. To take possession of the Pine Hawk Site collection, the town would need to demonstrate that it could provide a repository that meets MHC standards for secure, long-term curation of archaeological materials and supporting documentation.

PAL would assist the town in development of a curatorial facility meeting MHC standards and preparation of a custody permit application. In addition to storing the archaeological materials from the Pine Hawk Site, the curatorial facility could also serve as a repository or town museum for other artifacts and items of historic value that might be donated to the Acton Historical Commission in the future.

A cost breakdown or estimate for these services is attached

**Acton Board of Health  
Minutes  
March 25, 2002**

Members Present: William McInnis, Chair; Mark Benedict, Mark Conoby,  
Molly O'Neil, Associates Member  
Staff Present: Doug Halley, Health Director; Heather Marceau, Secretary  
Others Present: Susan Mitchell-Hart, Bill Brandon, Joyce Hanselman, Bruce Ringwall  
The meeting was called to order at 7:40 p.m.

**Community Preservation Act**

Susan Mitchell-Hart and Bill Brandon appeared before the Board to give a brief presentation on the Community Preservation Act (CPA). There is an article on the Annual Town Meeting warrant for the town to become a participant in the CPA. Ms. Mitchell-Hart distributed some information regarding the CPA for the Board to review. Mr. Brandon explained that the CPA has three main goals: Historical Preservation, Open Space and Affordable Housing. This program is funded through a surcharge on residents property tax bill and through annual matching funds from the state. Mr. Halley asked if the monies from this program could be used to purchase a place where artifacts recovered from the Pine Hawk Trail (on Adams Street). These items are currently not available for the residents to view, and he would like to change that. The Board members thought this might fall into the "Historical Preservation" goal of the CPA.

Ms. Hart and Mr. Brandon encouraged the Board members to read the literature provided to them and support this Act at Town Meeting.

The Board thanked them for the information and for their time in appearing before them.

**Local Upgrade Approval – One Orchard Drive**

The Board heard a request for a Local Upgrade Approval to allow for the replacement of the septic system at One Orchard Drive, Acton, MA. The system as designed cannot meet the requirements of Title 5 and the request is from the following:

- 310 CMR 15.211(1) Reduction of the required distance from a foundation wall  
(20' required, 13'8" provided).

The Health Department has reviewed this design and recommended the Board approve the Local Upgrade Approval requested.

On a motion made by Mr. Benedict, seconded by Mr. Conoby, the Board unanimously voted to grant the Local Upgrade Approval to allow for the septic system to be replaced at One Orchard Drive, Acton, MA. This approval was granted with the condition that the system be built in accordance with the plan stamped by Steven Calichman, RS, dated 2/11/02.

## MANAGEMENT ABSTRACT

PAL conducted an archaeological data recovery program at the Pine Hawk Site in Acton, Massachusetts from August to October 1999. The site was located on an elevated terrace overlooking the Assabet River within the proposed location of a wastewater treatment plant for the Middle Fort Pond Brook Sewer project. The Pine Hawk Site was first identified during an intensive (locational) archaeological survey of the Middle Fort Pond Brook Sewer project completed in December 1998. Subsurface sampling of the Pine Hawk Site in this survey indicated that it contained archaeological deposits associated with Native American activity from about 7,500 to 4,000 years ago in the Middle to Late Archaic periods. The site was considered to be potentially significant and further study at the site examination level was recommended.

In March 1999, PAL completed an archaeological site examination of the Pine Hawk Site. During this study, subsurface testing established the horizontal boundaries of the site, collected information about the integrity, density, and complexity of cultural materials and features, and about the temporal range of Native American occupations. The site examination established that the Pine Hawk Site covered an area of 3,300 m<sup>2</sup> and contained three primary concentrations (Areas I, II, III) of cultural material and features. Archaeological materials recovered from the site included four projectile points diagnostic of the Middle and Late Archaic periods, chipping debris of various lithic materials (rhyolite, quartzite, quartz, mylonite) and a ceramic sherd likely to be of Middle Woodland Period age. Two hearth features were radiocarbon dated to 3910±80 years before present (B.P.) and 4440±100 B.P., respectively. Archaeological data collected from the Pine Hawk Site indicated that the site was in good condition and had been occupied from the Middle Archaic to Middle Woodland periods. The most dense deposits of cultural material appeared to be associated with Late/Terminal Archaic components. Based on the results of the site examination, the Pine Hawk Site was considered to be potentially significant and eligible for listing in the National and State Registers of Historic Places. PAL recommended that proposed wastewater treatment facilities for the Middle Fort Pond Brook Sewer project be designed to avoid the Pine Hawk Site. Since avoidance of the site area was not a feasible or prudent alternative, an archaeological data recovery program was developed to mitigate adverse effects to the Pine Hawk Site from construction-related activities.

The research design developed for the data recovery program contained a set of research contexts or problems relating to: 1) site formation/depositional processes and episodes of intensive use on multicomponent riverine zone sites, 2) contrasting patterns of Late/Terminal Archaic Small Stem Point and Susquehanna Tradition settlement/resource use, and 3) prehistoric lithic resource use in the Sudbury/Assabet/Concord drainage. Excavation units placed within Areas I, II, and III during the data recovery program yielded a relatively large sample of cultural material and features. The stone tool assemblage from the site consisted primarily of bifacial tool blades and projectile points. Scrapers, retouched/utilized flakes, hammerstones, quarry blanks, and drills were also found. Ground-stone tools were limited to a few broken fragments (pestle, woodworking tool). The projectile points included diagnostic Middle Archaic (Neville, Stark) and Late/Terminal Archaic (Brewerton, Squibnocket Triangle, Small

Stemmed, Wayland Notched, Orient-like) types. A number of other untyped points likely to be of Late/Terminal Archaic affiliation were also found. A few ceramic sherds and other cultural material (jasper, hornfels chipping debris) dispersed through Areas I and II indicated there was also a low density Middle Woodland Period component on the site. Concentrations of rhyolite and mylonite chipping debris marking Middle or Late Archaic lithic workshop loci were identified in Areas I and II.

Features found on the site were mostly post molds and small firepits or hearths with some deep pits and burnt rock concentrations. Radiocarbon dates obtained from feature contexts ranged from 4440±100 B.P., 4260±70 B.P., 4170±60 B.P., 3910±80 B.P., 3710±40 B.P., 3220±70 B.P. and 3150±60 B.P., indicating numerous episodes of site use during the Late and Terminal Archaic. An unusual, deep pit feature radiocarbon dated to 3730±40 years B.P. was found in Area III of the site where it was part of a small Late Archaic deposition. The most recent radiocarbon date of 2100±70 B.P. may be associated with Terminal Archaic/Early Woodland activity on the site. Specialized analyses carried out on cultural materials and samples collected from the site included petrographic and geochemical analysis of lithic materials, soil micromorphology and oxidizable carbon ratio dating of charcoal samples.

The classes of archaeological data recovered from the Pine Hawk Site were used to assess the research contexts, interpret the site and compare it to others at the local (Sudbury/Assabet/Concord drainage), subregional (southern Merrimack basin) and regional (southeastern New England) scales. The categories of information collected in the data recovery program were considered sufficient to address the research contexts or problems posed for this investigation and mitigate the adverse effects of proposed construction on the Pine Hawk Site. As a result, it was recommended that construction of the proposed wastewater treatment facility proceed as planned.

### DISCUSSION AND CONCLUSIONS

The archaeological data recovery program completed on the Pine Hawk Site was able to achieve the primary research tasks defined for this study, from data collection during fieldwork, to analysis and interpretation. A sample of the cultural material, features, and faunal or floral remains, as well as other types of information such as soil micromorphology, was collected from the three concentration areas (Areas I, II, III) identified within the site area. The results of analysis of all the data categories collected from the site yielded information directly relevant to the set of three research contexts and associated hypotheses that were developed for this investigation. The final interpretation of the Pine Hawk Site was based on an assessment of these research contexts using the information collected during the data recovery program and earlier studies of the site. Some of the major points forming this interpretation of the site, and its function or role within larger Native American settlement systems are summarized below.

#### **Native American Settlement Patterns in the Combined Sudbury/Assabet/Concord River Drainage as Reflected at the Pine Hawk Site**

The most important overall contribution to current knowledge of past Native American settlement and other activity was the information obtained from the Pine Hawk Site relative to the internal characteristics of large, multicomponent, riverine zone sites. The Sudbury/Assabet/Concord drainage is an area where many moderate to large sized sites of this type are known but information about their internal structure, complexity and contents from systematic excavation is limited.

The most intensive occupations of the Pine Hawk Site occurred during the Middle and Late Archaic periods, between about 7,500 and 3,000 years ago. Activities were focused on intermediate stage reduction of lithic raw materials from both local and non-local sources, manufacture of chipped- and ground-stone tools, construction of pit, hearth and burnt-rock features for heat/light, and processing or cooking of plant and animal material for food. On-site activities inferred from stone tools, features, and faunal or floral remains included hunting, fishing, and collecting resources used for sustenance, tools and shelter. At least one burnt-rock feature at the site is suggestive of processing riverine resources such as fish or some type of plant food. Less intensive utilization of the site area occurred during the Terminal Archaic and Middle Woodland periods, between about 3,000 and 1,000 years ago. Overall, the temporal/cultural associations, distribution and numbers of tool types, lithic workshop loci, concentrations of fire-cracked rock, firepits and hearth features at the Pine Hawk Site indicate that composite occupations of the site area were relatively brief events.

Settlement pattern analysis attempts to trace the movements of populations across a landscape in an attempt to deduce the economic, cultural, and subsistence activities in which Native American groups

involved themselves. A settlement pattern approach to the investigation of the composite archaeological deposits at the Pine Hawk Site is useful in interpreting the overall nature of the site. Unfortunately, as a direct result of the very low probability of discovering all sites associated with a single group's movements over the landscape throughout the course of a year, archaeologists are forced to interpret the "remnant" settlement patterns of populations as opposed to "true" settlement patterns, making the task even more difficult (Dewar and McBride 1992).

Application of a remnant settlement pattern approach to the archaeological record of southern New England envisions the distribution of archaeological sites in any given single seasonal settlement round as taking the form of one of three different occupational sequences that include 1) a concentrated sequence of occupations, 2) a localized sequence of moderate congruence, or 3) a dispersed settlement sequence of low congruence (Figure 9-1) (Dewar and McBride 1992:234). Archaeologically, each of these occupational sequences would manifest themselves quite differently, and unless the overall context is taken into consideration a misinterpretation of the site data might occur.

A "concentrated sequence of occupations" results as individuals or groups of individuals return time and again to the same specific site location for the purposes of settlement or resource exploitation. Environmental characteristics, cultural requirements, or both, precipitate settlement at these exact locations. Return to the site location might occur seasonally, annually, or over some other interval of time. The superimposing mosaic of occupations results in the formation of archaeological sites that are extremely thick and contain dense deposits of artifacts and features. A "localized sequence of moderate congruence" differs from that of a "concentrated sequence of occupations" in that it is formed as groups return to generally the same location over and over again. Settlement does not necessarily have to be on the exact location as the previous settlement because the entire landscape is equally attractive. The occupational sequence results in the creation of larger sites that are broadly distributed across the landscape. A "dispersed settlement sequence of low congruence" settlement pattern sequence occurs when small single component occupations return to the area, but settlement locations are not

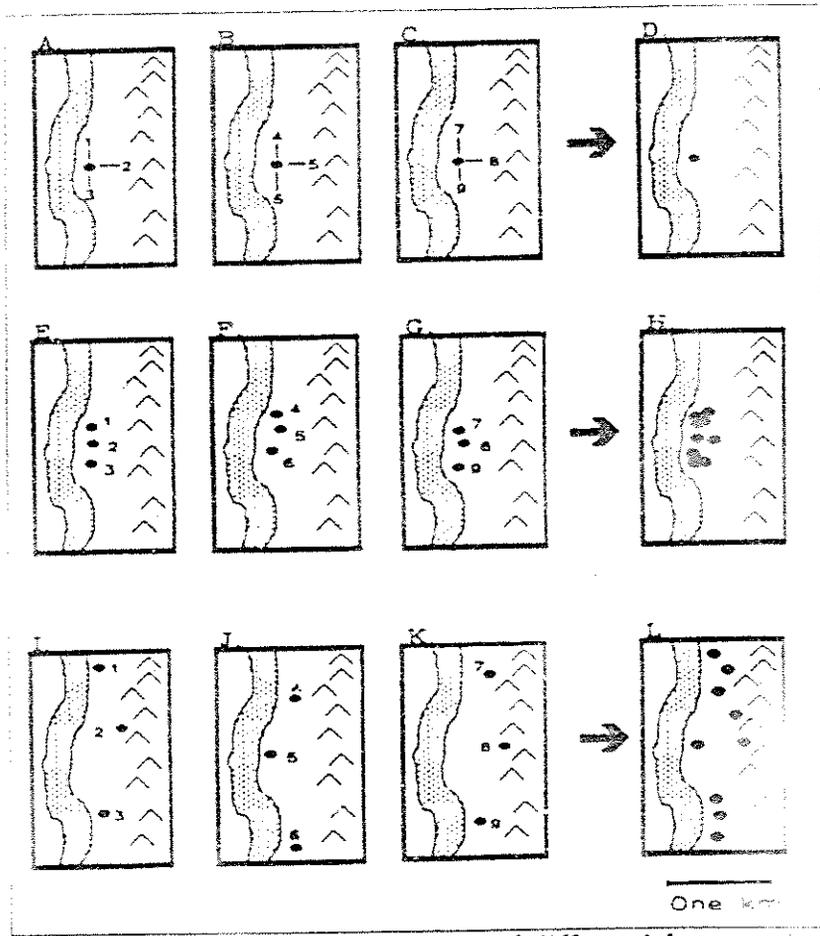


Figure 9-1. Hypothetical illustration of differential occupation sequences on a river floodplain (source Dewar and McBride 1992).

influenced by previous settlement. Sites representative of this settlement pattern tend to be widely dispersed across the larger landscape, are generally smaller, have fewer features, and do not exhibit the range of cultural materials witnessed in the previous two occupational sequences.

Despite the fact that the Pine Hawk Site contained archaeological deposits dispersed across a relatively large area of more than 3,000 sq m, its occupational history is not consistent with a substantial site type, such as a base camp or village. The characteristics of this site are also not consistent with a continuous Native American presence spanning long periods of time. The archaeological record of the site indicates that its formation, horizontal extent and internal structure resulted from a series of overlapping occupations of varying intensity over thousands of years. Following a remnant settlement pattern analytical approach, the occupational history of the Pine Hawk Site is best interpreted as representing a "localized sequence of moderate congruence" for the Middle Archaic and Late Archaic periods and a "dispersed settlement sequence of low congruence" for the remainder of the later and smaller Terminal Archaic and Early to Middle Woodland period components.

Features on the Pine Hawk Site, with few exceptions, are predominantly hearths and firepits associated with the production of heat/light or were used for cooking. The numerous charcoal-packed firepits identified at the site appear to be associated with the Late Archaic occupation episodes, such as the Laurentian and Small Stem Point components and are suggestive of a repetitive return to the site area. However, the individual occupations are somewhat spatially separated across the site area. Artifacts and artifact types recovered from the site include predominantly hunting and processing tools, such as projectile points and scrapers. Ground-stone tools such as axes, adzes, gouges, ulus, plummets, usually found on more substantial sites, such as riverine and lake or pond-side base camps, are noticeably absent from the site. Consequently, the stone tool assemblages and feature types derived from the site are consistent with short term, task specific (hunting, tool manufacture, repair or maintenance and resource processing) settlements.

Radiocarbon analysis and diagnostic artifacts recovered from the site indicate that it was first occupied during the Middle Archaic Period between about 7,500 and 5,500 years ago, and was not part of settlement systems after the Middle Woodland Period (1,600–1,000 years ago). The entire occupational history of the Pine Hawk Site spans almost 6,500 years. Although more features undoubtedly remained undiscovered at the Pine Hawk Site, 97 (most of which were post molds) were identified during data recovery investigations. The construction of 97 identified features over a 6,500 year site-life (less than 0.015 per year) is less than convincing evidence for the presence of a "concentrated" settlement history. Sites dating to these same periods are quite common in the combined Sudbury/Assabet/Concord river drainage, indicating that this basin, as a whole, was densely settled from the Middle Archaic through the Late/Terminal Archaic Period. The topographic setting of the Pine Hawk Site on a level, to slightly sloping deposit of well-drained sand/gravel glacial outwash deposits elevated above open water and wetlands resemble a number of other known multicomponent riverine zone sites in the Sudbury/Assabet/Concord drainage with similar long occupation histories. In addition to the natural features of topography and soils, other factors coercing settlement may have been close proximity to the major transportation route represented by the Assabet River and a river ford or trail crossing near the present location of High Street and the American Powder Company complex. These natural and cultural features probably ensured occasional resettlement atop previous campsite locations as small groups of Native American people or individuals stopped briefly during the course of their travels or other subsistence related

activities. In other words, it is likely that the overlapping components on the Pine Hawk Site occurred by happenstance as opposed to any culturally driven pattern mandating settlement at this specific site location.

### Middle Archaic Component on the Pine Hawk Site

The program of archaeological data recovery determined that the Pine Hawk Site was used for multiple occupations during the Middle Archaic Period. Middle Archaic artifacts recovered from the site include diagnostic Neville, Neville-like, and Stark type projectile points in addition to debitage of argillite, Braintree Slate, Lynn volcanic complex rhyolite, quartzite, and possibly mylonite likely to be associated with this component. This lithic material set has been found in other Middle Archaic assemblages from the Sudbury/Assabet/Concord drainage, such as the one recovered from the Watertown Dairy Site in Wayland (Ritchie 1995:130-133). Three pit features with oxidized subsoil fills of apparent Middle Archaic origin were also identified at the site.

The Pine Hawk Site feature and artifact data is in marked contrast to other more complex Middle Archaic depositions in the eastern/southeastern Massachusetts subregion such as the composite loci identified in the Annasnappet Pond Archaeological District in Carver, Massachusetts. These loci demonstrate evidence for substantial habitation and Middle Archaic feature construction in a core settlement area around a major wetland system (Doucette and Cross 1997). The Middle Archaic component to the Pine Hawk Site does not exhibit any evidence for a substantial, long term habitation. The recovery of relatively few tools and features implies that the site was occupied for only brief periods as individuals traveled/hunted along the Assabet River corridor or in adjacent uplands. The Middle Archaic component on the Pine Hawk Site appeared to be somewhat smaller and less complex than others known in the Sudbury/Assabet/Concord and Shawsheen drainages, such as those on the Watertown Dairy and Heath Brook Sites. These other components either were larger in horizontal extent or had more complex deposits of cultural material and features. The large oxidized subsoil features on the Pine Hawk Site were superficially similar to Early Archaic pits on the Heath Brook Site in Tewksbury and may be part of an occupation episode at least 6,000 to 7,000 years old. The apparent scarcity or low frequency of features clearly associated with the Middle Archaic component on the Pine Hawk Site may also be part of a larger subregional pattern (Ritchie 1995:133).

### Late Archaic Laurentian Tradition Component at the Pine Hawk Site

The Laurentian, as a concept, was first formulated and defined by William Ritchie in 1938 who regarded the Laurentian Tradition as "an extensive Archaic cultural continuum, widely spread throughout northeastern North America, with its major area of development and diffusion within southeastern Ontario, southern Quebec, northern New England, and northern New York" (W. Ritchie 1980:79). Cultural elements diagnostic of this tradition include "the gouge; adz; plummet; ground slate points and knives, including the semi-lunar form of ulu, . . . simple forms of the bannerstone; a variety of chipped-stone projectile points, mainly broad-bladed and side-notched forms; and the barbed bone point" (W. Ritchie 1980:79). In southern New England, the Laurentian Tradition is typically confined to the presence of projectile points (Vosburg, Otter Creek, and Brewerton varieties) that are rarely, if ever, associated with the other artifact types that originally defined this cultural tradition. Otter Creek, Vosburg, and Brewerton style projectile points may be more useful as horizon temporal markers for the Late Archaic Period in southern New England than indicators of the Laurentian cultural tradition (Dincauze 1975).

The small Middle Woodland sites in the Sudbury/Assabet/Concord drainage may be a direct reflection of the strong coastal orientation displayed by settlement patterns in and around the Boston basin during this period. The Middle Woodland component to the Pine Hawk Site might be representative of a small hunting expedition to the interior uplands from a coastal settlement location.

### Directions for Future Research

The data recovery program conducted at the Pine Hawk Site has made a number of lasting contributions to current knowledge about prehistory at the regional (southern New England) subregional (southern Merrimack basin) and local (Sudbury/Assabet/Concord drainage) scales. Taken together, the recorded archaeological features, suite of radiocarbon dates, Middle Archaic through Terminal Archaic and Middle Woodland period lithic assemblages and specialized analyses (petrographic and geochemical analysis of lithic materials, soil micromorphology) all contribute to a clearer understanding of Native American settlement and resource use in the section of the southern Merrimack River basin covered by the combined Sudbury/Assabet/Concord river drainage.

While a substantial amount of information was collected and analyzed, the research problems or contexts posed for the data recovery program have not been completely resolved. This includes such observed patterns as the apparent changes in the frequency and intensity of Native American occupation through the Archaic and Woodland periods on moderate to large riverine zone sites like Pine Hawk. The nature of interaction between Small Stem Point and Susquehanna tradition groups within the cultural landscape of southern New England about 4,000 to 3,200 years ago also remains as a direction for future research. The results of investigations on the Pine Hawk Site should be used as a starting point from which subsequent archaeological investigations in the area could supplement, modify or refine these contexts and others, contributing to a better understanding of pre-Contact, Native American occupation in southeastern New England.

### Archaeology in Acton

The archaeological investigations at the Pine Hawk Site represented the first professional archaeological excavation of a prehistoric site in the town of Acton. Few prehistoric sites have been recorded in Acton and the section of the Assabet River between West Concord and Maynard. The extant data base consists mostly of Native American sites along the Sudbury and upper Concord Rivers and systematic excavations by avocational or professional archaeologists have been on sites in nearby Concord, Sudbury, Wayland, Marlborough and Westborough. The town of Acton is likely to contain numerous, as yet unidentified prehistoric sites, particularly along the network of streams and wetlands that flow into the Assabet River.

Hopefully, the data recovery program for the Pine Hawk Site and the public education program developed from it can also serve as the impetus for community-based efforts to identify and preserve cultural resources in Acton. These efforts could range from an inventory of known, but unrecorded prehistoric sites and artifact collections to a townwide assessment survey of areas known or likely to contain both prehistoric and historic period archaeological resources.

## Conclusions and Recommendations

The total body of archaeological information recovered from the Pine Hawk Site during data recovery investigations was sufficient to address the research contexts and issues outlined in the research design. Following fieldwork and preliminary analysis, PAL submitted a completion memorandum to Woodard & Curran, the Town of Acton, and the MHC. It was recommended that the data recovery program had collected sufficient information to mitigate the adverse effects of proposed construction on the Pine Hawk Site and that the site be cleared so that construction of the proposed wastewater treatment facility for the Middle Fort Pond Brook Sewer project could proceed. Following review of the completion memorandum, the MHC and state archaeologist concurred with this recommendation and Woodard & Curran and the Town of Acton secured clearance to proceed with the project as planned.



## APPENDIX D

# ARCHIVAL SUPPLIES AND SUPPLIERS

Included in this appendix is a list of suppliers of archival materials and a copy of the order forms that are used at the repository. Over the past few years we have tried many different products from a variety of companies. Finally, we created a list of items that suit our needs from the companies that offer the most competitive price we have found. Although this should not be taken as an endorsement for these companies or their products, it can be a starting point for anyone trying to wade through catalogs and stay within a budget. We included those items ordered frequently as well as occasionally.

Suppliers	Products
Conservation Materials Ltd. 1165 Marietta Way P.O. Box 2884 Sparks, Nevada 89431	Acryloid B-72 HMG Adhesive, Humidity Indicator Cards, Silica Gel (blue and white), other conservation materials
Conservation Resources International 8000-H Forbes Place Springfield, VA 22151 (703/321-7730)	Plexiglas UF3, Plexiglas clear vinyl thin wall tubing, polyester and neutral pH paper enclosures (sleeves, folders, envelopes), alkaline reserve archival boxes and folders.
E.I. DuPont de Nemours & Co., Inc. Polymer Products Division 1007 Market Street Wilmington, DE 19898 (302/774-1000)	polyester sleeves and folders for prints and negatives, polyester sheets, rolls, and webbing.
Light Impressions Corp. 439 Monroe Ave. P.O. Box 940 Rochester, NY 14603 (800/828-6216: orders) (716/271-8960: inquiries)	general archival supply house (emphasis on photos)
Pohlig Bros., Inc. Century Division 2419 E. Franklin St. P.O. Box 8069 Richmond, VA 23223 (804/644-7824)	protective housing supplies: folders, boxes (acid-free and alkaline reserve)
Talas 213 West 35th Street New York, NY 10001 (212/736-7744)	general archival supply house

Taylor Made Co. P.O. Box 406 Lima, PA 19037 (215/566-7067)	Mylar protective housing (envelopes, folders)
The Hollinger Corp. P.O. Box 6185 3810 S. Four Mile Run Drive Arlington, VA 22206 (703/671-6600)	protective housing supplies: archival folders, boxes (paper and polyester), pH testing pens
University Products, Inc. P.O. Box 101 South Canal St. Holyoke, MA 01041 (800/628-1912)	general archival supply, Water Alert

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You may use the Archival Supplies Order Form to obtain supplies through SARC. It can be downloaded as a Microsoft Word 97 document, [supplies.doc](#), or as a .pdf file, [supplies.pdf](#), or a plain text document, [supplies.txt](#). If you want the .pdf file, you will need the Adobe Acrobat Reader. You can obtain it from [Adobe](#) at no charge.



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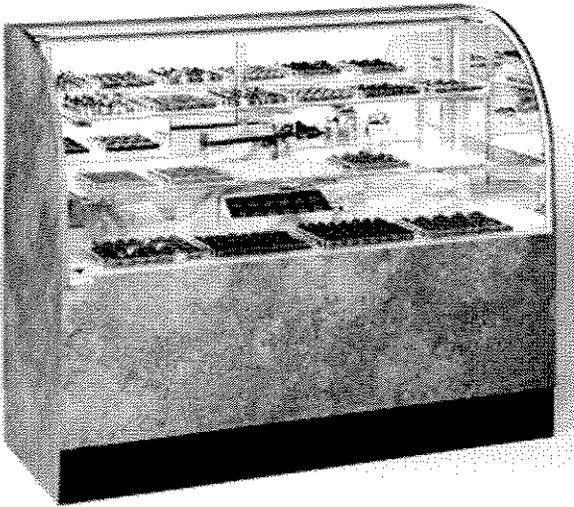
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HTML version of this document prepared by [Jim Haug](#)  
September 22, 2000



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### Curved Front Candy Display Cases



Shown with Optional non-standard Laminate Finish & Brasstone Hardware

Features & Finishes  
 Curved Front Glass  
 Anodized Aluminum Frame  
 Aluminum Frames Sliding Mirror Doors  
 Tempered Glass Shelves (1-12", 1-14")  
 Mirror Ends  
 6" Black Kick Base  
 Standard White HPL Exterior Finish  
 White HPL Deck  
 Top Light with Lamp & Shield  
 Climate Controlled Module Includes Self-Contained Condensing Unit  
 U.L. Listed  
 Cord & Plug on Climate Controlled Unit

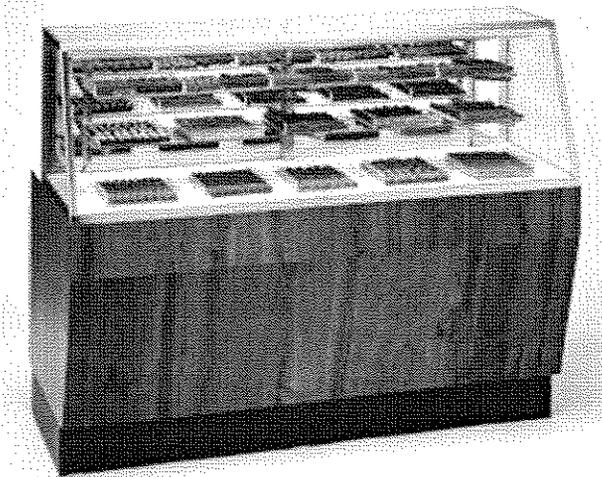
Stock Number	Description	Price Each
CPR-4C (climate controlled)	48-1/4"L x 24"D x 48"H	\$ 5,992.14
CPR-5C (climate controlled)	59-1/4"L x 24"D x 48"H	\$ 6,246.24
CPR-6C (climate controlled)	77-1/4"L x 24"D x 48"H	\$ 6,491.10
CPN-4C (non-climate controlled)	48-1/4"L x 24"D x 48"H	\$ 3,234.00
CPN-5C (non-climate controlled)	59-1/4"L x 24"D x 48"H	\$ 3,391.08
CPN-6C (non-climate controlled)	77-1/4"L x 24"D x 48"H	\$ 3,677.52
Options		
Brasstone Finish		\$ 586.74
Vented Doors (Non-Climate Controlled Units only)		\$ 161.70
Custom Color in Standard HPL Finish		By Quote
4 Year Extended Motor/Compressor Parts Warranty		\$ 129.36

# ALLEN Display

<a href="#">Home</a>	<a href="#">Store Fixtures</a>	<a href="#">Casework</a>	<a href="#">Visual Products</a>
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You are here: [Online Catalog](#) > [Bakery & Deli Cases](#) > **Prism Candy Display Cases**

## Prism Candy Display Cases



Shown with optional HPL Laminate Finish  
Standard Finish is White HPL

### Standard Features & Finishes

8" Work Ledge at rear for Packaging Products

Anodized Aluminum Frame

Tempered Glass Ends & Front & Top

Aluminum Framed Sliding Mirror Doors

Tempered Glass Shelves (1-8", 1-10")

6" Black Kick Base

Standard HPL White Exterior Finish

White HPL Deck

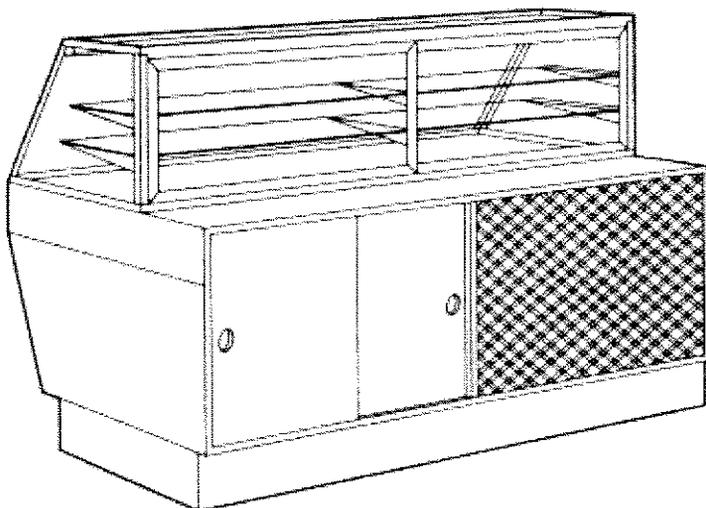
Top Light with Lamp & Shield

Refrigeration Unit:

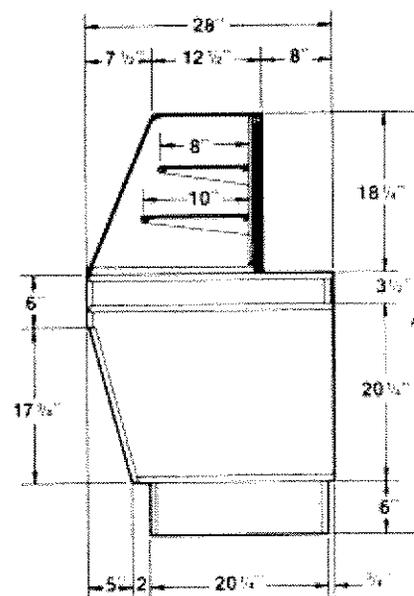
Climate Controlled Mode Includes Self-Contained  
Condensing Unit

Cord & Plug

U.L. Listed



**CPR-5 REAR VIEW**



**END SECTION VIEW  
CPR**

Stock Number	Description	Price Each
CPR-4 (climate controlled)	48"L x 28"D x 48"H	\$ 3,862.32
CPR-5 (climate controlled)	60"L x 28"D x 48"H	\$ 3,977.82
CPR-6 (climate controlled)	70"L x 28"D x 48"H	\$ 4,074.84
CPN-4 (non-climate controlled)	48"L x 28"D x 48"H	\$ 1,908.06
CPN-5 (non-climate controlled)	60"L x 28"D x 48"H	\$ 2,111.34
CPN-6 (non-climate controlled)	70"L x 28"D x 48"H	\$ 2,254.56

Options	
Brasstone Finish	\$ 600.60
Vented Doors (Non-Climate Controlled Units only)	\$ 161.70
Custom Color in Standard HPL Finish	By Quote
Mirror Ends	\$ 110.88 Pair
4 Year Extended Motor/Compressor Parts Warranty	\$ 129.36

## 6. Recent Developments

### 6.1 Control of moisture in the building envelope

Currently [i.e., in 1997], the moisture loads on building envelopes are under serious review, with a very active review of humidity loads in museum and preservation environments in particular. The review of moisture loads is part of a larger attempt to move beyond the rules-of-thumb approach to a more analytic approach, which uses better input values and tests design against well-defined criteria. The traditional analytic tool, described in *ASHRAE Fundamentals* and elsewhere, is a steady state simultaneous analysis of temperature and vapor pressure gradients through an assembly, using fixed indoor and outdoor design conditions. This is termed the 'dew-point method' in the US and the 'Glaser' method in Europe. Recent developments, recorded through the International Energy Agency (*IEA Annex 24 on Heat Air and Moisture Transport through Insulated Envelope Assemblies*), include quite sophisticated transient modeling tools. What remains missing from a modeling analysis of heat and moisture transport is appropriate input values and criteria for interpretation of the output. What are the correct input moisture loads for envelope design? What, short of waterlogging, constitutes a criterion of unacceptable building envelope performance? These questions are the focus of an upcoming effort titled *Moisture Engineering* by the Building Environment and Thermal Envelope Council (BETEC). This effort should lead to enhanced climate compatibility of various envelope designs, and an understanding of moisture storage in structures as a buffering technique for short cold spells. The success of these ambitions remains to be seen. The International Society of Indoor Air Quality (ISIAQ) is sponsoring a Task Group on Museum Environments. The aim of this group is to develop guidelines for 'preservation environments' which specifically include museum and library environments. The temperature and humidity guidelines will correlate closely with BETEC's effort to refine and formalize the moisture engineering approach.

### 6.2 Humidity levels for organic collections in museums

In 1993 Michalski, working at the Canadian Conservation Institute (CCI), published 'Relative humidity: a discussion of correct/incorrect values' — probably the most widely cited article in recent preventive conservation literature.[2] Although it presented no firm recommendations for humidity control, it provided an excellent and accessible summary of what was known, what was not known, and what could reasonably be inferred. Michalski attempted to determine the effect of repeated small variations in humidity below the critical fracture threshold would be. Here he proceeded by inference and his conclusions are not unassailable, but it seemed that at variations  $\pm 15\%RH$  around the mid-point, the majority of historic artifacts accumulated damage only very slowly and hourly variation was irrelevant for thick objects (as Buck had also noted, and Brewster had implied). Michalski also observed some pieces of antique furniture subjected to annual humidity cycling: sustained drops of  $-25\%RH$  from mid-point during the winter heating period did not cause cracking, whereas  $-40\%RH$  drops from mid point caused failure in some, but not all, pieces.

'The extension of the small fluctuation criterion to all artifacts has no merit except convenience. Drops of  $-40\%RH$  do not constitute an emergency for loose skins, fur, textiles, costumes, metals, botanical specimens, or most archival material... Leather bindings [of books] on non-acidic paper are indeed a mechanical issue, but they can only be considered low to moderately vulnerable. Brittle inks on parchment are highly vulnerable. For collections dominated by rigid organic materials (wood and paint), we must accept that data supports common sense, not magic numbers. Safe RH is a broad valley... Overall high risk begins outside the range  $25\%-75\%RH$ . Slight mechanical damage will accumulate on highly vulnerable assemblies at  $\pm 20\%RH$  but this is virtually eliminated by  $\pm 10\%RH$  in wood,  $\pm 5\%RH$  in paint.' [2: p.628]

The upper limit for Michalski's area of high risk does not depart significantly from Thomson's class 2 environment and has the same purpose in mind: the avoidance of mold growth. The difference lies in the lower limit at which Michalski was prepared to place major risk — always the main difference between European and North American specifications. Michalski also reiterated an important point — visible damage is most likely during drops in humidity, particularly if these drops are preceded by prolonged high humidity levels. Unfortunately, the significance of a drop varies according to the object. For lightly varnished furniture, with the doors and drawers kept closed, the half-time for response is the order of a week.[2: fig. 5] That is, if the humidity drops rapidly, it takes about a week for the object to reach half of its final response to the drop, about four weeks for 95% of the response. If the furniture is stuffed with clothing (natural textiles), the half-time is increased to about two months — at this point a sustained drop of a week becomes largely irrelevant, and a sustained drop of two months would produce only half of the full response. This may help to explain why furniture in use has survived so much better than furniture in many museums — when doors or drawers are left open for display purposes, when the furniture is emptied of contents, it reacts much more quickly to changes in humidity than would normally be the case.

In 1994 Erhardt and Mecklenburg published their 'Relative humidity re-examined'.[[69]] This paper, building on experimental work performed at CAL, provided a graphic introduction to the difficulty of specifying an 'optimum' relative humidity if one considers chemical decay (usually accelerates at mid to high RH) as well as mechanical damage (most noticeable at low RH).

'The RH settings most common in museums, those in the range 40-60%, minimize biological attack, mechanical damage and the efflorescence of common salt [NaCl]. It is interesting to note that these are the most visible, often the fastest, forms of damage seen in museums (other than for materials known to require separate treatment, such as corroded metals, weeping glass and mineral hydrates). It is easy to see how RH values around 50% have become so widely accepted. It is only when less obvious forms of damage are considered, such as the slow but continuous [chemical] degradation of organic materials, that lower values of humidity seem more desirable. In fact, the reduction of mechanical damage is the only major factor that would seem to argue against all but the lowest values of relative humidity, those below 25-30%RH. This conflict — mechanical versus chemical degradation, form versus content — is the main consideration in choosing a suitable RH, and one for which there is no obvious resolution.' [68, p.37]

Perhaps the most interesting part of the paper is the discussion of the possibility of calculation of allowable RH fluctuation. Erhardt and Mecklenburg proceed on the assumption that a fully restrained material represents the most vulnerable state, and then go on to calculate whether a particular variation in humidity will produce a stress which exceeds the elastic limit for the material, i.e., in their model the mechanical damage occurs when the elastic response of a material is exceeded, even though no visible damage such as cracking may have occurred. This is a rather elegant model because it allows us to deal with plastic deformation (compression shrinkage and ductile failure) at high humidities as well as mechanical failure (cracking and brittle failure) at low humidities. It is also an inherently conservative approach in that: 1) it assumes full restraint and maximum response whereas, in most composite objects, the materials will be responding in the same direction; and 2) classifies 'damage' as any excursion beyond the elastic limit. In short, this approach appears promising for arriving at a rational 'safe zone' for mechanical damage to organic materials. This method has already been pursued to the point where a number of very interesting charts have been produced, showing the safe and unsafe zones for a variety of fully restrained materials under different conditions of temperature and humidity. In particular, these diagrams clearly illustrate that the safe range of humidity fluctuation is small for organic materials acclimated to extreme high and low humidities, but considerably wider for objects acclimated at mid-range (45 to 55%RH). The dangers of moving an organic object acclimated to a high humidity to an 'ideal' mid-range humidity are referred to by many of the authors cited above, but the work at CAL gives

us a model for evaluating these dangers in detail. What is surprising is how narrow the 'zone of safety' suggested by CAL is for materials acclimated to extreme humidities (both high *and low*), and how broad in the mid-range. A detailed summary of the work at CAL work is beyond the scope of this paper: the reader is referred to their specific publications for more information.[63, 68, [70], [71], [72], [73]]

Conclusions drawn from the work at CAL are not without their critics.[[74]] In particular, attention has centered on whether the wider 'safe zone' for mid-range humidity fluctuation will allow cost savings in both the capital and running costs for mechanical control. We feel that this consideration, while certainly of great interest, is irrelevant in the context of our paper. What is important is that the data from CAL allow us to construct a coherent model of damage to composite laminar organic artifacts as a result of variations in relative humidity and temperature. The predictions of this model can be compared to the response of organic objects in the 'real world'. If necessary, such a model can be refined in the light of practical experience. But without such a model — without the understanding generated by the tension between theory and observation — it is impossible to improve our understanding of the mechanical damage to organic artifacts any further. Without such an increase in understanding we cannot meaningfully resolve such questions as whether a particular humidity and temperature (which is known to be safe for a building) is safe for an artifact.

## 7. Conclusions

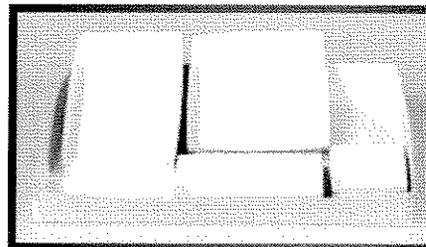
As we have shown, traditional museum humidity specifications have developed empirically as control of the indoor environment increased in sophistication during the twentieth century. It is not correct to dismiss these observations; with the benefit of hindsight we can see how they came about — the low relative humidities achieved during improved winter heating were destructive to objects which were initially acclimated to high humidity, and annually re-acclimated to high level by uncontrolled summer humidity. The humidity had to be stabilized and empirical observation showed that stabilizing humidity at levels around mid range during winter heating prevented the more obvious damage (indeed, this was the only practical option for most institutions prior to WWII). These observations were codified into a conviction of the superiority of close control around a set point of 55 or 60%RH for paintings, a conviction which was reinforced by the success of the WWII cave storage of British collections. The Thomson class 1 museum environment ( $55 \pm 5\%RH$ ) derives ultimately from the NG-L's post-WWII desire to improve indoor climate control for antique paintings on wood acclimated to high humidities — a class of material which was 'delicate' when subjected to large annual humidity variations — so that they could be displayed without glazing. We know that 50 or  $55 \pm 5\%RH$  'works', but this does not make it an 'optimum' level. It is questionable whether the notion of inherently 'delicate' organic objects (i.e. requiring control to  $\pm 5\%RH$ ) is still relevant in collections where mechanical control has prevented prolonged high or low indoor humidities and acclimated organic materials to mid-range humidities. If such objects do exist, and evidence that they do indeed, the fact remains that they are less likely to sustain further mechanical damage during humidity fluctuation at mid-point than at the same fluctuation at high or low humidities.

Despite the attention given in this article to moisture damage from elevated indoor humidities during winter heating, it must be remembered that most moisture problems in historic buildings are the result of roof leaks, damaged gutters and down spouts, poor surface drainage of rainwater, and wet basements and crawl spaces. That said, the work of Erhardt, McCormick-Goodhart, Tumosa and Mecklenburg at CAL, together with the work of Michalski and others at the CCI, suggests the following broad picture for *organic artifacts acclimated to mid range humidity*: Variation of RH of  $\pm 10\%RH$  (whether daily, weekly, monthly or yearly) about a central level between 45 and 55%RH presents a low risk of mechanical damage for almost all organic objects (including paintings and furniture); variation  $\pm 15\%RH$  about a central level is low risk for most, but not all composite organic objects; variation  $\pm 20\%RH$  about

## STORAGE TRAYS AND BOXES

### Specimen Trays

These trays are made with our patented .045 MicroChamber/Silversafe material. We have chosen this board because while the majority of the tray is composed of our pH 8.5, buffered MicroChamber paper, the inside is neutral in pH, non-buffered, white, lignin- and sulfur-free cotton paper, with a very strong, abrasion-resistant surface. Since we do not know what specimen may finally be stored in these trays, we feel most comfortable offering a non-buffered interior environment. Certain collections, including protein-based artifacts, are safest when stored in a neutral environment; and buffered paper can cause metal artifacts to corrode due to the salts formed when alkaline buffers neutralize acids. They fit neatly in standard specimen cabinet drawers measuring 29.625 x 23.25 x 1.875".

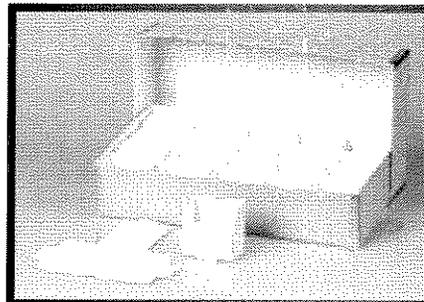


ITEM #	DESCRIPTION	10(MIN)	100	500
SPT-23-MS	2.925 x 3.625 x 1	\$2.10 ea	1.81	1.57
SPT-35-MS	3.625 x 5.85 x 1	\$2.20 ea	1.91	1.62
SPT-57-MS	5.85 x 7.25 x 1	\$2.41 ea	2.10	1.86
SPT-46-MS	4.6 x 9.5 x 2	\$3.60 ea	3.09	2.64
SPT-711-MS	7.25 x 11.7 x 1.5	\$3.60 ea	3.09	2.64
SPT-1114-MS	11.7 x 14.5 x 1.5	\$4.27 ea	3.73	3.36
SPT-529-MS	5.85 x 29 x 1	\$6.09 ea	5.20	4.89

### Artifact Storage Boxes

These storage boxes are a useful item for any natural history collection. Twenty small, neutral pH, non-buffered containers stored within a larger, 2-piece MicroChamber/Silversafe box are ideal for storing small items such as teeth, bone fragments, small shells, rocks ... the list goes on. The inner boxes measure 2 x 2 x 1½", the outer carton 11¼ x 6¼ x 2½". Extra trays may be purchased separately.

ITEM #	DESCRIPTION	2 (MIN)	5	10	20	100
1162-MCS	Slide Box	\$9.50 ea	8.60	7.60	7.25	6.95
1162-MCS-T	Extra Trays	\$0.50 ea	0.35	0.30	0.25	0.20



### Partition Trays

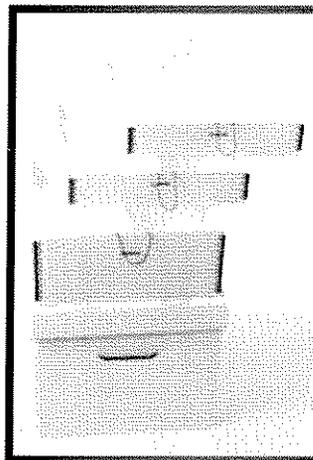
These trays have compartments to hold artifacts, and will slide neatly into standard cubic foot boxes (also called record storage boxes) for safe, secure storage. They are made from our Lig-Free Type II material, and feature a non-buffered, neutral pH, lignin- and sulfur-free surface. Select trays with 4, 6, or 15 separate compartments. These sturdy trays have metal corners for superior rigidity and nylon pull strings for smooth, effortless removal. Two large, four-compartment trays will fit in each box, while four of either the six- or fifteen-compartment trays will fit. You can mix and match, paying attention to the depth of the trays you need.

ITEM #	DESCRIPTION	2	10	25	50	100	500
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#### Boxes

#### 15 x 12½ x 10

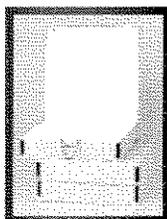
151210LF	Lig-free I	\$ 8.50 ea	7.05	6.45	6.35	6.15	5.95
151210MC	MicroChamber	\$10.50 ea	8.95	8.50	8.25	6.95	6.55



(continued on next page)

## Partition Trays *(continued from previous page)*

ITEM #	DESCRIPTION	1	4	10
<b>Trays</b>				
<b>15 compartment trays, 2 1/4 x 3 1/4 x 2 1/4</b>				
RSB-TR15	Lig-free II	\$ 7.95 ea	6.95	6.75
RSB-TR15MC	MicroChamber	\$ 9.20 ea	8.10	7.75
<b>6 compartment trays, 4 1/4 x 5 1/4 x 2 1/4</b>				
RSB-TR6	Lig-free II	\$ 7.95 ea	6.95	6.75
RSB-TR6MC	MicroChamber	\$ 9.20 ea	8.10	7.75
<b>4 compartment trays, 7 1/4 x 5 1/4 x 5</b>				
RSB-TR4	Lig-free II	\$10.95 ea	9.20	8.95
RSB-TR4MC	MicroChamber	\$12.60 ea	10.60	10.30



## Tops for Partition Trays

When one tray is enough, or when space does not allow the partition trays to be stored in large cubic foot boxes, you may elect to use these tops. Each is 2 1/2" deep and will fit any of the partition trays. As with the trays themselves, tops are available in both Lig-free II corrugated and MicroChamber corrugated board.

ITEM #	DESCRIPTION	1	4	10
RSB-TRT	Lig-free II	\$4.25 ea	3.75	3.50
RSB-TRT-MC	MicroChamber	\$5.10 ea	4.60	4.35

## Divided Specimen Trays

These are oversize, fold-up self-locking trays made entirely of acid-free, lignin-free, buffered corrugated board. They use neither glue nor metal corners. These trays can accommodate three dividers in either dimension. Choose dividers for either the "short" or the "long" dimension with your order. Quantities may be combined for price breaks.

ITEM #	DESCRIPTION	5 (MIN)	25	50
<b>14 x 22 x 2, long dividers</b>				
I4222-LD	Lig-free II	\$6.00 ea	5.25	4.95
I4222-LDMC	MicroChamber	\$7.00 ea	6.50	6.20
<b>14 x 22 x 2, short dividers</b>				
I4222-SD	Lig-free II	\$6.00 ea	5.25	4.95
I4222-SDMC	MicroChamber	\$7.00 ea	6.50	6.20

## Cards, Covers, Folders, and Envelopes

Conservation Resources offers these items in your choice of four papers:

Our **.010 Lig Free I paper** is buffered with 3% CaCO<sub>3</sub> to protect against acid damage. It maintains a pH of 8.5 and is a rich tan color with a smooth surface. It provides exceptional strength, with a folding endurance of over 1000 folds at 1 kg. in the weakest direction.

Our **.010 non-buffered paper** is lignin- and acid-free, but has a neutral pH and does not have a calcium carbonate reserve. For collections which are sensitive to higher levels, this paper has a pH of 7. Folding strength equal to the Lig-Free I paper described above.

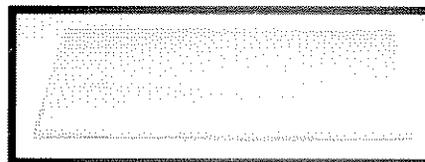
Our **.012 and .024 MicroChamber papers** offer the advantages of the best quality lignin-free, buffered papers, have a 3% calcium carbonate reserve, and outstanding strength characteristics. Additionally, patented MicroChamber papers contain our SPZ zeolite, which offers protection against harmful molecules, whether by-products of deterioration of the specimen itself, or airborne pollutants, which by-pass the calcium carbonate. It is important to note that unlike alkaline buffers, these zeolites are not reactive; they simply

lock harmful molecules in miniature crystalline cages. Furthermore, it is important to recognize that these are hydrophobic zeolites; they will not absorb water, and they are also acid-resistant. These features allow them to remain active long after the benefits of traditional alkaline buffers have been exhausted. For example, in tests MicroChamber papers have been proven to provide 170 times as much protection against acids as ordinary buffered conservation papers. We feel that the physical composition of the paper makes it the best choice for the long-term protection and preservation of collections.

Our **.012 MicroChamber/ Silversafe paper** was developed so the advantages of MicroChamber technology could be combined with neutral pH, non-buffered cotton Silversafe paper, and offered in archival file folders, map and print folders. The tan MicroChamber paper is faced with surface of white cotton Silversafe paper.

## Specimen Mounting Cards

Our specimen mounting cards are available in several papers, including .012 and .024 MicroChamber (buffered, with alkaline reserve and our proprietary SPZ zeolite) and .010 non-buffered folder stocks. Sheets are 11½" x 16½". For protection during handling and to allow safer viewing, we offer archival polyester envelopes into which mounted specimens may be inserted. Cards are sold in units of 100 sheets.



ITEM #	DESCRIPTION	PRICE
SMC-NB010	.010 Non-buffered	\$19.75/C
SMC-MC012	.012 MicroChamber	\$37.75/C
SMC-MCS012	.012 MicroChamber/Silversafe	\$37.75/C
SMC-MC020	.024 MicroChamber	\$65.50/C

## Genus Covers

Offered in .010 Lig-free Type I paper, .010 non-buffered paper, .012 MicroChamber paper, and .012 MicroChamber/Silversafe paper, our genus covers offer durability and proper paper chemistry to ensure that your specimens are protected for years to come. Single or double scored as indicated from an original sheet size of 16½" x 24", in three styles: without depth (single score), with two scores ½" apart, and with 2 scores 1" apart.



**...fold to a finished size of 16½" x 12" with no spine**

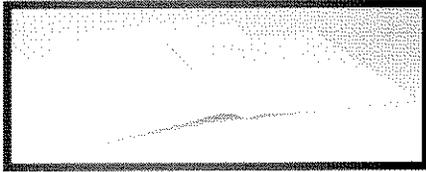
ITEM#	DESCRIPTION	50	100	250	500
GCLF-1	.010 Lig-free I	\$0.66	0.64	0.62	0.59
GCNB-1	.010 Non-buffered	\$0.66	0.64	0.62	0.59
GCMC-1	.012 MicroChamber	\$1.05	0.99	0.97	0.95
GCMCS-1	.012 MicroChamber/Silv.	\$1.05	0.99	0.97	0.95

**...as above, with double scores to produce a ½" spine (shipped flat)**

ITEM#	DESCRIPTION	50	100	250	500
GCLF-2	.010 Lig-free I	\$0.69	0.67	0.64	0.60
GCNB-2	.010 Non-buffered	\$0.69	0.67	0.64	0.60
GCMC-2	.012 MicroChamber	\$1.07	1.03	0.99	0.97
GCMCS-2	.012 MicroChamber/Silv.	\$1.07	1.03	0.99	0.97

**...as described above, with double scores to produce a 1" spine (shipped flat)**

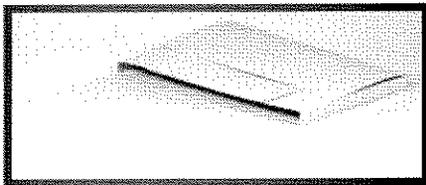
ITEM#	DESCRIPTION	50	100	250	500
GCLF-3	.010 Lig-free I	\$0.69	0.67	0.64	0.60
GCNB-3	.010 Non-buffered	\$0.69	0.67	0.64	0.60
GCMC-3	.012 MicroChamber	\$1.07	1.03	0.99	0.97
GCMCS-3	.012 MicroChamber/Silv.	\$1.07	1.03	0.99	0.97



## Bi-fold Genus Covers

These covers may afford better protection by virtue of their design. They have two flaps which fold in, and have 2 score lines spaced 1" apart on each side. The advantage to your collection comes from the added protection offered to mounted specimens. They are offered in all four of the papers described above. Large sheets, 17" x 34.5" will fold to a finished 17" x 12". (California type)

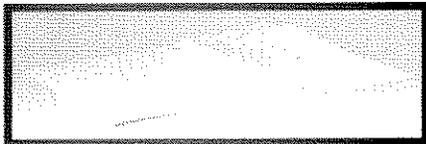
ITEM #	DESCRIPTION	50	100	250	500
GCLF-4	.010 Lig-free I	\$1.05	0.99	0.95	0.89
GCNB-4	.010 Non-buffered	\$1.05	0.99	0.95	0.89
GCMC-4	.012 MicroChamber	\$1.75	1.70	1.65	1.60
GCMCS-4	.012 MicroChamber/Silv.	\$1.75	1.70	1.65	1.60



## Palm Folders

These four-flap folders feature a 17" x 12" center block for specimen placement with flaps on each of the four sides. These flaps are scored twice at 1/2" intervals to accommodate a selected degree of depth, or to increase the size of the center section. Available in the papers described above.

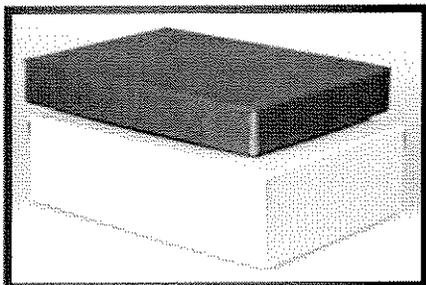
ITEM #	DESCRIPTION	50	100	250	500
GCLF-5	.010 Lig-free I	\$1.50	1.35	1.30	1.25
GCNB-5	.010 Non-buffered	\$1.50	1.35	1.30	1.25
GCMC-5	.012 MicroChamber	\$1.95	1.90	1.85	1.80
GCMCS-5	.012 MicroChamber/Silv.	\$1.95	1.90	1.85	1.80



## Species Folders

Species folders are offered in a lightweight paper which is traditionally used to make storage envelopes. These are available in neutral pH, non-buffered .006 paper, .007 MicroChamber paper, and .008 MicroChamber/Silversafe paper. Folders measure 16 1/2" x 11 1/2".

ITEM #	PAPER	100	250	500	1000
GCLF-5	.006 Non-buffered	\$0.45	0.42	0.38	0.35
GCMC-5	.007 MicroChamber	\$0.53	0.50	0.48	0.45
GCMCS-5	.008 MicroChamber/Silversafe	\$0.53	0.50	0.48	0.45



## Archival Storage Boxes for Folders

The inside dimensions of our herbarium storage boxes are 12 1/4" x 17 1/4". These boxes are available in two depths, 2 1/2" and 5". They are offered in three acid-free boxboards: our traditional acid-free grey/white board, our .060 lignin- and sulfur-free Lig-free Type I, and our patented MicroChamber board. Board samples are available upon request; we often find that actually seeing and handling the papers makes selecting a board a bit easier.

ITEM #	DESCRIPTION	3 (MIN)	25
<b>12 1/4 x 17 1/4 x 2 1/2</b>			
17122-GW	Grey/white	\$5.50 ea	\$5.35
17122-LF	Lig-free I	\$6.55 ea	\$6.43
17122-MC	MicroChamber	\$7.03 ea	\$6.90
<b>12 1/4 x 17 1/4 x 5</b>			
17125-GW	Grey/white	\$5.50 ea	\$5.35
17125-LF	Lig-free I	\$6.55 ea	\$6.43
17125-MC	MicroChamber	\$7.03 ea	\$6.90

## POLYESTER ENVELOPES AND POLYETHYLENE BAGS

### Polyester Envelopes

#### ...with flaps to hold mounting cards

These envelopes are designed to hold the mounting cards listed above, allowing safer viewing and handling of specimens. They are made with .003" archival polyester and have a 1" flap on the long side to facilitate insertion of mounted artifacts. The finished size is 12" x 17". These envelopes are sold in a minimum of 25.

ITEM #	DESCRIPTION	25	50	100	250
MY-HE-1217	Mounting Card Envelope	\$1.75 ea	1.70	1.65	1.63

#### ...for general purpose use

These .003" archival polyester envelopes are handy for cards, clippings, documents, and a variety of other things. These are open on one long side unless a short side is specifically requested. They will hold material up to the size indicated; the actual external size of the envelope is slightly larger.

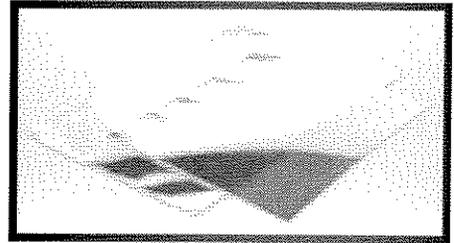
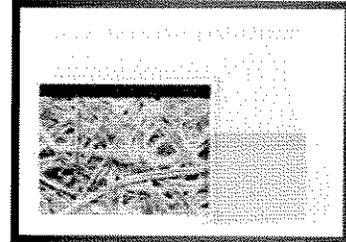
ITEM #	DESCRIPTION	25 (MIN)	50	100	250
MY-GPE-58	5½ x 8½	\$0.77 ea	.73	.64	.61
MY-GPE-69	6 x 9½	\$0.86 ea	.77	.67	.65
MY-GPE-710	7½ x 10½	\$0.95 ea	.85	.78	.76
MY-GPE-810	8 x 10½	\$0.98 ea	.87	.81	.79
MY-GPE-LT	8½ x 11	\$1.03 ea	.91	.80	.77
MY-GPE-LG	8½ x 14	\$1.13 ea	1.01	.88	.84

#### ...for fragments and small specimens

Offered in two styles, a small size open on one short end with a 1" tab and a slightly larger one with ½" tab. These envelopes are manufactured using crystal clear .003" archival polyester. The dimensions shown are the maximum size of the material which will fit inside; external dimensions will be slightly greater.

ITEM #	DESCRIPTION	25	50	100	250
MY-SPE35	3½ x 5½ with ½" tab	\$0.58 ea	0.56	0.53	0.51
MY-SPE34	3½ x 4½ with 1" tab	\$0.55 ea	0.54	0.52	0.50

Additional sizes of polyester enclosures, as well as sheets and rolls, are listed in our Polyester Products section on page 67.



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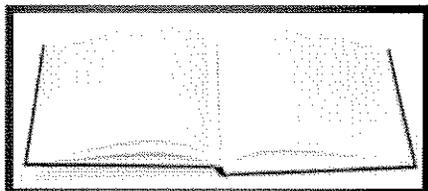
## Polyethylene Zipper Bags

4 mil "Zip-Pak" zipper bags feature uniform thickness and side seam welds with a reinforced "zip" strip. They may be used to store archaeological fragments, pamphlets, books needing binding repairs, or a host of other objects in the museum, library, field, or laboratory. Sturdy polyethylene is water resistant. The bags are sold in packages of 100 of a size.

ITEM #	DESCRIPTION	1 PKG.	4	10+
BG-4-23	4 mil polyethylene zipper bag, 2 x 3	\$ 6.75	6.00	5.25
BG-4-46	4 mil polyethylene zipper bag, 4 x 6	\$10.75	10.00	9.25
BG-4-57	4 mil polyethylene zipper bag, 5 x 7	\$12.00	11.45	10.75
BG-4-68	4 mil polyethylene zipper bag, 6 x 8	\$16.00	15.45	14.85
BG-4-912	4 mil polyethylene zipper bag, 9 x 12	\$25.00	24.25	23.40
BG-4-1215	4 mil polyethylene zipper bag, 12 x 15	\$38.00	37.00	36.00
BG-4-1318	4 mil polyethylene zipper bag, 13 x 18	\$66.00	64.00	63.00

## IDENTIFICATION SUPPLIES

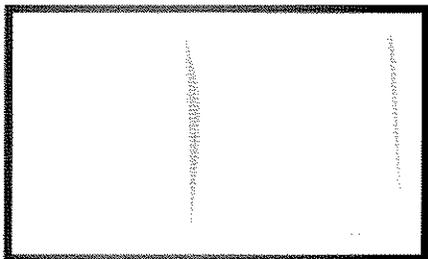
### Accession Registers



Modeled after those used by a major government agency, these accession ledgers have 80 pages and are manufactured from our own archival materials—alpha cellulose text pages and lignin-free MicroChamber binders board, and bound in dark green library buckram. Seven columns permit entry of information including catalog number, acquisition date, accession number, description, and other pertinent accession information.

ITEM #	DESCRIPTION	PRICE
AC-REG	Accession Register	\$85.00

### Tyvek Tags and Sheets



Durable and weather-resistant, Tyvek products from Conservation Resources are ideal for use with natural history collections. Our tags are 1 $\frac{1}{8}$ " x 3", and are offered with or without a hole for a string (not included). These tags are available in units of 100. The sheets measure a convenient 11 $\frac{1}{4}$ " x 16 $\frac{1}{2}$ ", and can be cut to your specific needs. Sheets are also sold in packages of 100 sheets.

ITEM #	DESCRIPTION	1 PKG.	5 PKG.	10 PKG.
TYT-P	Tyvek tags, no hole	\$15.00	11.50	9.50
TYT-H	Tyvek tags, hole	\$15.00	11.50	9.50
TY-A3	Tyvek sheets	\$72.00	68.00	65.00

## MOUNTING, CUSHIONING, AND PROTECTIVE MATERIALS

### Ethafoam

Ethafoam is a strong, resilient, medium-density, closed-cell, white polyethylene foam which is acceptable for use in the preservation of historic objects. Sold in planks 2" and 4" thick, it is an ideal material to use to cushion and protect fragile items. Ethafoam is easy to cut into the appropriate shape for particular purposes, including displaying items, creating cushioned housings, or for protection during transportation.

ITEM #	DESCRIPTION	2 SHEETS	6	12
940-12242	Ethafoam, white, 12 x 24 x 2"	\$ 6.75 ea	5.80	5.50
940-12244	Ethafoam, white, 12 x 24 x 4"	\$10.25 ea	9.75	9.00

### Volara

Light-weight white Volara polyethylene foam is the perfect choice for adding an extra layer of protection to storage boxes, drawers, or display cases. It has a non-abrasive white surface with a pleasant appearance, and also features low water absorption and good resistance to most chemicals. You will find it easy to cut using scissors or a knife. Volara is available in 1/8" and 1/4" thicknesses, with a density of 2 pounds per cubic foot.

ITEM #	DESCRIPTION	PRICE
940-6025-8	Volara foam roll, 60" wide x 25' long x 1/8" thick	\$45.00
940-6025-4	Volara foam roll, 60" wide x 25' long x 1/4" thick	\$90.00

### Artcare Foamboard

Artcare Archival Foamboard and Alphasag Artcare Foamboard were created especially for framing but have proven useful in a variety of other storage and exhibition endeavors as well. With the use of MicroChamber Technology, these boards outperform all other acid-free foamboards, removing any possible off-gassing from itself as well as atmospheric pollutants or by-products of deterioration. They are lightweight, cut easily, and have smooth mounting surfaces. The Alphasag Artcare Foamboard has the added distinction of being the only foamboard in the industry to feature cotton surfaces. Both boards are available in two thicknesses in a variety of sizes. It is sold only in full cartons.

#### Artcare Archival Foamboard

ITEM #	SIZE	1 CARTON	4+
<b>White, 1/8" thick, 25 sheets per carton</b>			
AC2436.2	24 x 36	\$117.50	105.00
AC3240.2	32 x 40	\$173.75	150.00
AC060.2	40 x 60	\$302.50	278.75
<b>White, 1/4" thick, 25 sheets per carton</b>			
AC2436.3	24 x 36	\$117.50	105.00
AC3240.3	32 x 40	\$173.75	150.00
AC4060.3	40 x 60	\$302.50	278.75
AC4896.3	48 x 96	\$562.50	530.00

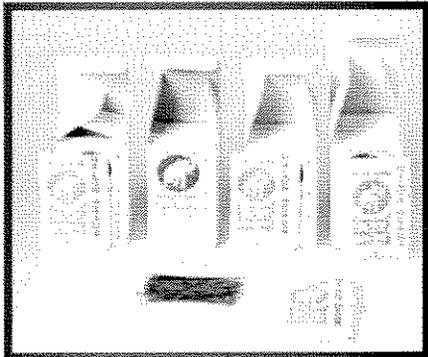
(continued on next page)

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## Artcare Foamboard *(continued from previous page)*

### Alpharag Artcare Foamboard (100% cotton surface)

ITEM #	SIZE	1 CARTON	4+
<b>White, 1/8" thick, 25 sheets per carton</b>			
AR3240.2	32 x 40	\$198.75	177.50
AR4060.2	40 x 60	\$373.75	332.50
<b>White, 3/16" thick, 25 sheets per carton</b>			
AR3240.3	32 x 40	\$198.75	177.50
AR4060.3	40 x 60	\$373.75	332.50



## Specimen Pins

These pins are made in Europe with points ground at an angle to prevent fish-hooking specimens. They offer securely attached nylon heads and a hard black lacquer finish to prevent rusting. Measuring 37mm in length, pins are available in six sizes, in boxes of 100.

ITEM #	DESCRIPTION	PRICE
924-1207-000	Size 000 pin	\$10.50
924-1207-00	Size 00 pin	\$10.50
924-1202-0	Size 0 pin	\$10.50
924-1202-1	Size 1 pin	\$10.50
924-1202-2	Size 2 pin	\$10.50
924-1202-3	Size 3 pin	\$10.50

### ADDITIONAL REFERENCES

FOR PENS AND INK, KNIVES AND SCALPELS, CONSOLIDANTS AND ADHESIVES AND OTHER CHEMICALS WHICH MAY BE USED WITH NATURAL HISTORY COLLECTIONS, PLEASE REFER TO THE CONSERVATION EQUIPMENT AND SUPPLIES PRODUCT SECTION ON PAGE 93. SHEETS OF PAPER AND BOARD ARE LOCATED UNDER "TISSUE, PAPER, AND BOARD" ON PAGE 81. SEVERAL VOLUMES REGARDING CARING FOR NATURAL HISTORY COLLECTIONS ARE LOCATED IN OUR BOOKS AREA.

CELEBRATING OUR 25TH ANNIVERSARY