Historic American Landscapes Survey
Guidelines for Drawings

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GUIDELINES FOR DRAWINGS APPENDIX A - Computer Aided Drafting and Design Recordation (CADD)

Introduction

This manual defines the standards of the National Park Service (NPS) Historic American Landscapes Survey (HALS) program. It is intended to be a comprehensive guide for generating existing conditions graphic documentation for both natural and human-impacted landscapes. Recorders wishing to submit their documentation to the HALS program for transmittal to the Library of Congress are required to follow these procedures. Recording teams are encouraged to read through the entire Guidelines for Drawings section before embarking on recordation to fully understand the methodology and to plan for the final drawing package.

HALS Guidelines for Drawings have evolved from well-established principles and methodologies set forth by HABS (Historic American Buildings Survey) and HAER (Historic American Engineering Record). HALS Guidelines for Drawings rely heavily upon this methodology but are adapted to meet the specific practices of landscape documentation. Section 6.0 of HABS Measured Drawings Guidelines explains the process of site documentation. However, the HABS Section 6.0 guidelines are inadequate for completing a comprehensive documentary study of a historically significant landscape. The section on landscape documentation within the HABS Guidelines touches on essential pieces of the documentation process; however, details needed to complete a more comprehensive broad-based documentation are omitted.

HALS recordation is intended to convey conditions at the time of documentation, including the accretions, alterations, and deletions that have occurred on the original site. HALS projects may focus attention on under-appreciated resources and establish their historic significance. Documentation can provide solid rationales for planning and funding of landscape preservation projects. Potentially, HALS records may aid in preparing future National Register nominations and Cultural Landscape Reports (CLR), or in the preservation, treatment, and interpretation of a landscape. HALS documentation may also be associated with mitigation processes that take place before a site is severely altered, disturbed, or destroyed.

A typical team for a HALS documentation project may consist of volunteers, paid project staff, landscape professionals, and/or NPS employees. A recordation project may be administered by the NPS HALS program and run twelve weeks during a summer, employing several students per recording team, depending on a sites complexity and available funding. Alternatively, recordation teams may consist of landscape professionals, garden club members, and/or other volunteer groups. Landscape architects and other professionals may develop HALS documentation plans for a historically significant landscape as a component of project work for the property owner or steward. In addition interested individuals and educational and volunteer groups, such as chapters of the American Society of Landscape Architects (ASLA), university classes, garden clubs and friends groups, may form a HALS recordation team. All HALS recordation efforts will contribute to the preservation of information and posterity of unique landscape resources by creating detailed, archival quality record documents. No matter who the team consists of, or how the HALS project is managed, these guidelines are to be followed for the recordation process.

Drawings produced by recordation teams should complement the history and photographic recordation of a site. A multi-disciplinary team comprised of several members might record a landscape or a single individual may complete the entire

documentation package, more typical for a Level I project. The complexity of the team will likely reflect the historic significance and size of the landscape and the level of documentation desired. These guidelines will discuss decisions on what aspects of a landscape to record and how to draw them, the types of drawings to use, how to obtain the measurements, the levels of accuracy required, and the appropriate scales for the drawings.

1.0 Role of the Recorder

1.1 Team Work

It is important for recordation teams (historians, landscape architects and photographers, et. al) to work closely during the documentation process. Working as a team is critical to understanding the scope and complexity of a landscape. If teams are working on a large site, time may be best utilized if members divide the site or important site features into manageable parts for individuals to record. Team members can be organized into groups to record separate parts of a landscape, and recordation from the individual groups can be synthesized at a later time. Individual team members may bring areas of expertise to the recordation process. These skills should be identified and utilized from the onset of the project. It is important that team members are systematic in their recordation methodology so field notes and field photography are easy to coalesce at the end of the landscape recordation process.

1.2 Identification and Recordation

Once the decision to produce drawings and maps of a historic landscape has been reached, the type of information essential in the finished drawings must be considered. The size of the site, the scope of the study, and the level of recordation desired will dictate the answers to the following questions.

1) What drawings will best explain and illustrate the significant features of the site?
2) What level of detail is required in the finished drawing? This will determine the scale of the drawing.
3) How many dimensions and annotations are necessary?
4) What level of accuracy is needed in the measurements? Dimensions to the nearest inch are adequate for site plans but inadequate for details, where measurements to the nearest 1/16 or 1/8 are required.
5) What sheet size should be used?

Measured drawings and maps require varying levels of detail depending on their ultimate use. Drawings that are intended to provide the basis for landscape restoration will require extensive dimensions and annotations to record the necessary historical and conditional information, while drawings intended for maintenance purposes may require little more than material or plant indications and dimensions for calculating gross areas requiring treatment. Measured drawings produced as mitigation may be the last recordation of a landscape slated for demolition or alteration, making recordation of a sites entire salient features important for future generations.

Recordation teams, especially those with limited resources or time, must decide what landscape features are the most important to document. What are the defining features of this landscape? What makes it distinct from other landscapes? What are its most significant features? Once these decisions are made, recorders must determine the best medium for capturing such features. A detailed section may be best for documenting topographic changes in a garden while a regional hydrology map may be best suited for explaining the watershed of a site. Measured drawings and maps document a range of site characteristics, from broad landscape systems to individual site features or materials.

After the decisions have been made about the level of recordation, the type and quantity of drawings and maps to be made, as well as level of detail, scales, accuracy and sheet layout, the fieldwork can begin.

1.3 Importance of Documentation Package

The entire drawing and map package produced by a HALS team should attempt to accurately communicate the experience of the particular landscape. While written documentation and photography exists to supplement the drawing package, verbally and visually telling the story of a site, graphics should also express nuances of the site. Documentation must be prepared accurately from reliable sources using primary source research as often as possible. The documentation package should be graphically, textually, and contextually consistent.

1.4 Graphic Documentation Cost and Efficiency

Drawings and maps are often the most expensive forms of landscape documentation because of the length of time they take to produce. More team members may be required for completing drawings than for narrative or photography recordation efforts. Sometimes the person or team at the site is not the same person producing the final drawings, hence it is critical that field notes are clear for ease of understanding and ultimately accuracy.

2.0 Survey Process

2.1 Planning

The types of surveying techniques used for a project will depend on the type of resource to be assessed and the access allowed to the resource. Before a site survey commences recorders must determine the scope of the project. What does the selected level of documentation entail? An initial overview or reconnaissance survey of the site to be surveyed is recommended during the planning process. Large sites or neighborhoods may require a pedestrian or windshield survey in which research teams make an initial assessment of significant features or site elements. Sites with hundreds of acres may require consultation of aerial photos or a survey by air, if available. Initial surveys of large sites may be best viewed from vantage points such as overlooks, towers, tall structures or high points.

Determining access is an important part of the planning process. Will recorders have access to private property? Are any areas of the site restricted by ownership, overgrowth, or unsafe conditions? How will such areas be assessed from outside vantage points?

2.1.1 Determining Scope

Recordation teams should have determined level of documentation by this point in the process. The next step is to determine the scope of research. What does the selected level of documentation entail? Will survey teams be creating a detailed site plan? What elements of the site are most critical to capture. Teams should list priorities for recordation and determine a schedule for carrying out survey tasks.

2.1.2 Considering the Relative Significance of the Site

Recordation teams should start to consider the relative significance of a site during the planning process. The significance of the site will lend clues as to priority areas for survey. What type of landscape(s) is the team surveying? What are the key elements that make this site significant? List these priorities as clues for later survey. The type of landscape may help recordation teams determine what elements are most significant on a site.

2.1.3 Physical Condition

What is the physical condition of the site? Is it overgrown, managed or maintained? An overgrown site is not necessarily less intact than a managed or maintained site. In fact, valuable features may have been removed or adapted over time in sites that are currently occupied and maintained. Non-maintained sites may have entire landscape elements intact.

2.1.4 Integrity

Typically, site integrity involves the following elements: location, design, setting, materials, workmanship, feeling, and association. The following National Register Bulletins may be helpful in assessing site integrity: NR Bulletin Numbers 18, 30, 38, and 40.

2.1.5 Budgeting Time

Once an initial assessment of the site has been made, teams should be prepared to schedule the recordation process. Time should be allotted for research/inventory, physical recordation, and drawing of final products. At least one-third of the project time should be allotted to the final drawing stage of the project. A checklist of tasks to be completed should be created after the reconnaissance survey. General time frames for completing these tasks should be allotted to each area of recordation.

2.2 Inventory

An initial inventory of available resources is an essential part of the planning process for recordation teams.

2.2.1 Locate Existing Resources & Records

The following is a list of potential sources for existing resources and records associated with a site. The list is by no means definitive, but it may give researchers clues for more extensive contributions to the planning process:

- o Historians
- o Photographers
- o City/County/State/Federal/Private Repositories/Libraries/Collections
- o State Historic Preservation Offices
- o Planning/Zoning Agencies
- o Natural Resource Conservation Service
- o USGS Quadrangle Maps
- o Web Based Resources
- o Digital Ortho Quarter Quadrangle Maps
- o LandSat Land Use/Land Cover Data
- o Geo-Rectified and Geo-Referenced Aerial Photography
- o Utility Companies
- o Private Owner Records
- o Historical Societies
- o Other Local Contacts

2.2.2 Preparing Appropriate Field Notes

Field notes are an essential part of the recordation process. This data becomes part of the final submission to the Library of Congress. Thus, it is important that notes be completed in an orderly and legible manner. o. 2 pencils for archival stability.

Recording teams should use No. 2 pencils for archival stability on 17 x 22 sheets of graph paper folded into fourths of 8.5 x 11 and only use one side of the sheet.

Field forms and sketches will become the basis for all measured drawings and maps produced for the site, so it is imperative that these forms be consistent. They must be carefully annotated and neatly labeled so that others can understand the information. Hasty or illegible fieldwork invariably includes errors and omissions that cause repeated trips to the site or flaws in the final drawings.

Field records may consist of copies of original drawings annotated to include later alterations or omissions, dimensioned sketches, photographs, etc. Sketches and measurements made in the field are recorded on graph paper and organized into a final field notebook to be filed as part of the field records. Field records are considered informal documentation because they are not rigorously archival (although archival materials and processes are used) and are not easily reproducible. Field records are transmitted to the Library of Congress along with other completed documentation. All HALS records are intended for reproduction by the Library of Congress. Although field records are not intended for quality reproduction, it is intended that they be used to supplement the formal documentation.

2.2.2.1 Format

(each sheet to contain the following in a consistent location on the sheet:)

- o Site Name and Location
- o HALS Number (if known)
- o Specific View/Feature (site plan, detailed elevation, etc.)
- o Name(s) of Field Recorder(s)
- o Date
- o Organization
- o North Arrow (if applicable)
- o Scale (if applicable)

2.2.2.2 Content

Field notes are the media for recording the measurable and immeasurable qualities of a site. Considering the final product will help to determine the best approach to capture the site through field notes. Included might be field drawings that will be transformed to final drawings, sketches that will be developed from photos, and recommendations on appropriate ways to document various aspects of the landscape. Measurements are a key to understanding a site, its components and the relationships between those elements. Measurements should be systematically recorded in field notes.

Information that may be recorded more efficiently through the use of field photography or collection should be gathered at the same time that field notes are recorded.

Plant materials, which cannot be identified in the field without further resources, should be accurately sketched and described in the field notes for later identification.

All construction materials on site should be accurately described for later transcription onto drawings.

2.2.2.3 Nomenclature

Many features of a cultural landscape may have been called various names at different times in a sites history. As an example a garden shelter today may have been a tea house in the past. It is important from the outset of a project that all involved in the documentation process use the same name consistently. While the history might discuss the various names a site feature has been known as or by, it will be important that the names used on the graphic documents are tied to the narrative form. The historical narrative as well as the photography should utilize the same terminology when describing a site feature.

2.2.3 Understanding Chronology/Evolution of the Site

During the recordation process, it is important that the recordation team stay in communication with members of the team who are writing the site narrative (although the team may be accomplishing all tasks or one person may be doing the entire recordation and documentation project). As the site history develops, the chronology and evolution of the site will become more apparent. Recorders and historians can work together to unearth clues about the site.

2.2.4 Site Limitations

Site limitations may include scale, time of year, time of day, eye of the beholder, level of historic documentation, existing conditions of site, overgrown vegetation, and limited access. These limitations should be noted in the field notes.

2.3 Field Survey

2.3.1 Initial Site Evaluation

If a reconnaissance visit is feasible, a preliminary assessment can be made of the site and an approach to its documentation planned prior to the recordation visit. There will also be situations when a single visit is all the recorder will be afforded. In either case, it will be important to read the landscape during that first visit and determine the most efficient way to describe the landscape through graphic means. The intent will be to capture the essence of the landscape through the drawings. The recorder might first consider the character-defining features of the landscape and insure that these elements are conveyed first in the mapping.

2.3.2 Field Photography

This section is intended for field photography that will supplement the drawing portion of HALS documentation. See Guidelines for Photography for more extensive photo documentation.

2.3.2.1 Methodology

Like field notes, field photographs are data storage media. In addition to verifying dimensional data, they capture in minute detail the actual on-site appearance of site features. Most efficient fieldwork will require a balance between dimensioned sketches/field notes and thoughtfully taken field

photographs. The relative significance of each object and features documented should guide reliance on either tool. The applications for field photographs are numerous. Aside from general survey photography at the site, photographs capture data about colors, materials, textures, form, massing, opacity, condition of plant materials or structures far more quickly and concisely than could ever be done by sketching and measuring. At the drawing board or computer, they can be used to double-check field notes without going back to the site.

Recordation time is at a premium, so photographing secondary contextual details needed for documentation can save recorders much time over hand-recording them. One can reserve dimensioned sketches for more significant site features, and fill in minor details from photos. Field photographs should never be taken as substitutes for measured field notes on features of primary significance. Some field conditions, such as cave photography, may require special knowledge regarding exposures and lighting.

Field photographs may include a scale stick or measuring tape to give approximate scale to elements in the view. Another technique, especially useful for irregular features such as stonework or split rail fences, is to place a grid of known dimension over the subject being photographed. Such a grid can be made from a rigid frame of pipe, five feet square with a string at one-foot intervals. Objects in or close to the plane of the tape or grid can be scaled relatively accurately. Objects in front of or beyond the plan or the tape or grid are either enlarged or diminished according to their displacement from the plane.

Aside from verifying measurements, photos can be used to document and count features such as stairs and brick courses. Due to the inevitable kinds of distortions in images, any derivation of measurements must be done carefully, and the process begins with appropriate planning in the field.

NOTE: Often two or more photographs must be compared to narrow down tolerances. Any corrections or additions made to field notes based on your field photographs should be so noted in the field notes. If a recorder derives a substantial number of dimensions of a feature from field photographs, he/she should make a dimensioned field sketch, and annotate it with references to field photographs used (by roll number and image frame number).

Another use for field photography is for comparing views with historic photos. Researchers may unearth historic photos of a site during the inventory process. A recorder can make a best guess as to the location of the historic photographer and attempt to match the view. The two photographs can then be analyzed. Comparative photography is often one of the most insightful research tools in determining the evolution of the site. Obscured views can be identified and missing or new plant materials and structures can be assessed.

2.3.2.2 Equipment

Basic equipment used for field photography includes a 35mm camera with assorted lenses. Suggested lens types include one 35150-zoom lens (or 35mm, 55mm, and 135mm telephoto lenses). A flash unit may be required for photographing dark spaces or interiors of garden structures. However, flash units should be used sparingly in wooded or shaded areas, as the flash tends to wash out color and detail from photos. Film speed should be adjusted according to light values. Additional photographic equipment includes a cable release and a tripod.

HALS does not accept digital image formats because of archival permanence and long-term data accessibility problems. However, prints of digital images are an acceptable field tool for use in checking measurements, etc. If digital images are intended to be submitted to the field records, be sure they are printed on an appropriate archival media using appropriate archival quality inks and archival quality printers, etc.

Black-and-white film should be processed locally as soon as is practical. Team members are discouraged from attempting their own processing because of the time consumption. Contact sheets are required for field notebook filing. An 8-power eye loupe makes viewing easy. Enlargements should be ordered selectively.

A sketch site plan should be marked with locations of the photographer for each photo. A simple numbering system and key with a description of the location can aid team members in recollecting where certain photographs were taken.

2.3.3 Resources for Field Survey Information

2.3.3.1 Historic Plans & Photos

Existing plans may be located for formal designed landscapes but are less likely to exist for rural or vernacular landscapes. Rural or vernacular landscapes may have some photographic recordation associated with them.

Although historic drawings and photographs are valuable resources for research, their integrity should be verified before they are used as concrete historical evidence. Older drawings should be checked for accuracy in the field, as variations may have occurred in construction or changes made after installation. Copies of historic maps, plans and photos may not be legible or they may have missing information, which is not apparent to the user. Researchers should always check existing drawings and reproductions for scale distortion due to photocopying, etc.

2.3.3.2 USGS Resources

USGS maps are an excellent starting point for your project. USGS Quadrangle maps delineate area water bodies, city limits, major roads, as well as topographical features. The most familiar series of USGS mapping is the 7.5-minute, 1:24,000-scale Topographic Quadrangle Map. This is the primary scale of data produced, and depicts greater detail for a smaller area than intermediate-scale (1:50,000 and 1:100,000) and small-scale (1:250,000, 1:2,000,000 or smaller) products, which show selectively less detail for larger areas. Also recently available are Digital Raster Graphs of USGS 1:24,000 Topographic Quadrangles.

USGS organizes maps into two categories: Current and Historic Maps. Current Maps are those maps that are in stock in any given office. Current maps are provided in color. Historic maps are defined by the USGS as any maps that are on microfilm (there are no date parameters). These maps will be copied in black and white. In some cases the historic map is the same as the current, but not always; there may additional data about lost features on historic USGS maps. Historic maps can date to the early 1900s. Note that current maps may have been surveyed within the past 50 years, but may not be entirely current.

USGS Topographic Maps are often available at local reprographic and camping stores. If such resources do not exist, USGS can be contacted directly by calling or writing: USGS Information Services, 507 National Center, Reston, VA. 20192 or call at 888.275.8747 (ASK USGS) or fax at 703.648.5548. Digital maps may be available by visiting: www.usgs.gov.

2.5.3.3 Historic Aerials

The United States Department of Agriculture began aerial photography at locations throughout the United States beginning in he 1930s. These aerials can be obtained through contacting the National Archives in Washington, D.C. (aerials from the 1950s and earlier) or the Aerial Field Office in Salt Lake City, Utah (aerials from the 1950s to the present). Various vendors throughout the country can assist in research of the archives for aerial photography. Vendors typically need a UTM location (see below) or USGS map marked with the site location. Vendors often make aerial photographs available digitally or in print format. When requesting aerial photographs, it is helpful to supply a map such as USGS with the area needed outlined.

2.3.3.4 UTM Grid System

The UTM (Universal Trans Mercator) Grid system provides an method for recording the geographic location of a historic site; the coordinates are used in a computerized data retrieval system, and must be accurate. UTM map accuracy standard for maps at 1:24,000 scale is +/- twelve meters. Depending on the scale of the

historic site, this method of location may not be accurate enough. The UTM grid location of a site can be found on a USGS quadrangle map that has the blue UTM grid tick marks along its edges. Most USGS Quadrangles published since 1950, and all published since 1959, regardless of scale, have these ticks. A supplemental transparency overlay of the UTM grid lines can be obtained through USGS if it is not included on the map. A supplemental transparency overlay with more precise tick marks is needed to read the exact UTM within the grid.

In the UTM system, the earth is divided into 60 zones, each six degrees wide, running north and south. Most of the United States is included in zones 10 through 19. Zones are numbered beginning at the 180 meridian near the International Date Line. On a map, each zone is flattened, and a square grid is superimposed upon it.

A UTM coordinate counter has measuring scales to match the common USGS map serious around its edges. These counters can be used in conjunction with a USGS map to find the accurate UTM reading for a site.

Further information on the UTM Grid System can be found in Cole, Wilford P. Using the UTM Grid System to Record Historic Sites. National Register Bulletin 28. Washington, 1977. (available via Internet at www.nps.gov/nr/publications/#bulletins)

2.3.3.5 Web Resources

Several resources exist via the Internet for digitized data including schematic maps and aerial photographs. Sites such as MapQuest (www.mapquest.com) contain links to aerial photographs and digitized road maps. Searches can be completed using address information, city name, or latitude and longitude coordinates. Other mapping sites offer similar information.

Terraserver (www.terraserver.com) also offers digital aerial photographs as well as digitized USGS information. Users should note that the quality of images from these sites is web-based and may not be appropriate for final research. Original aerial photos may need to be consulted for details. Digital photos available from Terraserver are up to one-meter resolution while USGS maps offer up to two-meter resolution.

Various Geographic Information Systems (GIS) Clearinghouses around the country may also have digitized aerial and base data for a site. Most states have GIS information available to the public. The National Park Service also has a GIS Clearinghouse, which contains a wide variety of data on individual parks. The federal government is curruently coordinating the creation, maintenance, and distribution of spatial data created by Federal agencies through the National Spatial Data Infrastructure and the Geospatial One

Stop Portal. The amount of data varies by state, but may include topographic, hydrologic, geologic, political, and geographic information. Aerial photographs may be available from a GIS clearinghouse as well. All digitally acquired materials should be checked for quality and resolution if these images are to be printed on archival materials. Often, web-based image materials are inferior to original photographic images. Original products should be used in archival reproduction.

2.3.3.6 Legal Resources: Land Plats/Deed Books/Sanborn Maps

Plat maps are often available from city or county clerk offices. Plats typically delineate the boundary of a property and any major structures present. Deed books available at most county courthouses help researchers trace the ownership of certain pieces of a legal property. The local Planning Department and Tax Assessors office are also good resources for land plats, ownership information and often have the associated aerial photography. Founded in 1867 by D. A. Sanborn, the Sanborn Map Company was the primary American publisher of fire insurance maps for nearly 100 years. These insurance maps provide valuable information on the location and use of properties within the United States. Sanborn Maps are often available from County Courthouses and other repositories of public record, but they can also be accessed via computer from academic institutions and public libraries.

2.3.3.7 GIS Data

GIS (Geographic Information System) is a computer-based tool for analyzing and mapping existing features. GIS technology integrates common database operations such as query and statistical analysis with unique visualization and geographic analysis benefits offered by maps. GIS combines layers of information about a place to lend a better understanding of that location. The layers of information combined will depend on purpose.

Each data set has a source scale from which it was originally collected. Mixing data from one source scale to another also mixes the spatial accuracy of the data. Users should be well acquainted with the metadata that accompanies each dataset to understand the source scale as well as other parameters such as projection system, datum, map unites, attribute definitions, and shelf life of the data they have acquired. Map products can then be created centered on any location, showing selected information symbolized effectively to highlight specific characteristics.

GIS can be especially helpful in creating regional analysis maps. Map types may include land use, viewshed analysis, district mapping, and aspect analysis.

Manipulating GIS data requires fairly sophisticated hardware and

training. However, many political entities (cities and counties) are beginning to post GIS-based data on websites and making this information available to the public. Users may need to download free software such as ESRIs ArcExplorer or ArcReader (available at www.esri.com) to view this data. These free viewers allow access to GIS information, however ArcView is required to manipulate and fully read data. With the free products, users may use http://sanborn.umi.com/ ProQuest Information and Learning's Digital Sanborn Maps, 1867-1970 provides academic and public libraries digital access to more than 660,000 large-scale maps of more than 12,000 American towns and cities. In electronic form, Sanborn Maps take on much improved value over the microfilm versions of the same maps, allowing for greater flexibility of use and improved viewing possibilities. Users have the ability to easily manipulate the maps, magnify and zoom in on specific sections, and layer maps from different years. have the ability to interact with municipality or county databases and query information relative to their particular site context.

GIS availability is a rapidly evolving realm of data collection. The potential uses for this data are limitless, however the archival stability of GIS products are somewhat restricted. Many maps generated by GIS systems utilize color for communication, and color is not archivally stable. However, pieces of information gathered from GIS sources can be utilized in map-making for HALS documentation. In particular, topographic, ownership, and vegetative cover information for large sites may be obtained from GIS resources. If available, GIS information is an extremely helpful tool in assessing sites and their condition

2.3.3.8 GPS Data

The GPS (Global Positioning System) is a collection of satellites owned and operated by the U.S. Department of Defense, which orbit the earth and make it possible for people with ground receivers to pinpoint their geographic location. The location accuracy is anywhere from one to one hundred meters depending on the type of equipment used. GPS collects coordinates in latitude and longitude using wgs84 datum.

Utilizing a handheld GPS receiver, data collectors can record fairly precise coordinates of elements in their project area. GPS data works especially well for large sites in locating particular features that may be spread out over many acres. Technological sophistication may be required to coordinate GPS information with GIS information obtained by research teams, but this methodology produces highly useful digital maps. NPS has used GPS information to map archeological and historical sites.

GPS can be used to geo-reference historic landscape maps which allows recorders to overlay these maps onto current day landscape plans for comparison. Recordation teams can then analyze changes in a landscape over time.

2.3.3.9 Topographic Surveys

For highly significant sites or sites with Level I recordation, it may be desirable to obtain a professional topographic survey. This survey will contain field-run spot elevations as well as locations of significant vegetation, structures, and hardscape elements. Survey crews will need a specific list of elements to place on their final drawing. The surveyor should provide a draft copy of the survey, allowing the recorder time to field-check the survey thus insuring all significant elements to the historic landscape have been noted. The draft survey should be marked-up based on the field verification and provided to the surveyor for refinements and the production of the final survey. All site elements including vegetation located on the topographic surveys should be field verified by the research team for accuracy in identification.

SAMPLE

TOPOGRAPHIC SURVEY SPECIFICATION

HISTORIC LANDSCAPE PROJECTS
Courtesy of The Jaeger Company

Elements to be surveyed are as follows:

Building Structures or partial ruins of structures *(with elevations for finished floor*)

All other structures (such as retaining walls, fences, steps, historical markers, monuments top and bottom elevations noted and material noted, such as brick or stone walls; isolated pieces of structures, such as brick piles, stone pillars, etc. should be noted as well)

All paved surfaces, such as drives, parking lots, and walkways with type of surface and edging noted (asphalt, concrete, stone, brick, gravel, etc.)

All curbs with top and bottom of curb elevations noted and type of material noted

Plant Materials Individual trees with species type and size noted (Size stated) caliper or greater with DBH (diameter at breast height)

All plant groupings of shrubs and ground covers should be noted as masses with species type noted (shrub trunks located to the extent possible)

Topographic data (two foot contour intervals)(spot elevations at various locations entrances to structures, walkway intersections, - and low points, high points, etc.)

Utilities (above and below ground) note top and bottom elevations of sewer line

Subsurface Drainage/with Catch Basins noted, if any
(invert elevations/rim elevation)
(determined from field investigation and existing plans)

Surface Drainage System
Open Ditch System

2.3.4 Methods & Tools for Measurement in the Field

FIELD TOOLS CHECK LIST

Steel Tape Measure
Level (24"- 48")
String or Twine
Clipboard
Measuring Wheel
Tree/Shrub/Vine Identification Books
Biltmore Stick/Merritt Hypsometer or Tree Calipers
Magnifying Glass
Photographic Equipment

2.3.4.1 A Step-by-Step Approach to Hand Measuring:

Planning
1. Establish type and number of measured drawings to be produced.
2. Develop methodology for taking measurements, including quality-control checks.
3. Assess site constraints:
    - o Access
    - o Safety

Measuring

1. First sketch the areas to be measured and establish the locations for the principal reference points and overall dimensions. The sketches will become the basis for field notes.

2. Establish datum lines and planes as points of reference for taking measurements. Locate datum lines and planes in relation to each other and note on sketches.

3. Begin by locating major points in relation to each other and any datum lines and planes. Take major dimensions. Record both in field notes.

4. Double check accuracy of initial measurements, since all subsequent measurements will rely on them.

5. Systematically take and record measurements to fill in the necessary dimensions for each drawing. Periodically tie your measurements back to the principal reference points or datum lines and planes to assure continued accuracy.

Checking

1. An effective way to verify the accuracy of your measurements is to block out the major dimensions in a drawing while still in the field, then check how the component parts will fit into the

overall drawing.

2. The preliminary drawings should be produced in the field to ensure the accuracy and completeness of the field measurements.

2.3.4.2 Additive Measurements vs. Running Measurements

Additive measurements should be avoided due to problems with inaccuracy. Additive measurements are chained each succeeding measurement begins where the last one ended. Grouped and overall measurements are obtained by adding individual measurements. While this method reduces a lot of measurements to a size that an unassisted person can make with a tape, tolerances/errors accumulate. If six measurements are added, each with a 1/8 tolerance, the sum has a tolerance of 6 x 1/8 or ¾". Adding dimensions with different tolerances gives a total with a final tolerance that is the sum of all the individual tolerances, regardless of their size. In the end, reasonably careful measuring results in an unreasonable amount of error.

Running dimensions reduce these problems by using the same starting point for all measurements made in a common direction, thus making measurements more accurate. For example, to measure the plan of a streetscape, measurements start at zero at the first building facade, and continue (or run) across the different elements in the streetscape, taking a measurement at each new element as it is read from the tape or measuring wheel until reaching the opposite building. Each successive dimension is larger than the one preceding it. Tolerances/errors do not accumulate.

In practice, additive measurement errors average out in many cases, but the total tolerance cannot be reduced mathematically. Use running dimensions whenever possible. Be aware of the following in reading tapes or wheels, or recording and plotting dimensions:

Recordation teams must be consistent with the way they record measurements throughout the documentation process. The entire team must agree on a method for recording feet and inches at the beginning of the project and carry this methodology through in all field notes.
The following are several examples of documenting measurements:

6.3 = 6 feet, 3 inches
6-3 = 6 feet, 3 inches

Record dimensions as they appear on the tape or wheel so mathematical conversion errors are not made. (Some tapes are in inches only, some feet and inches. Others feature both systems.)

TIP: Plotting errors will be less frequent if all dimensions are taken in feet and inches, since architectural scales are graduated that way. Converting inches to feet/inches can result in plotting errors.

2.3.4.3 Identification of Species/Nomenclature

A list of common vegetation identification resources has been included in the Additional Resources section of these Guidelines. Most of these resources have identification methodology for certain types of plants associated with them.

Nomenclature.

Planting lists must always include common and botanical names. The scientific name for an organism consists of two words: 1) the genus or generic name and 2) the specified epithet. The scientific names of plants should always be underlined or written in italics. The generic name is always written with a capital initial letter, and the specified epithet should always have a lower case initial letter.

The abbreviations are written in the form:

QA/WO QUERCUS ALBA-WHITE OAK

Botanical nomenclature is universally understood, based on natural relationships among plants, and consistent in form.

Common names readily identify plants to laymen. Since a variety of common names can be used for one plant, the preferred names as listed in Hortus III will serve as the standard for HALS documentation.

2.3.5 Field Safety

Few sites present openly dangerous conditions, however, recordation teams should always be alert to their surroundings. Besides being sure that correct procedure has been taken for access to the survey site, several preliminary precautions should be taken before survey work commences:
Apparel

Work clothes such as jeans, sweatshirts and sturdy shoes or boots provide protection against dirt and abrasion. Metallic materials exposed to sunlight get hot; work gloves should be kept nearby. Hard hats should be worn when in operational facilities or in deteriorating structures where overhead materials have been falling or in areas where there are falling branches from trees. Hard hats should also be worn on any site where construction or demolition is currently underway.

Deteriorated Structures

Do not go out onto landscape structures that are obviously deteriorated and unsound. Check the underlying structure in unused or abandoned structures before going out onto (or under) floors, beams, roofs, and walls. If necessary, use ladders, scaffolding and safety lines. Photography (rectified photos or even photogrammetry) may be the safest way to measure unsound portions of such structures. Never enter dilapidated

buildings or landscape structures alone, and always use lights in darkened areas. Do not assume old wiring is inactive.

Ladders

Always plant ladders on a firm footing and tie them down (top and bottom) or have team members hold them. Ladders are best for heights under 20 feet.

Noxious Plants and Animals

Noxious plants and animals may be present on any site. In the case of skin contact, wash any affected area immediately with soap and water. Be aware of all poisonous plant species that may be present on the site. Use caution in tall grasses and underbrush, since they can conceal thorns or snakes. Bees and wasps may build hives in abandoned structures or tree cavities. Ticks, chiggers, and fleas may be present in overgrown or wooded areas. Researchers should always check themselves for such pests after field visits.

Exposure

Use a sunscreen and wear a hat when outdoors. Drink plenty of water in the summer to avoid dehydration.

Animal Droppings

If recordation teams encounter accumulations of bird or animal droppings, avoid stirring up dust from them or contacting them directly. Illness from them is unusual, but can be serious. If you are going to work, for extended periods of time in fouled areas, wear a mask and protective clothing.

3.0 HALS Drawing Format

Recordation teams must consider the full graphic documentation package before embarking on documentation. Graphic options should be clearly defined and understood prior to selecting the most appropriate method. Measured drawings shall be produced from recorded, accurate measurements. Plan sheets need to be clear and concise in representing the site. Maps shall be produced from recorded accurate findings about a site. Portions of the landscape that were not accessible for measurement should not be drawn on the measured drawings but clearly labeled as not accessible or drawn from available existing drawings and other sources so identified. No part of the measured drawings shall be produced from hypothesis or non-measurement related activities.

3.1 Graphic Standards

3.1.1 Drawing Sizes

There are three sizes of HALS drawing sheets, 19 x 24, 24 x 36, and 34 x 44. The actual drawing space available on each sheet reduces to 15 7/8 x 20-1/8, 21 3/4 x 32, and 31 7/8 x 40 once the title block is taken into consideration. Several large sheets may be required to accommodate certain sites. Do not mix sheet sizes in a single set of drawings.

3.1.2 Materials for Final Submission

The basic durability performance standard for HALS records is 500 years. Ink on polyester film (Mylar) is believed to meet this standard. All ink must be archival quality, and designated for use on plastic drawing films (e.g. Pelikan). The standard HALS Mylar is four mils thick with a drawing surface on both sides. The final ink-on-Mylar HALS measured drawings are frequently tracings of preliminary drawings made from the field measurements. The consistency and accuracy of the set is worked out before the inking begins. The preliminary drawings are frequently done in pencil on Mylar. Pencil is used because it is easy to use and erase.

3.1.3 Scale

3.1.3.1 Determining Drawing Scale

HALS uses common architectural and engineering scales in its drawings. Other scales should be avoided. Scale may not be required if a drawing or map delineates a regional system or a large area.

3.3.2 Engineering Scale

Engineering scales are commonly used for site plans. The following are typical engineering/metric scales used for site drawings.

1 = 100 Common scale for overall site maps of large sites
1 = 40 Common scale for overall site maps of medium-sized sites
1 = 20 Common scale for residential-sized sites

1 = 10 Small site maps or detailed plans

3.1.3.3 Architectural Scale

Architectural scales should be reserved for recordation of small-scale landscape architectural features, structures, and site furnishings. The following are typical architectural scales used for site details:

1/4" - 3/4" = 1'-0"	Common scale for elevations of features and furnishings
1 1/2" = 1'-0"	Details
3 = 1'-0"	Details
Full Size	Small or intricate objects with elaborate ornamentation

3.1.4 Sheet Layout

3.1.4.1 Title Block

All sheets must contain a title block. Digital title blocks will be provided to recordation teams using CAD or GIS once HALS staff has reviewed the project. Sheets with preprinted title blocks are also available. Common elements of identification in title blocks include:

o Delineator or Recorder Names
o Project Name and Sponsor
o Address (Street, City, County, and State)
o Name of Landscape
o HALS Number
o Sheet Number
o Library of Congress Number

A north arrow and graphic scales (both English and metric) should be included somewhere in the drawing area (location should be consistent throughout the drawing set.) Every sheet in the drawing set must contain an indication of scale. All plans must show orientation with a north arrow.

3.1.4.2 Title Sheet

The title sheet for the set of drawings traditionally includes a statement of significance, and a project information statement. The site plan includes enough of the surrounding area to establish the setting for the structure or object being recorded. For urban sites, cities often have available detailed maps locating individual structures and lots. These can be copies, with the source, scale, and date cited. For rural sites, maps should include enough of the surrounding area so that the site can be reliably located. (A USGS map would be suitable for this use). The UTM coordinate for the site is lettered onto the site location map.

Title sheets should also contain the following elements:

Heading.

The record name of the site should appear at the top of the title sheet in letters at least 3/4" to 1 1/2"high.

Project Credit Statement.

Coordinated with the written narrative and historian, the statement of significance is a brief history that summarizes the significance of a site and often includes a brief interpretation. The project information statement describes the history of the recording project. It includes the concept behind the documentation, the organizers and sponsors, persons and organizations completing the work and the scope and limitations of research. This statement must be coordinated with the narrative.

Index to Drawing Set.

This is only necessary for larger sets generally of ten or more sheets. An index on the title sheet helps a user quickly locate particular views. If for some reason an index cannot be included on the title sheet, indicate on the title sheet where it can be found.

The look of the title page may be expressive of the original era of the landscape being represented. Typefaces and graphic styles can be utilized on the title page to represent certain historical eras.

3.1.5 Electronic File Sizes/Standards and File Formats

Computer aided drafting (CAD) techniques and GIS are highly efficient means of producing graphics. However, they should be viewed as a means for producing hard copy graphics. When utilizing digital tools in the recordation process, teams must always be aware that the final archival submission to the Library of Congress is the hard copy submission printed on mylar/film with appropriate inks.

3.1.6 Suggested Symbols

A variety of symbols exist for plan and non-plan graphics. Consistency is key in graphic representation throughout the drawing package. Recorders should decide upon plant and hardscape symbols before starting the drafting process and use these symbols throughout the delineation process. If a topographic survey is produced for site it will be important to instruct the surveyor on desired graphic symbols for use in the survey drawing, since this will likely serve as the base map for the HALS documentation mapping.

3.1.7 Legend

A legend should describe commonly used symbols on a plan. Legends should be present on all sheets where symbols are used.

3.1.8 Hatch Patterns

Common American Institute of Architects (AIA Standards) hatch patterns are used to delineate different types of construction materials. Hatch patterns show areas of distinct building materials and can be used in a variety of drawing methods including plans and sections. Hatch patterns may represent hard surface materials such as brick or concrete or they may delineate areas of vegetation such as shrub masses or lawn. The use of hatch can also be helpful in graphic representation of shadow.

3.1.9 Screening

It may be desirable to screen some information in the mapping to allow the most important elements of the drawings to be more easily understood. As an example, a topographic base map, showing such elements as topography and circulation systems, might be screened on a Plant Materials Map. In this case the plant materials information, which would not be screened, would be the obvious focus of the map.

3.1.10 Stipple and Shadow

Stipple and shadow are graphic techniques for adding depth to orthographic (two-dimensional) graphics. Stippling (the process of making tiny dots on the page) can be used to delineate texture or materials. Stippling is often used to define turf or grass areas. Many dots close together can indicate a shaded or darker area in plan. Stippling is often more dense in corners or at material transitions to define edges. Shadow indicates shaded areas in orthographic views. Shadows can consist of hatches, stippling, or lines. Shadowing should not obscure plan graphics. When used correctly, shadowing can give two-dimensional graphics a three-dimensional quality. All stippling or shadows should be legible if plans are reduced to 8.5 x 11 size.

3.1.11 Plan Orientation

When possible, plan graphics should have north pointing toward the top of the sheet. This orientation is most common in plan reading. However, a rotated orientation may be best suited for certain sites. North should be indicated on all plans and should be rotated to the same orientation as the plan.

3.1.12 Plant Nomenclature

Plant nomenclature should follow guidelines set forth in Section 2.3.4.3

3.2 Methods for Recording Drawings

3.2.1 Existing Information

Existing information should be presented within the drawing package. All historic photos and drawings should be properly cited as to their source following Library of Congress copyright policies. Copyright information is available at www.copyright.gov.

3.2.2 Hand Drawing

3.2.2.1 Hand Lettering

A variety of fonts and typefaces are available using a word processing program. Computer generated text can be used as an underlay for the final drawings. Tracing typed text will assist in keeping text on drawings neat and consistent. Consistent types of fonts should be used throughout the drawing package. One type of lettering should be used throughout for notes, labels, and text.

3.2.2.2 Pens/Ink

Technical pens in the following sizes should be used for hand drafting:
4x0 (0.18mm 0.007 in)
3x0 (0.25mm 0.010 in)
2x0 (0.30mm 0.012 in)
0 (0.35mm 0.014 in)
1 (0.50mm 0.020 in)
2 (0.60mm 0.024 in)
2-112 (0.70mm 0.028 in)
3 (0.80mm 0.031 in)
4 (1.20mm 0.047 in)
Only archival, permanent, waterproof, carbon-based, black inks formulated for drafting films (acetate inks) are permitted. Latex-based inks deteriorate. Acceptable inks include Pelikan-FT, Koh-I-Noor Universal Drawing Ink, or Pentel Ceran-O-Matic.) If an electronic pen plotter is used, final prints must be completed with pens containing archival ink.

3.2.2.3 Line Weight

Use a variety of line weights to reflect the significance of various features. Foreground and background can be conveyed by appropriate graduations of line weights. The following list outlines line width by application.

0.13 mm (.005 in)	Extreme detail
0.18 mm (.007 in)	Small details Poche patterns, stippling; dimension strings, witness lines, center lines, arrow lines
0.25 mm (.010 in)	Small details
0.30 mm (.012 in)	Outlines and edges of small areas and objects
0.35 mm (.014 in)	Outlines of medium-sized plant materials and structures, small wings of structures at 1/4" scale, projecting architectural details, edges at 3/4" scale and larger
.50 mm (.020 in)	Edges of walls in plan at scale, edges of moderately sized plant materials and structures and objects in section; dimensions
.60 mm (.024 in)	Edges of walls in plan at or larger scales, outlines of substantial building wings or entire structures; dimensions
.70 mm (.028 in)	Outlines and section lines

.80 mm (.031 in)	Section and ground lines
1.2 mm (.047 in)	Ground lines

3.2.3 Digital Recordation

3.2.3.1 CAD Recordation (See Appendix C for CAD Standards.)

3.2.3.2 GIS and GPS

Information should be recorded in accordance with hand drawn standards. Geometry and attribute information from GIS databanks should be translated into hatch patterns or labels as color inks are not archivally stable. GPS coordinate points can be easily transferred to an overlay.

3.2.4 Interpretive Drawings & Thumbnail Sketches

As an adjunct to measured drawings, interpretive drawings are schematic or illustrative representations of processes involving a landscape. These drawings may be diagrammatic or scaled and may depict distinctive qualities of a particular landscape.

3.2.4.1 Interpretive Drawings

Interpretive drawings go beyond orthographic views to clarify, explain and emphasize distinctive relationships distinctive relationships between physical features of the site and its functions. Such drawings may range from reconstructed historical perspective views of a site (when no historic graphic views survive); exploded axonometrics, cutaway views, flow charts of processes, or step-by-step schematics illustrating the evolution of a site. Choice of these views, or combinations, will be governed by the nature of the site and the specific recorded features. In planning a series of drawings, the recordation team must decide where drawings do the best documentary job, and where photographs and histories would be more appropriate. Expect many details of a drawing set to change depending on the evolution of historical research and fieldwork at the site itself.

3.2.5 Other Recordation Techniques

Recorders can overlay historic or current photographs with trace paper or vellum to create a site sketch. Aerial photographs can be reproduced (citing source) and annotated to depict site features.

3.3 Types of Graphic Representation

3.3.1 Location Plan

A location plan shows geographic location of a site. This plan can be at a variety of scales and can be based on a USGS quadrangle map. Recorders may desire to show site relation to a nearby city or town or to other significant historic sites within the area.

3.3.2 Existing Conditions Plan

An existing conditions plan is a graphic that documents and identifies current elements present in a landscape. Components may include historic features as well as contemporary additions to the landscape. The level of detail and accuracy of an existing conditions plan varies depending on the type of landscape and scale of information required for the project.

3.3.3 Site Survey/Topographic Plan

Significant sites may require a site survey or topographic plan. If topographic or survey information is obtained, it should be presented as existing conditions and should follow all HALS presentation guidelines including a title block

3.3.4 Period Plan(s)

A period plan is a map that graphically represents a landscape during a designated period or specific date. Several period plans may be developed to illustrate different eras of a landscape and illustrate the landscape layers that have comprised this landscape over time.

3.3.5 Layout Plan

Plan graphics are the most widely used form of delineating a site. They show the site from an overhead, aerial perspective and present special relationships clearly. The layout plan is often combined with a planting plan, but may be separate if legibility is compromised by the amount of information. The layout plan should include at a minimum:

3.3.5.1 Hardscape Elements

Hardscape elements include all surface materials such as pathways, driveways, sidewalks, patios, and parking lots.

3.3.5.2 Structural Elements

Structural elements include any three-dimensional objects on a site including walls, stairs, buildings, garden structures, barns, outbuildings, pools, spas, and fountains. Recordation teams may also want to include a detailed plan(s). These enlarged sections(s) of the site plan or planting plan provide more detail. An entire sheet may contain several detailed plans or detailed plans may be included on a related sheet as a vignette.

3.3.6 Vegetative Plans

Vegetative plans are aerial views of planted or natural plant communities within a site. Masses of trees/shrubs or wooded areas can be delineated as single forms; while other distinct planted features should be drawn as such. Formal planting plans should have species labeled appropriately. Plans illustrating plant materials might also note whether species are determined to be historic materials or non2 historic additions. Vegetative Plans should show the following in separate or

combined plans depending on the scale of the site:

3.3.6.1 Planting Design

A site plan containing documented plant material using annotation and/or symbols to key plants to an overall plant list providing both common and botanical names

3.3.6.2 Plant Communities

A plant communities map shows general ranges of plant materials and the species that comprise such grouping. These are typically natural occurring plants.

3.3.7 Section

Section drawings are vertical cuts through a structure or landscape that shows the vertical arrangement of spaces and objects. Section drawings are useful because they provide vertical information: vegetation heights, differences in elevation and vertical progression of spaces. They are also valuable for structural details and relation of function.

3.3.8 Elevation

An elevation is an orthographic projection (side view). The viewer is usually perpendicular to the frontal plan of the object. Section and elevation drawings are more realistic and easier to comprehend than plan drawings. The intent of these drawings is to show the change in vertical dimension. All flat surfaces parallel to the drawing surface and perpendicular to the observers line of site retain their scaled size, shape, and proportion.

3.3.9 Detail

A small-scale drawing that delineates the fine features of a site element. A detail may include elevations, sections or plan views of a specific site feature.

3.3.10 Site Perspective

A perspective is a dynamic view of three-dimensional objects. It is created when the viewer is looking at an object from an angle. Variables in perspective drawings include distance of the viewer from the object and the angle of view relative to the surfaces of the object. There are several methods for setting up perspective drawings including one- and two-point perspectives and the use of perspective charts.

3.3.11 Axonometric

Axonometric drawings show overall space relationships in perspective-like drawings. Axonometric drawings are most useful for showing plan views in three dimensions. Axonometric drawings use three axes of length, width and height for

measurement. Measurements remain absolute rather than the relative dimensions of a perspective

3.3.12 Isometric

A way of drawing a three-dimensional object without the distortions created by perspective. In a drawing based on true perspective, parallel lines converge in a vanishing point; this is the way objects look to us in real life. An isometric drawing shows that parallel lines in actuality do not converge, and represents the object's real proportions and spatial relationships; the isometric view is most useful for technical drawings. In an isometric drawing all three visible surfaces have equal emphasis.

3.3.13 Cutaway or Exploded View

A drawing which graphically removes portions of a subject to reveal details underneath.

3.3.14 Additional Drawings

Additional drawing methods that can be explored for depicting a landscape are:

o Analysis Mapping Plans which delineate certain analytical data relevant to the site (such as topographical/slope analysis, watershed analysis, or cultural assessments.) Analysis mapping may rely heavily upon GIS data or other analytical mapping techniques.

o Mass/Space Plan A plan which graphically delineates vegetation or other site features and the spaces devoid of such features. These plans typically show the organization of spaces within a site.

o Site Evolution Plans A series of plans which show the changes in a landscape over time.

o Material Schedules A plan which delineates the locations of specific materials used on a site. This plan would typically include a graphic key indicating specific material locations.

o Seasonal Color Plans A series or individual plan which delineates the location of certain seasonal colors of vegetation. Delineators should use the Munsell. Book of Color for demarcating different color areas on the plan.

3.4 Map List

The following is a basic list of drawings that may be present in a final drawing package (additional drawings may be desired by the recordation team):

o Title Sheet
o Site Plans

o Existing Conditions
o Historic Conditions (if applicable)
o Site Evolution Plans
o Site Boundaries
o Circulation Plans
o Topographical Plans
o Vegetation Plans
o Planting Plans
o Detailed Plans
o Views
o Elevation and Perspective Views
o Sections
o Isometric and Axonometric Drawings
o Details

GUIDELINES FOR DRAWINGS APPENDIX A

Computer Aided Drafting and Design Recordation (CADD)

HALS does not require or recommend the use of any particular CAD software nor of any specific file format. Library of Congress Prints and Photographs Division does not accept digital media for archival purposes so all submissions must be plotted utilizing the following materials:

1.0 Archival Media

1.2 Plotter Requirements

1.2.3 Pen Plotters (available at print/blueprint shops)
Plotters which use pens containing ink meeting the standards of the Library of Congress for archival stability. Plotters must use archivally stable ink, e.g. Pelikan-FT, Koh-I-Noor Universal Drawing Ink or Pentel Ceran-O-Matic.

1.2.4 Electrostatic and Laser Plotters

Plots made by electrostatic and laser plotters meet the standards of the Library of Congress for archival stability, and therefore may be used for making final plots of HALS drawings.

1.2.5 Inkjet Plotters

Plots made by inkjet plotters do not meet the standards of the Library of Congress for archival stability, and therefore must never be used for making final plots of HALS drawings.

1.2.6 Paper Requirements

Final plots must be made on 4 mil (0.004") thick drafting film (also known as Mylar), with a single- or double-matte finish. For plotters using cut sheets, sheets preprinted with a HALS border are available from the HALS office. Once a project has been reviewed and approved by HALS, digital versions of the HALS title block may be made available to the recordation team.

2.0 Text

2.2 Fonts

HALS recommends the use of a sans-serif or Roman serif or Helvetica font for drawing text. Fonts should be consistent throughout drawing package with consideration given to reproducibility and reduction of drawings. A different font may be used for the title sheet that is

representative to the period or style of the landscape being documented. All fonts should be TrueType (TTY) format.

2.3 Text Height

Text height for notes, etc. should be determined using the following chart according to the appropriate drawing scale:

UNITS	DRAWING SCALE	TEXT HEIGHT 1/8" TEXT	3/32" TEXT
	1:1 (FULL SIZE)	1/8"	3/32"
	1:1 (HALF SIZE)	1/4"	3/16"
ARCHITECTURAL	3"=1'-0"	1/2"	3/8"
	1-1/2"=1'-0"	1"	3/4"
	1"=1'-0"	1-1/2"	1/8"
	3/4"=1'-0"	2"	1-1/2"
	1/2"=1'-0"	3"	2-1/4"
	3/8"=1'-0"	4-1/2"	3-3/8"
	1/4"=1'-0"	6"	4-1/2"
	1/8"=1'-0"	1'	9"
	1/16"=1'-0"	2'	1'-6"
ENGINEERING	1"=10'	1.2'	9.375' (11 1/4")
	1"=20'	2.4'	1.875' (1'-10 /2")
	1"=30'	3.6'	2.8125' (2'-9 /4")
	1"=40'	4.8'	3.75' (3'-9")
	1"=50'	6' 4	6875' (4'-8 1/4")
	1"=60'	7.2'	5.625' (5'-7 1/2")
	1"=80'	9.6'	7.5' (7'-6")
	1"=100'	12'	9.375' (9'-4 1/2")
	1"=200'	24'	18.75' (18'-9")
	1"=300'	36'	28.125' (28'-5")
	1"=400'	48'	39' (39'-0")
	1"=500'	60'	46.875' (46'-10 1/2")

3.0 Line Weights

CAD line weights should follow the same guidelines as hand-drawn lines.

4.0 Layer Naming Standards

The following layer naming guidelines have been adapted from AIA CAD Layer Guidelines 2nd Edition. The following is an overview of the HALS adaptation of this methodology. Layer naming consistency is important for digitally submitted files so future teams can easily understand the multiple layers within a CAD drawing.

4.1 Discipline Code

Discipline is the primary method of classification for layer names. The discipline code provides information which leads back to the originator or type of data contained in a layer. The discipline code is a one-character field which is followed by a modifier (see groups below). The discipline codes are listed below:

A Architectural
C Civil
E Electrical
F Fire Protection
G General
H Hazardous Materials
I Interiors
L Landscape
M Mechanical
P Plumbing
Q Equipment
R Resource
S Structural
T Telecommunications
X Other
Z Contractor/Shop Drawings

For further reference on layer naming, refer to AIA CAD Layer Guidelines 2nd Edition

4.2 Major Group

The Major Group is the second group of letters listed (after the Discipline Code). This group identifies the landscape system described by the layer. This field must contain four characters. Some examples of major groups are:

L-Irrg Irrigation Systems
L-Plnt Plant and Landscape Materials

4.3 Minor Group

This is an optional, four-character tag for further division of Major Groups. The following modifies are defined for use in the Minor Group field:

Iden Identification
Patt Hatch Pattern Number

4.4 Status Field

The status field is an optional type of minor group which differentiates new materials from historic or nonexistent features. These tags can be particularly helpful in documenting non-existent features. The following are examples of Status Field modifiers:

Nexs Non-existing features
Exst Existing to remain
Relo Relocated items

4.5 Annotation

Annotation is a subset of minor groups which comprises text, dimensions, sheet borders, detail references and other elements on CAD drawings that do not represent physical aspects of the site. The major group ANNO designates annotation. Types of annotation are as follows:

-Anno-Dims Dimensions
-Anno-Keyn Keynotes
-Anno-Legn Legend and Schedules
-Anno-Note Notes
-Anno-Nplt Non-Plotting Information
-Anno-Symb Symbols
-Anno-Text Text
-Anno-Ttlb Border and Title Block

Annotation can be placed in both paper and model space. Dimensions, and notes would typically be placed in model space. Legends, schedules, borders, and title blocks would typically be placed in paper space. The same layer names would be used in both cases.

User-Definable Fields: The Minor Group field can be defined by the user, allowing additional layers to be added to accommodate special project requirements. This allows for flexibility by project.

The following are several commonly used layer names as a starting point:

L-Anno-Dims Dimension
L-Anno-Legn Legends and Schedules
L-Anno-Legn-Text Legends and Schedules Text
L-Anno-Note Landscape notes
L-Anno-Nplt Non-Plotting Information
L-Anno-Ttlb Title Block
L-Anno-Ttlb Title Block Text
L-Anno-Vprt-# Paper Space Viewports
L-Anno-Xref-# X-Reference Insertion Layer. # Denotes Detail Number, Number or Other Identifier
L-Irrg Irrigation Systems
L-Irrg-Covr Irrigation Coverage
L-Irrg-Eqpt Irrigation Equipment
L-Irrg-Pipe Irrigation Piping
L-Irrg-Spkl Irrigation Sprinklers
L-Plnt Plant and Landscape Materials
L-Plnt-Beds Rock, Bark and Other Landscaping Beds
L-Plnt-Grnd Ground Covers and Vines
L-Plnt-Plan Schematic Planting Plans
L-Plnt-Shrb Shurbs
L-Plnt-Tree Trees
L-Plnt-Turf Lawn Areas

L-Site Site Improvements
L-Site-Brdg Bridges
L-Site-Deck Decks
L-Site-Fenc Fencing
L-Site-Play Play Structures
L-Site-Pool Pools and Spas
L-Site-Sprt Playing Fields
L-Site-Step Steps
L-Site-Wall Walls
L-Walk Walkways
L-Walk-Patt Walkway and Steps Hatch Patterns