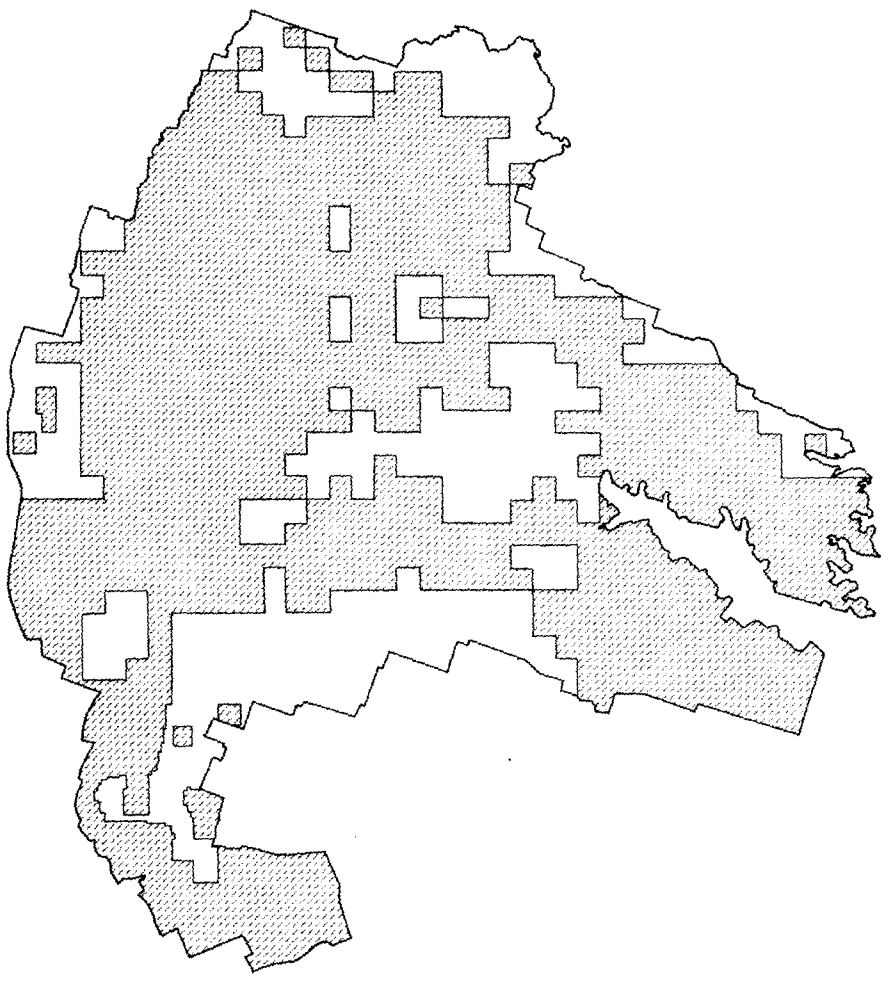
STANDARD OPERATING PROCEDURE FOR FIELD SURVEYS



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Revision Number 11

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Frederick L. Briuer

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Archaeological Resource Management Series
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1.0 INTRODUCTION

The Fort Hood Standard Operating Procedure (SOP) for archaeological resource management projects is a set of mandatory specifications to be followed by archaeologists working on the installation. Instructions have been organized so that general concepts and requirements are discussed first. Following this is an extensive set of more specific requirements presented in a chronological sequence as a guide for completing the required work. The SOP is not meant to be a cookbook recipe for project performance but is a set of instructions requiring careful revision as each project research design is developed. Ben Franklin is credited with having said, "There is a better way to do the job, find it." Users are encouraged to offer constructive suggestions on how to revise our methods and techniques with each new project, providing they fully understand the managerial and research objectives behind this document.

1.1 *Acknowledgments*

The SOP is a result of the cumulative efforts and experiences of many individuals who have been involved with Fort Hood projects for many years. The writing of this SOP draws upon several authors who are acknowledged for the sections they contributed. We wish to express our appreciation for the help given by Dr. David L. Carlson and Shawn B. Carlson in compiling the section on fieldwork. Shawn B. Carlson is especially thanked for her detailed work on the section dealing with historic sites. Dr. David S. Dibble and Jack M. Jackson are thanked for their help with the Laboratory Procedures section. We also want to thank Ann Mesrobian and Tom Dureka for their detailed analysis of this SOP and the valuable suggestions which resulted form their efforts.

Discussions with Dr. S. Alan Skinner, Dr. David S. Dibble, Dr. David L. Carlson, Woody Meiszner, Elton Prewitt, Jack Jackson, Henry Bruno, Erwin Roemer, Jr., Henry Moncure, Michael R. Bradle, and William E. Moore were not only productive in formulating research design strategy, but also contributed greatly toward the development and revision of methods and techniques implementing the multiphased research design. Another source of important innovation came from many others far too numerous to mention. Over 100 individuals have participated in some capacity, either in field or laboratory work. The valuable experience of all participants necessarily had an impact on the development of these procedures.

William E. Moore performed the final editing and preparation necessary to get the manuscript into its present condition and suitable for publishing in the Fort Hood Archaeological Resource Management Series. Celinda Stevens did the word processing of the final copy and Kathryn Reese drafted the figures.

1.2 *Archaeological Resource Management Projects at Fort Hood*

Over the course of nine years, several archaeological resource management projects have been completed at Fort Hood following procedures outlined in earlier versions of this SOP. Research results have been generated on a wide variety of problems including questions and answers regarding the prehistoric and historic archaeological record at Fort Hood and on other questions concerning the identification and control of the processes of archaeological site destruction. For further discussion summarizing previous research, see the annotated bibliography in Appendix I.

Each of the above projects listed in the annotated bibliography was usually undertaken with a separate research design. To date, over 2,000 archaeological sites have been recorded in surveys totaling about 90% of the installation. Field and analytical techniques have been designed purposely to maintain research continuity for answering increasingly more sophisticated resource management questions. This continuity of problem-oriented projects is resulting in an archaeological data base of unusual potential for solving problems dealing with responsible archaeological resource management.

2.0 GENERAL REQUIREMENTS

Since neither the inventory nor the evaluation of archaeological resources can ever be accomplished responsibly without problem-oriented research designs, it will be expected that all future contractors/principal investigators will prepare formal investigative strategies for undertaking archaeological survey or any other resource management project at Fort Hood.

The responsibility to inventory, evaluate, and protect archaeological resources can best be accomplished when a representative sample of archaeological sites is defined in the context of well-designed, problem-oriented research projects, each making positive contributions toward Fort Hood's long-range management goals and the archaeological record of Central Texas. Such positive contributions are only possible when the most up-to-date methods, theories, and techniques of anthropology and archaeology are incorporated in each stage of the archaeological program at Fort Hood.

Future archaeological resourcement management projects must build upon these efforts. As more and more of Fort Hood is surveyed and inventoried, an increasingly comprehensible set of data will become available, making it more and more possible to define and isolate a reliable and representative sample of Fort Hood's archaeological resources for protection and preservation.

2.1 *Coordination of a Problem-Oriented Research Design*

A joint research design shall be written by the contractor/principal investigator after receiving input from the installation archaeologist, Dr. Briuer. In this way, the unique professional experience, facilities, resources, capabilities, and especially the research interests of both the contractor/principal investigator and the installation archaeologist can be taken into consideration before undertaking the archaeological project. The completion of a joint research design will better assure that meaningful data will be sampled and analyzed, thereby avoiding unstructured data collection during the course of the field survey. Furthermore, the writing of a joint research design will help determine the optimal analytical strategy for achieving the desired results of the project.

The joint research design must include the contractor's statement of explicit problem formulation appropriate for the Fort Hood region. In addition to a detailed discussion of the contractor's problem orientation and guiding theoretical biases, there shall be a list of specific and testable archaeological hypotheses. Each hypothesis shall have a sufficient number of test implications and bridging arguments to convincingly verify or refute that hypothesis using specified data. In addition, a detailed discussion shall be written that describes the particular methods, techniques, and analyses to be used for testing each hypothesis.

The above specifications shall be compiled within the contractor's research design (including Dr. Briuer's input). The research design shall be submitted to the contracting officers authorized representative (COR) for review prior to the beginning of field work. Submission of the contractor's

research design must allow a reasonable time for COR review prior to beginning field work.

In addition to the specific questions formulated in the contractor's research design, the following objectives must also be considered in the development of the research design and in the implementation of the analysis and subsequent report writing.

A. To continue the ongoing inventory and description of Fort Hood archaeological resources.

B. To identify, describe, measure, and evaluate all sources of adverse impact on Fort Hood archaeological resources.

C. To develop recommendations for creatively dealing with all forms of adverse impact on archaeological resources.

D. To contribute to the development of a regional typology and chronology of archaeological sites.

E. To begin to describe and explain patterns of archaeological site use, location, density, distribution, and diversity.

F. To provide new data and insights for updating a regional archaeological research design.

G. To continue efforts to describe and explain patterns of past human behavior.

H. To develop, evaluate, and experiment with field survey procedures in order to improve data recording and data analysis procedures for future phases of the Fort Hood Archaeological Program.

I. To determine realistic estimates of man hours and funds needed for future data recovery and analysis.

2.2 *Sampling Design Requirements and Key Definitions*

For purposes of this specific project, the sampled population shall consist of cultural material and impacts to cultural material observed during the sampling survey. Sample units shall be Universal Transverse Mercator (UTM) grid squares (quadrats), each one square kilometer (247 acres). A prehistoric site, or site of native American origin, shall consist of at least one or both of the following two criteria.

A. Any structure or feature, cultural in origin, such as a burned rock mound, burned rock scatter, shell

midden or other organic residues indicating a midden, hearth, rock art, bedrock mortar, or any other commonly accepted aboriginal archaeological structure or feature. These site types are described in Section 6.5.14 and appear on the prehistoric site form (Appendix II) under item 10.

B. A flake scatter lacking any of the above criteria shall be defined as a site if it is found to contain at least one minimum concentration of artifacts. A minimum concentration of artifacts is defined as any two obvious artifacts from our formal artifact typology (Appendix III) that are found no more than five meters from each other. This concept is extremely important and shall be fully incorporated into the survey procedures and decision making process regarding site definition and boundary estimations. An isolated find is defined as an obvious artifact not associated with other evidence allowing for formal site definition under the criteria presented above. Both isolated finds and minimum concentrations of artifacts are important units of analysis to consider with respect to the difficult task of defining sites across space. These concepts are also important independent units of analysis for answering specific research questions.

Historic archaeological sites are defined as pre-military acquisition, non-aboriginal sites, displaying evidence of architecture or remnants of architecture or obvious historic period features such as trash dumps. Included as architectural structures are buildings and water storage facilities including wells, cisterns, and water troughs. Cattle dipping tanks, windmills, root cellars, corrals, and dams are examples of other architectural structures. Historic sites will also include those with other evidence of architecture such as dismantled brick or cut limestone indicating former structures (see Section 6.8 and Appendix IV). Cemeteries are a category of historic site requiring special recording. Information concerning cemeteries is recorded on the cemetery supplement (Appendix V). Surveyors should also be aware of other subtle clues found around historic sites. Domestic vegetation such as fig trees or other introduced species are good historic site indicators. Other cultural phenomena not recorded as sites include stock ponds, recent corrals, and fenced enclosures. These are frequently encountered on Fort Hood and should be noted on quad maps and forms.

A notable exception to the above historic site definition is the presence of stone walls, fences, or road systems. Because it would be arbitrary and especially problematical to record and number such sites at this time, it has been decided to treat them as systems rather than sites until they can be defined and recorded as sites across space. Stone wall systems, road systems, and barbed wire fences shall be carefully recorded on quadrat maps and mentioned in notes.

The use of the above definitions and concepts is required in order to ensure continuity and standards in archaeological resource management projects that will probably continue over a long period of time in a piece-meal fashion. These definitions are offered in order to get objective, replicable results from future surveys accomplished by various individuals. To rely on less objective definitions of important concepts that vary from person to person and project to project will necessarily result in a less reliable data base with conclusions that will be difficult, or even impossible, to replicate or understand. The methods and definitions presented here need to be continually scrutinized and modified to meet new problems and needs as they arise.

2.3 *Units of Analysis*

The site and the UTM quadrat are both important units of analysis. For research purposes at Fort Hood, project archaeologists are required to record and map information as observed in all physiographic zones. The entire sample unit is swept by a crew of six, as detailed in section 5.0. During Phase I quadrat sweeping and recording, individuals map and record cultural information for an overall quadrat perspective on the nature of cultural resources. Only some of these cultural observations will meet minimum criteria as archaeological or historical sites (see sections 5.0 and 6.0). Following the standard format described, these observations will be recorded in detail during Phase II site recording. This is not to say that cultural observations not meeting site criteria are ignored or discarded. By virtue of their placement on the quadrat record, they are mapped and the records curated for future reference. This quadrat information can then be taken into consideration if the need arises. Important observations recorded on quadrat maps and records such as isolated find locations or low density flake or historic artifact scatters, though not meeting our site definitional criteria, may ultimately prove instrumental in isolating new sites on the basis of supplemental information. Future surveys in adjacent quadrats or return visits and monitoring projects will allow more time and effort to be expended, thus adding to your observations. The opportunity in the future to re-evaluate our original recorded observations is a recognition of the limitations inherent in the efforts of any one survey project. Just as you build on the systematic work of earlier surveyors, others in the future will rely on your efforts.

2.4 *Systematic On-Site Sampling Procedures*

Multi-phased archaeological surveys conducted over a large region are unique opportunities to answer formal research questions. The answers to these questions are absolutely needed to comply with legal requirements for developing an archaeological resource management program. Research questions can be re-formulated with each survey project so that increasingly more sophisticated questions can be answered. In this sense, multi-phased archaeological surveys are on-going research activities in and of themselves. This implies that future archaeological surveys at Fort Hood will be much more than descriptive inventories of sites located on the installation. This

also implies that archaeological surveys can be much more than crude exercises for answering questions, primarily about the location of sites suitable for excavation. Rather than assuming that the difficult task of evaluating archaeological sites can only begin with subsurface excavation, we are arguing that the task of evaluating sites begins with the development of a regional research design to be implemented first with field surveys then supplemented by selective subsurface excavations where justifiable and necessary.

The nature of the explicit research questions to be answered by surface survey observations will determine, to a significant extent, what particular observations and measurements will be made and emphasized during each survey project. The systematic on-site sampling required for this project is an attempt to gather specific kinds of data needed to answer particular research questions. This position is contrary to the notion that there is a set of basic, self-evident surface observations which we can expect any responsible archaeologist to make.

On-site data sampling counters the idea that more rigorous quantitative procedures must necessarily be limited to laboratory or excavation situations where one has the time to be less subjective. On-site data sampling is an attempt to improve our ability to make reliable and objective observations needed for answering specific research questions. These procedures, to be discussed in more detail later in this SOP (Appendix VI), are not meant to be a substitute for the more traditional and subjective insights and observations of a skilled archaeologist. We are not attempting to reduce our observations and measurements to a simple set of mechanistic, quantitative facts. Subjective or qualitative observations will always be important and, as such, are highly encouraged by the format of the site recording form itself but we view the required sampling techniques as essential adjuncts to these qualitative data gathering procedures. It is argued that working back and forth between qualitative and quantitative procedures is more fruitful than relying on either one by itself.

Finally, the sampling procedure to be implemented has evolved in full awareness of the practicality of time constraints. The procedure is sensitive to the necessity of rapidly recording systematic observations without appreciably increasing the amount of time one would normally spend on a site using more traditional recording procedures. The choice of opting for a systematic sampling procedure is a concession to the reality that we simply cannot afford to record exhaustive and precise data at each site. The goal of this sampling procedure is not comprehensive accuracy with respect to those variables we feel are important to measure. The goal is, instead, to make more reliable estimates and approximations on key observations. This is normally impossible without some formal sampling strategy.

2.5 *Some General Requirements for Field Procedures*

Sections 4.0 and 5.0 discuss specific requirements on how to undertake the field survey. However, a few general requirements regarding field procedures are in order at this time. Any archaeological site encountered

will be recorded using the specific procedures set forth in this SOP. This includes sites that may have been previously recorded by the Fort Hood Archaeological Society (FHAS) as well as earlier archaeological surveys. One cannot rely on the consistency or accuracy of these older site records. For instance, during the FY 1978 field season, a site was encountered that had been excavated in the 1930s, and for which an excavation report was available. It is important that such sites be recorded using the procedures set forth for this project. Former site records should be treated as important auxiliary information that must be reviewed and taken into consideration before the survey begins. When the crew is familiar with the existing records they can more expeditiously conduct their survey. Being fully aware of all pertinent existing records assures that new site numbers will not be assigned to previously recorded sites. The problem of duplicating sites has in the past proven to be a serious one, especially in view of the cumulative nature of our incremental surveys. Previous recordings will also allow the crew to benefit from and build upon the work of earlier crews, thereby taking the opportunity to upgrade and refine site records. When any site has been recorded two or more times, it shall be the policy that previous recordings should be considered as supplemental information. Information from the most recent recording shall normally take precedence.

Because of the many problems of locating oneself and sites on the ground in this region, it is imperative that field crews be resourceful in their use of any and all locational aids. It will, from time-to-time, be necessary to return to these sites for evaluative work; therefore, it is critical that accurate site locational information be diligently recorded. By using all available maps and useful aerial photographs, the problems of locating and relocating sites and sample quadrats previously surveyed should be minimized. The crew chief will be expected to use all available maps and aerial photographs to accomplish this. The persepective from one set of maps or aerial photos to another will vary. Each portrays something different.

Before discussing specific field survey procedures, some general requirements for a formal survey procedure need to be discussed. Our experience in conducting surveys over the last nine years at Fort Hood in rugged terrain, densely wooded areas, and often under unpleasant conditions points out the very real need to establish formal survey procedures that are understood by the entire crew.

Quadrat sweeping with a survey crew on line is an essential component of our field procedure. It must be made clear that each crew member does not have the prerogative to survey at an individually determined pace. The procedures used will require that crew members show a great deal of consideration for each other as a team. Those who would prefer to cover the ground very rapidly may simply have to slow down in order to remain on line with someone who cannot survey at the same pace. Conversely, those who would prefer to survey at a more leisurely pace may have to show consideration for others by moving on a bit faster. The only way to maintain a line is to keep up constant communication with those surveyors on each side. If the alignment while sweeping is lost and if crew members become separated, a

great deal of time is invariably wasted attempting to relocate everyone. Secondly, if the crew cannot sweep areas as a team there will be no assurance that the survey area has been swept and recorded uniformly. The results can lead to highly unreliable and biased data.

It is obvious that field surveying must be done quickly and efficiently. To cover a lot of acreage at the expense of allowing sites to slip through is counterproductive. Surveying too fast or too spread out will also lead to the obvious bias of emphasizing large sites at the expense of observing and recording fewer small sites. The development of formal sweeping procedures is an attempt to alleviate this bias. The general rule is that surveyors will maintain an interval of absolutely not more than 30 meters apart. Some circumstances may require an interval of less than 30 meters, but in no case will there be more than 30 meters between surveyors.

A final problem with respect to surveying procedures has surfaced as a result of previous surveys. Some of the most unusual and interesting archaeological sites on Fort Hood have been discovered by surveyors paying special attention to fortuitous subsurface exposures. Sites buried in flood plains have been exposed to military training involving excavation. Natural erosion has also uncovered some highly unusual sites. Surveyors are urged to be opportunistic and thorough about inspecting fortuitous exposures of subsurface deposits. This may require some flexibility in crew alignment during surveying.

2.6 *Some Requirements for Site Records at Completion of Survey*

At the close of each survey the contractor is required to provide typed copies of each field and lab site form and inked copies of each site map along with two copies, one for the archaeology office and one for the laboratory.

While producing the typed forms the typist should be alert to inconsistencies and wording of the original field forms that appear to be meaningless or confusing. We have had problems with uncritical typing in the past, as typists had difficulty with light pencil or idiosyncratic handwriting.

Inked maps are best produced as tracings using a light table with indelible black drawing ink on bond paper. Together, these final site maps will provide an easily retrievable and readily publishable store of uniformly legible information about each site. Any drawings of architectural structures, rockshelter cross-sections, features exposed in naturally cut profiles, or any supplemental sketches deemed of major importance by the field crew will be considered as part of the site map.

3.0 PROCEDURES PRIOR TO FIELDWORK

3.1 *Scheduling*

A research design and sampling strategy are critical considerations for determining survey scheduling. In order to assure a maximally efficient survey capable of producing reliable results, it is imperative that a schedule be prepared at the earliest possible date. This is especially critical if work is to be done inside the impact area, as use of the impact area must be coordinated with range-firing schedules well in advance. Every effort should be made to follow any survey schedule as closely as possible, particularly because the survey will be closely coordinated with numerous post operations and personnel.

3.2 *Safety*

The crew chief will be required to coordinate daily with G3 Range Control prior to working inside the Artillery Impact Area. Working inside the impact area will require four-wheel-drive vehicle transportation and constant radio communication with G3 Range Control. For surveys outside the impact area, crews will also coordinate their schedule with G3 Range Control. Weekly coordination by a crew chief with the Area Access Control Office has usually been adequate for work outside the impact area. During periods of large scale intensive military training, it would be advisable for crews to coordinate daily with G3 Range Control to assure that the survey proceeds unimpeded by concurrent and intensive military actions. For safety considerations, even outside the impact area, it would be advisable for crews to have radio contact with G3 Range Control.

Although more than a dozen field surveys have been successfully conducted without serious injury or mishap to crew members over the last nine years, there are some potential hazards that surveyors need to be aware of so that normal precautions will be practiced and emergency action can be taken if necessary. Several species of poisonous snakes can be expected to be encountered from time to time. Steep, unstable slopes, sudden unexpected sinkholes, and treacherous creek crossings are also serious dangers to unwary surveyors. To minimize accidents, surveyors are expected to own and use sturdy walking boots. A canteen is highly recommended as a precaution against dehydration. Comfortable, loose-fitting trousers and long-sleeved shirts for protection from greenbriar and poison ivy are highly recommended.

Unexploded ordnance or hazardous pyrotechnics can also be encountered in areas even outside the impact area. As an important precaution, surveyors need to be especially watchful for unfamiliar metal objects so that physical contact can be avoided. Surveying in areas where intensive maneuver training is occurring can also be hazardous, especially in heavily wooded areas where it will be hard for vehicle drivers to see them on foot. Many new armored vehicles are not only fast but move relatively quietly. Drivers of these vehicles have restricted visibility, especially when driving with hatches closed and using periscopes. For these and other reasons, surveyors should have a backup plan for emergency action. Radio contact with G3 Range Control

would give them access to "Lifesaver" helicopter evacuation on very short notice.

3.3 *Data Review*

If each sample quadrat is to be surveyed properly, there are certain important data that must be reviewed, reproduced, and taken into consideration prior to going into the field. The crew chief and crew, prior to fieldwork, shall familiarize themselves with all available previously recorded quadrat, site, and monitoring records. Computerized inventories of known and recorded sites, such as the ASIS list and Quadsearch files, are available at Fort Hood. Using these lists will alleviate the difficulty of preparing a daily checklist of all known sites to be expected in each survey area. In addition, master site maps, quadrat maps, and site maps from previous surveys are also available at Fort Hood. Use of these records and computer lists will assure that surveys consider the locations of previously known sites and other cultural resources information in planning and completing quadrat surveys. These preparations will greatly facilitate accurate and reliable recording. Surveyors will be expected to repeat the recording of all previously recorded sites in order to upgrade our expanding survey data base (see section 6.0). The duplication of survey data needed for field copies will be the contractor's responsibility. Previously duplicated records housed in building number 4213 are available on a temporary loan basis. The Laboratory record set at Fort Hood is to remain in building number 4480, except when certain records are unavailable elsewhere. The following is a list of useful records that, depending upon the nature of the particular survey or monitoring project, will be found to be a useful checklist for data review prior to fieldwork.

Checklist For Data Review

1. Field set of orthopicto maps.

2. Experimental Ground Tactical Data (EGTD) map set showing environmental zones and hydrology.

3. Computer drawn maps showing available GIS generated variables.

4. 3" x 5" quadrat cards (in-house and contract).

5. Special aerial photos with survey and monitoring data, e.g., FY 1981 West Fort Hood.

6. IGAS blueline quad photos.

7. IGAS blueline quad topographic maps.

8. Hand-drawn site boundary data or topographic maps.

9. All appropriate site records.

10. All appropriate quadrat records.

11. All appropriate survey records (including vandalism and monitoring).

12. Computerized ASIS and MISTRESS lists.

13. 5" x 8" site cards.

14. Bell and Coryell County soil surveys.

15. Geological Atlas of Texas, Waco Sheet 1970.

3.4 *Fort Hood Terrain Analysis (FHTA), Experimental Ground Tactical Data (EGTD), and Soil Conservation Service (SCS) Maps*

In addition to the older site records, the FHTA and EGTD maps contain important information describing geology, soils, hydrology, and vegetation patterns. SCS maps for Bell and Coryell counties shall be reviewed for soil classifications.

3.5 *Terrain and Accessibility*

Preliminary inspection of available maps and aerial photos and coordination with Fort Hood staff, when appropriate, will be helpful in determining the best transportation routes, the most practical quadrat starting points, and the most efficient survey sweep directions. Terrain and accessibility must be taken into consideration when planning the field work.

3.6 *Locational Aids*

A careful inspection of all available aerial photography and maps prior to commencing field survey is critical in coping with the difficulties in locating survey crews on the ground and in planning efficient completion of sample units. It will be required that all available locational aids be used. By working back and forth between aerial photographs and maps on a daily basis, problems in locating points on the ground can be alleviated. Current projects will use reproducible aerial photographs with the scale 1 inch:400 feet. UTM grid lines on these reproducible aerial photos are only accurate in an approximate sense. Until the UTM grid lines originating through the computer program are completed, it must be assumed that all available grid lines are of limited accuracy. This is one of the major reasons why surveyors are required to use all back-up maps and references. We will use the best available maps or photographs for quadrat mapping.

3.7 *Equipment*

Prior to going into the field, an equipment checklist should be prepared. All items on this list should be assigned as the responsibility of specific crew members. Contingencies should be made to reassign equipment responsibilities in the absence of crew members. There are inevitably problems with small items such as compasses, whistles, pens, and pencils in the absence of a well-organized equipment inventory. The following equipment has been found to be necessary:

EQUIPMENT LIST

Paper and Forms

Aerial Photos (best quality available)

First Aid Kit

Graph Paper (Metric or 1/10")

Letter of Introduction (one for crew chief to carry into the field and one to remain in the vehicle)

Lifesaver Guide

Maps (1:25,000)

Maps (1:50,000)

Photographic Record Forms

Quadrat Forms

Quadrat Air Photos (1 inch:400 feet [Aerial Photo quadrat reproductions or next best alternative])

Quantitative Sampling Forms

Rock Art Forms

Prehistoric Archaeological Site Survey Forms

Prehistoric Archaeological Lab Supplement Forms

Historic Archaeological Site Survey Forms

Historic Archaeological Site Lab Supplement Forms

Writing Tablets

Other Equipment

Cameras and film (black-and-white and color)

Carrying Bags (packs, shoulder bags, etc.)

Clipboards

Compasses (one for each crew member)

Hammer

Map Measure

Marking Pens

Metric Rule

Military Coordinate Counters (1:25,000 and 1:50,000)

Notebooks (one for each crew member)

Pencils (mechanical)

Paper Bags (#2, #4, and #8 are useful sizes)

Pens

Plastic Bags (for collections)

Pliers or Wirecutters for Barbed Wire Samples

Protractor

Sampling Line (beaded)

Wooden Stakes (yellow-ended)

Flagging Tape (fluorescent orange, red, yellow, blue, etc.)

Tags (tie-on)

Toilet Paper (TP)

Whistles (optional)

4.0 FIELDWORK IN TWO PHASES

In the course of the Fort Hood survey program, we have found by trial and error that surveyors work more efficiently if fieldwork is conducted in two flexible phases. Before discussing both phases in detail, a few remarks concerning general skills for both phases will be appropriate.

4.1 *General Survey Skills*

4.1.1 Compass Reading. A comprehensive guide to compass reading is out of place in a specialized SOP; however, a few major points need to be stressed. When writing notations of direction or orientation in degrees, it is preferable if the entire scale, from 0^{o} to 360^{o}, is used. In other words, it is less confusing, and is consistent with previous surveys at Fort Hood, if a stone wall orientation is written as 317^{o} and not 43^{o} west of north. We realize that this may not be consistent with normal procedures elsewhere.

Almost all areas of the world have a standard declination between Mercator grid readings and magnetic readings. In Central Texas, the declination has been at 8^{o} 30′ east for a number of years, and it is gradually shifting to 9^{o} east. Thus, if a surveyor presets his compass so that he sights somewhere between 351^{o} and 352^{o} magnetic he will be sighting along a line that is close enough to UTM grid north for practical purposes (Figure 1).

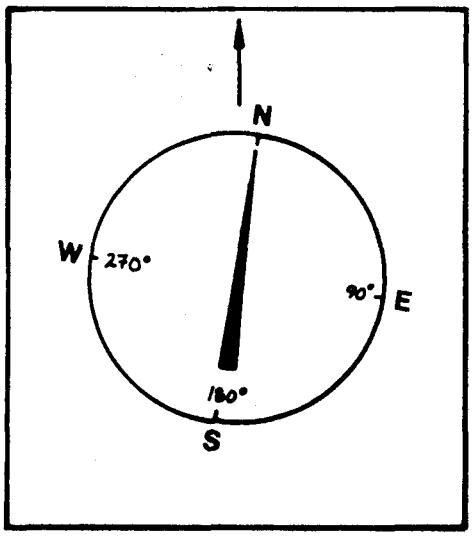


Figure 1. Declination Setting for Central Texas Area (Compass set for grid-magnetic declination 8^{o} 30′ and oriented for sighting grid north [360^{o}; actually 351^{o} 30′ magnetic])

Other readings are grouped logically around the circumference in the same scale as that on a 360° protractor. Just remember, when you determine a magnetic reading and you want a UTM grid reading, add nine degrees to the magnetic reading. When you determine a grid reading and want a magnetic reading subtract eight or nine degrees. This is illustrated in Figure 2.

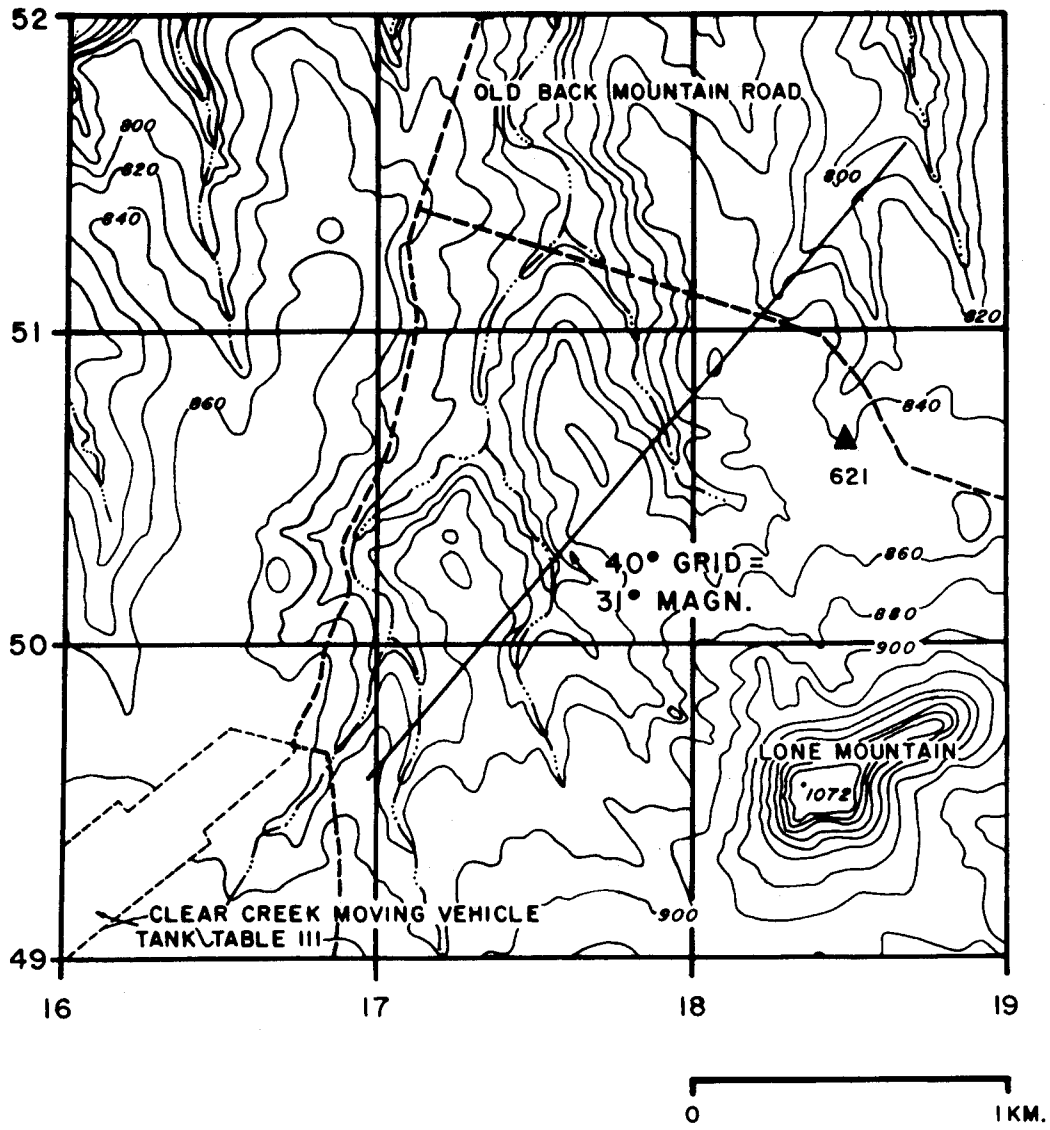


Figure 2: Grid and Magnetic Aizmuths

4.1.2. Map Interpretation. Generally speaking, any United States Department of Denfense (USDOD) map of Fort Hood will have distinctively marked UTM grid lines every 1,000 meters. These lines help in plotting and relocating archaeological sites. For example, the hypothetical site located in grid square 18/50 (Figure 2) is situated just off a road on the 840 foot contour line. In addition, most maps will be of the 1:25,000 or 1:50,000 scale. Maps drawn to 1:75,000 scale are usually too small for accurate site plotting but are extremely useful for plotting locations of sampling units and for general navigation in driving to the areas scheduled for survey.

The compass declination and sighting discussed and illustrated in 4.1.1 pertains to the UTM grid and UTM cardinal directions that are usually printed on USDOD maps. To determine a magnetic reading on the map, measure the grid readings with a protractor and subtract eight or nine degrees as illustrated in Figure 2.

As seen in Figure 2, contour lines are usually clear in depicting major landform and drainage features. Note the unnamed, intermittent tributary flowing northward through grid square 16/51. Also, Lone Mountain, in grid square 18/49, is clearly depicted through the use of contour lines.

4.1.3 Sketch Mapping. This is a generalized skill, the basic requirements of which are discussed in sections 5.5 through 6.1. It is mentioned here only for the purpose of stressing that compass reading and mapping skills will be used most intensively during this stage of the survey.

4.1.4 Cultural Resource Recognition. This skill is acquired partially through field experience and with the aid of orientation and instruction. It becomes further refined through academic exposure and some individuals will always be found to excel in this department. Cultural factors are not the only things comprising a full understanding of cultural resource recognition. Geological, hydrological, botanical, and zoological data are also important. One individual, regardless of experience, should not be exclusively relied upon to make interpretive observations. Rather, the crew should work as a team so that a composite of everyone's observations goes into the final interpretation. Each crew member is encouraged to be creative, and the crew chief is encourged to consider each individual's ideas constructively in the final decision. As discussed in section 4.1.3, this is the basis of the quadrat mapping and composite mapping procedure.

5.0 PHASE I QUADRAT SWEEPING AND RECORDING

The standard survey sample unit will be the UTM grid square (quadrat), one kilometer on each side. The quadrat is an important unit of anlysis for research purposes and compliments the recorded site as a separate unit of analysis (see Section 2.3). Determining patterns of cultural and environmental observations with the sample quadrat offers a crucial perspective that both compliments and assists in defining and recording archaeological sites. While the six surveyors are collecting and recording systematic observations on quadrats, they should remain alert to the opportunities to record as much data as possible on individual sites. The mapping and recording of site information on quadrat maps during quadrat sweeping is critical information to build upon during the further site recording phase. Six surveyors as a team can more expeditiously gather important site information during this phase than a fewer number of people returning to the site later for further recording. In other words, you are being asked to exploit the opportunity of the quadrat sweeping procedure in order to minimize a duplication of effort required to finish site recording later. Phase I quadrat sweeping and recording is not simply "finding the sites" so they can be recorded later. Much of the essential site recording information is actually gathered while sweeping and recording each quadrat. The tasks for Phase I will be found to be more demanding and time consuming than those that follow this phase.

Survey sweeping and quadrat recording is accomplished by a crew of six to eight individuals, walking abreast, spaced at even intervals, and executing progressive observational sweeps back-and-forth across the sampling unit (quadrat). Only in emergency situtations should the crew be reduced to five surveyors. In no case should the number be less than five. The interval between surveyors shall, under no circumstances, exceed 30 meters. If the line is not controlled by a decisive crew chief and a mutually understood system of signals, there will be an increased risk of wasting time and missing sites because of inadequate coverage. Proper communication and alignment will also help prevent the problem of surveyors losing contact and straying off course. The survey course is determined by the UTM grid orientation of the sampling quadrats with a consideration of terrain and other physical obstacles.

5.1 *Beginning a Survey Sweep.*

The crew chief, or designated crew member positioned in the center of the survey line, leads the team by following his compass and paying close attention to his aerial photo(s) so that he remains on line and always knows his location. The rest of the crew keeps on line by referring to their own compasses and photos and maintaining an interval of 30 meters or less between themselves and adjacent crew members. This can be done through frequent visual contact and/or signals when in dense brush. The last surveyor in the line provides the anchor for the return sweep by setting out frequent strips of toilet paper (TP) as the sweep progresses. This person should be sure his TP line is visible from the direction it will be viewed on his return sweep. It has been found from past experience that an inadequately marked TP line is not only hard to follow but causes unnecessary delays in relocating the line

and realigning the crew. It is also useful to set out a highly visible flag at the beginning of the sweep, 30 meters beyond the starting point; that is, at the projected end point on the return sweep (the "catcher flag"). All crew members carry flagging tape and flag the beginnings and ends of sweep lines as directed by the crew chief. Often, the crew member who walks the quad line must also flag his entire line. This provides a visible perimeter of the surveyed area and facilitates lining up to survey adjacent quads.

5.2 *Communication, Maneuver, Alignment, and Interval*

Each crew member will have the important responsibility of maintaining constant alignment and communication with crew members on each side, whether it be by whistles, whistling, shouting, or walkie-talkies. A simple signaling system is critical in densely wooded areas. Instructions signaled by the crew chief can be repeated at either end of the line to assure the crew chief that the instructions were communicated to the entire line. When crew members become aware that they have crossed the sweep markers (TP), when crew members notice that others have become separated from the line, or when sweep orientation markers have been lost, those crew members should immediately inform the crew chief so that he can stop the team and realign them. If these inevitable errors are not corrected immediately and decisively they become increasingly difficult to deal with. Quick, efficient survey sweeps are possible only if a good alignment is kept and important information is effectively communicated. It is worth repeating that under no circumstances must the interval between surveyors exceed 30 meters.

5.3 *Coordinating Multiple Sweeps and Completing a Quadrat*

The crew chief is dependent on information relayed by the crew along the line, particularly in terms of cultural information and, very importantly, whether or not the crew sweep has arrived at a sampling unit boundary. In these cases, proper alignment and crew communication save time, particularly in heavily wooded areas where it is necessary for the crew to use vocal or whistle signals to make sure each member has reached the end of the sweep. In low visibility conditions, the crew chief directs this process by sighting along the cardinal grid azimuth of the boundary with a compass in order to determine if the crew's sound signals are in line. Once the crew chief is certain that the grid sweep is complete, he should give a pre-arranged signal and the entire crew can gather at the spot where the anchor person ended his TP line. Here the crew has the important opportunity to share information as to each crew member's observations. The crew chief can then note these cumulative observations and determine strategy for the next sweep. The anchor person should then use his compass to align the crew at paced intervals of 30 meters, preparing for the next sweep. Before commencing the new sweep, the new TP marker at the far end should again set out fluorescent orange survey tape then mark the route with TP during the sweep. They, in turn, become the pivot person at the end of the sweep. The TP markers alternate their duties. This duty should be rotated fairly among the entire crew throughout the day. It is important that the crew member who sets out the line shall be the one who follows it on return sweeps. The crew chief should continue to rely on a compass to direct sweeps once the first sweep is complete. Discontinuation of the compass bearing usually increases the

probability of deviating from thorough coverage. It is, however, imperative to have compasses for each member. Everyone will have to rely on a compass, except in open fields, even if the crew is successfully following well-marked TP lines. This procedure of sweeping and pivoting while following the well-marked course shall continue until the entire grid square is thoroughly covered.

5.4 *Survey in Open Grassland Versus Wooded and Broken Terrain*

Resist the general tendency to "get wide" in open terrain. The 30 meter interval will seem much smaller than it does in the brush. While it is possible to rely entirely on visual contact in the open, it is imperative to maintain constant contact in areas of dense vegetation. Broken terrain, wind, and military maneuver noise must be considered when using signals. Lack of visibility coupled with needing to weave around vegetation and broken terrain can rapidly destroy a survey line, and regrouping in dense brush is both aggrevating and a waste of time. When in dense brush or homogeneous vegetation, be especially alert to any landmarks visible on the aerial photo which are on your line and look for them. You will find from time-to-time that you will lose visual contact with surveyors on each side. At such times, rely on your compass and signalling until you re-establish alignment.

5.5 *Quadrat Recording and Mapping*

Directorate of Engineering and Housing (DEH) and the Fort Hood Archaeological Laboratory now have the capability of producing aerial photographs of any area on Fort Hood. The Aerial Photo Sheet Key (Appendix VII) shows the distribution and coverage of each sheet. UTM coordinates have been drawn on each mylar original (100% of the sheets), so that blueline copies now have each grid square marked. In addition, IGAS maps are available for the entire fort. This coverage is depicted in Appendix VIII.

We have instituted a procedure whereby blueline copies are processed by on-post photographic support facilities to produce 8" x 10" black-and-white aerial photos suitable for use in preparing the Composite Quadrat Map (Appendix IX). A completed Quadrat Map is illustrated in Appendix IX.

All crew notes on blueline sheets and copies will be filed in the folder in each grid square/sample unit, or in the map drawers in the Fort Hood Archaeological Laboratory, for use in accumulating cultural resource data from all sources.

Each surveyor will carry a copy of the quadrat air photo or "sweep sheet" on which they will plot cultural, environmental, paleontological, and other data pertinent to survey requirements. The quadrat air photo is a reproduction of a 1 inch:400 foot scale aerial photograph with UTM grid lines drawn in their approximate position. Each surveyor will receive a reproduction of the photograph containing that day's grid square. In a few cases, a particular grid square may overlap two or more photos requiring the quadrat recording to be done on more than one quad photo. A composite quadrat air photo will be required as usual. Surveyors will be supplied with

photo copies of each grid so that a clean composite quadrat photo can be drawn.

5.5.1 What to Record on Quadrat Air Photos. Off-site cultural features, as well as the sites, must be plotted on the quadrat air photos to the best of the surveyor's ability. Often, one or two dissenting surveyors can correct the overall impressions and estimations of the entire crew. This sharing of observations allows the crew to construct a more reliable composite air photo. The locations of prehistoric flake scatters and isolated finds, where no minimum tool concentrations are observed, are to be plotted on quadrat air photos along with historic phenomena such as abandoned roads, stone walls, barbed wire fences, and unaligned fragments or bundles of barbed wire. Linear, off-site items should be drawn with the compass reading of the feature's orientation written beside it. Geological, botanical, and zoological data are to be plotted, as well as any evidence of the presence of paleontological phenomena. Any springs, active or dry, noted in the field or located in the lab on a map of known springs should be recorded. Surveyors are encouraged to observe areas of possible extinct springs and to note these possibilities on their maps. Tank traps, both open and filled in, when encountered shall be carefully plotted.

The quadrat air photos produced by the crew during the course of the day should be collected at the end of the day by the crew chief. From these, the composite air photo of the quadrat should be drawn on the special copy provided. See Appendix IX for examples. Care should be taken that the magnetic readings are converted to UTM grid readings and accurately drawn on the composite with the aid of a protractor. In Central Texas, 360° UTM, grid north equals 352° magnetic north (see Sections 4.1.1 - 4.1.2). Thus, to draw a fence alignment from magnetic data onto a UTM grid map add 8° or 8° 30′ from the UTM lines. The information plotted on the crew chief's aerial photos shall be transcribed to the daily composite quadrat air photo, bearing in mind the high degree of locational accuracy characteristic of detailed aerial photos.

In the past, there has been a problem with identifying specific bluelines as to project. As a result, there are numerous bluelines with important data on them but it is impossible to tell who recorded the information during what project. For this reason, surveyors are now asked to record their name, date, and project number on each blueline. This should be done before going into the field and certainly before the bluelines are turned in as completed. Proper labelling of the bluelines will be discussed during the orientation prior to the beginning of each survey.

5.5.2 What to Record on Quadrat Forms. The quadrat form (Appendix X) is to be filled out immediately following the survey of a quadrat. An individual to whom the crew chief should assign this responsibility should request any impressions as to number and kinds of sites, off-site cultural phenomena, and general environmental data observed throughout the day. When writing descriptions of these observations the information on the quadrat air photos will be very helpful.

5.5.3 Some Pitfalls to Inadequate Interpretations. Don't lose control over big sites, features, and systems. Here, it is appropriate to point out again the importance of data review before going into the field (see Section 3.3). All the care and consistency in field recording may still leave unrecorded a large site which previous surveyors observed to extend into the present quadrat. The site may have been subjected to large amounts of impact or other post-depositional processes after initial observation and current surveyors may indeed observe no site indications extending into their area. Or, the site may have ended beyond the old quadrat boundary in the form of a light flake scatter and current surveyors may be inclined to record it as such without realizing that it is connected to a greater concentration outside current quadrat boundaries. A careful recording of the flake scatter during the sweeping procedure should eventually enable us to tie the site and scatter together. But, it must be stressed that a prior knowledge of this incompletely recorded site's position will save time as the crew will be alert to the presence of the site and concentrate on defining its limits within their survey area.

In the case of wall, fence, or road systems, if one crew has traced a stone wall to the quadrat boundary within an adjacent quadrat and has drawn it clearly on the composite map, a later crew must try to extend the mapping of this wall into the quadrat for which they have responsibility.

5.6 *Quadrat Recording and Site Isolation*

5.6.1 Obvious Artifacts. An artifact is considered obvious if it appears to have been intentionally altered and/or used by humans beyond reasonable doubt. In some cases, this decision is characteristically weighted by personal discretion; however, the stone tool dictionary (Appendix III) and the various artifact typology lists (see Section 6.8.4 and Appendices II and VI) provided should be of assistance.

5.6.2 Minimum Concentration. Once a surveyor observes an artifact, he shall quickly search around the artifact in a circle, within a radius of five meters, to see if another obvious artifact falls within that search area. If such is the case, the surveyor should mark the location of this minimum concentration on his quadrat map, taking care to use a different color of flagging tape than that used to distinguish end boundaries. If no other artifacts are found within five meters, the lone artifact shall be designated and mapped as an isolated find. Once a minimum concentration of artifacts has been encountered, site recording by definition will become necessary.

5.6.3 Determining Site Boundaries. Decisions on what form the site recording will take must not be made hastily because sites will, in many cases, lack distinctive boundaries. Therefore, as the crew continues with routine survey sweeping (see Section 5.0), each crew member will plot his or her own cultural observations. Later, or even while survey proceeds, it becomes possible for the cumulative observations of the entire crew to be considered when attempting to discuss patterns indicating site boundaries. General criteria that must be considered in determining archaeological site boundaries are:

A. The pattern of structures, features, ecofacts, or other cultural phenomena observed and recorded.

B. The presence of at least one minimum concentration if the above criteria are missing.

C. The pattern and distribution of minimum concentrations observed and recorded.

D. The pattern and distribution of isolated finds observed and recorded.

E. Areas with flake scatters or areas devoid of flake scatters.

F. Final important considerations are environmental observations about natural terrain, topography, geology, hydrology, and vegetation. These considerations can throw light on the problem of boundary estimates for those sites proving most difficult to estimate. Site boundary definition can depend on numerous considerations. These considerations are closely related to the geological setting and depositional conditions within the immediate area. We cannot avoid some subjective elements in making decisions about site boundaries under varying circumstances.

The above criteria, if conscientiously observed and mapped during quadrat sweeping, are an excellent basis for establishing site boundaries. Deciding on boundaries will be one of the most difficult tasks asked of surveyors. For many reasons, some sites will appear to have rather obvious boundaries, which many others will not. If the above criteria are not used, one could logically connect observations on cultural remains interminably across space. This would serve no useful purpose. By considering the pattern of observed structures, features, minimum concentrations, isolated finds, flake scatters and their natural environmental context, areas of greater cultural evidence (hot spots) can be objectively separated from areas of fewer cultural remains. Once a decision has been made about problematical boundaries, it needs to be documented on the site form by referring to the rationale used. Future surveys and monitoring projects will be in an excellent position to refine boundaries once the criteria for assigning boundaries at problematical sites has been documented.

Site boundaries should be drawn according to the level of confidence for the site at the time it was recorded. There are three boundary conventions used for Fort Hood maps. They are discussed in section 6.3, Standard Mapping Symbols.

Before proceeding to Phase II recording, bear in mind that there are some cases such as small distinctive sites with obvious boundaries that would be relatively simple to record while sweeping. Small isolated historic sites

lacking complex features or structural evidence can also be quickly recorded. Travel time necessary to return to record sites is also an important consideration that may warrant site recording during Phase I sweeping.

6.0 PHASE II SITE RECORDING

Once the quadrat has been swept and the crew has systematically recorded the required information on historic and prehistoric observations, Phase II site recording should usually begin. Two or more persons can then return to finish site recording. This decision should be flexible, depending on many considerations. There are times, especially when surveying in easily traversed open quadrats with few sites, that it is best to continue quadrat sweeping as a full crew and postpone site recording. It is not advisable, however, to build up a backlog of unrecorded sites, especially if it results in delays in completing quadrat unit reports or excessive travel time to and from sites that could have been recorded very quickly. A great deal of flexibility is necessary to find the best solution.

6.1 *Mapping*

This task is considered first for two important reasons. First, mapping embodies the essential criteria for recording the site. Secondly, mapping produces most of the primary data needed by the other members of the crew in order to complete, or even to begin, their supporting tasks. All crew members should be familiar with the mapping procedures, although two to three people who demonstrate a talent for mapping may be relied on for the majority of the time. Estimating site boundaries is critical in answering many of the research questions for this project. Many of our quantitative measures rely on estimates of the surface area of sites. Surface area is a variable that can be estimated better when a site's overall configuration is considered. Thus, the approximate length and width measurements of a site are not adequate for describing oddly-shaped sites.

In most cases, the spatial dimensions and configuration of a site may be established from an arbitrary central point. From this point, the site mapper should supplement quadrat map information by sending crew members out in radii (Figure 3) to systematically discover where the site appears to end,

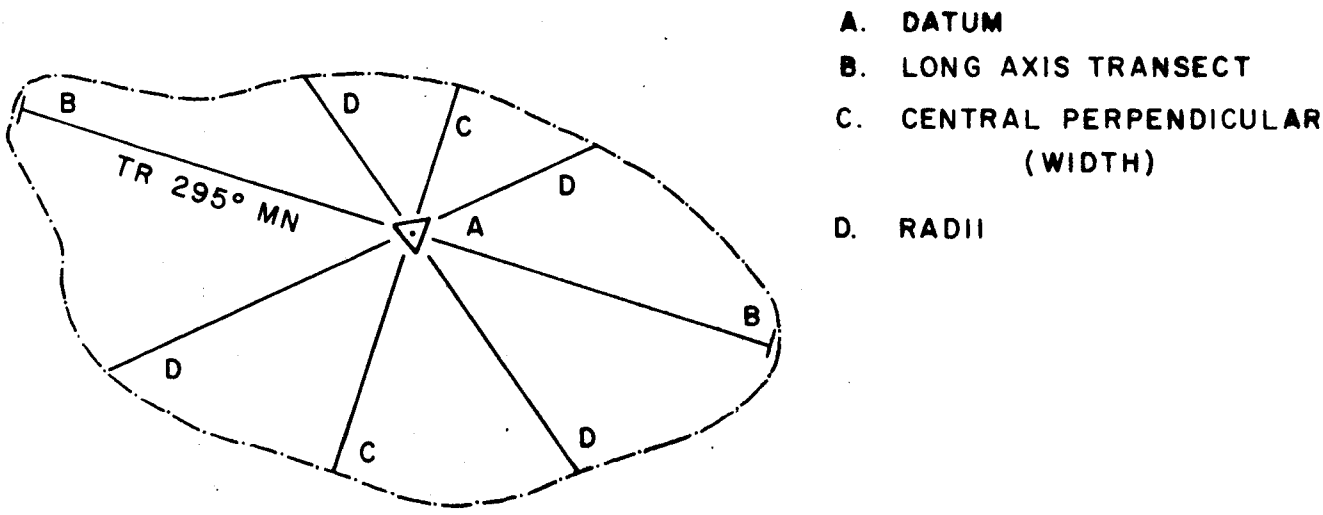


Figure 3. Example of Radii and Central Perpendicular Used in Defining Site Boundaries at Prehistoric Sites.

i.e., where flakes and artifacts are no longer continuous, where fire altered rock and shell or midden features end, or where the "hot spot" of minimum concentrations phases out. Each crew member should then coordinate with the mapper for recording the compass reading and pace back along this radius reporting to the mapper the distance involved. The number of radii should depend on the size and particular configuration that emerges. It is important that artifacts encountered at this stage should not be collected but should instead be temporarily but distinctively marked with survey tape or flagging pins until they can be properly mapped or collected as in the case of diagnostic artifacts. Flagging tape should be another color from that used for quadrat boundary marking and should clearly distinguish minimum concentrations. Each surveyor should note his observations (a list of artifact types observed) so they can be cumulatively reported on the site form.

Once the boundary information from quad maps and paced radii are reported to the mapper, an approximate estimate of the site's size and configuration can be drawn to an appropriate scale on metric graph paper. This will also be the time to establish a datum at the center of the site for mapping and for systematically sampling the site. Using a protractor, the mapper should plot feature and artifact locations onto the site map, as well as site boundaries. The aerial photograph has been found to be most accurate for determining the boundaries of all but the smallest of sites.

Once the mapper has located the site on a topographic map and aerial photo, it is an easy matter to include on the map the nearest contour line and its orientation. A single reference to an important geographic or permanent cultural feature will greatly help anyone to find the site in the future. This reference could also include unusual landmarks such as roads, nearby streams, and buildings. At least one such reference should be included. All minimum concentrations observed shall be mapped. Outstanding cultural structures or features, such as burned rock mounds, shell middens, and dense lithic scatters should also be mapped. Isolated finds, especially if collected, must be mapped. Isolated finds along and near the transect line (see Section 6.0) can be very easily and quickly mapped. The scale of the map shall depend on the site size but, as a general rule, it is best to try to proportion the drawing on the graph paper for greatest ease in interpretation. For large sites, additional sheets may be attached to produce a fold-out map. If appropriate, use an inset map to depict important information and prevent unnecessary clutter.

Draw all maps in number two pencil, dark enough to be photocopied. A grid may be drawn on an individual blueline (1 cm = 50 m) and then transposed to graph paper, usually at a scale of 2x, 4x, or 8x, the scale of the blueline. Tick marks made on the graph paper for this purpose should be very light or erased.

All writing should be readable with north at the top of the page or at the binder-side of the page. The site mapper should transfer the boundaries to the Preliminary Composite Map.

6.2 *Mapping Elements*

The following is list of essentials for all maps. Site and quadrat maps are required to contain these elements but should not necessarily be limited to these:

Project Code (e.g. FY 1986 [____])

Site field number or TARL number

Sample quadrat number

Date

Name of mapper

Scale

North arrow (both grid and magnetic)

Central datum

Systematic Sampling Transect (Prehistoric sites only)

Slope arrow(s) to supplement contour lines

Reference to nearest mapped contour line

Site boundaries

Reference to important geographic and cultural features

Minimum concentrations

All collected artifacts

Photograph positions using symbol indicating direction and number of each roll and frame

Outstanding isolated finds, features, and structures.

Recognizable landmarks (road intersections, creek confluences, etc.)

Drainages (depicting direction of flow)

Impacts and areas of impact (tank traps, hull downs, vandalism, etc.)

UTM gridlines

6.3 *Standard Mapping Symbols.*

It has found to be valuable to create and utilize standardized symbols for use by mappers. These symbols, when used consistently, reduce confusion and make mapping quicker and easier for those accustomed to these symbols. Standard mapping symbols used at Fort Hood are illustrated in Figure 4.

6.4 *Sites Extending Outside the Quad*

Relying on the search for and mapping of minimum concentrations, isolated finds, and other cultural and non-cultural observations in the sample quadrat gives us the capability of discovering areas of differential human activity based on surface evidence. "Hot spots" can be isolated quantitatively from other areas with lower densities of cultural evidence. Often these site areas can be quite large, extending well outside the sampling unit for which your crew has responsibility. This usually means that there is no practical means of determining whether the boundaries are close by or a great distance away. In such cases, a site form must be filled out as described below. This is to be accompanied by a suitable map illustrating the locational and landform situation of the incompletely recorded site. In some cases, this map can be a photocopy or tracing of the quadrat air photo (composite), but in most cases more detail will be needed. This decision will be left to the discretion of the crew chief.

As survey coverage increases through time, additional site boundary information can be obtained within adjacent quadrats. This is another reason for a careful review of previous survey data (see Section 3.3). The basic idea is that future projects can build upon the mapping and recording of earlier crews with their separate areas of responsibility.

6.5 *The Site Form*

The following entries are numbered to correspond to the numbered entries on the site survey form. Examples of prehistoric and historic site forms are found in Appendices II and IV. The following discussion should help to answer some anticipated questions concerning entries that are not self-evident. The following site form entries correspond with those on the Prehistoric Site Form in Appendix II.

1. *Site Number.* The site number assigned by the Texas Archeological Research Laboratory (TARL) goes in this blank. Fort Hood sites will be either 41 BL ___ (Bell County) or 41 CV ___ (Coryell County). Consult the quadrat maps if there are any questions about site numbers. UTM coordinates may be readily recorded in the field.

2. *Field Number.* Temporary numbers or field numbers will be kept numerical and consecutive (F.N., the abbreviation for Field Number, is not to be written in front of field numbers). The crew chief shall keep a numerical inventory of site numbers assigned to insure a consistent sequence of numbers. Previously recorded site numbers shall, in all cases, take

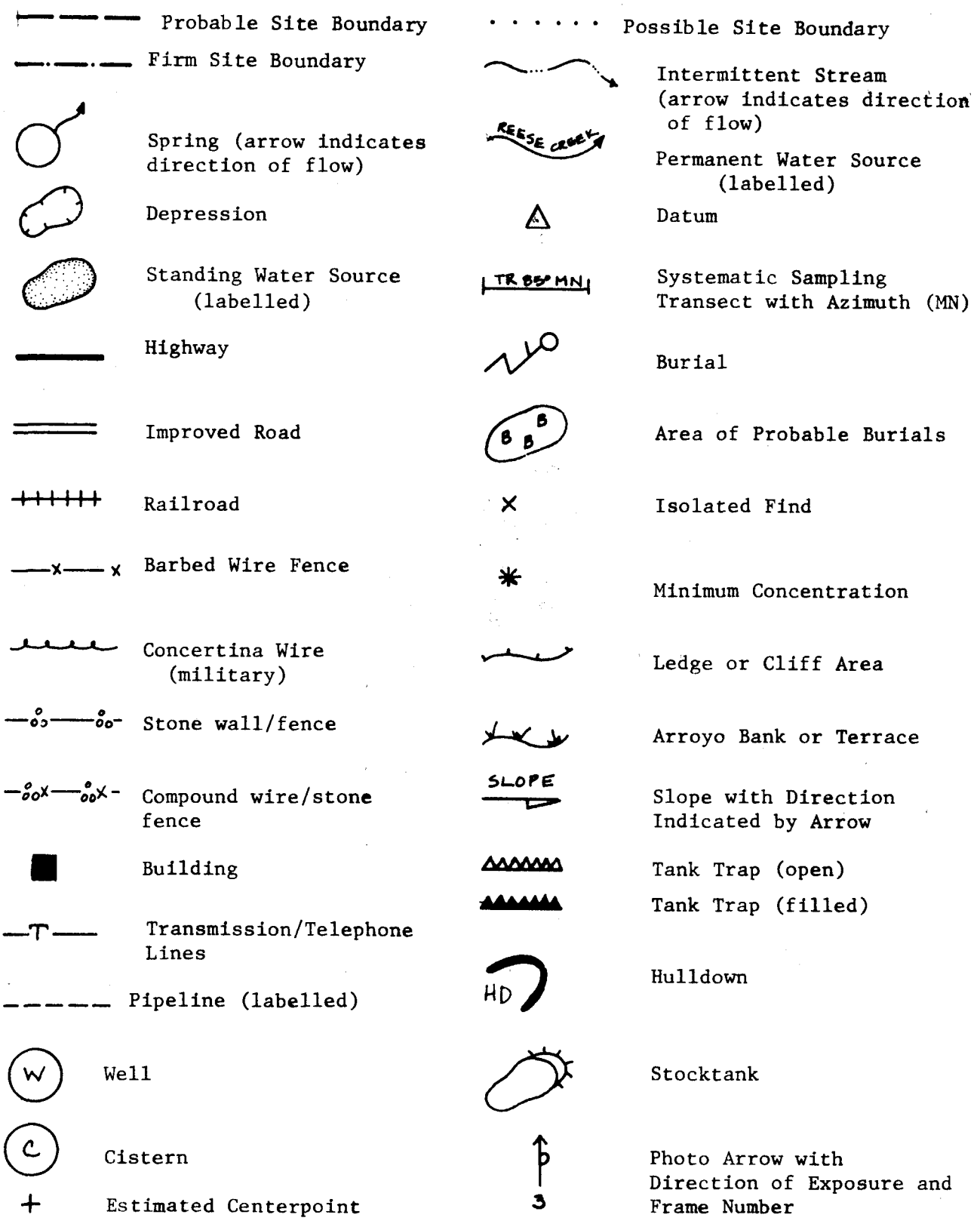


Figure 4. Standardized Mapping Symbols Used at Fort Hood.

precedence. In order to avoid unnecessary duplication in numbering sites, any site previously assigned a field number or TARL number shall not be assigned a new number.

3. *County*. (Bell or Coryell)

4. *Map Name*. The name of the map being used is placed in this space.

5. *Map Number*. The number of the map being used is placed in this space.

6. *Scale*. The scale of the map being used is placed in this space.

7. *Elevation*. The elevation of the site, in feet, as depicted on the map being used is placed in this space.

8. *UTM Location*. Sites will be located by means of Universal Transverse Mercator coordinates (not geographic coordinates). Numbers from west to east are listed first (under Easting) and numbers from south to north are listed next (under Northing). Read right for Easting and up for Northing. We will be recording a 10 x 10 meter spot as near as possible to the estimated center of the site (8 digits). The map maker will carry a UTM mapper's protractor or coordinate counter and will inform the site form reader of his calculation.

9. *Grid Square*. This refers to the area currently being surveyed or sampled for which a quadrat form will be completed.

10. *Quadrats*. List all possible quadrats involved with the site's boundaries.

11. *Landform*. This entry refers to observations concerning classification into uplands, lowlands, and intermediate uplands. Each of these major environmental zones is subdivided into landforms. This information is explained in the Landform Dictionary (Appendix XI) and the Landform Chart (Appendix XII). The recorder is encouraged to describe additional landform observations which will contribute to the development of this experimental Landform Dictionary.

12. *Site Location*. This description will supplement the UTM coordinates. The site must be described according to its relationship to natural terrain features such as generalized creeks or tributary valleys, and/or distance and direction from road intersections or any other feature that will help relocate the site in the future.

13. *Nearest Water*. A description is needed of the nearest observed water, natural or artificial, as well as any observations of possible extinct or dry water sources as well as remarks concerning the landform(s) associated with the water. This is not the same as the laboratory form entry concerning distance to nearest (flowing) water (see Appendix XIII).

14. *Site Type.* Indicate site type by placing an "x" in the appropriate set of brackets. Remember that any combination of types is hypothetically possible. The category "other" is purposely left open to account for additional unforeseen or unusual observations. The prehistoric site types are defined as follows:

Burned Rock Mound. The key to observing this type is to find clear evidence of artificial mounding. Often, these mounds or structures containing burned rock will be very subtle low profiles in a semi-hemispherical shape. Look for disconformity in the natural contours of the surrounding area.

Burned Rock Scatter. Obvious fragments of thermally-altered limestone or other rocks, usually chert, but also including other cryptocrystalline rock, are present as cultural residues. It will be difficult in some cases to determine if thermally-altered rock is cultural. All discolored rock is not necessarily cultural. With limestone, look for such clues as quantity, fracturing pattern, size (usually fist or sub-cobble size) and obvious discoloration and evidence of oxidation both externally and internally. The prevalent colors will usually be grey to black. Cherts and other cryptocrystalline minerals will often be waxy and lustrous, often deep red or brown but in many other colors. Look for thermal shock fracture or evidence of hair line cracks and "potlid" spalls.

Lithic Scatter. Obvious chipped and/or ground stone artifacts are present and usually in association with debitage.

Midden. This type is reserved for sites containing a dark, sooty deposit indicating a high organic content. Pieces or flecks of shell or animal bone are often important constituents in a midden. The term should not be used for burned rock accumulations in the absence of a dark sooty deposit or preserved organics.

Rock Art. The presence of any pictographs or petroglyphs constitutes a rock art site.

Rockshelter. A rockshelter will be wider than it is deep. Shelters are present in the form of solution cavities and overhangs created by large rocks.

Cave. A cave will be deeper than it is wide. A sinkhole or solution cavity is a special kind of cave in a Karst or limestone landscape.

Other. If the site does not fit any of the above categories this box is checked.

Unknown. If the site type is not known this box is checked.

15. *Site Description.* This should be as close as possible to an objective description of cultural factors present. For example, a lithic scatter is the most common type of prehistoric site encountered at Fort Hood.

Note presence of features, tools, and relationship of cultural items to other factors such as a rockshelter. Be as descriptive as possible without being verbose. Do not underestimate subjective insights, hunches, or conjectures about site age, function, etc.

16. *Site Dimensions*. Record the long axis of the site and a perpendicular to the long axis at the widest point (length-width axis).

17. *Orientation, Long Axis*. Record the compass reading of the long axis of the site (indicate grid north or magnetic north)

18. *Character of Deposit*. In this blank describe the soil characteristics and geology of the site or any observations regarding the non-cultural deposit. For example, does a rockshelter have a waterborne or aeolian deposit? Does the site show water rounded or angular gravels? Is the site heavily deflated, etc.?

19. *Depth of Deposit*. This, in most cases, will be a rough estimate of the potential cultural depth of the site below the surface. Express this estimate in centimeters or meters with a plus or minus factor. Erosional cuts, vehicle damage, bulldozing, or any other subsurface exposure must be examined. Our experience indicates that few sites are without some depth indication. Do not fall into the habit of reporting the depth as unknown. Deflated or eroded areas in the Intermediate Uplands and especially upland sites may no longer exhibit soil horizons in which case notations such as exposed Comanche Peak Marl or exposed Edwards Limestone are appropriate.

20. *Features*. Describe any cultural items that cannot be removed without being destroyed.

21. *Ecofacts*. Describe any biological remains that may have been used by the site's inhabitants such as shell, bone, charcoal, etc.

22. *Natural Vegetation*. List observations and types of plants present and their relative abundance by circling the appropriate number on the scale from low to high.

23. *Diagnostic Artifacts*. Describe any artifacts that may be useful in identifying the chronology of the site. Be careful to describe the type of mineral for each groundstone artifact observed (Appendix III) as well as rare or unusual attributes, e.g. two-sided mano or metate fragments.

24. *Artifact Density*. Give an estimate of the quantity of artifacts observed on the site.

25. *Chronology*. This entry refers to a tentative statement of the age of the site, notwithstanding the obvious problems one encounters with one or a few diagnostic indicators, etc. Do not use vague terms such as prehistoric or historic.

26. *Exposure*. Record by circling good, fair, or poor visibility of artifacts through grass, leaves, or other ground cover. In other words,

how well can the surface evidence be seen and why? Please pay close attention to observations about exposure. It will also be very important to accurately locate the transect and site boundaries on the aerial photographs.

27. *Slope.* A short description of the slope conditions at the site (Appendix XI).

28. *Condition of the Site.* This entry supplements item number 27 where the total percent of the site surface affected by impacts is provided. Circle one entry which describes the overall site condition in terms of its potential for further analysis or excavation. Three sites with 50% of their surface affected by impacts could be placed in different categories depending on the location and severity of the damage. If one site contains an undisturbed burned rock mound and the 50% damage consists of shallow vehicle track marks, it would be considered to be in good condition. A site in which the 50% damage consisted of deep potholes in the site, however, would be in poor condition.

29. *Agents of Impact.* A list of Agents of Impact is on the quadrat form (Appendix X). When filling out estimated percentages under Agents of Impact, ask what percentage of the surface area of each site is affected by each form of recognized impact. The total of these percentages should equal the "Estimated Surface Area of Site Impacted." Since there has been considerable difficulty in implementing this estimate so that meaningful analyses can be performed, some further explanation is needed. Remember that your estimate of the percent of the surface area affected is expressed as a fraction of the entire surface area of the site, once its boundaries have been estimated. You are not being asked to subjectively rate each form of impact on an arbitrary scale. You are being asked to consider what fraction of the entire surface area can be estimated for each form of recognizeable impact. Hypothetically, bulldozing would be 100% only if the entire site were completely bulldozed with nothing remaining of the site's surface. In such a hypothetical case, it is hard to imagine how site boundaries could ever have been estimated in the first place. Also, bear in mind that you cannot estimate things like surface collecting, old erosion, and old vehicle damage if that damage cannot actually be perceived today. Please elaborate on the site form on any observations or problems encountered in recording these estimates. Consistent data are needed for defensible recommendations to prevent and control further impacts. Do not use vague terms such as military impact or time. Also avoid the word "dismantling," as it is universal on Fort Hood historic sites and we have not found a set of research questions for which "dismantling" would be useful data.

30. *Total Estimated Percent of the Site Surface Area Affected.* Estimate the percentage of the surface area of the site affected by all impacts.

31. *Photographs.* All photographs must be accounted for by each photographer on a photographic record form and on the site form (see Section 8.0).

32. *Blueline Number.* In this space put the number of all blueline(s) used for each quadrat.

33. *IGAS Map. Number.* In this space put the number of all IGAS maps used for each quadrat.

34. *Other Air Photos.* List information for other available air photos with site data.

35. *Man Hours to Record.* In this space put the total man hours.

36. *Material Collected.* Since only diagnostics or extraordinary artifacts will be collected, they must be listed here and mapped with reference to the sampling transect. This information will be expanded upon in the Field Sack Log attached to every site form from sites with collections (Appendix XIV).

37. *Remarks/Evaluations.* This refers to any observations or impressions not already covered that may prove helpful in describing and evaluating the site. Please be wordy in any observations you make that may be useful.

38. *Recorded by.* This refers to the names of those persons involved in the site recording process for each site.

39. *Date.* This refers to the actual date the crew was in the field recording the site, not the date the form was completed.

40. *Observed Artifacts.* List all artifacts observed that were observed by the entire crew.

6.6 *Systematic Sampling Method.*

Once the configuration of a site is estimated and mapped, a sampling transect can be laid out. This transect will be laid out following the entire long axis of every prehistoric site. In cases where the site has a very irregular shape, the transect should follow the closest approximation to the site's long axis.

The sampling line is beaded at five-meter intervals or increments and can be quickly laid out using a compass. It is important that this transect be plotted on the site map and aerial photo. Include the compass bearing, either grid north or magnetic north, on the map.

Two people, one recording and the other observing, can walk rapidly along one side of this transect recording data on the On-Site Systematic Sampling Form (Appendix VI). Each recorded sample unit is one meter wide by five meters long. A quick count from the standing position is to be made of the following items in each one meter by five meter sampling unit and recorded in the horizontal blocks on the On-Site Systematic Sampling Form. A completed sampling form is illustrated below in Figure 5.

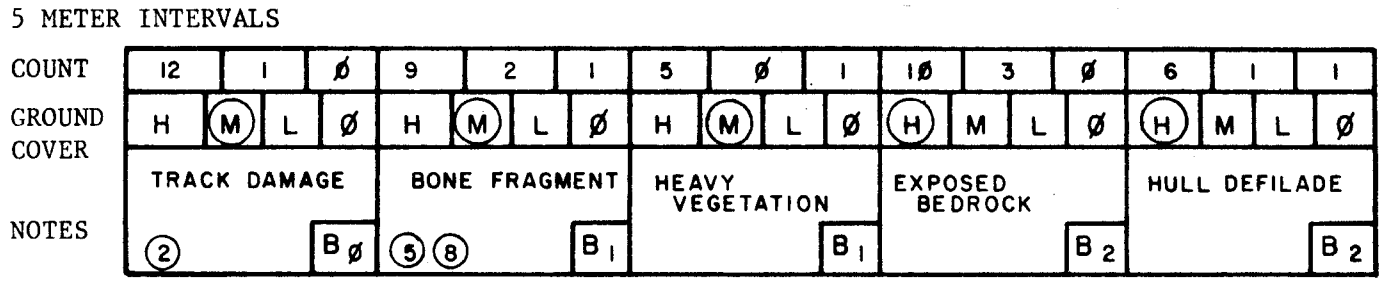


Figure 5. Example of Completed On-Site Systematic Sampling Form.

Each block on the form represents a five meter interval which coincides with the beaded intervals on the beadline. The first line (labelled "Count") depicts the artifacts observed. The number of flakes or debitage is placed in the first space, tools in the second space, and ecofacts in the last space. The example in Figure 5 shows 12 flakes, 1 tool, and 0 ecofacts found on the first bead.

When tools are observed, they are identified by placing the appropriate number from the Key on the form (Appendix VI). Thus, the tool found on the first bead was a Type II - Preform, and is indicated by the number 2 circled.

The density of ground cover is noted on the second line by circling the appropriate value (H=high, M=medium, L=low, and 0=zero). In our hypothetical example, ground cover was seen to be medium on the first three beads and high on the fourth and fifth beads.

Burned rock is indicated by placing the appropriate number in the box labelled "B" at the lower right-hand corner of each square. Values for burned rock are 0=absent, 1=light, and 2=heavy. The density of burned rock in Figure 5 is shown as absent on the first bead, light on the second and third beads, and heavy on the fourth and fifth beads.

The remainder of the square is reserved for notes concerning other observations made on the transect. Here, comments regarding site disturbance, vandalism, or change in site condition are solicited.

On long transects, more than one set of observers/recorders should work to expedite this recording. These data can later be combined into a single transect form. The direction of each transect should be indicated on the site map by a magnetic or grid bearing in degrees and an arrow (See Section 6.1).

This procedure is not concerned with exact counts and precise typological discriminations but attempts, instead, to make estimates that are more reliable than totally informal, subjective impressions. Variables 1, 2, and 3 are measured by a somewhat less rough-hewn scale than variable 4.

Some problems will be encountered that shall preclude recording these four observations. For instance, if an area is heavily disturbed by obvious post-depositional processes or other obscuring factors such as bulldozing, heavy erosion, extremely dense vegetation, it will not be possible to make counts and estimates that would be as reliable as in open and undisturbed areas. Thus, these sample units should simply be labeled as problematical with a statement as to why. These data can then be treated accordingly for a variety of analytical purposes.

On a very few sites, transects will crosscut areas with extraordinarily dense accumulations of chips and flakes. In rare instances, some sample units may have to be decreased in size to accomodate exceedingly large numbers of lithic fragments that require a great deal of time to count. In this case, it is suggested that the sample unit be reduced to one meter by one meter at the beaded increment and special note be taken of the sample unit size reduction for that five-meter increment. The observer can then mathematically extrapolate an estimate of the counts for the unit based on observations within the specified fraction of that unit.

6.7 *What is Not Recorded as a Prehistoric Site*

There are numerous prehistoric cultural phenomena that will be encountered which do not meet the minimum site criteria described above. These must be carefully recorded and described on the quadrat forms and quadrat maps so that they can be relocated and reconsidered when practical or as the need arises.

Ultimately, the crew chief will make the final decision in the inevitable event of controversy over a particular case. It must be stressed again that the crew should base site definition decisions on criteria that are as objective as possible. It never hurts to describe these criteria in writing. By recording cultural information using the quadrat perspective we are allowing for a reconsideration of your observation in view of future known impacts to that particular area.

6.8 *Recording Historic Sites*

6.8.1 *Historic Sites Definition.* Historic sites represent the tail-end of an archaeological continuum and, as such, should be perceived no differently than prehistoric or proto-historic sites. Despite the disputes and controversy over an acceptable definition of historic sites archaeology and its relationship to history (Schuyler 1978: 1-32), Robert Schuyler (1978:27) has proposed that it simply be defined as "the study of the material remains from any historic period." The historic period is that period for which a documentary record is available and enables the researcher to understand the historic archaeological site more fully. With the aid of documentation and the use of the direct historical approach, the potential for understanding prehistoric and proto-historic sites increases. Consequently, the same methods may be used on prehistoric, proto-historic, and historic sites. Within a field context, and for the purposes of recording, historic sites at Fort Hood may be identified by the presence of structures or features such as building foundations, wells, cisterns, and

root cellars, or three artifact classes such as glass, metal, and ceramics within a radius of five meters. The major historic site types already identified at Fort Hood include the following:

Farm/Ranch Complexes. This is probably the most commonly occurring historic site type at Fort Hood and is characterized by its frequency, large size, evidence of multiple structures or activity areas, and recognizable farm related artifacts (tractor parts, plow parts, etc.) or features (dip tanks, stock tanks, troughs, etc.).

Domestic Dwellings. These occur somewhat less frequently than farm/ranch complexes and are primarily identified by their smaller size and fewer structural remains and activity areas. The artifacts are domestic in nature (ceramics, glassware, etc.) and features such as stock tanks or troughs would not be present. In general, these are believed to represent tenant farmer dwellings.

Dumps. These occur throughout the region and often in drainages. Though their integrity is not good, they may be associated with nearby dwellings and provide a range of artifact types for the period in which the dwelling was occupied.

Cemeteries. Most cemeteries are fenced and marked with headstones, however, small family cemeteries may not be readily discernable. Fencing may not be present and headstones may be simple field stones marking the head and/or foot of each grave. If the field stones have been moved, the shallow depression of the grave pit may be all that remains.

Townsites. A number of extinct communities have been identified at Fort Hood and are characterized by multiple structural remains and activity areas of a domestic nature over a large area. It is preferable that the individual elements of the town be recorded as sites - if their boundaries can be distinguished - rather than assigning only one site number to the entire townsite.

Special Purpose Sites. These sites are generally community structures that may or may not double as dwellings. Depending on the type of structure (e.g., school, church, or post office), they may be mistaken for domestic dwellings if no supplemental historical data are available. Other commercial structures such as grist mills or saw mills should be readily identifiable as to function.

Isolated Features. Many features related to stockraising occur frequently and alone in isolated pastures. Since it is necessary to record these features, but difficult or impossible to associate them with any particular site, they should be given their own site numbers. These are generally structural features such as stock tanks, troughs, wells, and windmills but may also include such things as bridges, dams, or rock carvings.

Unknown Historic Sites. Sites that are so small or sparse that it is impossible to identify their function, or that are unique and unusual, may

be placed in this category. It is recommended, however; that every effort be made to identify the site function and avoid use of the unknown category if at all possible.

6.8.2 *Historic Site Recording*. All techniques described for prehistoric site recording (see Section 6.5) may be applied to historic sites as well, the only difference being in the artifact classes observed or collected and the systematic sampling from transects (see Appendix VI).

6.8.3 *Historic Site Structures and Features*. Some of the kinds of structures and cultural features previously observed on historic sites at Fort Hood are discussed below.

A. Bridges: These are generally represented by wooden, iron, or stone and concrete pilings with associated hardware.

B. Chimney falls: These are either brick or stone with mortar attached and possible evidence of burning. Bricks that have been subjected to intense heat will exhibit a greenish-colored glaze that results from silicas in the clay being drawn to the surface.

C. Cisterns: These are subsurface water storage facilities that are usually bell-shaped, but may be square or cylindrical as well. They are generally constructed of brick or stone and are plastered with mortar on the interior to hold the water. Cisterns were generally fitted with a cover, though the covers were often not always used with the cisterns, so that a pipe could drain rain water from the gutters of a nearby structure.

D. Concrete piers: These are generally trapezoidal or rectangular and used to support a structure. They may be used in combination with stone or wooden stumps.

E. Concrete slabs: These usually represent sidewalks or slab structures on late dating sites.

F. Concrete water tanks: These features are above-ground water storage facilities associated with windmills. They are usually quite tall (3 m or more) and wide (3 m in diameter or more).

G. Concrete water/feeding troughs: These are small rectangular or cylindrical troughs approximately 60 cm in depth and 60 cm in diameter which rest on the ground.

H. Corrals: Corrals are small fenced or stone enclosures for livestock. Note that some corrals are in current use or recent use by cattle leasees.

I. Depressions: These low, sunken features may represent a former privy, root cellar, or storm cellar location.

J. Dip tanks: Commonly used in the 1920s and 1930s for tick infestation in cattle and sheep, these concrete features may have a concrete loading platform with an abrupt drop-off into the subsurface dip tank. The tank is a narrow passage just wide enough for a single animal to walk through with a sloping exit up to another concrete platform. Fenced corrals would be common at either end of this feature.

K. Domestic plants: Some plants have been identified as markers for historic sites. These include large live oak trees, invading mesquite trees, Black Walnut trees, fig trees, fruit trees, border grass along pathways, perennial flowers, such as daffodils or irises, and rose bushes, philodendrons and non-native cacti, horehound, Tuscajilla (pencil cactus), and Lilacs.

L. Extant structures: Few undisturbed structures remain at Fort Hood and should be carefully recorded if found.

M. Fencelines/fenceposts: Often fencelines designated by the use of barbed wire or wooden fenceposts are found as part of the site. These fencelines may represent property boundaries, fields, or corrals.

N. Foundations: Foundation for domestic dwellings and outbuildings are common and generally represented by brick, stone, concrete, or wooden piers in some type of linear arrangement that can be recognized as a building foundation. Loose foundation stones and bricks bulldozed into piles are common.

O. Paving stones: Flat flagstones either in situ or loose.

P. Roads: Historic roads are probably more apparent on aerial photographs than in the field and will appear as linear sunken features, heavily overgrown with vegetation. Portions of roads may be heavily disturbed. Record these as parts of sites if not found alone.

Q. Root cellars: Rectangular subsurface features for storing vegetables and measuring approximately 1 m x 2 m, or larger, with a depth of about 1.5 m. These may be unlined or lined with wood, brick, or

stone. During use, these would probably have some type of wooden plank covering. Some were completely vaulted over with stone and mortar.

R. Rubble: Rubble piles often represent structures that have been bulldozed or disturbed by other means by the Army and should be examined for structural remains (foundation stones, bricks from chimney falls, nails, window glass, or other associated artifacts.

S. Stock tanks: These are large circular water impoundments with a man-made berm along one edge. These are commonly called stock tanks in Texas but known as stock ponds elsewhere. These can often be expected to be post-acquisition and in current use.

T. Stone walls: Dry laid stone walls are common in some areas of Fort Hood and probably represent early property lines or field boundaries during initial clearing of the land. Again, record these as parts of sites if not found alone.

U. Wells: Wells are deep and narrow circular shafts lined with brick or stone. These should not be confused with cisterns or concrete water/feeding troughs. Drilled wellheads 2-6 inches in diameter are common.

V. Windmills: Blade parts or iron leg remains may be found, possibly in association with concrete footings, and will probably be found near large concrete tanks or other water storage structures that store the water pumped by windmills. Usually one can find a drilled well with casing in association with windmill remains. Look for angle iron footings.

W. Other: Any cultural feature that does not fall into the above categories should also be described.

6.8.4 Historic Site Chronological Indicators. Ceramics are usually the best chronological indicator on historic sites, but for late nineteenth and early twentieth century sites, such as those at Fort Hood, glassware is believed to be a better indicator. For metal artifacts, patent numbers and trademarks generally give the best chronological information. The following paragraphs address the chronological significance of artifacts that are most likely to be found at Fort Hood.

A. Ceramics

1. Coarse earthenwares: These low-fired, soft-paste ceramics are found infrequently on historic sites at Fort Hood. They are usually red-paste utilitarian wares such as crocks, jugs, jars, platters, and mugs prior to

1850. After 1850, these redwares were usually confined to flowerpots and drain tiles. Yellow earthenwares are common at Fort Hood, primarily in the form of mixing bowls, with the characteristic blue, pink, and white slip banding below the rim. These vessels were made during the ninteenth century and are still made today.

2. Whitewares: Creamware (1760-1820), a refined whitepaste earthenware with a yellowish-tinged, clear lead glaze and pearlware (1780-1830), a refined whitepaste earthenware with a bluish-tinged clear lead glaze, were the precursors of the nineteenth century whitewares produced from about 1830 on into the early twentieth century. Whitewares made between 1830 and 1860, are nearly indistinguishable from the pearlwares because many of the decorations were the same. The primary difference is that the glaze is clear so they appear whiter, plus the paste has been improved and is harder. The term ironstone is sometimes used to refer to these wares but is generally not used. The decorations that occur most frequently are: annular (or banded), edge-decorated, sponged, cut sponged, stamped, stenciled, and transferprinted.

Annular ware is easily recognized by the multiple bands that occur below the rim of each vessel, usually a bowl or mug form. Below the bands, on the body of the vessel, other decorations may occur. These are generally one of the following: (1) mocha - a dendritic brown design on rust and less frequently on blue or green, (2) marbled - a cloudy mixture of colors swirled together, (3) swirled - a mixture of colors trailed across the vessel in a manner resembling fingerpainting, (4) cat's eye - a mixture of colors applied by finger resembling a cat's eye, and (5) engine-turned - an impressed geometric design.

Edge decorated wares are mostly limited to "shell-edge" which is a feather-like impressed decoration along the rim of plates and is generally painted blue over the impressions. Tableware that has a single band along the rim is also referred to as edge decorated for this period.

Sponged wares (sometimes called spatterware) have had the decoration applied by a sponge, usually in bright red, green, blue, or lavender that may cover the entire vessel.

Cut sponged wares are the same except that a design has been cut from the sponge and stamped on the vessel - usually a crude flower form.

True stamped wares have a much finer and more delicate design than the cut sponged wares and generally occur as a border design.

And finally, transferprinted decorations were applied with an inked waxed paper onto which the design was transferred from a copper plate engraving. Blue is the most common color, but black, brown, green, lavender, and red also occur. "Flown" blue, which is a variation of transferprinting, was made also during this period and reappeared in the 1890s.

By 1855, a trend towards undecorated whitewares began and continued up until about 1930. Prior to 1900, these wares were characterized by a molded rim design but later are completely devoid of decoration.

Around 1900, decal decorated wares were available in the United States but did not become popular until the 1930s. The decals are generally polychrome floral designs that can be scratched off with use. The edge of the decal can be felt and should not be confused with transferprinted wares which are always monochrome and rarely have more than one color applied.

3. Stoneware: This ware is a non-porous, hard-paste ware that has been fired at a higher temperature than the whitewares. The early whitepaste earthenwares, creamware, and pearlware, were fired at a temperature so low that the paste can be scratched with a fingernail. The later whitewares have been improved and are harder, hence the term "ironstone." Stoneware, however, actually has ground flint in the paste, causing it to be harder. The paste colors usually fall within the ranges of gray and tan, and vessel form is utilitarian, i.e., crocks, jugs, butter churns, and milk pans. Stonewares pre-dating 1900 generally have a salt glaze which is clear with an "orange peel" finish. The interiors of vessels are often slipped with a matte brown Albany slip, a clay source from New York. After 1900, a Bristol glaze was more common. This glaze is a thick creamy white glaze that sometimes appears to be pitted. It is used for the interior and exterior of vessels; however, all combinations of the Albany slip and Bristol glaze occur. The most common is a Bristol glazed exterior and an Albany slipped interior. Blue Bristol glazes also occur frequently on chamber pots with molded decoration.

4. Semi-porcelain: This ware is a fine, thin tableware with a high fired white paste and a clear alkaline

glaze. The paste has somewhat of a grainy texture and decal decorations are common. It occurred infrequently during the late nineteenth and early twentieth century at Fort Hood.

5. Porcelain: This is the highest fired ware and is very thin with a smooth glass-like texture. Decal decorations were popular on this ware. Porcelain has generally been an expensive ware and was not common at Fort Hood during the late nineteenth and early twentieth centuries.

B. Glassware

1. Fire-polished (?-1855), flanged or folded finishes (?-1870): These are the earliest types of glass bottle finishes and are rarely found on Fort Hood sites. Fire polished finishes result from breaking the bottle neck from a blow-pipe and then smoothing the roughened edges in a fire. Flanged and folded finishes are done similarly except that while the glass is still warm the lip is flared (flanged) outwards for easier pouring, or completely folded over. All are irregular in shape.

2. Applied string finishes (?-1845): These bottle finishes are made the same way as a fire polished finish except that an extra band of glass has been applied around the lip and exhibits the impression from a string used in holding the bottle cork in place. This is also rarely found at Fort Hood.

3. Applied tooled finishes (1825-1875): These bottle finishes are found infrequently at Fort Hood and can be identified by the obvious piece of glass that has been applied to the bottle neck. It has been tooled with lipping shears so that its shape is regular. Lipping usually occurs on the exterior below the tooled portion of the lip where it attaches to the bottle. A ridge can also be felt inside the bottle neck as further evidence that the finish has been applied.

4. Improved tooled finishes (1870-1915): These bottle finishes occur frequently on Fort Hood sites and are characterized by their regular shaping. The lipping shears have been used directly on the unfinished bottle neck without the application of more glass as in the applied tooled finish. The easiest identifying characteristic is the absence of mold lines on either side of the bottle immediately below the tooled finish. The mold lines may stop on the shoulder of the bottle but usually extend up the lip almost to the finish.

5. Three-piece dip bottom mold (1830-1905): Bottles exhibiting this type of mold method have seams encircling the shoulder and one on either side extending upwards from the shoulder. They are not common on Fort Hood sites.

6. Snap case (1860-1915): This type of mold method leaves no seams but indentations on the body of the bottle may be apparent where the snap case grips it.

7. Three-piece post bottom mold (1858+): A circular seam appears on the base of bottles made by this method with a seam extending out and up either side of the bottle all the way to the finish.

8. Three-piece cup bottom mold (date unknown but seems to coincide with the three-piece post bottom mold): A seam encircles the sides of the bottle just above the base and has a seam extending up either side of the bottle to the finish.

9. Owen's scar (1904-1969): An irregular feathery circular suction cut-off scar on the base of machine-made bottles, sometimes extending up onto the sides of the bottle. Note that machine-made bottle finishes have mold seams extending up and over the bottle lip.

10. Valve mark (1935-1955): A small (about 1 cm diameter), regularly-shaped circular scar on machine-made bottle bases.

11. "Federal Law Prohibits" (1933-1964): This is usually inscribed on bottle sides just beneath shoulder or just above base.

12. "Duraglass" in script: (1940-1963).

13. "Duraglass" printed: (1964-present).

14. Lavender glass (1880-circa 1918): This glass resulted from attempts to decolorize glass because of the many impurities that can cause it to be various colors (greens, browns, yellows, etc.). Manganese dioxide was added as a decolorant; however, exposure to the sun caused it to turn lavender or purple. This is an important chronological marker for historic sites at Fort Hood.

15. Carnival glass (1905-1935): This is an irridescent pressed tableware given away at carnivals during the early part of the century.

16. Depression glass (1930-1940): This is a pressed glass tableware usually occurring in pale pink and pale green colors and to a lesser extent in pale blue and amber.

C. Trademarks

Trademarks are the most accurate method of dating historic artifacts since their use has usually been documented. Ceramic trademarks are usually stamped in ink on the base of vessels but may be found on other parts of the vessel as well. Glass trademarks usually consist of an emblem on the base of bottles. In their absence, manufacturer's names or product names are also helpful. Glass tableware generally does not have trademarks present although some does. Metal is less easily identified and dated because of corrosion; however, manufacturer's names occur with some frequency on various metal items.

D. Building Materials

Few building materials can be precisely dated. However, some items can provide limited information.

1. Nails: The preponderance for cut nails over wire nails, or vice versa, can be of significance. The pennyweight of whole nails can also aid in structural identification.

2. Window glass: measurements on window glass thickness have been used for dating historic sites although there are many limitations with this method. If a diversity of window glass thickness is encountered, representative samples should be collected.

3. Bricks: Some bricks have been stamped by their manufacturer. Also, crudely made bricks may be evidence of either early manufacture or local manufacture. Collect samples of bricks not in the Fort Hood collection.

4. Barbed wire: Barbed wire types can be identified, but their use as a chronological indicator is limited since most were patented during a short period of time and were used over a long period of time.

5. Log notching: While log structural remains are not expected, the method of notching in structures that are found may be useful in determining a date of construction.

E. Miscellaneous

Many modern artifacts, such as plastic, rubber, or military debris occur on historic sites at Fort Hood. While these may seem unimportant, their presence is useful in determining the length of occupation of a site or its disturbance. Floral and faunal materials are generally not considered useful since their association with cultural materials cannot be determined.

6.8.5 *What is Not Recorded as an Historic Site?* As with prehistoric observations, there are numerous historic phenomena that will be encountered which do not meet the site criteria of this project. These must be carefully recorded and described on the quadrat forms and quadrat maps so that they can be relocated and reconsidered as the need arises.

Rock wall systems, soil retention structures and systems, currently used stock ponds, check dams, piles of rock indicating clearing of fields, abandoned roads and railroads, and barbed wire fences will not be recorded as sites unless clearly associated with other structures and features defined above. Because of the obvious problems of defining and evaluating these often exhaustive and numerous finds, they shall be treated separately. Establishing a representative sample of these for protective purposes will be postponed until later project stages when more distribution data are available and a larger sample is known and recorded. Furthermore, there is a certain arbitrariness about assigning site numbers to the above structures or features since they can be both aerially extensive or discontinuous and discreet. Make certain these systemic structures and features are carefully described in the quadrat maps, quadrat forms, and aerial photos.

7.0 COLLECTION

The question of whether or not to collect artifacts from prehistoric and historic sites is a difficult one. While collection is a destructive activity irreversibly altering the fragile patterns and associations which might exist on a site surface, it is the method by which artifactual data are most quickly and efficiently obtained for laboratory measurement, weighing, cataloging, illustration, and storage for later reference. In order to collect but still retain a record of the spatial associations of artifacts on a site, only selected artifacts will be collected and the locations of all collected items will be drawn on the site map. Thus, not only can we retain artifacts and their catalog records for use in the laboratory, but we can also retain records of the fragile patterns and associations destroyed through collection.

7.1 *Guide to Collection Strategies*

A. Diagnostic, distinctive, or unusual artifacts located along the systematic sampling transect line on the site's long central axis will be collected. Diagnostics are especially distinctive or unusual artifacts indicating rough chronological, functional, or other significant data.

B. Unbroken or otherwise essentially complete diagnostic artifacts that would enhance the comparative collection in the archaeological laboratory, mapped and collected on or off the transect should also be collected.

C. The emphasis is on the artifacts that can either provide firm chronological indications or where the material is of such a nature that it could be expected to be removed by any casual finder. Items which fall into the first category are distinctive types of pressed brick, distinctive types of barbed wire, clear and complete maker's marks from ceramics, coins, firearms and ammunition casings, small items with patent numbers, unusual buttons, and patent medicine bottles with embossed brand or company name. Artifact types which are not of these types but which appear to the field crew as attractive to the casual collector should also have some value in defining site function. Examples of these include intact ceramic or glass table items, attractive and unusual whole bottles, unusual old tools, china doll pieces, fragments of jewelry, and other items that one might encounter in an antique store or flea market. All such items should be useful in defining site functions in addition to the above criteria. If doubt exists, leave the artifact on the site. See Section 6.8.4 for more specifics.

D. Any other items of potential utility to analysis. For this project, collect complete biface types I, II, and III and projectile points from the sample transect.

E. All ground stone artifacts are to be collected. In cases where very large ground stone artifacts are encountered, they should be photographed and, if feasible, a fist size mineral sample collected for future laboratory mineral identifications.

F. It will be important to have a sample of artifacts collected from the transect line as well as a systematic sample of select artifacts from elsewhere on the sites. Certain research questions will require some laboratory analysis of these artifacts. Before collecting an isolated find during a quadrat sweep, communicate to others and determine whether they are also seeing collectible items. This is important, especially when surveying under a two-phased schedule. There is a danger that a collected artifact might later prove to be within the boundaries of a site and its collection makes it difficult to place on the site map. As a precaution against this difficulty, mark the location of each isolated find with survey tape while collecting it. A surveyor should be able to recognize the marks he has made and identify the artifact to the site recorders and mappers.

8.0 PHOTOGRAPHY

8.1 *Color and Black-and-White Photography*

The main emphasis should be on 35 mm color slides with black-and-white photography as a backup. A supplementary effort can be made with a larger format, 120 black-and-white film but technical advances in 35 mm film coupled with the ready availability of 35 mm cameras have increased the emphasis that can be placed on them.

8.2 *Recommended Film Speed*

As a general rule, the slower the ASA (film speed), the smaller the grain and, consequently, the sharper the image will be. Black-and-white film with an ASA of 125 and color slide film with an ASA of 64 are recommended.

8.3 *Photographers*

There should be at least two photographers per crew - one using color film and the other black-and-white film.

8.4 *Suggested Photographs*

The following are exmaples of situations where photographs should be taken and is in no way meant to be a restrictive limitation. Much discretion has to be left to the surveyors taking photographs in view of the variety of opportunities that arise.

A. Close-ups of outstanding or representative artifacts, features, structures, etc.

B. A view of the datum and transect line for purposes of getting a systematic overview of each site if feasible.

C. A view with a scale and north arrow.

D. A view with an example of an outstanding landmark or other phenomenon that might help to relocate the site and orient ourselves in the future.

E. As many additional views of the site from as many directions as feasible.

F. Examples of unusual or characteristic economic flora and fauna.

G. Examples of introduced vegetation indicating the former presence of an historical site.

H. Examples of recognizable forms of impact such as heavy track vehicle damage, staging area effects, heavy erosion, shell centers, pot holes, burning, etc.

I. Close-up photographs will be taken of any large ground stone artifacts that are not collected. The photographers are encouraged to photograph collected artifacts in situ.

J. Stone, wood, and brick building materials should be photographed in black-and-white and color. Milling stones from querns (hand-turned grain mills) and objects with early patent numbers should be carefully documented and photographed and may be collected at the discretion of the survey crew where collection would aid in the preservation of highly unusual material or where functional identification is required.

8.5 *Photo Log*

Every exposure must be carefully recorded and accounted for on one of the two Field Photographic Record Forms (Appendices XV-XVI). Each photographer is accountable for his own photograph. No one can ever hope to make sense of someone else's photography, especially when some time has elapsed since the photograph was taken or when the original photographer leaves the project, without properly recording the exposures. Each roll of film should be numbered and assigned to individuals so it can be accounted for as soon as it is taken. This will require some discipline on the part of each photographer and some close supervision by the crew chief. Required on each photo log entry will be an entry for each frame including:

a. Site Number.

b. Description of View.

c. Direction of View (See site map)

d. Shutter speed.

e. Aperture (f-stop).

f. Date.

g. Initials of photographer.

8.6 *Curation of Undeveloped Rolls of Film*

Regardless of how color slides are developed, each box of slides must return clearly marked as to roll number. If a developer mailer service is used, it is best to designate a crew chief or crew photographer in charge of this task. It is also advantageous if this individual has a local or otherwise convenient mailing address. The roll number is written on the return address label along with the name of the photographer.

9.0 SKETCHING

An additional set of recorded data is sketching. As the mapping responsibility usually falls to an individual who can produce a clear map, there should usually be additional individuals who can sketch good likenesses of artifacts, features, and environmental details. The surveyors are encouraged to produce as many graphic likenesses of such items as they have time for and to try their hand at making rubbings of raised designs on historic artifacts or features. Some minimum concentrations are in order as the availability of sketches and rubbings among the site records will be of great advantage to the Fort Hood program.

9.1 *Suggested Subjects*

This is a suggested list of sketching subjects and should not be construed as a limitation of the subjects sketched.

A. Artifacts that are not collected.

B. Details on large features whether or not they have also been photographed.

C. Large artifacts such as metal objects too large to be collected.

9.2 *Suggested Rubbings*

In the past rubbings have been made on:

A. Embossed designs and lettering on historic glass or pottery.

B. Engravings, encasings in concrete, or on structures such as tombstones.

C. Raised lettering on labels and patent plates.

10.0 LABORATORY PROCEDURES

10.1 *Laboratory Procedures of Field Crew*

In the interest of saving time and recording reliable data, certain data entries will be recorded after leaving the field. The Lab Supplement form (Appendix XIII) is to be filled out in the lab where the necessary information sources are conveniently available. The following is needed for each site:

10.1.1 Drainage Stratum. The Fort Hood Terrain Analysis Map depicting hydrology has been divided into five drainage strata or drainage systems. An interfluvial divide separates these major streams.

1. Leon drainage system
2. Owl/Henson drainage system
3. Cowhouse drainage system
4. North Nolan drainage system
5. Lampasas drainage system

10.1.2 Soil Type. See Soil Conservation Service Maps (Bell and Coryell counties).

10.1.3 Landform. The first decision for classifying sites concerns the major environmental zone in which each site is located. The Landform Dictionary (Appendix XI), which is a classification designed to describe each site's unique physiographic characteristics, may be used in determining the environmental zone. The landform dictionary is a table representing a series of decisions (Roman Numerals I-V) from left to right that systematically describe the site being classified. This table may also be consulted for information concerning the landform, creek/crest, and position categories.

10.1.4 Geology. See Geologic Atlas of Texas, Waco Sheet, and *Geology of Bell County, Texas* (Adkins and Arick 1930).

10.1.5 Vegetation Type. See Terrain Analysis Vegetation Map.

10.1.6 Surface Area. Using the site map with boundaries drawn to scale on graph paper, estimate the area of the site's surface in square meters. This will be done by counting the number of squares falling inside the site's boundaries. Those squares with more than half falling outside the site's boundaries are excluded while those squares with more than half falling inside the site's boundaries will be included in the square meter area estimate.

10.1.7 Hydrology. The nearest major water source may be determined from the EGTD Maps. Descriptions of surface and ground water may

also be found on the EGTD maps and the Fort Hood map of known spring locations. Also, measure the straightline distance to the nearest permanent (perennial) water source (depicted in blue) and record its rank by consulting the EGTD map designating the rank of perennial and seasonal water sources.

10.1.8 Chronological Estimate. Give your best estimate of the site's period of occupation avoiding such general terms as "prehistoric" or "historic."

10.2 *Sample Unit Reports*

The quadrat recording form (Appendix X) must be completed once field work has been accomplished in any given grid square. These data plus the site forms and quadrat maps are elements of the sample unit report. The entries on the quadrat form are self-explanatory and should not require further elaboration here. The laboratory supplement form plus all site forms, site maps, quadrat forms, quadrat maps, aerial photos, photo records, and rock art forms (Appendix XVII) shall constitute the sample unit (grid) report to be delivered to Dr. Briuer for review. In this way, the crew will be able to respond immediately to all necessary corrections or remedial actions. Sample unit reports will be urgently needed upon completion of each quadrat. There cannot be exceptions. At close of fieldwork, the field and lab forms for each site will be typed and site maps traced in black drawing ink on bond paper.

REFERENCES CITED

Adkins W. S. and M. B. Arick
1930 The Geology of Bell County, Texas. Bureau of Economic Geology. University of Texas Bulletin 3016. Austin.

Schuyler, Robert L., editor
1978 *Historical Archaeology: A Guide to Substantive and Theoretical Contributions*. Baywood Publishing Company, Inc. Farmingdale, New York.

APPENDIX I

ANNOTATED BIBLIOGRAPHY

ANNOTATED BIBLIOGRAPHY
UNITED STATES ARMY, FORT HOOD, TEXAS.
ARCHAEOLOGICAL RESOURCE MANAGEMENT SERIES

Skinner, S. Alan, Frederick L. Briuer, George B. Thomas, and Ivan Show
1981 Initial Archaeological Survey, Fiscal Year 1978. United States Army, Fort Hood Archaeological Resource Management Series: Research Report Number 1.

The first professional archaeological survey project addressed two kinds of research questions using data from an initial 8% stratified random sample survey. The ambitious goal of reconstructing the prehistoric settlement system met with only limited results. A second objective focused on testing hypotheses about the nature of recognizeable military impacts to archaeological resources. Answers to both kinds of questions led to recommendations for a continuing archaeological resource management program emphasizing further field work and research.

Skinner, S. Alan, Frederick L. Briuer, W. C. Meiszner, and Ivan Show
1984 Archaeological Survey, Fiscal Year 1979. United States Army, Fort Hood Archaeological Resource Management Series: Research Report Number 2.

Additional survey, bringing the total installation coverage to about 14%, was conducted as part of a research design that extended the main objectives of the previous research project. Questions focused on chronological patterns and evidence suggesting different functions for prehistoric sites. An attempt was also made to answer questions about historic site settlement patterns. Potentially important relationships between modern environmental variables and prehistoric archaeological survey observations were investigated with some surprising results. Further questions concerning military impacts were answered. This iteration of the Fort Hood region research design led to additional management recommendations.

Dibble, David S. and Frederick L. Briuer
n.d. Archaeological Survey, Fiscal Year 1980 (Spring). Draft Report. United States Army, Fort Hood Archaeological Resource Management Series: Research Report Number 3.

New field surveys brought the cumulative survey coverage to about 18% and resulted in a report that departs significantly from the previous research objectives. Except for the important accumulation of descriptive survey data, the research almost exclusively emphasizes research questions concerned with the processes of archaeological site damage and destruction. The explicit nature of the hypotheses tested, the refinements in testing methods, and the overall improvements in the data base resulted in answering questions that allow us to better understand and mitigate the complex impact processes occurring at Fort Hood. Further recommendations based on this research give new directions to the overall management program and the developing research design.

Dibble, David S. and Frederick L. Briuer

n.d. Archaeological Survey, Fiscal Year 1980 (Fall). Draft Report. United States Army, Fort Hood Archaeological Resource Management Series: Research Report Number 4.

With approximately 24% survey coverage, this report was designed to complement the FY 1980 Spring impact research. Anthropological questions are emphasized. Two models, one cultural and one non-cultural, are posited as potential explanations for extensive prehistoric site survey observations. Significant progress was made in classifying sites, both chronologically and by environmental zones. Quantitative site data, including lithic assemblage data, gathered from systematic on-site sampling are selectively used to test hypotheses logically drawn from the cultural and non-cultural models.

Prewitt, Elton R., Frederick L. Briuer, and George B. Thomas

1983 Archaeological Analysis of Airphotos: A Feasibility Study. United States Army, Fort Hood Archaeological Resource Management Series: Research Report Number 5.

Certain types of prehistoric archaeological sites were identified from aerial photography. Rockshelters, sinkholes, and vandalized sites were successfully identified using United States Army air photos. Site recognition criteria were developed using a study set of photos containing known sites. These criteria were then evaluated in a blind test experiment where the air photo interpreter had no knowledge of the archaeological sites in the test imagery. This carefully designed experiment resulted in conclusions with important potential for cost effective use of inexpensive air photos for the discovery and monitoring of archaeological sites.

Jackson, Jack M.

1982 Archival Information Search and Archaeological Survey for the Proposed Aircraft Maintenance Facility, Robert Gray Army Airfield, Bell County, Texas. United States Army, Fort Hood Archaeological Resource Management Series: Research Report Number 6.

Special archival research was conducted for an area to be impacted by planned construction. The research focused on a small segment of the late-nineteenth and early-twentieth century community known as Okay, Texas. Mr. Jackson's research emphasizes questions about architecture, community and regional patterning and property ownership records. Community identification, road systems, site occupational information, economics, and ethnicity were reconstructed from available archival sources and historic informants.

Jackson, Jack M.

1982 Archival Research on the Mayberry Community. United States Army, Fort Hood Archaeological Resource Management Series: Research Report Number 7.

A wide variety of archival records were used to answer a set of questions about the site of the Mayberry Community and to evaluate that site

for possible inclusion on the National Register. Census, tax and deed records, published local histories, newspaper files along with real estate and legal records, maps and aerial photographs, cemetery records, original patents, surveyor notes, and knowledgable historical informants were all used to evaluate the significance of the Mayberry Community. On the basis of this investigation, Jackson recommended that the site does not meet the criteria for nomination to the National Register of Historic Places.

Carlson, David L., Frederick L. Briuer, and Henry Bruno
1983 Selecting a Statistically Representative Sample of Archaeological Sites. United States Army, Fort Hood Archaeological Resource Management Series: Research Report Number 8.

This research represents an important progressive step in the maturation of the Fort Hood Archaeological Resource Management Program. Research directions are discussed and explicit hypotheses are tested about prehistoric and historic site locations, considering select environmental factors. More importantly, the Fort Hood archaeological computer data base was significantly improved, offering the opportunity to achieve the long-range goal of establishing a statistically representative sample of prehistoric and historic sites for protection and preservation. An important method was devised for selecting sites on the basis of formal variation in chronological, functional, and environmental classifications as well as the physical condition of sites. This trial effort, initiated for sites from a limited area, has great potential for improvement and refinement considering recent advances in other Fort Hood research projects. The research points the way for analyzing the entire Fort Hood archaeological sites inventory in the near future so that a priority preservation sample can be selected that cross-cuts the wide range of archaeological variability known in this region.

Carlson, David L. and Frederick L. Briuer
n.d. Archaeological Site Monitoring at West Fort Hood. Draft Report. United States Army, Fort Hood Archaeological Resource Management Series: Research Report Number 9.

The concept of monitoring the effectiveness of site protection plans is an integral component of the Fort Hood program. This study rigorously evaluates a series of site protection techniques. Some 27 sites were revisited one year after their original recording in order to gather data to evaluate various techniques that were implemented to protect sites from all military but especially maneuver damage. Data on the conditions of sites, both before and during monitoring, were analyzed along with data on over 1,000 military training events that occurred in the study area prior to monitoring. A cost comparison was made between site protection and monitoring costs and estimates of what it would have cost to perform data recovery. Site protection and responsible site monitoring offer important alternative mitigation strategies for federal landholdings with processual impacts similar to those at Fort Hood.

Roemer, Erwin, Jr., Shawn Bonath Carlson, David L. Carlson, and Frederick L. Briuer

1985 Archaeological Survey, Fiscal Year 1982. United States Army, Fort Hood Archaeological Resource Management Series: Research Report Number 10.

The research report for the FY 1982 field survey brought total survey coverage up to 34% of the installation. Research emphasized testing hypotheses about prehistoric and historic sites as well as lithic technology. The research questions answered provide more reliable information for better understanding of variation in site function and chronology as well as improved environmental classifications for sites. The report advances our knowledge about past human adaptations in the region. The research strategy is both thorough and replicable and results in another progressive step toward protecting and preserving a variety of archaeological resources in a highly responsible manner.

Carlson, David L, Shawn B. Carlson, Frederick L. Briuer, Erwin Roemer, Jr., and William E. Moore

n.d. Archaeological Survey, Fiscal Year 1983. Draft Report. United States Army, Fort Hood Archaeological Resource Management Series: Research Report Number 11.

From October 1983 to August 1984 the Archeological Research Laboratory at Texas A & M University conducted a cultural resources survey of 96 square kilometers (24,000 acres) in the Eastern Training Area at Fort Hood. As a result of the survey, 468 archaeological sites were recorded or revisited. Following the survey, laboratory analysis was conducted from 1984-1986. The 248 prehistoric sites show evidence of human occupation spanning the last 10,000 years. The 220 historic sites represent the initial migrations into Central Texas by Anglo settlers beginning about 1850 and ending with the purchase of the land by the Army in the 1940s and 1950s. The information obtained from the sites was used to explore several questions concerning historic and prehistoric settlement patterns in the area. Significance recommendations were based solely on the surface indications of the sites with the result that a number of rockshelters and terrace sites will require shovel testing in order to appraise the depth of the deposits.

Carlson,, Shawn Bonath

1984 Ethnoarchaeological Studies at a 20th Century Farmstead in Central Texas: The W. Jarvis Henderrson Site (41BL273). United States Army, Fort Hood Archaeological Resource Management Series: Research Report Number 12.

Data recovery at the W. Jarvis Henderson site focused on the excavation of two cisterns dating to the early part of this century and the distribution of cultural materials across the site. Research questions about the two cisterns and the rest of the site were answered using excavation information and information provided by knowledgable informants discovered after the excavation began. Construction methods revealed by excavations were corroborated by the original site occupant, Mr. W. Jarvis Henderson. Shovel testing across the site, in combination with a SYMAP program, distinguished

artifact densities which were identified as the dwelling, storm cellar, and an outbuilding. The results of the archaeological investigations suggest that an archaic lifestyle, more typical of the nineteenth century, lingered in western Bell County as late as 1943 and was, in large part, due to the absence of such amenities as electricity, plumbing, and gas heating.

APPENDIX II

FORT HOOD PREHISTORIC ARCHAEOLOGICAL SITE SURVEY FORM

Project Code: _____

Revised: November 25, 1986

FORT HOOD
PREHISTORIC ARCHAEOLOGICAL SITE SURVEY FORM

1. Site # _____ 2. Field # _____ 3. County _____ 4. Map Name _____

5. Map # _____ 6. Scale _____ 7. Elev.(Ft) _____ 8. UTM Location _____ _____
Easting Northing

9. Grid Square _____ 10. Quadrats _____

11. Landform (Field observation): _____

12. Site Location: _____

_____

_____

13. Nearest Water (Description, Orientation & Distance from Site Center in Meters): _____

_____

14. Site Type: Burned Rock Mound [ ] Burned Rock Scatter [ ] Lithic Scatter [ ] Midden [ ] Rock Art [ ]
Rockshelter [ ] Cave [ ] other [ ] unknown [ ]

15. Site Description: _____

_____

_____

16. Site Dimensions: _____X_____m 17. Orientation, Long Axis: _____°

18. Character of Deposit: _____

19. Depth of Deposit: _____ 20. Features: _____

_____

21. Ecofacts: Charcoal [ ] Bone [ ] Shell [ ] Other [ ] (Specify) _____

22. Natural Vegetation:

PLANTS	low------high	PLANTS	low--------high
_____	1 2 3 4 5	_____	1 2 3 4 5
_____	1 2 3 4 5	_____	1 2 3 4 5
_____	1 2 3 4 5	_____	1 2 3 4 5

23. Diagnostic Artifacts: _____

24. Artifact Density: High [ ] Med [ ] Low [ ] None [ ] 25. Chronology _____

26. Exposure: Good [ ] Fair [ ] Poor [ ] 27. Slope _____

28. Condition of Site: Destroyed [ ] Poor [ ] Fair [ ] Good [ ] Excellent [ ]

29. Agents of Impact:

_____	_____%	_____	_____%
_____	_____%	_____	_____%
_____	_____%	_____	_____%
_____	_____%	_____	_____%

30. TOTAL estimated % site surface area affected: _____%

31. Photos: Roll # Exposure #s 32. Blueline #: _____

Color _____ _____ 33. IGAS Map #: _____

B/W _____ _____ 34. Other Airphotos: _____

Other _____ _____ 35. Man Hours to Record: _____

36. Material Collected (Itemize): _____

_____ No Collection (check) _____

37. Remarks/Evaluation: _____

_____

_____

38. Recorded by: _____ 39. Date: _____

40. OBSERVED ARTIFACTS, CIRCLE IF PRESENT

BIFACIAL
(Indicate Whole or Fragmentary)
- Type I: Roughout
- Type II: Preform
- Type III: Finished

MODIFIED
- Bored/Perforator
- Biface Scraper
- Other

PROJECTILE POINT (Type if Possible)
- Large (Dart)
- Small (Arrow)

BURNED ROCK:
- Absent
- Light
- Medium
- Heavy

UNIFACIAL
- Blank
- Flake with Retouch
- Blade with Retouch
- Side Scraper
- End Scraper
- Graver
- Burin
- Other

OTHER ITEMS
- Core
- Hammerstone
- Chopper

LITHIC DEBRIS
- Flakes
- Chips

GROUND STONE ITEMS
(Indicate material & whether one-sided two-sided or other)
- Mano _____
- Metate _____
- Other _____

41. List artifacts observed but not listed above: _____

_____

_____

APPENDIX III

STONE TOOL DICTIONARY

BIFACE

Artifact bearing flake scars on both sides (Crabtree 1972:38).

Biface Morphology

Truncated	Ovoid	Circular
Lunate	Tear-shaped	Other
Leaf-shaped	Triangular	

Bifaces may be categorized according to the following generalized criteria, assuming lithic reduction sequences:

Type I: Roughout

Implement in rudimentary stages of manufacture, rarely showing signs of use; could be a core.

Some original flaking surfaces likely to be present.

Nodular cortex likely to be present; could be abundant to absent.

General thickness in relation to overall production.

Coarse flaking: Crabtree (1972) lumps all bifacial implements that are not in a "completed" state into one category, *Preform*. Rudimentary and preform bifaces share varying degrees of coarseness, as suggested in these definitions. Flaking in early stages is always percussion.

Type II: Preform

Implement in intermediate stages of manufacture, sometimes showing signs of use.

Some original flaking surfaces may be present.

Nodular cortex may be present; could be moderate to absent.

May exhibit thinning flake scars, but still retains thick proportions in most cases.

Direct percussion flaking, but often more finely executed than on roughouts (Type I). Deep bulbar scars and triangular edges still present to some extent.

Implement shows no means of hafting.

Larger than, and without the refinement of, the completed tool.

Note: Rudimentary and preform (Types I and II) bifaces are not to be confused with blanks (qv.) (Crabtree 1972:85).

Type III: Finished

Implement in final stages of manufacture and usually showing signs of use.

Some original flaking surfaces may be present in rare cases.

Nodular cortex not likely to be present.

Usually fine flaking, imparting a smooth finish to the implement.

Usually thin in proportion to length-width size.

Implement has specific recognizable utility or familar shape. Examples are:

(qv.) Projectile point
Corner-tang tool
Borer/Perforator

Implement sometimes shows a means of hafting, such as notching, grinding, or basal thinning.

Modified

A "finished" biface which has been reworked to produce an implement with a form or function apparently different from its original. Examples are:

Borer/Perforator on a projectile point
Scraper on modified biface

Note: All bifaces are potentially utilized, whether or not in finished form.

BLADE

Specialized flake with parallel or subparallel lateral edges; the length being equal to, or more than, twice its width. Cross-sections are planoconvex, triangulated, sub-triangulated, rectangular, or trapezoidal. Some have more than two crests or ridges. Associated with prepared core and blade technique, not a random flake (Crabtree 1972:42).

BLADE WITH RETOUCH

Blade as defined, with systematic, intentionally-produced modifications by secondary chipping, usually on one or more edges. Spalls are larger and

more obvious or regular than those produced by nibbling.

BLADE WITH NIBBLING

Blade as defined, with small edge spalls, smaller than, and less obvious or regular than retouch.

BORER/PERFORATOR

Bifacial tool with pointed, sometimes elongated, tip or beak.

BURIN

A chisel-like implement derived from a flake or blade; or the modification of other implements by using the burin technique to remove the edges parallel to their long axis and/or transversely or obliquely. Generally forms a right angle edge on one or both margins. The specialized flake removed as a result of a burin break is called a burin blade or spall (Crabtree 1972:48).

CHOPPER

Heavy core tool presumed to be used for chopping. May be a uniface or biface (Crabtree 1972:51) displaying obvious pitting or crushing.

CORE (All flaked tool industries are represented by either flakes or cores).

Nucleus. A mass of material often preformed by the worker to the desired shape to allow the removal of a definite flake or blade. Piece of isotropic material bearing negative flake scars, or scar. Cores can be embryonic, such as a piece of natural, unprepared raw material with scar or scars reflecting the detachment of one or more flakes such as the Mexican polyhedral core (Crabtree 1972:55-56).

CORE TOOL

Be careful not to include, as tools, any amorphous decorticated cobble. Many of these "cores" from chert fields are naturefacts. A "Core" is an ambiguous term, usually reserved for techniques based on nodular reduction, such as cobble choppers or Acheulean hand axes. Large flakes serve also as the core for future axes and, in the absence of the original cortex, this distinction is futile. Carried to its logical conclusion, all tools from which flakes are removed are core tools (Crabtree 1972:56).

DEBITAGE

Flakes and chips, anything cultural not meeting our tool typology.

FLAKES

Any piece of stone removed from a larger mass by the application of force, either intentionally, accidentally, or by nature. A portion of

isotropic material having a platform and a bulb of force at the proximal end. The flake may be of any size or dimension, depending on which technique was used for detachment (Crabtree 1972:64).

FLAKE WITH NIBBLING

Flake as defined, with small edge spalls, smaller than, and less obvious or regular than retouch.

FLAKE WITH RETOUCH

Flake as defined, with systematic, intentionally-produced modifications by secondary flake or spall removal on one or more edges. Spalls are larger and more obvious or regular than nibbling.

GRAVER

Uniface tool with pointed tip or beak.

HAMMERSTONE

Cobble, core, or flake of any hard, dense material displaying battering, crushing, or pitting on its margins.

PERFORATOR

See Borer

PROJECTILE POINT

Finished, point artifact; usually bifacial and often modified according to recognizable, standardized types.

SCRAPER, END

Beveled implement made on a flake or blade with the working edge on one or both convex ends. The bevel is formed by unifacial flaking or by use (Crabtree 1972:60). Keeled-end scrapers are collected as diagnostics.

UNIFACE

Artifact flaked on one side only (Crabtree 1972:97).

VARIANT

Any morphologically distinct tool which is difficult or impossible to categorize by means of these definitions. Examples may be the keeled-end scraper, gouge (*Clear Fork Gouge*, if recognized), biface scraper, corner-tang knife, compound end scraper, and side scraper.

Terminology used in this section was taken from "An Introduction to Flintworking," by Don E. Crabtree, Occasional Papers of the Museum, Idaho State University, Number 28.

APPENDIX IV

FORT HOOD HISTORIC ARCHAEOLOGICAL SITE SURVEY FORM

Project Code: _____

Revised: December 8, 1986

FORT HOOD
HISTORIC ARCHAEOLOGICAL SITE SURVEY FORM

1. Site # _____ 2. Field # _____ 3. County _____ 4. Map Name _____

5. Map # _____ 6. Scale _____ 7. Elev.(Ft) _____ 8. UTM Location _____ _____
Easting Northing

9. Grid Square _____ 10. Quadrats _____

11. Landform (Field observation): _____

12. Site Location: _____

_____

_____

13. Nearest Water (Description, Orientation & Distance from Site Center in Meters): _____

_____

14. Site Type: Cemetery [ ] Domestic Dwelling [ ] Dump [ ] Farm/Ranch [ ] Isolated Features [ ]
Special Purpose Sites [ ] Town [ ] Unknown [ ]

15. Site Description: _____

_____

_____

16. Site Dimensions: _____X_____m 17. Orientation, Long Axis: _____°

18. Character of Deposit: _____

19. Depth of Deposit: _____ 20. Features: _____

_____

21. Domestic or Introduced Vegetation: _____

22. Natural Vegetation: _____

23. Diagnostic Artifacts: _____

24. Artifact Density: High [ ] Med [ ] Low [ ] None [ ] 25. Chronology _____

26. Exposure: Good [ ] Fair [ ] Poor [ ] 27. Slope _____

28. Condition of Site: Destroyed [ ] Poor [ ] Fair [ ] Good [ ] Excellent [ ]

29. Agents of Impact: _____ _____% _____ _____%

_____ _____% _____ _____%

_____ _____% _____ _____%

_____ _____% _____ _____%

30. TOTAL estimated % site surface area affected: _____%

31. Photos: Roll # Exposure #s 32. Blue line #: _____

Color _____ _____ 33. IGAS Map #: _____

B/W _____ _____ 34. Other Airphotos: _____

Other _____ _____ 35. Man Hours to Record: _____

36. Material Collected (General): _____

_____ No Collection (check) _____

37. Remarks/Evaluation: _____

_____

_____

38. Recorded by: _____ 39. Date: _____

40. ARTIFACTS, CIRCLE IF OBSERVED, INDICATE DENSITY WITH 1 (low)-3 (high) IN BOX, ASTERISK * INDICATES MOST CHRONOLOGICALLY DIAGNOSTIC ARTIFACTS

☐ CERAMICS
- coarse earthenwares
- undecorated whitewares
- *decorated whitewares
- stonewares
- porcelain
- *maker's marks
- tobacco pipes
- toys
- other _____

☐ GLASS
- *bottle glass (lips, bases)
- brandy/whiskey bottles
- canning jars
- cold cream jars
- condiment jars/bottles
- *Depression glass
- insulators
- kerosene lamp parts
- *lavender glass
- medicine bottles
- milk glass lid liners
- soft drink bottles
- snuff bottles
- *tableware (plates, etc.)
- tumblers
- other _____

☐ METAL
- barrel hoops
- buckets
- car parts
- chains

☐ METAL CON'T
- clothing related items
  - buckles
  - buttons
  - shoe eyelets
  - snaps
  - suspender slides
- farm machinery
- gun cartridges/gun parts
- hand tools
  - files
  - other _____
- harness gear
- horseshoes
- household items
  - bedsprings
  - cast iron stove parts
  - eating utensiles
  - enamel ware
  - furniture hardware
  - kettle parts
  - lantern parts
  - pans
  - other
- plow parts
- tin cans
  - soldered top & side seams
  - same w/soldered hole in top
  - locked end & side seams
- toys
- tractor parts
- wagon/wagon hardware
- washtubs
- other _____

☐ BUILDING MATERIALS
- asphalt shingles
- brick/brick with maker's mark
- flat glass
- foundation materials
  - concrete piers
  - cut limestone/cut sandstone
  - natural stone
  - other _____
- mortar
- plaster
- structural hardware
  - bolts
  - fence staples
  - hinges
  - hooks
  - lock plates
  - nails: cut, wire, lead-headed
  - screws
  - spikes: cut, wire
  - wire: barbed/chicken/hog/plain

  _____
- tiles: drainage/sewage
- tin roofing
- wooden planks/wooden posts
- other _____

☐ OTHER
- butchered bone
- graphite battery cores
- leather (shoes, etc.)
- plastic
- rubber
- other _____

36. Artifacts observed if not in above list: _____

_____

_____

APPENDIX V

FORT HOOD HISTORIC ARCHAEOLOGICAL SITE SURVEY FORM (CEMETERY SUPPLEMENT)

Project Code _____
Revised: October 1, 1986

FORT HOOD HISTORIC ARCHAEOLOGICAL SITE SURVEY FORM
(CEMETERY SUPPLEMENT)

Name _____

Birth Date _____

Death Date _____

Male [ ] Female [ ] Age _____

Motif (Describe) _____

_____

_____

Photos (B/W & Color) _____

Remarks _____

_____

_____

_____

Name _____

Birth Date _____

Death Date _____

Male [ ] Female [ ] Age _____

Motif (Describe) _____

_____

_____

Photos (B/W & Color) _____

Remarks _____

_____

_____

_____

Name _____

Birth Date _____

Death Date _____

Male [ ] Female [ ] Age _____

Motif (Describe) _____

_____

_____

Photos (B/W & Color)_____

Remarks _____

_____

_____

_____

Name _____

Birth Date _____

Death Date _____

Male [ ] Female [ ] Age _____

Motif (Describe) _____

_____

_____

Photos (B/W & Color_____

Remarks _____

_____

_____

_____

APPENDIX VI

FORT HOOD ON-SITE SYSTEMATIC SAMPLING FORM

Revised: October 1, 1986

FORT HOOD
ON-SITE SYSTEMATIC SAMPLING FORM

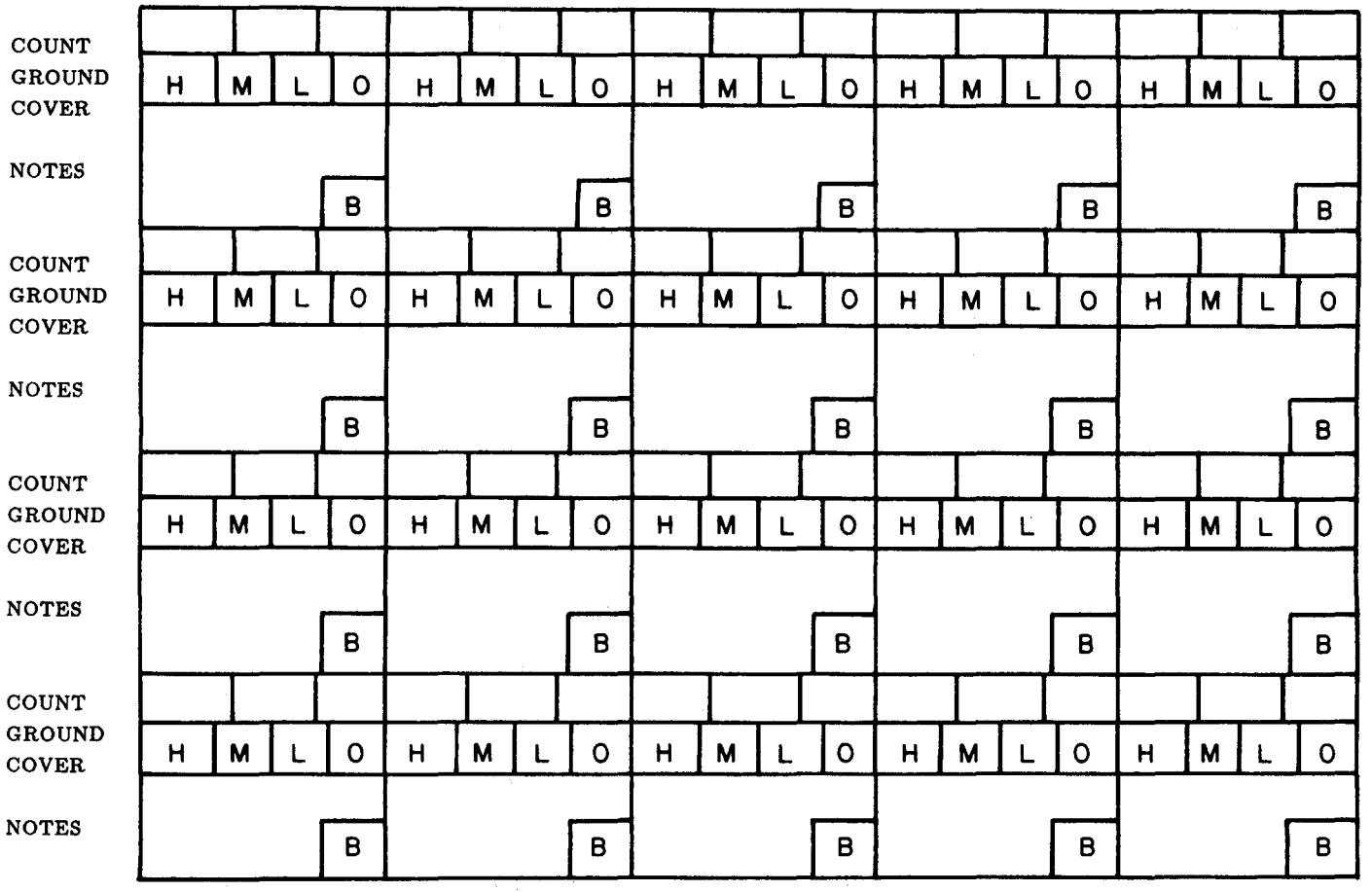
PAGE _____ OF _____

TARL Number _____ Field Number _____ Project Code _____

Magnetic or Grid Orientation(s) of Transect _____

Reader _____ Recorder _____ Date _____

5 METER INTERVALS



BIFACIAL
(Indicate Whole or Fragmentary)
1. Type I - Roughout
2. Type II - Preform
3. Type III - Finished

MODIFIED
4. Borer/Perforator
5. Biface Scraper
6. Other

PROJECTILE POINT
7. Large (Dart)
8. Small (Arrow)

UNIFACIAL
9. Blank

KEY
10. Flake w/Retouch
11. Blade w/Retouch
12. Side Scraper
13. End Scraper
14. Graver
15. Burin
16. Other

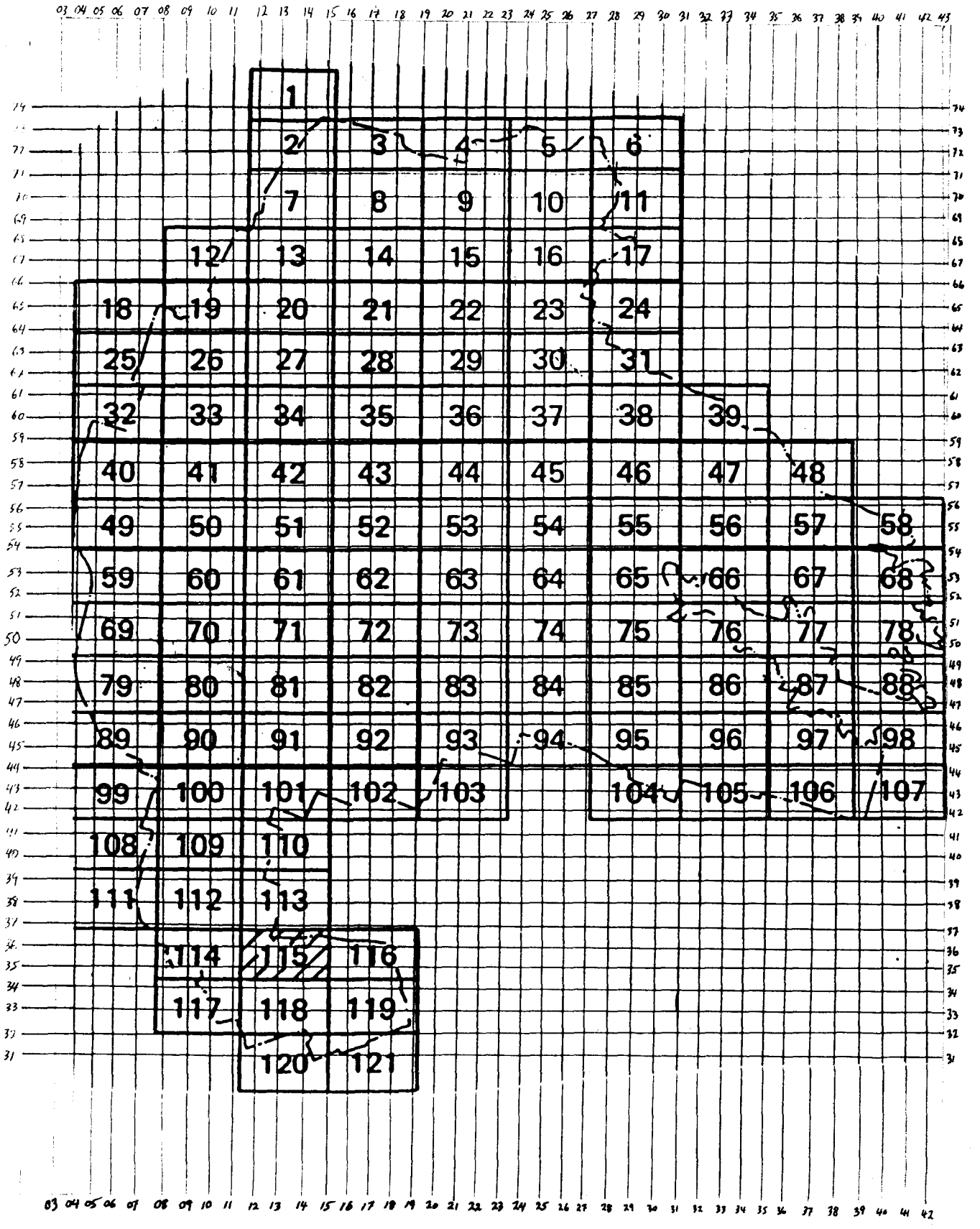
OTHER ITEMS
17. Core
18. Hammerstone
19. Chopper

GROUND STONE ITEMS
20. Mano (one-sided)
21. Mano (Two-sided)
22. Mano (Other)
23. Metate (One-sided)
24. Metate (Two-sided)
25. Metate (Other)
26. Other (One- sided)
27. Other (Two- sided)
28. Other (Other)

BURNED ROCK
B_0 Absent
B_1 Light
B_2 Heavy

APPENDIX VII

AERIAL PHOTO SHEET KEY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69 70 71 72 73 74 75 76 77 78
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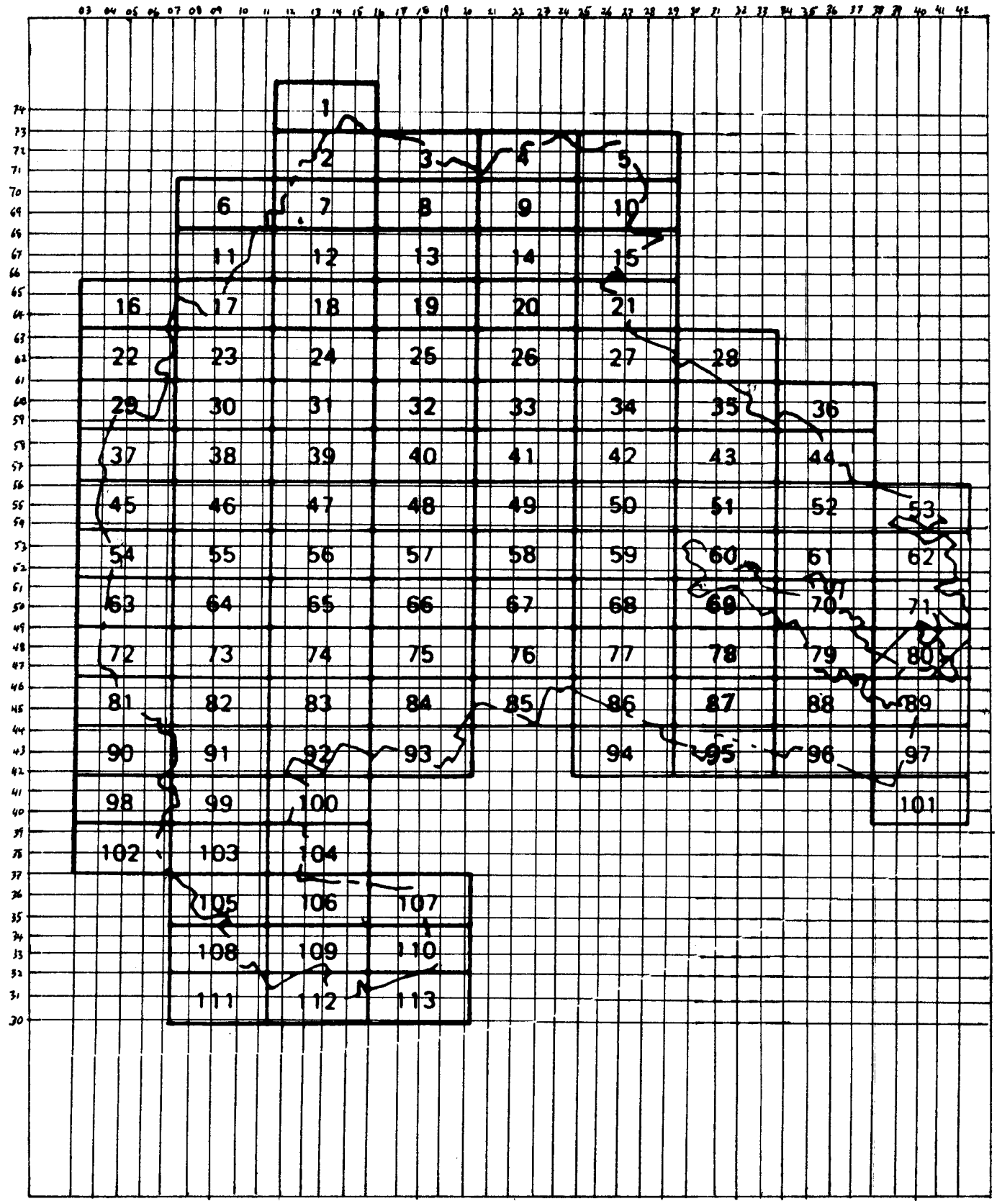
APPENDIX VIII

INTER-GRAPHICS ANALYSIS SYSTEM (IGAS)
TRANSPARENCY KEY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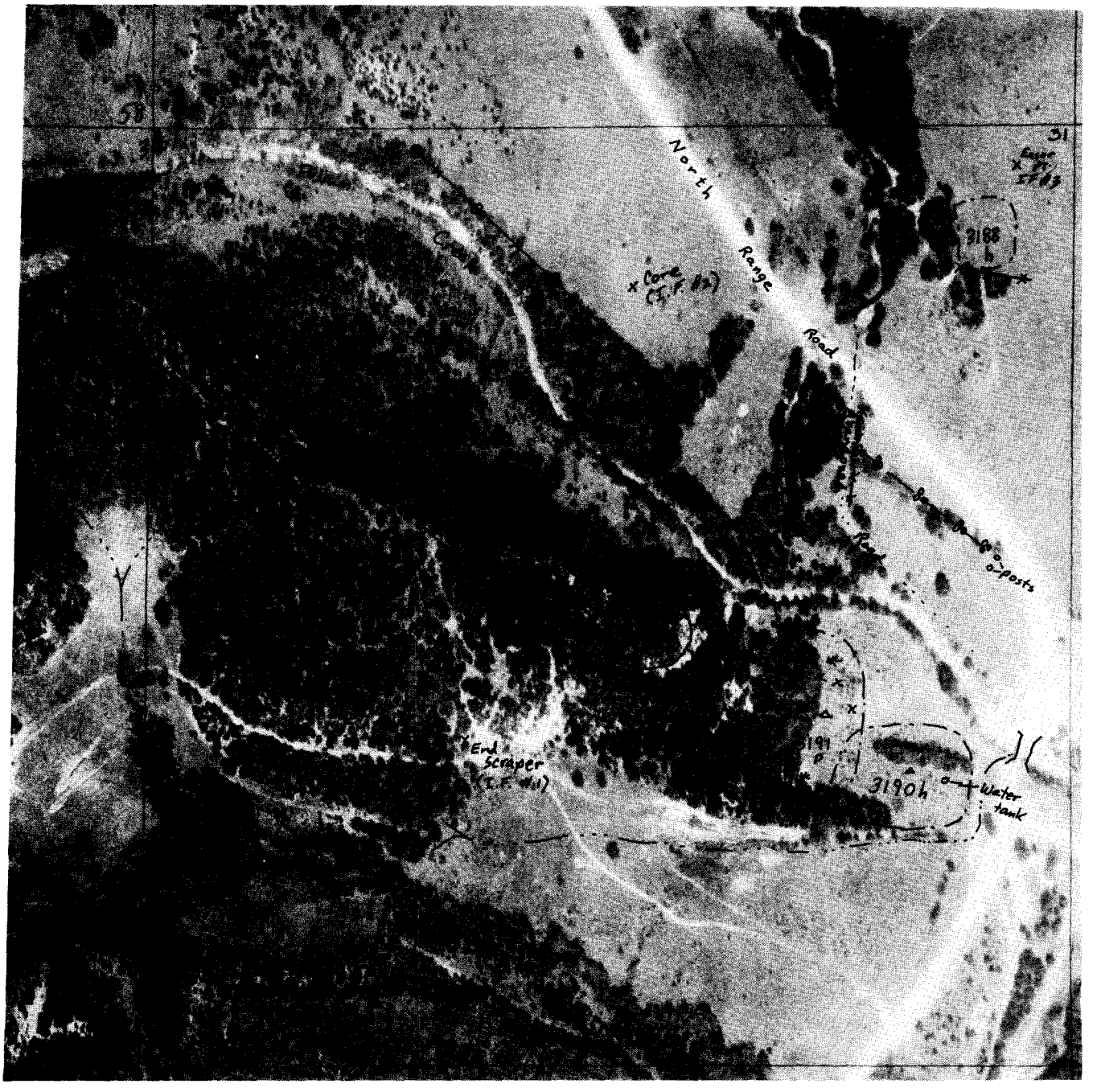
APPENDIX IX

SAMPLE AERIAL PHOTO WITH QUADRAT BOUNDARIES DRAWN IN



METERS

0 100 200 300 400 500

QUADRAT 30/57

COMPOSITE MAP

COMPLETION DATE Feb. 30, 1978

GRID MAGN.

N

APPENDIX X

FORT HOOD QUADRAT FORM

Project Code _____

FORT HOOD QUADRAT FORM
(Revised: December 8, 1986)

1. Quadrat Location: _____ _____ 2. Aerial Photos: _____
Easting Northing

3. Map Name: _____ Map. No. _____

4. General Environmental Observations:

a. Geology _____

_____

b. Soils _____

_____

c. Vegetation _____

_____

d. Landform (See SOP, Appendices XI-XII) _____

_____

5. Lithic Resources:

Upland Nodules [ ], Lowland Nodules [ ], Cobbles [ ], Chert lenses [ ],

Other [ ] (describe) _____

6. Water Sources (modern observations and notes on possible water in past):

_____

_____

7. Former Communities: Approximate Distace from Quadrat _____

Names _____

8. Road/Fence/Wall/Systems: _____

_____

9. List Site Numbers Assigned in Field:

Prehistoric _____

Historic _____

10. Appreciable areas in which no cultural resources observed:_____

_____

11. Impacts on Cultural resources. Circle if observed:

BURNING
EARTH MOVING
- Borrow Pitting
- Earth-Moving/Bulldozer
- Miscellaneous Military

EROSION, ETC.
- Erosion
- Cattle
- Wild Animal

LAND MANAGEMENT
- Vegetation Pushing
- Vegetation Cutting
- Land Clearing
- Plowing

MANEUVER DAMAGE
- Tracked Vehicle
- Wheeled Vehicle

ORDNANCE

ROADWAYS, ETC.
- Road
- Railroad
- Pipeline

VANDALISM

OTHER
- Old Field
- Historic Habitation
- Structural Collapse
- Roof Fall (Rockshelters)
- Miscellaneous

12. Other impact not listed above (describe):_____

_____

13. Accessibility of Sampling Unit (problems encountered in reaching the area):

_____

_____

14. Difficulty of Movement within Sampling Unit (terrain, vegetation, etc.):

_____

15. Difficulty of Observation (weather, vegetation, etc.):_____

_____

16. Isolated Finds (locate on map):_____

_____

17. Miscellaneous or Unusual Sightings (geology, flora, fauna, etc.):_____

_____

18. Remarks: _____

_____

_____

19. Man-Hours to Record: _____ 20. Date: _____

21. Recorded by: _____

APPENDIX XI

LANDFORM DICTIONARY

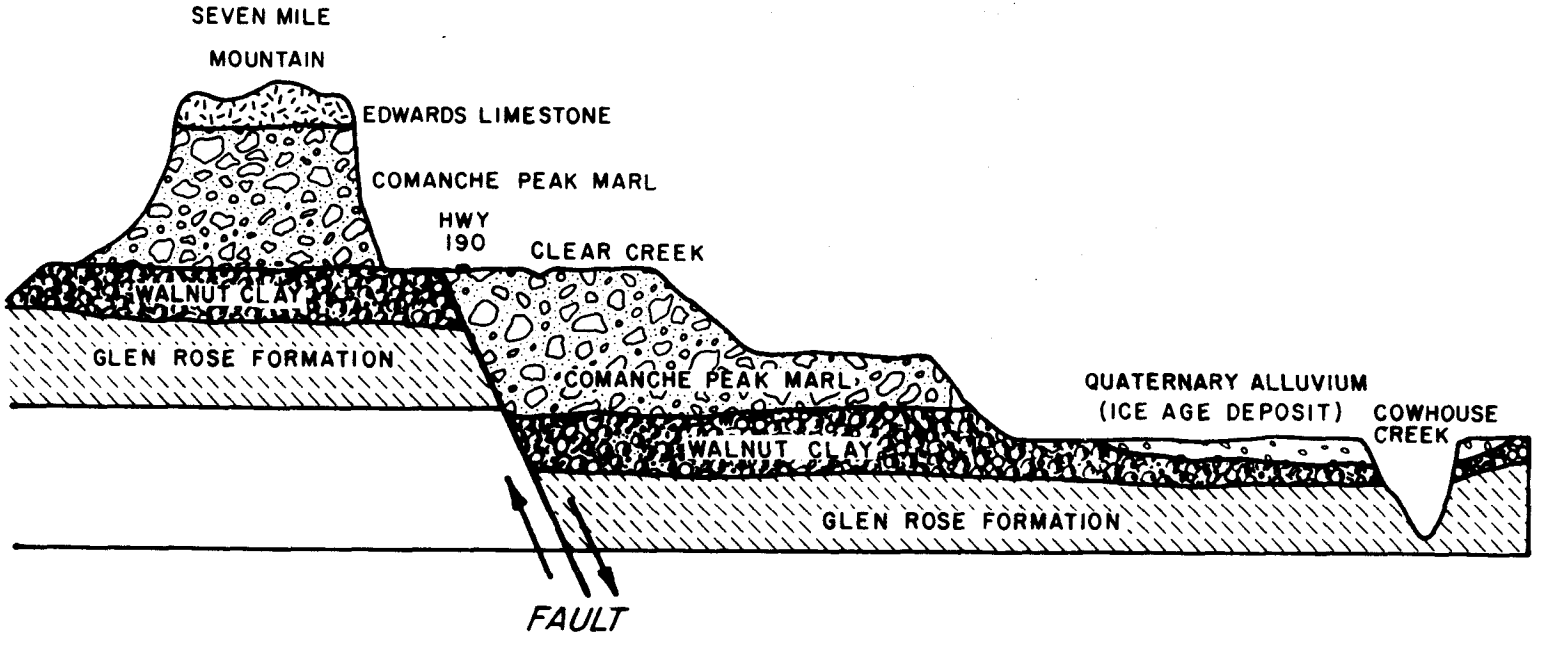
October 1, 1986

LANDFORM DICTIONARY

MAJOR ENVIRONMENTAL ZONES	LANDFORM TYPE	CREEK/CREST	POSITION
I	II	III	IV
UPLAND INTERFLUVIAL	Ridge/Plateau		
	Spur		
_____	Draw		
	Contact Zone	Near Crest	Top
	Escarpment Edge		
INTERMEDIATE UPLAND	Butte		Slope
	Outlier	Near Creek	
_____	Floodplain (T-1)		Base
	Terrace (T-2; T-3; etc.)		
	Bench		
LOWLAND FLUVIAL	Hillock or Knoll		
	General Slope		
	Other		

APPENDIX XII

LANDFORM CHART


SEVEN MILE
MOUNTAIN
EDWARDS LIMESTONE
COMANCHE PEAK MARL
HWY
190
CLEAR CREEK
WALNUT CLAY
GLEN ROSE FORMATION
COMANCHE PEAK MARL
QUATERNARY ALLUVIUM
(ICE AGE DEPOSIT)
COWHOUSE
CREEK
WALNUT CLAY
GLEN ROSE FORMATION
FAULT

APPENDIX XIII

FORT HOOD SITE SURVEY FORM
(LAB SUPPLEMENT)

Project Code _____

FORT HOOD SITE SURVEY FORM LAB SUPPLEMENT
(Revised: October 1, 1986)

TARL No. _____ Field No. _____

UTM _____ _____
(Easting) (Northing)

1. Drainage Stratum (see Drainage Stratum computer map)

   Leon [ ], Owl [ ], Cowhouse [ ], Nolan [ ], Lampasas [ ]

2. Soil Type

   SCS _____

3. a. Environmental Zone (Appendix K, Column I) _____

   b. Landform (Appendix K, Column II) _____

   c. Creek/Crest (Appendix K, Column III) _____

   d. Position (Appendix K, Column IV) _____

4. Geology

   a. Bureau of Economic Geology (Waco Sheet) _____

   b. Military Terrain Analysis (EGTD) _____

5. Vegetation Type (Military Terrain Analysis [EGTD]) _____

   _____

6. Surface Area (M^2) _____

7. Hydrology

   a. Distance in Meters to Nearest Permanent Water Source (coded blue on the EGTD Map)_____

   b. Description (From Appendix EGTD Definition) _____

   _____

8. Chronological Estimate _____

   _____

APPENDIX XIV

TEXAS A&M UNIVERSITY ARCHAEOLOGY RESEARCH LABORATORY
FIELD SACK LOG

TEXAS A&M ARCHEOLOGY RESEARCH LABORATORY

SITE NO_____ FIELD SACK LOG SHEET NO_____of_____

PROJECT_____PROJECT SUPERVISOR_____

Sack Number	Feature or Area	Horizontal Location and/or Grid Square Number	Verticle Location or Stratum	Specimen Description and Remarks	Date Collected	Recorder

APPENDIX XV

FORT HOOD FIELD PHOTOGRAPHIC RECORD FOR BLACK-AND-WHITE CAMERA

Revised: October 1, 1986

FORT HOOD FIELD PHOTOGRAPHIC RECORD FOR BLACK-AND-WHITE CAMERA

Project Code _____ Year _____

Camera type _____ Lens _____ Roll No. _____

Film type _____ ASA _____

Exp.	Site No.	Description	V	S	F	D	I
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							

V = View S = Shutter F = F-Stop D = Date
I = Initials of Photographer

Exp.	Site	Description	V	S	F	D	I
19							
20							
21							
22							
23							
24							
25							
26							
27							
28							
29							
30							
31							
32							
33							
34							
35							
36							
37							
38							

Additional Comments _____

V = View S = Shutter F = F-Stop D = Date
I = Initials of Photographer

APPENDIX XVI

FORT HOOD FIELD PHOTOGRAPHIC RECORD FOR COLOR CAMERA

Revised: October 1, 1986

FORT HOOD FIELD PHOTOGRAPHIC RECORD FOR
COLOR CAMERA

Project Code _____ Year _____

Camera type _____ Lens _____ Roll No. _____

Film type _____ ASA _____

Exp.	Site No.	Description	V	S	F	D	I
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							

V = View S = Shutter F = F-Stop D = Date
I = Initials of Photographer

Exp.	Site	Description	V	S	F	D	I
19							
20							
21							
22							
23							
24							
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38							

Additional Comments _____

V = View S = Shutter F = F-Stop D = Date
I = Initials of Photographer

APPENDIX XVII

FORT HOOD ROCK ART RECORD FORM

Project Code _____

FORT HOOD ROCK ART RECORD FORM
(Revised: October 1, 1986)

1. Site No._____Field No. _____ 2. UTM _____ _____
Easting Northing

3. Face:_____ 4. Dimensions of Decorated Area:_____

5. Horizontal Location:_____

6. Kind of Rock:_____ 7. Position of Rock:_____

8. Method of Decoration: Pecked [ ] Rubbed Grooves [ ] Painted [ ]

9. Colors:_____

10. Design Elements:_____

_____

_____

_____

_____

11. Superimposition:_____

12. Natural Defacement:_____

13. Vandalism:_____

14. Associated Features:_____

15. Additional Remarks:_____

_____

_____

16. Published References:_____

_____

17. Sketch:_____ 18. Scale of Sketch:_____

19. Photos: _____

20. Recorded by: _____ 21. Date_____