ISAS Field Manual 2012

ILLINOIS STATE
ARCHAEOLOGICAL SURVEY
PRAIRIE RESEARCH INSTITUTE

Standard IDOT-ISAS Field Procedures for Phase I, II, and III Archaeological Investigations

Illinois State Archaeological Survey
A Division of the Prairie Research Institute at the University of Illinois

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1 General Information

This manual is designed to acquaint Illinois State Archaeological Survey (ISAS) personnel with the excavation techniques and procedures used during fieldwork for the Illinois Department of Transportation (IDOT) as well as other ISAS projects. It provides the general excavation rules that will apply in the majority of cases. Please remember that this manual is not a "cookbook" outlining the procedures to be rigidly followed in every excavation situation. At any time the specific methods or techniques may be modified as the situation demands. Instructions from supervisors will take precedence over the following guidelines whenever deemed necessary.

Consistently intelligent and methodologically sound excavation and recording of data are fundamental to the success of any archaeological field project. All personnel should also be aware that an excavation functions as one large system with many interrelated parts. It is vital that field, laboratory, analytical, and curational aspects of the project be consistent with one another. Accordingly, every task and procedure has a purpose, even though it may not be immediately apparent to personnel involved in any one aspect of a project. All personnel must recognize the importance of following all instructions for completing each task in a conscientious manner.

IDOT-ISAS History and Organization

The Illinois Department of Transportation began funding a program in archaeology shortly after Congressional passage of the 1956 Federal-Aid Highway Act. This legislation allowed (but did not mandate) the use of highway construction dollars for the salvage of archaeological sites threatened by potential highway construction. Each state was given the prerogative to implement this section of the act; some did, many did not. In Illinois, two events occurred subsequent to the Federal-Aid Act that established a cooperative, and enduring, climate of cooperation between engineer and archaeologist. In June 1956, Illinois Department of Transportation Administrative Memorandum No. 45 was issued in Springfield that established a policy for the preservation of cultural properties found in proposed highway rights-of-ways. Shortly afterwards, archaeologists from the University of Illinois (UIUC), Southern Illinois University (SIUC), and the Illinois State Museum (ISM) formed a professional organization, the Illinois Archaeological Survey (IAS). UIUC Professor John McGregor, a principal founder of the IAS, stated that the major function of the association was 1) to act as a lobbying group for archaeological concerns, 2) to serve as a liaison between the archaeological community and state and federal highway officials, 3) to establish an archaeological site file and recordation system, and 4) to assign member organizations surveys and excavation work on a noncompetitive, regional basis. The IAS office was established at the UIUC.

During the first 20 years of transportation archaeology, funds were allocated only for field investigations. No money was available for laboratory processing or report preparation. The funds that were programmed for archaeology allowed only partial survey of proposed rights-of-ways and led to the selection of small numbers of the most promising sites for excavation. The logic behind this arrangement was that highway dollars were to be expended to remove artifacts and contextual data from the construction threat; archaeologists were then to obtain other funding, theoretically in the

form of grants, for analysis and write-up. After four years of limited salvage, the proposed construction of I-55 and I-70 through the American Bottom floodplain across the Mississippi River from St. Louis led to the first major test of the highway archaeology program in Illinois. In the path of these new highways was a major portion of the vast Cahokia site and one of its major satellites - the Mitchell site to the north. Cahokia is now recognized as the preeminent Mississippian (AD 1050-1350) civic-ceremonial center in North America. The Cahokia salvage program - which lasted from 1960 to 1964 - resulted in extensive excavations of residential areas of this temple town and led to the discovery of a series of large "Woodhenges" - huge circular patterns of tall posts thought to have had astronomical/ceremonial functions. After years of field work the massive task of analyzing and interpreting the data from the I-55/70 Project began. Outside grants were obtained to aid in this effort - most notably several from the National Science Foundation. Although no major synthesis resulted from this project, a series of reports were issued which tremendously advanced knowledge concerning this major prehistoric site. During subsequnt years, a number of theses and dissertations have been written utilizing the data generated by this project, ranging from James Porter's 1974 University of Wisconsin dissertation on the Mitchell site to Timothy Pauketat's recent 1991 University of Michigan dissertation on the excavation of residential zones in the shadow of Monk's Mound at the center of Cahokia.

In 1966 the passage of the National Historic Preservation Act broadened the protection of historic resources and this protection was greatly enhanced in the 1976 revisions to the Act**.** Now, for the first time, identification of archaeological and other cultural resources was mandatory in project planning and, importantly, funds were allocated for laboratory analysis and report preparation. Archaeology in Illinois during this period was dominated by professionals from major universities and museums. "Research" was the byword. Simply going out and surveying a proposed highway corridor was no longer acceptable. A "research design" was now required. The importance of a site was delineated by its "research potential" and projects were judged by their contribution to research. In Illinois this period was also organized by "research universes;" that is, each major institution staked out its territory and was assigned work in that particular area of the state. This system was structured so that each university would have a corps of trained archaeologists familiar with their geographical region to provide expertise concerning survey and evaluation strategy. Projects could be accomplished in an efficient and less costly manner since the resident experts had intimate knowledge of the cultural resources in their regions. This system was extremely successful. Funds were not wasted in repetitious evaluation exercises and were quickly allocated to the investigation of significant resources. Reports were generally submitted in a timely fashion since the researchers were already experts in their regions.

By 1976 the number of transportation related construction projects were increasing rapidly and archaeological work, expanding accordingly, reached new heights and levels of complexity. During this time archaeological efforts were also required not only on highways but were also expanded to include several major water resources programs and areas for proposed new airports. The recent survey of a 10,000 ha area in Will County for a new Chicago airport is an example of the potential magnitude of some of these non-highway transportation projects in Illinois.

Pedestrian surveys within two of the highway project corridors, the FAI-270 project in the American Bottom, and the FAP 408 project in west-central Illinois, resulted in the discovery of nearly 300 archaeological sites. Data recovery efforts began almost concurrently on these two massive projects. With crews numbering over 150 workers in each area, the years 1977-1987 were tumultuous, exciting, and exhausting. The inclusion of funds for laboratory analysis and report preparation in the budgets of each of these projects was particularly significant. Each project held unprecedented potential to yield significant new information concerning regions of exceptionally intensive and complex prehistoric occupation. Urban sprawl and modern farming and flood control led to the ongoing destruction of much of the cultural resource base in these areas adding a sense of urgency to the recovery efforts. Archaeological investigations along the two highway corridors were viewed by regional archaeologists as perhaps one of their last opportunities to investigate region-wide patterns of prehistoric life ways, cultural change, and complexity. The impact of these massive highway archaeology programs is reflected in the numbers of publications that they have generated. The 223 reports and publications produced by the end of the year 2000 on the archaeology of these two projects represents 37% of all of the publications which have been issued over the past 40 years as the result of Illinois Department of Transportation sponsored archaeological investigations.

While a number of large-scale projects located largely in riverine floodplains like I-270 have received considerable attention, significant discoveries have also been made concerning human adaptation in the upland regions of the state, which is a portion of the eastern extension of the Prairie Peninsula - a huge tall grass savanna stretching westward into the Plains. The need for fill materials (borrow) for highway construction (which is contractor furnished in Illinois) resulted in the survey of long transects of bluff top uplands above both the Mississippi and Illinois River floodplains. These surveys and the subsequent excavation of many of the identified sites have provided a more complete picture of regional prehistoric settlement systems. Recently, a survey of some 1000 ha in the Silver Creek uplands for the proposed Mid-America Airport adjoining Scott Air Force Base resulted in the discovery of over 100 prehistoric sites. This upland drainage region is situated 20 km east of the American Bottoms and was largely unexplored archaeologically. The excavation of the sites to be impacted by proposed construction yielded large numbers of house remains and other features. The ongoing analyses of these data will lead to a new understanding of the developmental and economic relationship of Cahokia and interior upland settlements. Besides such major projects, thousands of small-scale surveys have been conducted for internal improvement projects such as bridge replacements and highway widening. Over 2000 archaeological sites have been found as a result of such state and local projects in the last decade alone. Numerous spatially diminutive archaeological sites, many of which in the past would have been ignored by researchers, have now been intensively studied. Entirely new perspectives on prehistoric occupations of the many and varied physiographical regions of Illinois have been produced by these efforts.

Transportation Archaeology: From ITARP to ISAS (Illinois State Archaeological Survey)

The UIUC-IDOT transportation archaeology program is the product of a more than four decade long intergovernmental cooperative agreement between the agencies to ensure the preservation of our knowledge of the past within the framework of IDOT's mission to develop and expand the state's transportation infrastructure. Beginning in 1957, this highly successful cooperative effort has enabled Illinois to produce an outstanding network of ground and air transportation facilities while being a leader in the protection of its prehistoric and historic archaeological resources. In 1994 the program was reorganized as the Illinois Transportation Archaeological Program (ITARP; 1994–2009) under Thomas E. Emerson. This reorganization was intended to increase communication and the responsiveness of the archaeological program to IDOT's needs. The establishment of ITARP was the result of IDOT's interest in developing a centralized program to facilitate its cultural resources protection efforts.

In 2010, the IDOT archaeology programs were incorporated, along with the Ancient Technologies and Archaeological Materials Program into the newly created Illinois State Archaeological Survey (ISAS), a division of the Prairie Research Institute (PRI). PRI is the home of the state scientific surveys at UIUC.

The Transportation Archaeology Program (TAP) at ISAS articulates directly with IDOT's archaeologist. The establishment of ISAS was the result of IDOT's concern for developing a more comprehensive centralized program to facilitate its cultural resources protection efforts across the state.

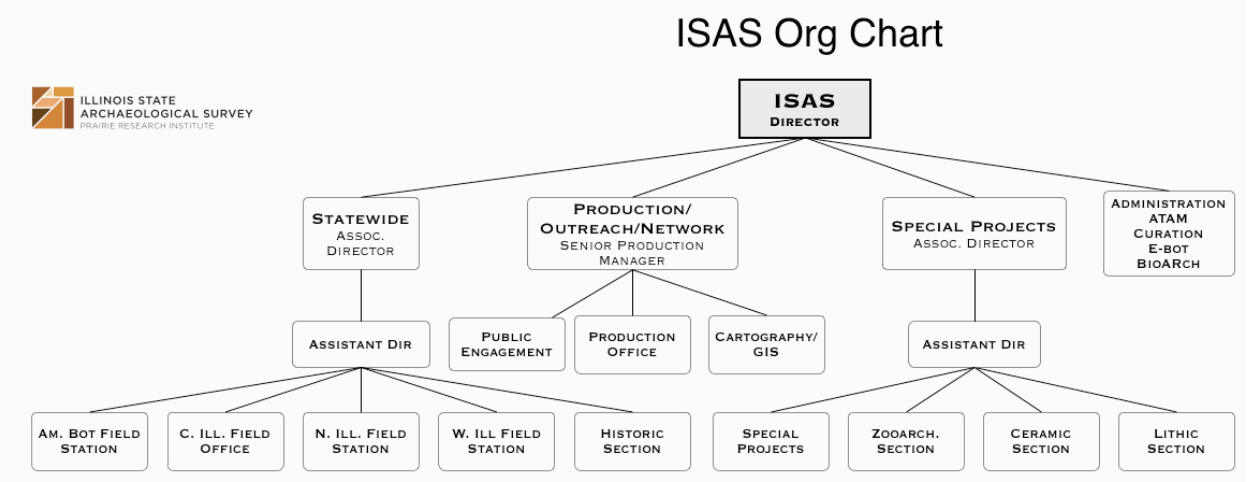
The mission of the Illinois State Archaeological Survey's TAP, is to assist the Department of Transportation in the preservation and protection of Illinois' historic and archaeological resources, to conduct research activities that enhance the educational and public service mission of the University of Illinois, and to promote and ensure the professional and public dissemination of information about the prehistory and history of Illinois.

Consequently, ISAS concentrates exclusively on archaeological research within the state of Illinois. Illinois serves as an ideal archaeological laboratory within which to explore issues as wide–ranging as hunter–gatherer theory to the rise and fall of complex societies. As an area in the forefront of the inception of North American archaeology with the University of Chicago field schools in the late 1920s, Illinois has continued up to the present day to be a leader in archaeological theory, technique, and cultural history in the Eastern Woodlands. This program and its immediate predecessors have been one of the critical ingredients in Illinois' leadership in archaeological research. In 1984 Prof. Charles Bareis, then Program Director at University of Illinois was presented the joint U.S. Department of Transportation and the Advisory Council on Historic Preservation "Award for Outstanding Public Service to Transportation and Historic Preservation" by Secretary Elizabeth Dole. In addition, in 1986 Prof. Bareis was awarded the Public Service Award by Secretary Hodel, U.S. Department of the Interior (DOI), for the excellence of the program's research and, specifically, for the creation of "a program that splendidly serves the professional community and the American people". This is the highest award that can be given by

DOI. The current program leadership all stem from this period of national level of excellence.

Survey ISAS is divided into six major areas of responsibility (see flow chart). *Statewide Survey,* based in Champaign, provides oversight and technical and logistical support for all IDOT survey projects across the state. In addition, its staff conducts archaeological reconnaissance surveys in 37 Illinois counties stretching the length of eastern and south-central Illinois. Within the Statewide Survey, the staff carries out historical and specialized archaeological research, digital cartographic production, and GIS analysis. Regional field stations are located in northern, western, and southwestern Illinois. The *Northern Illinois Field Station* in Rockford is responsible for surveying the northern-most 18 counties including the Chicago area. The *Western Illinois Field Station,* with offices in Jacksonville and Macomb, carries out surveys in the 27 counties of the Lower Illinois River Valley and areas to the west. The *American Bottom Field Station* has offices in Wood River and performs archaeological surveys and testing within 26 counties including the complex American Bottom region of western Illinois as well as southern Illinois to the Kentucky border.

Special Projects coordinates large multi–year research projects across the state. *Program Support* is based in Champaign and is responsible for program administration, curation and security issues, manuscript production, formatting, editing, graphic design, and artwork of the various ISAS publication series and public displays. The various groups within ISAS also conduct long–term, large–scale archaeological resource projects that provide funding and research opportunities for students and other researchers.



Research Facilities and Collections The program occupies large facilities on the edge of the University of Illinois Champaign-Urbana campus that include administrative offices, computer and GIS facilities, processing and research laboratories, as well as significant lithic, ceramic, and ethnobotanical comparative collections. The program curates major prehistoric and historic archaeological collections (including nearly 20,000 boxes and million of items) from over 3000 Illinois sites including the massive FAI–270

Project, and many Cahokia site collections from the American Bottom with the associated photographic, map, and documentary records.

The single–most important component of the ISAS collections is associated with the FAI–270 Project. This project conducted excavations on over 100 major sites in the American Bottom area. The type collections for all of this work reside in the ISAS collections. The resulting analysis and publication of 28 volumes by the U of I Press is marked as a major landmark in North American Archaeology. This research has lead to the definition of 27 new cultural phases in the midcontinent and a reorientation and reformulation of the trajectory of Eastern North American archaeology.

The research importance and potential of the collections is reflected in various nationally respected scholars' comments:

> *"One of the really major events in Mississippi Valley archaeology during the past two decades has been the major excavations and the rapidly–completed publications of the I– 270 project under the general direction of Charles J. Bareis of the University of Illinois, Urbana... Nowhere else in the East has major contract archaeology done so much to provide a such detailed and chronologically controlled sequence from Early Archaic times to the protohistoric period. Anyone working in the "Central Basin" of the continent must know and understand these well–documented data bytes."* Dr. Stephen Williams, Harvard University (1992)
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> *"The FAI–270 project is without doubt the most ambitious archaeological undertaking to ever have been conducted in eastern North America since the WPA era. Yet despite the enormous scale of the endeavor and the staggering volume of data recovered, the overall quality the data produced is absolutely outstanding..."* Dr. James Stoltman, University of Wisconsin (1987)
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> *"It is no exaggeration to state that* (the FAI–270 project has)*... capture*(d) *in summary form the enormous strides that a single, large–scale project has had in completely rewriting the history of the bottom and in propelling the area from the intellectual status of a marginal study area to one of major importance in the interpretation of cultural evolution in the Mississippi valley."* Dr. James Brown, Northwestern University (1986)
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> *"The FAI–270 Project is one of the most ... productive large–scale archaeological endeavors ever undertaken in the United States....Seldom if ever has so much been added to archaeological knowledge..."* Dr. James B. Griffin, Smithsonian Institution (1984)

The FAI–270 collections have been extensively utilized by ISAS personnel on a daily basis in their ongoing statewide research efforts. Numerous students have been trained in specialized archaeological analyses, especially with the ethnobotanical collections. In addition, both national and international researchers have been involved in FAI– 270 research and a number of academic dissertations have resulted from analysis of these collections.

Library ISAS is one of three permanent repositories for the records of the Illinois Archaeological Survey. This is one of the country's oldest professional organizations and its records are a critical resource for understanding the developmental history of North American Archaeology. In addition, a research collection containing nearly 20,000 items specializing in CRM–related documents is housed at the program offices in Champaign while researchers also have access to the main campus libraries of the University of Illinois.

Publications ISAS produces a number of publication series: American Bottom Archaeology FAI–270 Site Report Series with the University of Illinois Press (28 volumes), FAI–270 Archaeological Mitigation Project Research Reports (85 volumes), the Resource Investigation Program Research Reports (40 volumes), Studies in Illinois Archaeology (4 volumes), Transportation Archaeology Research Reports (108 volumes), and Bulletins. Several hundred scholarly works and professional papers have been published by program personnel over the last 15 years. These works have been featured in all major archaeological journals including *American Antiquity* and *American Anthropologist* and in volumes published by the Smithsonian, University of Illinois, Florida, Nebraska, Alabama, Academic, Springer, and JAI Presses.

IDOT and ISAS Web Sites

The ISAS internal web site http://www.isas.illinois.edu/intranet (login name and password required – contact the ISAS Network Administrator to obtain access) contains useful employee information on contacts, policies, forms, etc. ISAS's public web page is located at http://www.isas.illinois.edu/ and contains general information about the program as well as proving links to other useful sites. The IDOT web site http://dot.state.il.us/ updates the local road conditions each day and, at times, has some project information available that may be useful.

A list of definitions for the more commonly used archaeological terms used in this manual can be found in Appendix A.

General Conduct Rules

The actions of ISAS employees reflect directly on IDOT, UIUC, PRI, ISAS and the archeological community. Consequently, you are expected to act in a professional and responsible manner at all times. Furthermore archaeological endeavors require teamwork to be successful. Behaviors that interfere with teamwork are detrimental to the project and to the Survey.

There general rules for conduct that must be followed by all ISAS personnel:

1. All health and safety rules promulgated for each site or field situation must be followed to ensure personal and crew safety. This is critical for those personnel who work in close proximity to heavy equipment—who must wear hard hats, orange vests, and steel-toed boots—or other identified hazards. If there is any

question about soil contamination or other possible hazards, ask a supervisor. In addition, each crew is provided with a list of hospital and emergency telephone numbers for their work area.

2. Proper clothing and footwear should be worn. Bare feet and sandals are not allowed.
3. There is a University of Illinois “no smoking” policy that includes all vehicles and buildings. You may smoke only in designated outside areas. If there is not yet a designated smoking area at a site, then ask a supervisor for one.
4. Alcohol and drug use at the sites, laboratory, or anywhere else during working hours is strictly prohibited. Violation constitutes grounds for immediate dismissal. In addition, the possession of firearms on state property or work sites is not allowed by the University of Illinois.
5. Field personnel will remain at the sites during the half-hour lunch break unless excused by the supervisor. All trash resulting from the lunch break must be disposed of properly; no trash is to be left in the site areas or in the state vehicles after the end of the day.
6. Individuals will at all times demonstrate responsible conduct during work. IDOT surveyors, contractor representatives, union representatives, the general public, IDOT and Federal highway agency representatives, project monitors, Occupational Safety and Health Administration representatives, and other archaeologists may visit the sites either informally or officially at any time. Such visits are often made with no prior notice. Unprofessional or irresponsible behavior will not be tolerated.
7. All project personnel are expected and required to assist in loading and unloading equipment into and out of ISAS vehicles in both the morning and the evening.
8. As indicated earlier, a wide variety of tasks are necessary for successful project completion. Minimally, these include fieldwork, laboratory work, report writing, and clerical work. Mutual respect and cooperation must be the rule of conduct between all project personnel. No harassment of other employees will be tolerated. Such behavior is prohibited by University policy.
9. It is important to be on time to work. Please notify your supervisor ahead of time if you know you will need to miss work or as soon as possible in the event of illness.

Tools

Field personnel may use their own excavation tools or they may check out tools from ISAS. Minimally, each excavator is expected to have a metric folding rule, a pointed trowel (blade not to exceed 6 inches), a retractable metric tape, a line level, 2 ice picks or chaining pins with string, 2 pencils (2H lead), 1 pen, 1- 12” and 2 -6” rulers, waterproof markers (Sharpies), a metal spoon, and chopsticks. On rare occasions, additional items may be added to this list as circumstances dictate by OSHA regulations. Additional supplies including files to sharpen tools are kept in the ISAS vehicle. ISAS tool kits will be made available for crewmembers if needed. The items in these tool kits are listed in Appendix B. Field personnel who check out ISAS equipment

are required to return it at the end of the excavation season. Broken or lost items are replaced at the expense of the excavator to whom they were issued. This should be kept in mind when equipment is loaned to others.

Whether the tools are owned by the excavator or the Survey, the excavator should take proper care of equipment. This includes cleaning dirt from trowels and shovels at the end of each day and keeping shovels and trowels sharp at all times. This task should be accomplished prior to returning tools to the vehicle. Tapes also need frequent cleaning, which should be accomplished immediately after their use instead of waiting for the end of the day.

In addition to the equipment listed above, excavators should bring a water jug, sunscreen, bug repellent, hat, and/or long-sleeve shirt to avoid dehydration and sunburn.

Responsibilities of field staff

Field excavations of any size require the commitment of significant amounts of time and resources involving all aspects of ISAS (i.e., administration, field, laboratory, production, and curation). Decisions on when and how to proceed with excavations and how extensive the excavations will be are done only after consultations with IDOT and with the various administrative levels of ISAS (Field Offices, Statewide Coordinator, Special Projects Coordinator, and the ISAS Director). The implementation of procedures that will ensure proper archaeological standards are fulfilled and excavations are conducted in a timely and cost efficient manner is ultimately determined by administrators at the central ISAS Champaign Office and the ISAS Director after consultation with the Field Station Coordinator.

The field staff at ISAS at any point in time consists of personnel with wide-ranging levels of archaeological field experience (e.g., crew with ISAS experience, crew with experience elsewhere, recent graduate and undergraduate student workers with field school or with no field experience). A field staff and crew hierarchy, or “chain of command” has proven to be an efficient method to manage site excavations and train personnel in the ISAS system. The complexity of the hierarchy will vary with the size and complexity of the site and the number of field personnel involved. The four major field position categories used by ISAS are: Site Director, Site Supervisor, Crew Chief, and Crew Member. Basic responsibilities for each of these categories are summarized below. Regardless of where an individual fits in the categories below, it is critical to keep in mind the importance of clearly written field notes whether on a feature form or overall site notes. Accurate field observations are a critical component of any site analysis and are commonly referred to during analysis and interpretation of materials and features. Our ability to accurately analyze and report on a site is severely hindered without the contextual information provided by the good field documentation.

At all levels one of the most important aspects of archaeology research is communication. It is essential that all members of a crew, from the Site Director to the newest crewmember, be aware of the goals of a field project and to understand the procedures for reaching that goal. Crews contain many people with diverse levels of experience and skills. Supervisors need to take advantage of that knowledge through constant interaction with their fellow supervisors and their crewmembers.

Crewmembers and supervisors need to be encouraged to ask questions and seek assistance if needed. The most serious problem that can afflict a project is a lack of communication between the supervisors and crewmembers.

Project/Site Director: The Project/Site Director is directly responsible for the day-to-day field investigations of the site and overall management of the specific site or project. This person carries out the excavation strategy and research design developed during consultation with the ISAS regional and administrative coordinators. Responsibilities of this position include:

1. Ensuring that the project is run as an organized and orderly operation
2. Submits either weekly or monthly project progress reports and otherwise keeps the Division and Champaign offices informed of site developments and progress
3. Communicates with local IDOT personnel
4. If a separate lab is needed, ensures that such lab is properly equipped and staffed
5. Ensures that crew size is sufficient for the task
6. Ensures that a site or project specific safety manual has been prepared and that proper field safety measures are implemented. Examples of the type of information to include in safety handbooks are the following:
    a. Location of nearest medical facilities
    b. Emergency numbers for
        i. Hospital(s)
        ii. Local and State Police
        iii. Ambulances
        iv. Fire Department
    c. Type of protective clothing necessary (if necessary)
    d. Location of first-aid kits – ensure that kits are completely stocked with emergency first-aid supplies
    e. Emergency response plan – identify all crew members who have any medical training so that in case of emergency, you can ask for their assistance
    f. Instructions on reporting accidents that occur in the field
    g. Instructions on how to safely handle dangerous tools (e.g., trowels, shovels)
7. Ensures ISAS vehicles are maintained and vehicle use policies followed
8. Ensures that University/ISAS personnel policies are followed
9. Ensures that proper archaeological field techniques are implemented and alters “normal” field procedures when specific field situations dictate.
10. Is in charge of scheduling and monitoring heavy equipment excavations
11. Operates total station to establish survey or excavation grids, map piece plots, features, or site area topography and modern landscape features. (Another trained person may be the designated total station operator in which case the Site Director will instruct the trained operator on the tasks to be performed)
12. Organizes crew excavations to achieve excavation priorities
13. *Ensures that proper amounts of field equipment/supplies are available

14. *Prepares daily field journal and daily notes on site excavations
15. *Defines features in plan view and scribes profile walls
16. *Assigns feature numbers and orients crew member on feature procedures prior to the start of feature excavation
17. *Monitors individual feature excavations and ensures that excavations proceed in a timely manner, that proper samples are taken, and that the crew record sufficient field notes
18. *Resolves excavation problems regarding procedures, superpositioning sequences, and context.
19. *Adds input to crew on individual feature function and component after examination of feature fill/recovered artifacts
20. *Takes field photographs of general site excavations, feature plan views, feature profiles, special artifacts and contexts
21. *Checks plan and profile maps and field notes at feature quarter section and/or halfway point and determines level of sampling and excavation strategy for the remaining portions of the feature
22. *Back checks completed feature reports/field notes in the field and informs crew member of any problems
23. *Completes daily Master Bag Checklists
24. Ensure that all documents and photographs (digital, slides, and negatives) are appropriately housed and/or backed up in accordance with ISAS policy.
25. Ensure that excavated materials are handled appropriately according to ISAS processing guidelines.
26. Informs the Field Station Coordinator and ISAS Director of on-site looting, landowner issues, difficult visitors, and contacts with the media representatives.
27. Supervise water control issues (e.g., flooding of excavated units)
28. Resolves disputes between crew members when it affects their ability to work

Site Supervisor: On larger scale sites/projects the site director may have one or more supervisors to aid in the management of the survey/excavation at individual sites. Supervisor(s) allow the site director to focus efforts on specific tasks, such as machinery monitoring or feature definition, without delaying other aspects of the site investigations. Supervisory level positions will be filled with personnel who have several years of field experience and who are conversant with the ISAS field methods. Supervisory staff will work closely with the site director and will be performing many of the same tasks as the site director. From the list of site director responsibilities above, site supervisory staff can be expected to perform tasks numbered from 13* to 25* on a daily basis. If there are multiple supervisors, each may be assigned to specific tasks from the above list based on expertise (e.g., total station work or photography work). The site director may develop a hierarchy among the supervisors.

Crew Chief: Crew chiefs may perform similar duties to the Site Supervisor, although he/she typically is in charge of fewer crewmembers and tends to work most closely with crew members. The use of this position depends largely on the size of the site and the number of crew members.

Crew Member: Members of the crew form the core of the field investigation workforce. Crew members are directly involved with the various "hands-on" field tasks associated with archaeology. Many of these tasks involve strenuous physical labor performed under wide-ranging weather conditions. Crew members need to have a working knowledge of the ISAS field methods contained in this manual and will work under the direction of the supervisory staff as well as more experienced crew personnel. Because crew members will handle most of the excavating tasks in the field, they will be the first to encounter and deal with intact archaeological features of all types (middens, pits, scatters, structures, burials, etc,), as well as numerous types of artifacts of various lithic, ceramic, bone, or botanical material during site investigations. Since certain areas of the state have detailed cultural chronologies based on changes in various artifact styles, crew personnel should acquaint themselves with the specific temporal span involved with the site/project they are associated with by reading background material. Supervisory staff can provide references if needed.

Trained crew members will quickly fall into the field routine required of their specific site/project, but should always be cautious when encountering changes in soil types, soil inclusions, artifacts types or artifact density that may require a change in archaeological methods. At all times crew members must keep supervisory staff informed of task progress and ask for assistance from supervisory staff when problems or questions arise. By using the methods outlined in this manual, crewmembers will be able to perform the various tasks required in the manner desired. Some of the most important skills that an excavator can bring to the job are an ability for careful observation and an ability to clearly describe those observations in notes and forms. Responsibilities and tasks of crewmembers are listed below.

1. Perform Phase I survey tasks (pedestrian survey, soil augering, postholing, or shovel testing)
2. Perform basic excavation tasks (Hand-excavated Unit (HUs) and various types of features)
3. Perform basic mapping tasks involving plan and profile maps
4. Complete field forms and records detailed notes on excavation results
5. Complete collected artifact and other sample bags
6. Aid in training other crew members
7. Maintain site field equipment and personal field kit
8. Complete other tasks as directed by supervisory staff

Survey and Field Etiquette for Field Surveyors

All surveyors should be aware of the fact that they serve as representatives of IDOT, ISAS and the University of Illinois, and should conduct themselves accordingly in public. Interaction with state officials, landowners, media representatives, interested passers-by, and the general public is inevitable, so we need to put our best foot forward since we wish to make a positive impression on the citizens of Illinois to whom we are ultimately responsible. It is to our advantage that the public in Illinois has acquired a very positive impression of the University of Illinois, and often shares a fascination with archaeology; we should endeavor to enhance this positive image by acting

professionally, courteously, and with dignity. Any crewmember may address the general questions of a friendly and interested member of the public; specific project related questions voiced by IDOT officials, landowners, and especially reporters, however, are to be directed to the District Archaeologist, Site Supervisor, or highest-ranking crewmember on site. We are always willing to share with the public information about the nature of our work and the methods we use to accomplish our investigations; as a rule, however, we do not discuss the legal and administrative aspects of our investigations, especially in regards to the significance of a site or whether or not we intend to recommend further work. These determinations are made after careful review of the evidence gathered in the field in consultation with IDOT and the Illinois Historic Preservation Agency (IHPA).

The only individual that can grant final historic resources clearance on a project is the IDOT Archaeologist (currently Brad Koldehoff), who will do so in consultation with IHPA. You should remember that projects are subject to compliance reviews on many resources, e.g., wetlands, endangered species, botanical resources, and so forth. A historic resources clearance in the absence of other environmental clearances will not "clear a site" for future construction. Thus, it is important that IDOT District or field representatives, engineers, and building contractors do not come away with the impression that a project has been "cleared" by us in the field. If you are pressed on this issue refer them to the IDOT Archaeologist.

Because much of our work is undertaken prior to road construction, we are often the first persons to contact landowners. It is important to be courteous to landowners because we are dependant on their cooperation to effectively complete our mission. Landowners are often understandably upset because they may lose a significant portion of their property; land which may have been held in the family for several generations. Usually, landowners are wary but cooperative. In cases of road widening, or minor realignments, where little land acquisition is planned, they usually understand and agree with the need to make roads safe for travel. Proposed road construction that involves substantially new right-of-ways along new alignments will inevitably cause major impact on some property owners. It is important that we stress to individual property owners that we are only provided with a broad corridor, or in some cases, several alternate corridors to survey. Make sure they understand that completing a survey on a piece of property does not mean that the road will definitely follow this alignment - the survey is simply a preliminary assessment of the proposed alignment. Always remember that highway corridor maps are planning documents that are not intended for release to the public. IDOT will determine the timing of release of this type of information and will do so at open public hearings.

District Archaeologists should make a reasonable effort to contact landowners prior to survey. For larger projects, this may be done in written letters or by phone, but for most projects this is often done personally and immediately prior to survey, especially when a small number of properties are impacted. Although it is our legal right to survey on property that may be affected by highway construction, in general it is our policy not to do so against the objections of a property owner. Should a property owner ask you to leave before or even during a survey, please do so. Any dispute is best sorted out with the help of the IDOT District representatives. If there is concern about a previously recorded site on the property, or if there is a high probability for significant sites to be

present, we can usually wait until the land has been purchased by the state to complete our investigations. If we have made an attempt to contact a landowner and are unsuccessful, we will go ahead with Phase I survey, especially if only a small amount of property is involved. It is important to use our time efficiently and it is not cost effective to make repeated visits to a project without completing necessary investigations. If property owners ask to maintain ownership of the material recovered from their land, we will not conduct a survey since it is not the policy of IDOT or ISAS to use taxpayer money to collect artifacts for private ownership. In addition to the obvious value of maintaining good working relationships with property owners, remember we may wish to conduct Phase II testing prior to actual land transfer to IDOT, in which case we will need signed permission from the landowner. All forms necessary for landowner contacts can be found on the internal ISAS website.

Finally, because of the public's interest in the history of Illinois, and in archaeology in general, reporters and journalists are often made aware of our investigations and may want to conduct interviews. If you are caught unprepared you may be able to delay an interview until a more convenient time, but any attempt to entirely avoid an interview will raise suspicion about what you are finding (or, from their perspective, hiding). Interviews with reporters are fine as long as a few rules are observed. It is important to let the ISAS main office know that you have granted an interview so that this information may be passed on to IDOT. Many projects are politically sensitive and we do not want to inadvertently make IDOT's efforts more difficult. You may answer any question about Illinois prehistory/history or the nature of the site that you are investigating. Never attempt to answer questions about the amount of money, the timing, or the politics involved in any project; individuals attempting to obtain this information should be directed to the IDOT Archaeologist. If you are asked if our investigations will hold up highway construction, the answer is -- NO. Although some enjoy creating attention-grabbing and confrontational headlines like -- "Archaeologists Hold Up Highway Construction" IDOT does not. In fact, in the nearly fifty years we have cooperatively worked with IDOT on construction projects, archaeology has never been the source of a project delay. We make every effort to facilitate construction and we are usually working months or years in advance of any construction dates. As a cooperating state agency, we have partnered with IDOT to be part of the early planning process; our investigations are designed to identify and deal with significant archaeological sites early in the planning stage and far in advance of the initiation of road or project construction.

2 Bag Numbering System– Field and Lab

To systematize the recording of materials coming into the laboratory, the following bag categories have been created. Below is a summary list of these categories with accompanying examples of how field personnel should apply the bag numbers to material collected during fieldwork. These categories should be applied to materials collected at the start of any new projects. Projects currently in progress should continue with the current system used for that individual project.

Initial field surveys (includes walkovers, postholes, shovel tests, auger tests)

Field site numbers should be identified by adding a dash and an arbitrary number to the ISAS project log number. For example, the first site encountered during a survey with the log number of '98101' should be designated as '98101-1'. The second new site encountered on this same project should be assigned the field number of '98101-2'. This number should not be added to the field bag until it is clear that the material is from an individual site. This number is NEVER to be labeled on the artifacts without consultation with the Lab Supervisor/Director.

The supervising Archaeologist should keep an ongoing bag checklist with him/her at all times while in the field during a survey. Each bag checklist will be project specific. Consequently, there will be one bag checklist for ALL materials (regardless of how the material was collected or when) from a single survey project. For example, for project 98707 (using the ISAS log system), every type of bag (material, posthole material, shovel test material, flot, soil, etc) within this project will be assigned an arbitrary sequential bag number. This will be used to keep track of the total number of bags collected in the field and taken into the laboratory during the survey. Next to the bag number should be written the detailed contextual information of the sample (field site number or IAS site # if known), provenience, the date of collection and the initials of the collector (See Section 5). Material collected from the surface can be described as 'general surface' or more specific descriptions such as 'Area of Concentration 1' (or however the surveyor is recording the location of these materials in the field notes; e.g., 'FCR concentration', 'lithic concentration', 'lithic concentration 1'). The description used should be consistent between the field notes, the bag checklist, and what is recorded on the bag itself.

800's

All surface materials from Phase I survey should be given an '800' designation to indicate they were recovered from the surface of the site (see below). Each individual surface bag will be assigned a consecutive '800' bag number within the survey bag check list. Thus, the first surface bag will be assigned '800-1', the second will be assigned '800-2' and so on regardless of which site the materials are from (see Section 5*)*. '**800' bag numbers are used only for Phase I survey materials.**

Postholes (PH#), Shovel tests (ST#), and Auger tests (AU#)

Postholes (PH#), shovel tests (ST#), and auger tests (AU#) should be assigned an arbitrary bag number within the project bag checklist. For example, material from Posthole 1, 0-20 cm will be assigned the bag number PH1 with descriptive information (e.g., 0-20 cm) in the column labeled 'Provenience Units/Description' (see Section 5). If multiple bags representing different cultural zones are present in a single post mold, you should assign a sequential bag number within that PH/ST/AU designation. For example, PH1 has a plowzone and a midden. The bag number in this example would be 'PH1-1, 5-15 cm, plowzone; PH1-2, 15-23 cm, midden). This bag number system will not imbed the individual site visit within the bag number (e.g., walkovers). All bags and tags associated with these materials should include the bag number as well as any additional

provenience information (e.g., PH5, 5-10 cm, plowzone, ceramics; ST6, 20-30 cm, possible feature, chert flakes; etc.).

In the laboratory, these artifacts should be labeled with the IAS site number and the actual provenience (e.g., PH1, 0-5 cm). DO NOT label any artifacts with the arbitrary bag number or the field site number. The arbitrary bag number along with the field site number SHOULD, however, be recorded on the exterior ziploc bag with the artifact as well as on the field bags and tags.

Piece Plots (pp)

Piece plots **mapped with the total station,** regardless of whether Phase I, Phase II, or Phase III, should be assigned a number starting with '4001'. Thus, the first piece plot at a site will be 'PP4001', the second will be 'PP4002' and so on. '4001' is the code that is currently in the total station for piece plots. Since the total station records additional information, such as the type of artifact, during mapping of piece plots, the excavator can obtain a printout of all the piece plots from the computer after the data is downloaded and use this as the Piece Plot inventory. Unlike previous systems that have been used at ISAS, there is to be NO additional bag numbering category with piece plots (such as a '900' number). The complete piece plot number should be labeled on all bags, tags, and the artifacts as 'pp #' (e.g., pp4001 - see Section 5 for an example).

On occasion, multiple diagnostic artifacts may be piece-plotted using the GPS. In these circumstances, assign a survey bag number (i.e., ‘800’) and a sequential piece plot number to each artifact (e.g., 800-1, pp1, pp2, etc.). Piece plot numbers are site specific- not project specific.

Piece plots that are within a defined unit such as a house structure will be assigned piece plot numbers that are specific to that feature. The numbers should begin with '1'. Thus, the first piece plot within a house structure will be assigned 'PP1' - the specific feature number should always be recorded both on the individual piece plot bags as well as labeled on the artifact. These piece plots will also be recorded under a general feature bag checklist. For example, piece plots from Feature 5 will be recorded as 'F5-15' (as the bag number) 'PP1-25' (under provenience) on the bag checklist for Feature 5. See Section 5 for an example of piece plots within a structure. This situation will also apply to piece plots within hand-excavated units (HU). Such piece plots should also be recorded on the piece plot form.

Geomorphic Test Trench (GT)

The bag category of Test Trench is to be used ONLY in reference to Geomorphic Test Trenches. Bag numbers for material collected from Geomorphic Test Trenches should be designated by the Geomorphic Test Trench number (e.g., GT 1) and the arbitrary bag assignment for that individual hand-excavated unit (HU) (i.e., GT 1-1, GT 1-2). A description of the contents of the bag and any details on location should be recorded in the appropriate columns on the Bag Check List (see Section 5). Each Geomorphic Test Trench should have an individual Bag Check List to be kept with the general field forms.

Previous systems have sometimes used a category of 'Test Trench' to describe long linear areas exposed by heavy machinery during testing. In the future, such trenches will be referred to as 'Excavation Blocks' (see below).

Excavation Blocks (EB)

This category is only descriptive and should be used as additional provenience information on material bags. Excavation blocks refer only to areas that have been machine-scraped and can be any size area (trenches as well as larger areas). Excavation blocks should always be given a number designation (e.g., EB1). Material collected from non-feature contexts in Excavation Blocks should be given either an '888', '900', or '700' bag number (see below) depending upon the context of the material.

Hand-excavated units (HU)

Bag numbers for material collected from hand-excavated units (HU) should be designated by the hand-excavated unit (HU) number (e.g., HU1) and the arbitrary bag assignment for that individual hand-excavated unit (HU) (i.e., HU1-1, HU1-2). A description of the contents of the bag and any details on depth and location should be recorded in the appropriate columns on the Bag Check List (see Section 5). Each hand-excavated unit (HU) should have an individual Bag Check List to be kept with the hand-excavated unit (HU) field forms.

Features (F)

Bag numbers for material collected from Features should be designated by the Feature number (e.g., F1) and the arbitrary bag assignment for that individual feature (i.e., F1-1, F1-2). A description of the contents of the bag and any details on location should be recorded in the appropriate columns on the Bag Check List (see Section 5*)*. Each Feature should have an individual Bag Check List to be kept with the individual feature field forms.

Postmolds (PM) and Wall trenches (WT)

Designation of a postmold will include the designation 'PM' and the postmold's number (i.e., PM1). Similarly, wall trenches should be designated 'WT' and a letter designation (e.g., WT A) Postmold numbers should only be assigned for posts that are clearly associated with the walls and support of a structure - either a single post structure or with a wall trench structure. For postmolds within wall trenches, postmolds are numbered sequentially within individual structures. All other isolated postmolds outside of structures are to be given a feature number.

Artifacts from postmolds should be labeled with the IAS site number, the feature number, and the Postmold number. Each house feature should have an individual postmold form that includes information only for the posts associated with the walls of that individual feature (see Section 5*)*.

900's

This category of bag number is reserved for materials collected **within the plowzone layer only** (including both recent and potential 'buried' plowzones). This does NOT include materials from the surface, below the plowzone, or piece plots. This DOES include all material collected during machine-scraping, or from plowzone backdirt piles. There should be a separate bag checklist for material given 900 numbers (see Section 5*)*. Each individual bag should be given an arbitrary number that is to follow the '900' designation (e.g., 900-1, 900-2). Details regarding the context of the material and the type of sample (i.e., material) should be recorded in the Bag Checklist. This information should be recorded on all material bags (paper, plastic, tags) as well as be the number labeled on the artifact itself.

700's

This category of bag number is reserved for materials collected **below the plowzone** and **NOT associated with an identifiable feature or excavation unit** (such as squares). There should be a separate bag checklist for material given 700 numbers (see Section 5*)*. Each individual bag should be given an arbitrary number that is to follow the '700' designation (e.g., 700-1, 700-2). Details regarding the context of the material and the type of sample (i.e., material) should be recorded in the Bag Checklist. This information should be recorded on all material bags (paper, plastic, tags) as well as labeled on the artifact itself.

800's

Used exclusively for Phase I survey surface materials (see earlier discussion).

888's

This bag designation is reserved for **ALL surface materials recovered as a general surface collection or a controlled surface collection during testing and mitigation**. This number is used to distinguish these materials collected sequentially within individual sites during testing (Phase II and III) from those surface collections (i.e., 800's) collected as part of the larger survey project (Phase I). There should be a separate bag checklist for material given 888 numbers during mitigation (see Section 5*).* Each individual bag should be given an arbitrary number that is to follow the '888' designation (e.g., 888-1, 888-2). This information should be recorded on all material bags (paper, plastic, tags) as well as labeled on the artifact itself.

The individual '888' bag number should contain only information from a single Collection Unit to avoid mixing the materials. Thus, the provenience description of Bag number '888-1' should include only material collected from Collection Unit 1 (e.g., 888-1, CU-1).

Individual collection units should be denoted as 'CU' for Collection Units. Since the shape of the collection units may vary according to project (either square or circular),

this term was deemed to be better for consistency's sake than using either 'Collection Circle' or 'Collection Square'. CU should be used at all times regardless of the shape of the area collected.

Ultimately, all the UTM coordinates of the Controlled Surface Collection should be written on all bags (paper, plastic) and tags accompanying the material. When UTM coordinates are not available (such as for smaller projects), use the site grid coordinates. As a standard procedure, the coordinates of the **southwest** corner of the Collection Units should be the one recorded on bags and tags. In cases where the Collection Unit is circular, the UTM point recorded should be the **center point** for the circular units.

Below is a list of categories for bag numbers and how they should be written for labeling artifacts and bags.

Bag category	Examples
Under the Survey Bag Checklist	
Surface Collections	800 - #
Posthole and number	PH #/or PH#-#
Auger and number	AU #/or AU#-#
Shovel Test and number	ST #/or ST#-#
Piece Plot (GPS-surface)	i.e., PP 1, PP 2
All Testing and Mitigation	
Piece Plot and number (Total station, non-feature)	i.e., PP 4001
Piece Plot and number (Feature/Hand-excavated unit)	i.e., F (HU) #- #/PP 1
ALL surface collections (including Controlled Surface Collection)	888 - #
Controlled Surface Collection	888-#, CU #
General Plow-zone material	900 - #
Controlled Plow-zone Collection (metal detecting)	900-#, CU #
Material from non-feature SUB-PLOWZONE context	700 - #
Hand-excavated unit and number	HU # - #
Geomorphic Test Trench	GT # - #
Feature and number	F# - #
Postmold and number	F#-#, PM #
Wall Trench and letter	WT ‘letter’

3 Survey Procedures

Before IDOT can begin any construction, the impact of construction on any historic (as used here, this means both historic and prehistoric resources must be assessed. This stage of the investigation is typically referred to as a Phase I survey and may include any or all of the following investigative methods: historic document research, identification of previously recorded sites, collector interviews, metal detection, geophysical surveys, pedestrian walkovers, shovel tests/ auger tests, backhoe trenches, and geomorphologic cores. The purpose is to evaluate the potentially impacted area within the project boundaries provided by IDOT. If cultural materials (prehistoric and/or historic) are found, the location of the artifacts are recorded and the materials are collected to be processed in the lab and analyzed by ISAS researchers. Following the analysis of collected materials, an Archaeological Survey Short Report (ASSR) is prepared by ISAS and submitted to IDOT who, after review, will ultimately submit it to IHPA. The ISAS report includes recommendations to IDOT and IHPA on whether additional archaeological testing and/or mitigation are necessary before construction can begin. Recommendations for any further evaluation of identified resources are also included in the ASSR. Remember that it is the mission of ISAS to identify ALL historic resources within the project area and to fully resolve issues of National Register significance.

When a project first arrives at ISAS, it is immediately assigned a unique project number within the ISAS Statewide system. This is completed by the ISAS Statewide Coordinator's office and will only be passed on to the appropriate ISAS archaeologist after it has been logged into the ISAS Statewide database. The log number is a 5 digit number with the first 2 digits representing the year that the project came into ISAS. The remaining 3 numbers represent a sequential number assigned to that particular project. For example, a project log number of 03051 can be interpreted as the 51st project to be logged into ISAS during the calendar year 2003. Log numbers should be recorded on all paperwork and field bags for Statewide Survey projects.

Background Research

In addition to the fieldwork, standard record searches are also undertaken to glean relevant information about previous archaeological investigations, known site locations (IAS sites files), culture history, and historical settlement patterns in each project area. Included in this research is a systematic review of nineteenth century US Government Land Office survey maps and historic plats and atlases. Additional historic information from the Illinois State Archives and the Illinois Historic Preservation Agency will be provided to the District Archaeologist by the ISAS Historic Researcher. Copies of the maps that are examined during these reviews are attached to the ASSRs. These record searches are sometimes supplemented with collector/informant interviews conducted in the field as the survey progresses. District archaeologists should always contact regional archaeologists who are local to the area under investigation for additional information.

Survey Notes

The District Archaeologist in charge of any survey field project is required to take daily notes that include at a minimum the following types of information: date, weather conditions, surface conditions, crew members present, field time for personnel, general description of the topography of the area, survey techniques employed, bag checklists, description of sites found with detailed locations, and any contacts with local landowners. A more expanded version of particular types of information to include in the survey notes can be found in Section 5. Please follow these guidelines when applicable. This is critical since this is the information to be used when identifying sites that need further investigation.

ALWAYS REMEMBER TO CALL THE *JOINT UTILITY LINE INFORMATION FOR EXCAVATION* (J.U.L.I.E.) at 1-800-892-0123 TO CHECK THE AREA BEFORE BEGINNING ANY FORM OF SUBSURFACE TESTING!

Pedestrian Survey

Plowing typically will disturb subsurface deposits and bring cultural materials to the ground surface on ancient or stable surfaces. Cultivated fields and other areas with sufficient surface visibility (>25% average) can therefore be subjected to standard pedestrian survey. Such fields also are relatively clear of dense vegetation at certain times of the year such as in the spring and late fall- thereby allowing for a more efficient method to identify sites.

Surveyors should be especially sensitive to local landforms. In instances where initial surveys of high probability areas for site locations do not reveal materials (e.g., bluff edges, floodplain ridges, stream openings, etc.), they should be re-examined. Re-walking terrain, when feasible, at 90 degrees to the original direction of survey will often produce materials that were obscured by plow furrows or crop rows. Shovel testing, augering, and /or heavy equipment may also come into play in such situations. Always remember to call J.U.L.I.E. at 1-800-892-0123 to check the area before beginning any form of subsurface testing! It is critical that we locate ALL historic and prehistoric locations within project areas so they can be properly evaluated. Construction stoppages due to the unexpected discovery of historic resources are detrimental to both the construction process and historic resources.

Pedestrian survey involves walking over the area in transects that are 1-5 meters apart. The surveyor focuses on the ground surface at all times - looking side to side to cover the area between transects- in order to find any cultural materials (ceramics, chert flakes/tools, fire-cracked rock, cobble tools, etc.) that are present on the ground surface. This method of survey is the most efficient since it usually can identify the presence of cultural materials through direct observation, and has served to identify the vast majority of all sites recorded in the IAS site files.

Even where pedestrian surveys are possible, surveyors should place shovel, auger, or posthole tests (see detailed instructions below) strategically in selected topographic settings to gain an understanding of subsurface conditions such as the presence of middens, degree of erosion, soil type, etc. This information can be very important in

assessing the nature and significance of the surface finds. It can also be critical in planning any required Phase II testing strategies. Always remember to call J.U.L.I.E. at 1-800-892-0123 to check the area before beginning any form of subsurface testing!

In areas where ground cover prevents the use of pedestrian walkovers, surveyors should investigate the possibility of having the area plowed or disked. In some areas where trees are present, it is sometimes possible to use a roto-tiller to increase visibility. Raking away piles of leaves can also reveal cultural materials on the ground surface. Remember that after plowing, it is necessary to wait for a rainstorm to create sufficient visibility before the area can be effectively surveyed by pedestrian walkovers. Prior to arranging this, ensure that the area has been previously plowed through shovel/auger/posthole tests and, if possible, historic records and aerial photographs. If a site has not been plowed at any time in the past, then any subsurface deposits are considered undisturbed and can provide important contextual information for site evaluation. In such a situation, you should not arrange for plowing without consulting with your local ISAS Coordinator and the ISAS Central Office.

In cases where there is strong evidence to suspect there are intact cultural resources over a large area, a backhoe or paddlewheel may be used at the Phase I level to remove the overburden to search for subsurface features. This procedure is commonly used in cases of borrow pit investigations where time is of the essence. Before implementing such a procedure get permission from the relevant District or Statewide Coordinators. Always remember to call J.U.L.I.E. at 1-800-892-0123 to check the area before beginning any form of subsurface testing!

Shovel/Auger Tests/Post Hole Tests

In situations where the ground surface is obscured by pasture, timber, or other groundcover, and where plowing cannot be used as a method for collecting materials, shovel tests (or auger tests) placed at 5, 10 or 15 meter intervals (no greater than 15m intervals) are used. These methods are designed to identify cultural activity by looking at subsurface deposits. Remember that this is a very inferior method of site discovery and should only be used as a method of last resort. Always remember to call J.U.L.I.E. at 1-800-892-0123 to check the area before beginning any form of subsurface testing! The excavation of shovel/auger/post hole tests, unlike artifacts picked up on the ground surface, is generally restricted to the area within the project boundaries. The first shovel/auger/post hole test should be located in an area where the surveyor believes a typical natural soil stratigraphy can be observed. This test should remain open during the first few shovel tests so that it can be used to aid the surveyor in identifying subsurface disturbances. Shovel/auger/post hole tests are excavated at least ten centimeters into sterile subsoil deposits. All soil that is removed from each shovel/auger/post hole test is dry screened through 0.25-inch hardware mesh to collect any cultural materials. Profiles should be completed for at least one shovel/auger/post hole test representing the natural stratigraphy as well for as any shovel/auger/post hole tests yielding cultural material. Profile forms for shovel/auger/post hole tests are used to record these types of profiles (see Section 5). Such information can aid in identifying soil profiles and site formation processes as well as occasionally revealing the presence

of subsurface features and/or disturbances. Field crews need to backfill any subsurface tests to avoid injury to people or animals- especially in residential or farmland areas.

In projects located on floodplains, all areas should be carefully investigated for buried deposits. Keep in mind that such deposits may be present over 1 meter below the current ground surface. Examining nearby creek banks can also be useful in identifying buried surfaces. In most cases, a geomorphologist may complete these types of subsurface tests (see below).

Residential yards, commercially developed or disturbed tracts, and wooded/pasture areas with greater than 10% slope typically cannot be accessed or otherwise have extremely low potential for encountering significant, intact archaeological deposits. Surveyors, however, need to demonstrate rather than assume that "disturbed" landscapes have a low potential for historic resources. This can be done most efficiently by placing a few shovel tests in representative areas. Remember that in older road projects the possibility of intact archaeological features in highway right-of ways is extremely high. We have encountered numerous examples of such intact resources at the Hoxie Farm, East. St. Louis Mound, and Knoebel sites to name just a few. In light of this, any decision not to examine these areas must be made very carefully especially in cases where known sites of National Register quality are known to occur in the immediate vicinity. If any doubts or questions exist – survey the areas.

If there is a known site in the vicinity, shovel tests may be used in select residential yards to determine the boundaries of the site. Any obvious exposed erosional areas (cattle paths, etc.) located within tracts that otherwise have prohibitive surface cover should be visually inspected for cultural material. Unplowed bluff top areas are routinely examined for evidence of prehistoric mounds and artifact scatters exposed as a result of erosion. Often, bluff top areas along the major river trenches (Mississippi, Illinois, Rock, Big Muddy etc.) will likely be recommended for testing, regardless of Phase I results, because they have a known high probability of being the locus of burial activity during many prehistoric periods; often such burials are impossible to locate using standard Phase I techniques since they have no surface representation and a very subtle subsurface signature. Cut banks along waterways need to be examined to search for buried archaeological deposits, determine natural stratigraphy and/or identify the existence of historic alluvial buildup in areas.

Collection and recording of artifacts

When cultural material is encountered during pedestrian survey, each artifact location is marked with a pin flag and the surrounding area is examined at one to two-meter parallel intervals. Diagnostic artifacts are marked with two pin flags so that they are readily identified for mapping. All additional artifacts are flagged until the complete area of scatter is defined. At times, the limits of a material scatter may extend outside the limits of the project limits and, if possible, it should be included in the mapping of artifact distributions. A hand-held, GeoExplorer Global Positioning System (GPS) device is then used to record the limits of the sites and any material concentrations or surface features that are observed (see Section 6**).** This type of information aids in accurately plotting the location of the artifacts and sites on a topographic map. In addition, the locations of all diagnostic or temporally sensitive artifacts that are recognized in the field

are recorded with the GPS unit (within reason). In situations where there is a high density of material, the surveyor may choose to establish collection units rather than mapping individual artifacts. Two types of collection units have been used at ISAS- the grid-based collection units and the circular ('dogleash') collection unit. The District Archaeologist in charge of the project determines the type of collection units to be used at a site.

All prehistoric cultural material observed during the initial walkover of a site/find spot are collected. At historic sites the procedure is generally the same with the exception that only samples of construction related debris (brick, mortar, concrete, sandstone, window glass etc.) are recovered from the field and notes taken of additional concentrations of such materials. Likewise, any cultural material that is found during shovel testing is collected. When previously recorded sites are revisited and recollected by ISAS personnel, only tools, ceramics, and exotic materials are systematically collected. However the presence and density of uncollected materials must be noted. On longer-term projects, surveyors should systematically revisit and recollect all previously documented sites located partially or entirely within the proposed project limits. Such revisits have been demonstrated to provide extremely important additional information that cannot be obtained though a single site visit.

Artifact bags are labeled in the field with sequential field site number (ISAS log number-sequential field site number) and the bag numbers. All bags with Phase I surface materials are given the prefix of 800 and then a sequential bag number (e.g., 800-2). Shovel tests are denoted by ST# and Auger Tests by AU#. For more detailed explanation on the bag numbering system, please see Section 2.

Identification of sites

When recording information about a site while in the field, it is important to note the relevant data needed for completing the Illinois Archaeological Survey (IAS) Site Forms to support recommendations and future investigations. This includes type of ground cover, visibility (%), topography, nearest water source, survey method, collection technique, any disturbance to the site, survey date, and cultural affiliation (if readily apparent from the diagnostic artifacts). A sketch map that includes roads, waterways, buildings, fences, relationship to other nearby sites, property ownership lines, and relevant topography (i.e., steep slopes, rises) is helpful when later describing the site. It is *essential* to take the time to write good notes while in the field rather than to try to 'recall' this information back at the lab or at a later date. It is often helpful to take relevant views of the landscape with the digital camera that may be used in the report of investigations. An example of a form that a surveyor may use while in the field to collect information is presented in Section 5.

When defining the limits of a site, surveyors may want to keep in mind that each area of the state is unique in terms of it's landforms and history of land use. Consequently, site boundary definitions may vary significantly between project areas, such as East St. Louis versus Peotone Airport, due to differences in occupational or landscape history. One approach is to define site limits based upon the distribution of cultural material on specific local landforms. Thus, for example, concentrations found on two separate moraines will be identified as separate sites. Do not group widely

dispersed artifact occurrences into one site for the sake of convenience since this distorts the archaeological record. When defining the site in field notes and reports, you need to clearly define what factors were used to identify the site area.

Pre-Columbian Period (Pre-1673 A.D.)

Sites that have material dating prior to 1673 (both prehistoric and protohistoric) are considered to date to the Pre-Columbian Period. All new sites and diagnostic isolated finds are submitted to the ISM for official site numbers. In the meantime, each newly identified site is given a temporary field number that includes the ISAS log number and a sequential site field number. For example, a temporary site number of 03221-3 represents the third new site identified on the project with the ISAS log number of 03221.

During a brief period, ending in 2012, locations on IDOT projects that produced 5 or less *non-diagnostic* aboriginal artifacts, were classified as 'find spots' and were not submitted as sites. According to IDOT directives, prehistoric sites were defined as bounded locations with six or more non-diagnostic individual artifacts and all locations (regardless of the count) that produce diagnostic or temporally sensitive artifacts (projectile point, ceramics, etc.). Locations not meting these standards were "find spots". However, ISAS mapped, recorded, and collected such find spots in the same manner as the prehistoric "sites". Find spots were identified by an ISAS project number prefix and sequential field number [e.g., for a field site number of '00080-1', the find spot number is 'FS 00080-1']). Relevant information about the find spots is available in a searchable database maintained at the Champaign ISAS office. The locations of 'Find spots' are included with project maps attached to ASSRs. If additional material was recovered from a 'Find Spot' location at a later date, the status of the material concentration was changed to an actual site and submitted for a site number. Furthermore a computerized inventory of all find spots is maintained by ISAS's Cartography lab.

Historic Period (Post 1673)

The term "historic" for purposes of Illinois archaeology refers primarily to post-1673 Native, French, Spanish, British and American cultural resources. Illinois has a colorful, complex, and regionally varied history, so district surveyors should familiarize themselves with the basic outline of this early state history as it applies to their particular survey area. The convenient but arbitrary sub-periods of Colonial (1673-1780), Pioneer (1781-1840), and Frontier (1840-1871) are commonly recognized and are listed on the IAS site forms as options for site component identification. The resources dating to these periods are currently a primary focus of historic archaeology in the state. Later periods (e.g., Early Industrial, 1871-1900; Urban Industrial, 1901-1945; and Post-War, 1945-present) are recognizably important but are less a subject of archaeological study because of their accessibility through historic records. In a very few instances, unique or special resources dating to these later periods (e.g., taverns, pottery industry, locations associated with a significant person or event, etc.) may be the focus of archaeological research; but more often, because they may involve standing structures, a thorough documentation through photography or measured drawings is sufficient to ensure that

they are properly recorded prior to destruction. This decision largely rests with historians at IHPA and is therefore outside of our purview.

Each of the recognized early periods has its own set of research questions; issues of Native and Euro-American interaction, ethnicity, frontier expansion, early "squatter" settlements, political conflict, warfare, developing markets, farmstead patterning, urban-rural dichotomies, and the development of systems of transportation are only a few of the themes that may be explored archaeologically. Although all of these topics are potentially of state and national levels of interest, they unfolded in unique ways that are best understood at the regional level. Historic archaeology is still in its infancy, and although we have a steadily growing database for some periods in a few counties, we lack comparable assemblages from the majority of the state. Because of this, case-by-case judgments will be made as to how to approach a specific historic resource. At the Phase I level it is our policy to collect all artifacts that date to periods prior to the twentieth century, with the exception of construction material such as limestone, sandstone, brick, window glass, wood etc. that may be sampled. While these latter material classes are not collected in total, they should be documented in the field notes, and an estimate of their relative occurrence at the site be provided. **Twentieth-century artifacts typically not collected should be recorded in field notebook to indicate the presence of this resource.** The reason for near total site collection is that the signature of very early settlements is often masked by later periods of occupation and, as a result, easily overlooked. The potential diagnostic materials that might indicate such an early settlement are too numerous to mention and we rely on a small number of individuals whose responsibility it is to identify such remains. Prior to making recommendations for further investigation at a historic site, the ISAS historic archaeologist should either look over the collected materials or be sent images of the material to assess whether an earlier component is present at the site.

Geomorphological testing

Geomorphological testing may be necessary in areas where there is the possibility of deeply buried deposits such as on floodplains, alluvial fans, or some upland settings. In such cases, ISAS will contract with a geomorphologist to complete coring, backhoe trenching, or other deep subsurface testing techniques within the area under investigation. To provide a perspective on the issues of deeply buried landforms, archaeological resources, and local geomorphological settings, it is often necessary to work outside the immediate project limits. The project archaeologist needs to work with the geomorphologist and landowners to coordinate such efforts. Upon completion of the testing, the geomorphologist works closely with the archaeologists in interpreting the data and providing a report on the geomorphic context. The results of these particular tests provide invaluable information on the geomorphological history of an area, both naturally and culturally.

4 Excavation Procedures

General Background

Recording Dates

The dates on all Project records are written in the following manner: 18 March 2002 or 18 March 02. The day is written first, followed by the month (spelled out—no numbers are used for the month), with the year last. Examples follow:

Right	Wrong
6 Aug. 2002	Aug. 6, 2002
6 August 2002	August 6, 2002
8 May 2002	5/8/02
2 September 2002	2-9-02

Recording Archaeological Field Notes and Labels

All archaeological excavation data must be properly and consistently recorded in a clear and readable script. All forms are to be filled out in pencil—no exceptions. All bags (material, flotation, soil sample, pollen sample, charcoal, etc.) are to be filled out with a waterproof felt-tipped marker (Sharpies). Writing needs to be clear and legible on all forms and bags. For many people, increased legibility depends upon printing rather than using cursive. Mistakes on forms are to be erased, and the correct entry is then written in the space in pencil. *Note: these are different from actual changes to paperwork that occur as feature interpretations change during excavation. Early notes on feature interpretation can be an important element during analysis of the site. If you are unsure about whether to erase, please ask a supervisor.* Do not fill up the margins with notes and do not write on the backs of forms. If you need more space for your notes, "continuation" forms are available for your use. Mistakes on bags are to have a line drawn through them with the correct entry recorded next to or above the erroneous entry.

There are a number of different categories for archaeological materials that you will be collecting in the field. Every sample of cultural material (i.e., artifacts, flotation samples, C-14 samples, soil samples, botanical samples) MUST have a unique bag number that is recorded on your feature paperwork and on the paperbags or tags accompanying the sample. This information must be kept with the sample at all times. Here is a brief list of the more common types of samples:

Material bags – these bags will hold the artifacts that you collect in the course of excavation. Each material bag is given a unique bag number that needs to be recorded on your Excavation Notes and the Feature/Hand-excavated unit (HU) bag Checklist as they are collected. Do not wait and record all the information at a later time. It is especially important that recovered materials and samples be carefully handled. All material from a given zone of a given feature is bagged together. *Materials from different levels and zones must not be mixed-*

*particularly from second half excavations- unless otherwise directed by a supervisor***.** All the paper bags will be stamped with the types of information that needs to be recorded (see below):

Project _____
Site _____
Feature/ Unit_____
Bag # _____
Zone/Level_____
Half/Quarter _____
Date_____
Initials_____

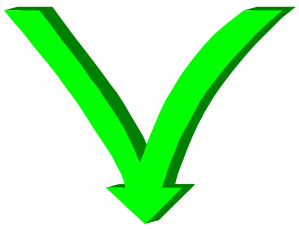
If there is a large amount of material, you will want to bag the various types of material separately. Heavier materials such as FCR should be bagged separately from the more fragile pottery, bone and shell, thereby avoiding damage to the latter. Smaller sized, inner bags are used if appropriate.

In addition to filling out the stamped area, **identify the contents of the bag**: i.e., All Material, All Ceramic, All Lithic, C-14, All Botanical or All Faunal. Additionally, if in the All Material bag ceramics are bagged separately, this (internal) ceramic bag **must** be labeled with the site, bag number, date, contents, and 'Inner Bag' (in case it gets separated from the outer bag).

Example – Organization of Material Bags

Site: 11S333
Bag #: F3-1
Date: 12 May 01
All Ceramic
Inner Bag

Site: 11S333
Bag #: F3-1
Date: 12 May 01
All FCR
Inner Bag



Site: 11S333
Feature/Unit: F3
Bag #: F3-1
Zone/Level: ZA N1/2
Date: 12 May 01
Initials: MA

If excavating a hand-excavated unit (HU), collect materials by individual levels of excavation (arbitrary or natural) and indicate the Level # on the bag.

Example – Hand-excavated unit (HU) Bag Information

Site: 11S333
Feature/Hand-excavated Unit: HU5
Bag #: HU5-1
Zone/Level: Level 2 (or depth i.e., 0-10 cm)
Date: 12 May 01
Initials: MA

While excavating the first half of a **very deep, artifact rich feature** (e.g., over a meter) collect materials by 25 cm levels. Note on the All Material bag "collected from the first 25 cm."

Example – Material Bag Information

Site: 11MS456
Feature/Hand-excavated unit (HU): F55
Bag #: F55-3
Zone/Level: All S 1/2
Date: 23 Feb 01
Initials: GG
Material collected from 0-25 cm

All material bags are to be turned in at the completion of a feature or the close of the field day (whichever comes first). At this time, these bags are checked into a Master Bag Checklist by a supervisor. All bags need to be accounted for before leaving the field for the day. You cannot use the same bag or bag number on separate days. Example: Ms. Shovel finds 2 sherds and 12 flakes on Tuesday, she then puts her material bag into her tool box for Wednesday. *She is wrong*. She should have turned in her material bag(s) at the end of the field day and then make up a new bag with a new bag # the following field day.

Each bag should have a unique bag number even if it is has material from the same zone and same feature on the same day. Continuation of material bag numbers because of a large amount of material is not an acceptable bag numbering option (e.g., F8-3 1/2 and F8-3 2/2). Multiple material bags with the same bag number result in more confusion in the lab. Example: Mr. Archaeology collects a ton of material from Feature 8 on Monday and he starts filling out his bag as F8-1. After lunch he finds that his material bag is full so he labels his next bag F8-1 2/2. *This is wrong*. The bag F8-1 2/2 should be F8-2.

Flotation Samples – A flotation sample consists of a sample of soil from a feature or level within a hand-excavated unit- usually within a specific zone (or layer).

When the flotation sample is taken back to the lab, it is processed in water using fine mesh screen to collect small fragile botanical, faunal, and cultural material.

Flotation samples ("flots") consisting of soil matrix are usually collected from all cultural proveniences at a site. Standard collection procedures typically involve the collection of a single, 10-liter, sample of fill matrix from 1) each level in a hand-excavated unit (with the exception of the plowzone) and 2) each cultural zone in the second half of a feature. At times, your supervisor may ask you to take additional flots from identified subzones with a feature (e.g., Zone A1, A2). Samples may also be taken from wall trenches and post molds when instructed by your supervisor. *Flotation samples should only be taken from features that represent a single component.* If half of a feature has been superimposed by a later feature, chances are that some mixing of deposits has occurred and thus the material in the flotation sample could be from multiple occupations. Shallow features may result in the collection of smaller volumes.

Exceptionally deep features exhibiting no zonation may also merit collection of several samples from arbitrarily designated levels in the second half. At the discretion of the site supervisor, samples may also be collected from the first half of a feature if a particularly dark, charred, or discontinuous layer is noted. For structures, standard procedure involves the collection of 10-liter flots from each quadrant. Occasionally the entire content of a feature is bagged for flotation. The site supervisor may also advise collection of standardized volume samples from any intact subsurface provenience, including middens and living surfaces.

If you are digging a component or time period not frequently encountered by ISAS in the archaeological record (e.g., poorly known or not represented in the existing ethnobotanical record), it is important to collect more samples than usual. Additional samples may also be collected from hand-excavated units and posthole tests.

Flot samples serve the purpose of systematically collecting micro-artifactual samples from sites. Such samples are especially important in instances where screening is prohibitive in terms of time and soil matrix. In this regard, you may often be instructed by your supervisor to take flot samples when you encounter large amounts if small objects such as delicate fish bones and scales, microdebitage, masses of carbonized seeds or nutshells, historic beads, etc. This approach is usually more economical and ensures better recovery rates to sort these types of deposits in the lab under controlled conditions.

Soil volumes are measured in the field using buckets that have been premarked for liters. No more than 10 L of soil should be put into one float bag. The fill matrix for flotation is placed into a double lined bag. To collect the sample, you should chunk out samples (fist size chunks) of soil from the designated area with your trowel or shovel. Flots (primarily taken from second half) must be pristine samples. The sample must not be from the first scrape of the zone, rather it needs to be collected from throughout the entire zone. Also, remember to flot burned areas or areas with small bone/fish scale or microdebitage concentrations. Under certain circumstances, the Site Director may choose to water screen the soil from such areas. If you are unsure about whether you need to collect a sample, ask your supervisor. **While collecting a**

flot sample, pull out all diagnostic artifacts and bag with your material bag for that zone. This will ensure that such materials will be stored with the remaining diagnostic artifacts from the feature.

In all cases, two flot tags should be filled out for each sample. The first is attached to the cord that is used to close the outer bag, the second is put in a small Ziploc bag and placed between the inner and outer plastic bags. Make sure that the inner tag is facing out to that it is observable and legible. Each flotation sample is given a unique bag number that needs to be recorded on your Excavation Notes and the Feature bag Checklist as they are collected. Do not wait and record all the information at a later time. Information on the flot tag is also recorded on the bag checklist for the given feature. It is important that flot tags be filled out completely and accurately as it is the primary record of provenience for these samples. Flot tags are to be filled out as indicated in the following example.

Example – Flot Tag Information

SITE_____
BAG#_____
NAME____ LITERS____
ZONE_____HALF_____
DATE_____

Flot Bag Numbers cannot be continued. Example: Flot Bag F23 1/2 and F23 2/2 is incorrect. Your initials should be recorded in the line that says NAME.

Radiocarbon (C-14) Sample – A C-14 sample consists of small samples of burned floral material (charcoal, nuts) that can be analyzed at the Illinois State Geological Survey Radiocarbon Laboratory at UIUC to help determine the time period that a feature and/or site was utilized. These samples are collected only when directed by a supervisor. Samples (6-7 grams minimum) are first wrapped in tinfoil (do not crush) or put in a clean vial and then bagged separately with their own bag number. Then the elevation of the sample must be recorded (this is written on the bag) and the location of the sample must be drawn on plan map (with elevation also noted here). All C-14 samples receive a unique bag number within the feature Bag Checklist sequence (i.e., F4-8, C-14 sample).

Botanical/Floral Hand-collected Samples- Small botanical or floral samples, either wrapped in tinfoil or put in small vials, are placed in the All Material bag. The handling of charred organic artifacts such as bowls, mats, baskets, and house construction material, etc., require special care and handling (e.g., piece plot item on map, photographs, special packaging). Always get instructions from your supervisor before removing any such items. Remember to record elevations of the botanical sample(s) on the plan map and in your notes. Significant botanical samples (very large fragile samples, wooden bowls, thatch, etc.) are

bagged or boxed separately. Such unique samples generally are assigned a unique bag number as well.

Soil Samples and Archaeomagnetic Samples - Soil samples may be taken to document site soil types, unusual feature fills, or to be used in special analyses such as phytolith or pollen studies. These types of samples are less commonly collected in the field. If you need to collect such a sample, your supervisor will show you exactly what needs to be done. All samples are recorded in the Feature and Bag Checklist forms and are assigned the next sequential bag number within the feature. Be sure to record the specific provenience (Zone, depth) in the notes and bag checklist as well as on the bag.
Archaeomagnetic samples are collected from in situ heavily burned or oxidized areas such as burned house floors or hearths. If you encounter such an area during excavations, contact your supervisor and he/she can inform you on how to proceed.

Use of screens during testing and mitigation

The decision to screen deposits during excavation is determined by the Site Director in consultation with the local ISAS Coordinator and the central ISAS Office. Factors affecting such decisions include the type of deposit (e.g., midden), types of materials present in the deposit (e.g., large quantities of small fauna bones), size and temporal component of the site (e.g., historic), and type of soil. In situations where time is a constraint, the decision may be to take large numbers of flotation samples from features in lieu of screening, particularly if the soil is hard-packed clay.

One-quarter inch (1/4”) screens are used for most test excavations. The use of screens during mitigation is more variable and largely depends on the characteristics of the site deposits as discussed previously. In situations where a large amount of material is found (e.g., small fauna), a smaller screen size may also be used in conjunction with water (water-screening) to facilitate the separation of soil from material. Smaller screen size in conjunction with flotation samples will also frequently be used in the context of early historic or proto-historic sites where very small artifacts such as beads or pins may be missed in the regular screening process.

Please indicate on the field paperwork when screens are being used as well as the size of the screen mesh (1/4”, 1/8”).

Assignment of Tasks

Upon completion of a task, completed paperwork is given to a supervisor who will check it for clarity and accuracy. Other tasks are then assigned to you by the supervisor who determines what needs to be done next. An excavator should not take it upon himself/herself to simply choose a subsequent task that he/she is interested in performing. Note: if an excavator is merely waiting to have his/her profile map checked they should help someone else with forms, mapping or filling out bags, moving backdirt, helping others screen materials, and so on.

Flagging Color Codes

The following indicates the most common usage of the various ribbon (flagging) colors used by ISAS archaeologists:

White or pink:	Feature outline
Red:	A, B, C, D mapping nails
Blue:	Grid Points

Elevations

All elevations (vertical coordinates) used for ISAS projects are in metric units. When taking elevations, you must **always** indicate the reference nail (datum) that you are using to calculate the elevations. These may be referred to on the maps by either the UTM coordinates (e.g., N545.67E353.21, elevation 125.56 MASL) or the nail reference letter (e.g., 'A' elevation 125.56 MASL). Recording the actual elevation of the datum on the map allows for double-checking your calculations. Sample calculations follow:

1. top of datum nail: 124.56 m
   top of feature: 4 cmbd (124.52 m) (cmbd is "cm below datum")
   bottom of feature: 41 cmbd (124.15 m)

2. Top- 124.56 m minus 4 cm:
   124.56 m
   -.04 (4 cm)
   124.52 m

3. Bottom -124.56 m minus 41 cm:
   124.56 m
   -.41 (41 cm)
   124.15 m

The decimal point is moved two places to the left (on the number in cm, thereby converting it to m) to add or subtract centimeters from meters.

Elevations must be recorded on all profile maps and forms. Elevations are recorded on bags representing arbitrary hand-excavated units (HU), or units from midden context, but bags from features are usually labeled by zone and feature half. Excavators must think when recording elevations on anything; the elevations must make sense. For feature excavation, the datum nail elevation will be rounded off to the nearest centimeter.

Excavation Blocks

Phase II testing frequently involves the use of heavy machinery such as a backhoe to carefully excavate a trench or a large block of area through plowzone disturbed deposits to see if there are intact subsurface cultural deposits such as features, middens, or buried surfaces. Prior to deciding on a testing procedure (e.g., hand-excavation units, excavation blocks with heavy machinery), the field archaeologist

is responsible for determining the type and extent of site deposits. This can be done through the use of a limited number of smaller hand-excavation units (i.e., 1 m x 1 m) and/or systematic shovel/auger tests across the site. *The use of heavy machinery should only be considered when there is clear evidence that the area has been plowed or otherwise disturbed such as in an urban setting*. The absence of a plowzone suggests that in situ cultural deposits may be close to the ground surface, in which case all efforts should be directed towards collecting contextual information for these types of deposits. In such cases, hand-excavated units should be used to test the site. For very large unplowed sites, you may want a combination of hand-excavation units and heavy machinery. An exception to this can occur in situations where deposits are deeply buried such as in a floodplain. In such cases, heavy machinery could be used to deep test a small area. Always consult with your local Coordinator and the ISAS Central Office before proceeding with any testing strategy. **ALWAYS REMEMBER TO CALL J.U.L.I.E . (JOINT UTILITY LINE INFORMATION FOR EXCAVATING - 1-800-892-0123) TO CHECK THE AREA FOR BURIED CABLES BEFORE BEGINNING ANY SUBSURFACE TESTING!** Failure to do this may result in a several thousand-dollar fine if fiber optic cables are damaged, or be life threatening if a high-pressure natural gas line is breached.

Any machine-excavated area (both during testing and mitigation) is referred to as an Excavation Block. The limits of all excavation blocks as well as any features are shot in using the total station and tied into UTM benchmarks (see discussion below). The decision to excavate subsurface features at this time will be determined by the project director in consultation with the local ISAS Coordinator and the ISAS Central Office. Factors to be considered at this point include the type of project (e.g., borrow pit or large highway corridor), the percent of the site that has been tested with heavy machinery (is the site significantly larger than the tested area? How much of the site extends outside the project boundaries?), and whether the particular project limits are proposed (i.e., a preliminary corridor that may not be chosen for a final project) or are based upon detailed IDOT plans (i.e., final project ROW plans).

If the site is small (e.g., <10 small, shallow basins), all identified features may be excavated at this time using the methods described in the Mitigation section (see below). This is particularly important in regions where the archaeological record is poorly understood. If there is a high density of features and it is clear that the impacted area of the site will need to be completely excavated, a sample of features may be excavated to provide information on the age, depth of features, productivity, and potential complexity of deposits represented. The remaining exposed features may be covered with tarp and excavated during the actual mitigation of the site. This is particularly important under certain circumstances such as when large structures are present (e.g., Mississippian farmstead) or at a historic site where excavation of a sample of features can provide information about the nature of the temporal components at the site.

At this point, the site supervisor, in conjunction with the local ISAS Coordinator and the ISAS Central Office, should follow procedures outlined on the internal ISAS Web site regarding subsequent investigations at the site.

Establishing a site grid

Before any testing or excavation begins, a site grid needs to be established to map the horizontal and vertical location of hand-excavation units, excavation blocks, and features within the site. This method divides the site into a series of metric units (see Example below). A horizontal site grid is typically established for any investigation- whether Phase II testing or mitigation- using a total station (see Section 7 - Total Station). The total station is a tool used to assist researchers in the creation of a site map using a grid system based on either arbitrary grid coordinates or UTM (Universal Transverse Mercator) locations. The total station records the location and elevations (described as Meters Above Sea Level, or MASL) of all grid coordinates that are either arbitrary or tied into a benchmark and downloaded into the computer in the lab.

When establishing a site grid, all efforts should be made to tie the grid into the UTM grid system. This is typically accomplished through the use of reference points provided by IDOT (or their consultant engineers) or by higher accuracy GPS recording of ISAS reference points. Exceptions to this rule include when the site is very small, when no features are found, or in situations where time is extremely limited (e.g., borrow pits, emergency projects). In such cases, an arbitrary grid may be established with a total station although *you will need to still tie the location of the site into 'real world' coordinates by using the GPS*. This is best performed by GPS mapping the excavation block limits following the instructions in Section 7. *All large testing and excavation projects must use the UTM grid system*.

All UTM grid points (horizontal coordinates) are mapped using the standard metric Northing Easting (Cartesian) grid, which is based on the UTM (Universal Transverse Mercator) system. The UTM system is used on the USGS (United States Geological Survey) 7.5-minute quadrangle maps. In Illinois, the Northing consists of a seven-digit number, and the Easting consists of a six-place number. For purposes of the ISAS site grid, all the digits from the Northing and the Easting are used. Remember that the Northing numbers increase from south to north, and Easting numbers increase from west to east.

Hand-excavation Units

A site may be investigated and excavated through the use of hand-excavated grid units (previously called test units or excavation units). Hand-excavated units are used most often in the early phase of site investigation (Phase II) to evaluate whether intact, subsurface features are present. Such units may also be used during later site investigations (i.e., Phase III mitigation) depending upon the circumstances of a particular site (e.g., presence of an intact midden). Typically, the field archaeologist in charge will consult with the local ISAS Coordinator and the ISAS Central Office to identify the number and location of the units needed to evaluate the site. The size of the hand-excavated units at during the testing stage of investigation will vary (1m x1m, 1m x 2m, 2m x 2m).

Ideally, the site grid is established before determining the location of the hand-excavated units. This approach results in corner grid points falling on 'even meter' intervals (e.g., N505.00 E233.00) and makes it easier to keep track of the UTM coordinates during mapping and excavation. Alternatively, the location of the units may

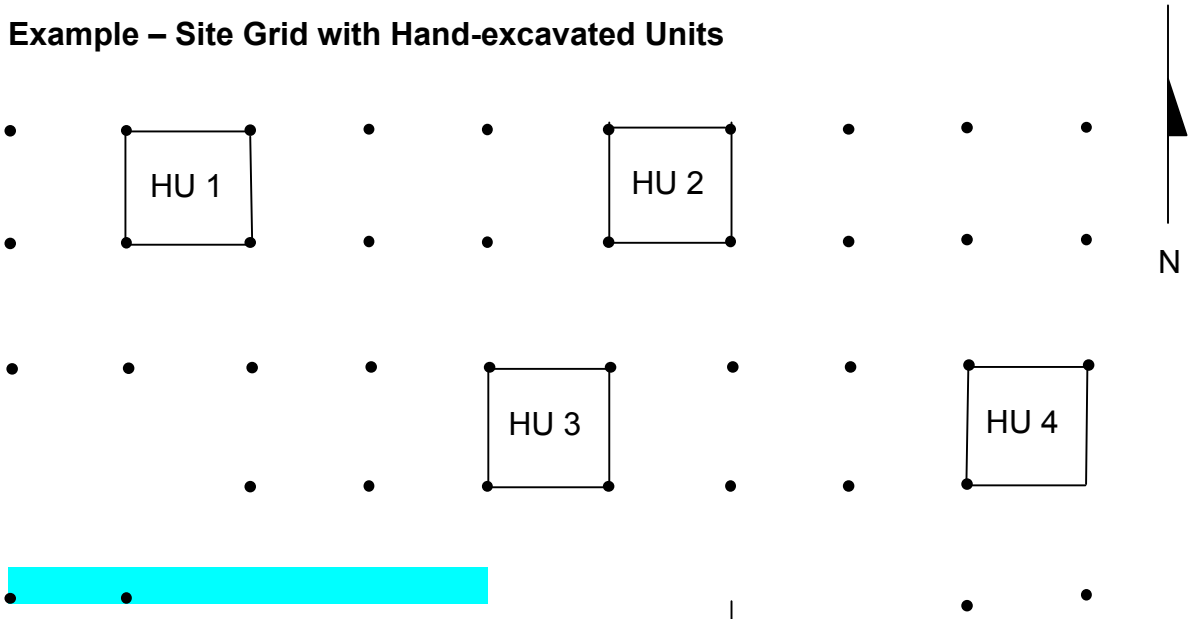
be determined by the topography and/or surface artifact concentrations. The four corners of these type of hand-excavation units will be shot in using the total station after the units have been laid out. The resulting corner points will commonly NOT fall on 'even meter' intervals in these situations (e.g., N505.53 E233.79). All grid points shot in with the total station are incorporated into the final site grid system.

As mentioned previously, such grid units may also be used during mitigation to allow for spatial control of artifacts from unique contexts. Hand-excavated units used during mitigation of a site occur most commonly in situations where large, widespread deposits such as middens are present. Generally these units are larger (ranges- 2m x 2m to 5m x 5m) than those used during Phase II testing of a site.

All hand-excavated units -whether they are used during testing or mitigation - are designated sequentially as Hand-excavated Unit 1(HU1), Hand-excavated Unit 2 (HU2), etc. (see Example below). This Hand-excavated Unit designation MUST be recorded on all forms and maps pertaining to the excavation of the grid unit.

Example – Site Grid with Hand-excavated Units

Example – Site Grid with Hand-excavated Units



The methods used to excavate all hand-excavated units are essentially the same regardless of the size of the unit.

To begin excavation of a hand-excavated unit, assemble all following necessary forms:

- Several Hand-excavation Unit Forms – one for each level
- Bag Checklist
- 2 sheets of 8 1/2 x 11 graph paper
- Continuation Form for additional comments

Fill in the basic information on the forms (see Section 5 for example):

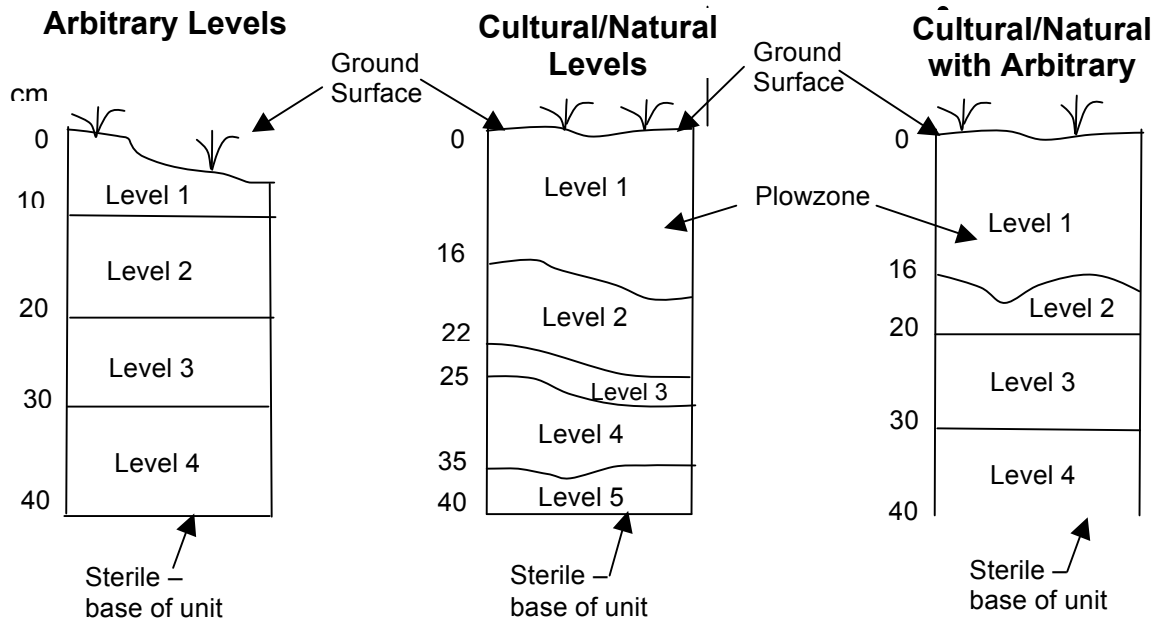
- Site number and name
- Hand-excavation Unit number (e.g., HU1)
- Date
- Excavator initials
- Level
- Grid Coordinates of the four corners of your unit
- Elevation of your datum
- Elevations of the four corners at the top of your first level

The grid coordinates and elevation of your datum will be supplied by your supervisor. Typically the datum elevation is the grid nail with the highest elevation, although occasions may arise where you will be asked to use an alternative grid nail. It is important to ALWAYS indicate in your notes and maps which grid nail you are using for your elevation. Your datum elevation is used to measure all depths during the excavation of the hand-excavation unit. Always indicate which grid point you are using as the datum elevation for your unit! Generally, if you extend a string over 2.5-3 meters (e.g., when excavating in a 5 m x 5 m unit) to obtain the elevation of an artifact in the center of your unit, you will end up losing precision. To avoid this, you should either establish a central elevation datum in the center of the unit or, alternatively, use multiple corners of your unit and clearly indicate which grid point you used (or calculate the elevation in terms of your datum elevation). Your supervisor will instruct you in which method you should use.

You should also prepare a paper bag to hold any materials you collect during the excavation of your first level by recording the information discussed above in the Field Material Bag section.

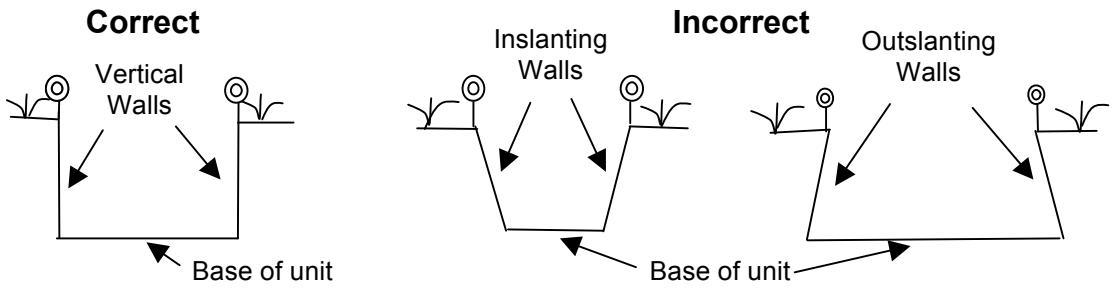
Levels are excavated by either arbitrary or cultural/natural criteria. Arbitrary levels involve excavating the same depth for each level (e.g. 10 cm). In situations where the hand-excavation unit is on a slope, the first level will be less than 10 cm in depth since your top depth (i.e., '0 cm') will be from the highest elevation of the unit (see example below). In the second method – cultural/natural levels – each level is determined by a single cultural/natural horizon (e.g. plow zone, midden) or natural levels (e.g. alluvial deposits). Differences between cultural or natural levels may be determined by soil color and texture as well as artifact density. The depth of each level will vary more with cultural levels (see Examples below). Typically, when plow zones are present, your first level will consist of the entire plow zone. After the plow zone has been removed, your supervisor will instruct you on whether the following levels will be cultural/natural or arbitrary. All material and samples need to be collected by levels. Each level should have a test unit form and individual material/sample bags. If a significant soil change occurs within an arbitrary level, it is important to keep the artifacts from each of the distinct zones separate by assigning a different bag number to each group of artifacts. Also ensure that you indicate in your notes whether the levels are arbitrary or cultural.

Examples – Types of levels



Excavation of hand-excavation units involves using a shovel/hoe and/or trowel to carefully excavate the unit in sequential levels. When excavating, you need to carefully skim the surface evenly so that the entire floor of your unit is always approximately the same depth. This allows for early detection of any cultural deposits as well as ensuring that you do not excavate too deeply below the base of your level. Always remember to keep your unit relatively clean of large amounts of soil. Large accumulations of shoveled soil on the floor of your unit may get trampled into the floor and obscure deposits. Also, it is very important to keep the walls (profiles) of your hand-excavation unit vertical as you excavate all your levels. If your unit walls slope inward as you excavate your levels, you may find that, while you began with a 2m x 2m unit, the floor area is now a 1m x 1m unit (see Example below). If the walls slope too outward (e.g. undercutting), you run the risk of the upper portion of the wall collapsing. Maintaining vertical walls ensures that you have collected all the cultural material present within the boundaries of your grid unit. When unit walls are sloping inward significantly, you may be missing important artifacts. Vertical walls also are critical when mapping the profiles by minimizing distortion. It is also important to remember that a hand-excavation unit should never be deeper than 5 feet for safety reasons.

Example – Maintaining vertical grid unit walls



Standard procedure is to put all the soil from a hand-excavation unit through a 1/4" mesh screen and collect all cultural materials according to the procedures discussed in the Field Material Bag section. *Be careful not to bury your corner nails!* Additional diagnostic artifacts located in a profile should be removed and placed with the general material from the appropriate level *only after the profile wall has been photographed and mapped*. Do not remove nondiagnostic artifacts from the profile wall since they will not provide any significant additional information.

In addition to the screened cultural material, you may also need to take at least one standard flotation sample from the same area within each level (with the exception of the plowzone which is disturbed). Additional flotation samples may be taken of unusual concentrations of artifacts (e.g., micro-debitage, nutshell, fauna). If you observe such a concentration, consult with your supervisor regarding whether to take an additional flotation sample. Make sure to indicate *where* the flotation sample came from within the unit (e.g., HU5, Level 2, NW 1/4 *or* HU5, Level 3, SW1/4, nutshell concentration). One exception to taking flotation samples from the plowzone would be where you have a protohistoric/early historic site with material in the plowzone. In such cases, flotation samples from plowzone contexts may be used to recover trade beads or other small materials that would not be easily observed in the field. Consult with your local Coordinator and ISAS Central Office regarding flotation sampling procedures from protohistoric/early historic sites. Additional samples (e.g. radiocarbon, soil) may also be taken at the direction of your supervisor.

If you notice soil discolorations or material concentrations that may indicate features or changes in deposits, consult with your supervisor on how to proceed. At this point you will need to define the soil changes on the floor of your unit by carefully troweling the surface clean to allow your supervisor to observe the soil differences. It helps to compare the soil exposed in your unit walls to the soil on the floor of the unit. At times, subtle soil changes may be more apparent in a profile than in plan view. A digital photograph of the floor may be taken and you will need to map the limits of the soil changes on your hand-excavation unit form and/or an 8 1/2 x 11 sheet of graph paper (see Section 5 for example). All photographs need to be recorded on your hand-excavation unit form.

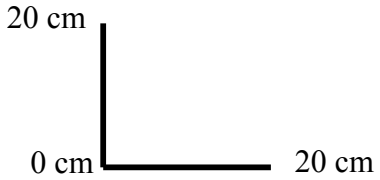
Plan maps – Hand-excavation Units

A plan map is a 2- dimensional representation of the outline of the hand-excavation units and any cultural features and/or material present on the floor of the grid unit. The Hand-excavation Unit form includes a grid map. This should be used for general recording of top and bottom depths, occassional piece plots, and general lines of soil distinctions. More complex situations may require the use of individual 8 1/2 x 11 inch sheets of graph paper or larger (up to 1 meter^2) pre-cut sheets of graph paper using a 1:20 scale (see below)**.** The ISAS standard scale for most maps is 1:20, but there may be occasions where you may need a 1:10 scale to show more detail of the area you are mapping. Your supervisor will instruct you regarding which type of graph paper you should use (Hand-excavation Unit form or separate large sheets of graph paper) as well as the type of scale. Following are some basic mapping guidelines regarding what should be recorded on the graph paper (see sample map-Section 5):

1. Information block is to be printed dark and clear in the upper right hand corner of your sheet of graph paper. The following information should be included:

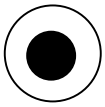
   Site #
   Hand-excavation Unit #
   Level #
   Map Type (Plan View)
   Date
   Initials
   Scale 1:20 cm (or 1:10 cm in certain cases)
   North Arrow

2. Scale of plan maps is to be written out: 1:20 or 1:10 cm **and** drawn out:



3. Northing, Easting and elevation are filled in next to each of the four corner nails on the plan map. This information is provided by the supervisor.

   Example N 25654.00
   E 2024.00
   Elev. 125.77 MASL

4. On the plan map, nails are drawn as: 

5. Map **must** fit within the limits of graph paper and leave room for page number. Do not put any information on page edge or in margins.

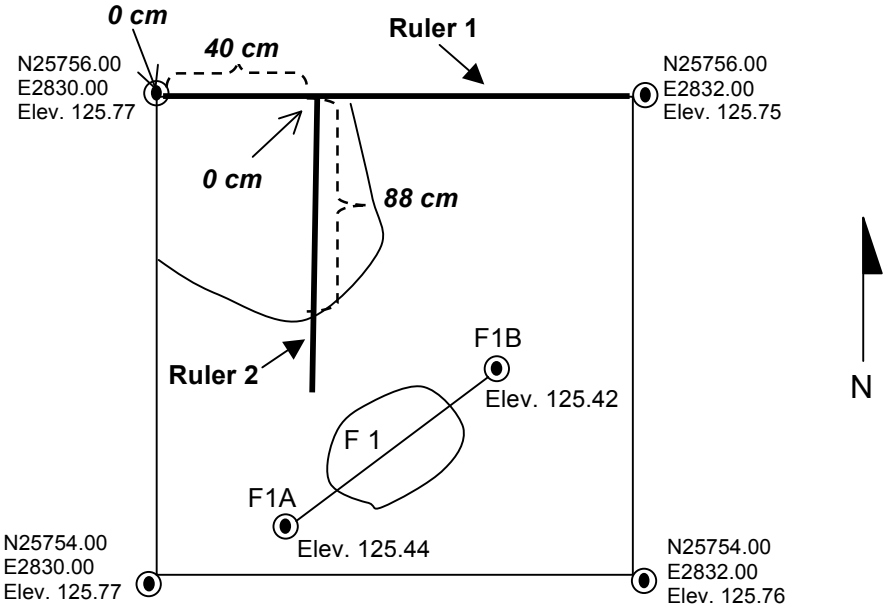
6. Handwriting must be clear, clean, legible printing. Do not write on page edge or in the margins. Use pencil only since ink pens and markers can blur the text and lines if it gets wet. Remember to bear down when writing with the pencil since the lead has a tendency to smear when people write lightly.

7. Always orient your map so that the edges of the unit correspond to major grid lines on the graph paper; the top of the grid unit and the map should be oriented to north. An arrow should be drawn under the information block in the upper right hand corner of the graph paper. North arrows should only look like this:

8. Features within hand-excavation units should always be mapped and excavated following the guidelines described below for subsection 'Mitigation'. They should be assigned 'A' 'B' mapping points and – if possible – these 'A' 'B' points should be shot in with the total station. If this is not feasible, make sure to indicate the exact location of the 'A' 'B' points on your plan map using the procedure described below. Make sure to include the depth of each of the points on your map. These mapping points are critical when excavating a feature.

To begin plan mapping, place a metric ruler along the edge of the hand-excavation unit closest to what you are mapping. The '0' on the ruler should be located at the nail located at the left corner grid unit as you face the wall (see *Example* below). Once this mapping baseline ruler is in place, you can begin mapping soil zones, material, and features outlined in your floor by holding a second ruler perpendicular to the first ruler. At every 10 –20 cm increment, you should measure the distance from the base line to the near and far edges of the feature's boundary. It is important that all measurements be taken at a right angle (90°) to the mapping line. These measurements are transferred at a scale of 1:20 cm to the map sheet by making a dot at the proper location. Although this 1:20 cm scale is typically used for plan view maps, a site director may decide to use a 1:10 cm scale in certain circumstances. Any additional measurements necessary to draw the correct and accurate shape of the feature are also taken.

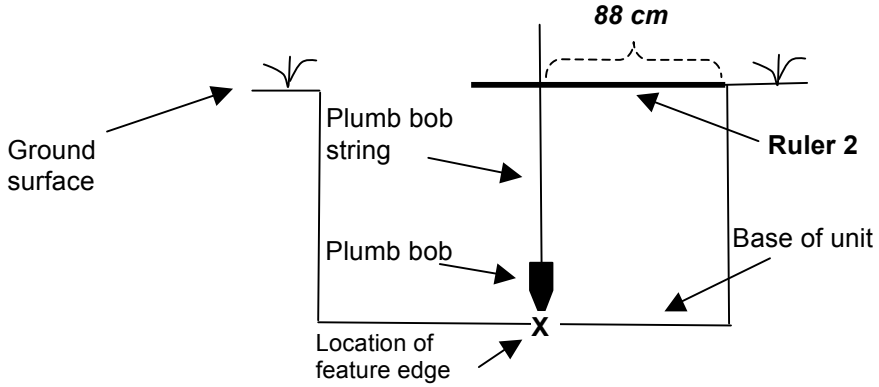
Example – Plan map of hand-excavation unit floor (2m x 2m)



Most times you will need to use an additional tool such as a plumb bob to help you accurately map the points within a hand-excavation unit. To use the plumb bob, you hold the '0' of the second ruler at a specific point along the first ruler (e.g. 20 cm) at a

right degree angle so that the ruler extends to the line you are mapping. Hold the plumb bob about 1 cm above the line in the floor with the upper portion of the plumb bob string touching the edge of the second ruler. The distance out from the hand-excavation unit wall is determined by where this string falls on the ruler (see *Example* below).

Example – measuring with a plumb bob – side view

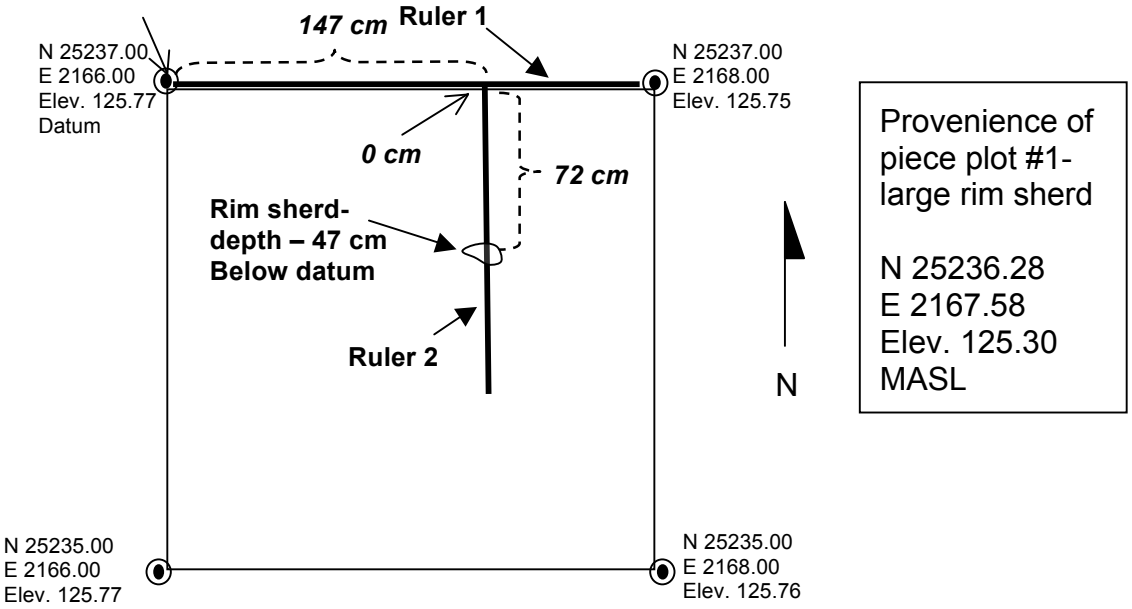


When all necessary points have been plotted on the grid map, the dots must be connected in one easy motion. Then, the excavator must stand over the feature and compare the outline of the feature in the ground with the feature outline on the map to ensure that the feature outline is accurately represented by the map.

At times you will need to map the specific location of individual artifacts such as projectile points, tools, large pieces of bone, burned logs onto your plan map. Such individually mapped artifacts - called piece plots - should always include the specific horizontal (Northing, Easting) location and the elevation (MASL). This may be a single unique artifact or artifact concentration such as a chert concentration or large fragment of a ceramic vessel. The distribution of piece plots will aid in the analysis of the temporal associations of individual levels as well as indicate possible activity areas such as tool manufacture or food preparation. Other materials that may be piece plotted include burned logs/thatch (this gives us information on the construction of the structure) and charcoal concentrations.

To piece plot an artifact, you need to map it on your plan view map measuring the distance from known points (see below). If the hand-excavation unit is deep (e.g., over 1 meter) you may need to make a new baseline on the floor of your unit tat can be used to map artifacts. Ask your supervisor which method to use. Alternatively, the site supervisor may decide to map piece plots with the total station.

Example – Piece Plotting Artifacts- Plan View



Checklist for Plan Maps:

- The entire hand-excavation plan view being mapped should fit within the limits of the graph paper when ever possible (if not, then the lines must match with boundaries drawn on the adjacent sheet).
- Make sure each map has a complete legend that includes the site number, hand-excavation unit number, level number, scale, north arrow, date, excavator initials, and key for any symbols (e.g., use of solid, dashed, and dotted lines requires that each one must be explained).
- Every plan map sheet—no matter its size or number of features that it contains—must have at least four clearly identified reference points with known coordinates. These would be your four corner grid coordinates.
- Remember that hand-excavation unit plan maps should only include information from a single level. *Do not combine piece plots and soil distinctions from multiple levels onto a single plan map*. For example, Ms. X wants to save on graph paper by using a single sheet of graph paper to record her piece plots from Level 2 and Level 3. This is incorrect- she should use a separate sheet of graph paper for the piece plots from each Level.
- Identify your datum nail and record the elevation of your datum.
- Double check to ensure that the distance between all the grid points on the map are the same as the distance between the grid points on the ground
- Map all historic and natural (e.g. rodent runs) disturbances.
- The accuracy of hand-excavation unit plan maps must be checked in the field by a supervisor.
- The unit of error is 2 cm.

- Map on the plan map any piece-plotted artifacts. Remember to include a key to any symbols used on the plan map (e.g. X=charcoal, B=burned clay)

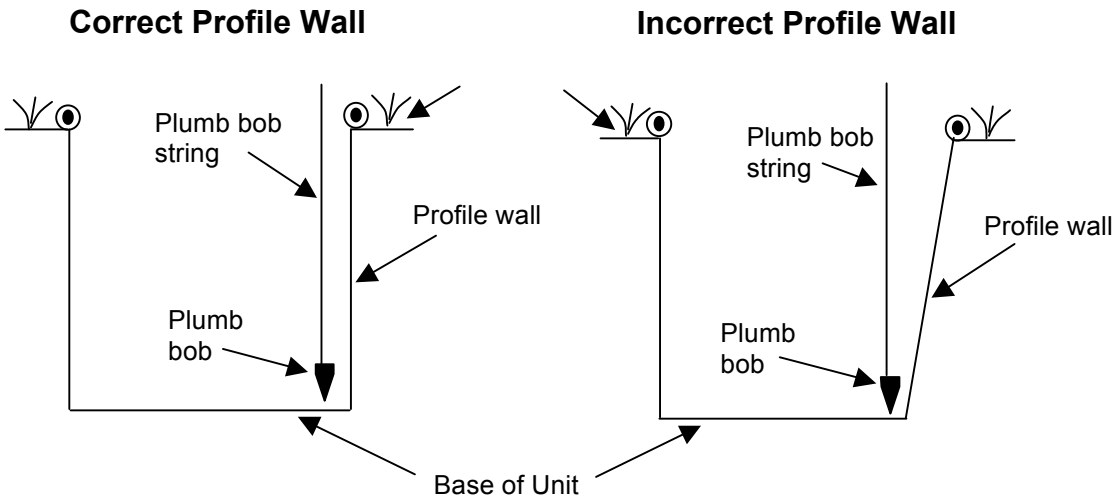
Profile photography

Once your hand-excavation unit is completed – usually determined by the presence of sterile soil – you will need to prepare your profile walls for photographs and mapping. Generally at least one to two profile walls are selected by your supervisor – generally perpendicular to each other - will be photographed and mapped. The decision as to how many walls to record is based upon the complexity of the stratigraphy and the presence of features. Prepare your walls by using your trowel to make a smooth vertical surface-make the wall as straight as you can. A smooth surface will facilitate the identification of zones within the hand-excavation unit. Please keep in mind that profile walls can collapse particularly in certain types of soil such as sand. To avoid your profile wall collapsing, please observe the following tips:

- Never set heavy objects such as tool boxes or flot samples on the edge of your profile
- Be careful when entering and leaving the unit - do not place your hands or feet on or near the edge of the unit when entering or exiting
- Never sit or kneel on the edge of your profile
- Do not cut the profile wall completely back until you are ready for photographs. For example, if you complete your hand-excavation unit 15 minutes before lunch, you should cover up your profile and double-check your paperwork and material bags until lunch. Plan on preparing the profile wall for photographs first thing after your lunch break.
- Prior to photographing, try and make sure that amount of light on your profile wall clearly shows the stratigraphy. Either ensure that the wall is exposed completely by sunlight or, alternatively, by light shading. Shadows on the profile wall will frequently obscure any stratigraphy or features that you are documenting.

To ensure that your profiles are vertically straight from top to bottom, you may use a plumb bob. This is done by holding the string of the plumb bob at the level of the ground surface but not touching the edge of the unit. You should have an even amount of distance between the profile wall and the string (see Example below). A straight wall for profiles less than one meter in depth can usually be visually estimated by standing over the profile wall and looking straight down upon it. Remember not to stand too close to the edge since this may cause the edge to collapse. In this way one can readily see where the profile needs to be cut to obtain a perfectly straight wall. Profile walls slanted either in or out will be inaccurate for mapping purposes.

Example – Using a Plumb Bob to Evaluate Profile Wall



Once the profile wall has been cut back, it is troweled in one direction. It should not be troweled in several different directions as this may create the optical illusion of additional zones that are not, in fact, present in the wall. All loose dirt and excavation tools (e.g. tarps, buckets, trowels, paperwork) should be moved away from the feature before being photographed.

Once you have prepared the profile wall, you need to contact a supervisor to take photographs of the profile before you begin mapping. To prepare for profile photographs, the excavator needs chalk board/mug board, scale, compass, Photo log(s), and a North arrow. These are all stored in the camera box. The chalkboard must contain the information indicated in the following example:

Example – Chalkboard Information for Photograph

SITE #: 11MS778
FEATURE #: HU 5
DATE: 7 July 02
Profile facing north

The chalkboard, scale, and North arrow must appear in the photograph. As of February 2004, we use primarily the digital cameras to record all field shots. Additional color slide photographs of unique or unusual features or materials may be taken with a 35 mm single lens reflex camera. We no longer use black and white film as a general rule. As the profile is being photographed, the excavator should fill out the Digital Photography Log form, and, if necessary, the 35 mm Photography Log (see Section 5 for an example) and record the log numbers for the photographs on the Hand-excavation Unit Report.

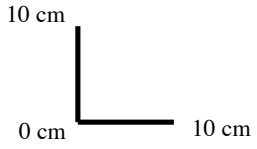
After photographs have been taken, the supervisor will then inscribe lines indicating zones on the profile wall. The uppermost or first zone excavated in the unit is designated Zone A. Use sequential letters (Zones B, C, D, etc.) to designate any subsequent zones encountered from top to bottom. Charcoal lenses and slumping

episodes will receive their own zone designations. Once all zones are defined, the profile is mapped. The use of subzones (e.g. ZA1, ZA2) in a complex situation is determined only by a supervisor.

Profile Maps

Vertical profile maps are made for at least one to two of the four hand-excavation unit walls. The decision regarding which walls to map is made by your supervisor and depends upon the complexity of the stratigraphy and the presence of features. The profile map must fit within the parameters of the graph paper and leave room for a page number. You will need to use a separate sheet of graph paper for each profile map. Hand-excavation unit profiles are done at a scale of 1:10 cm. Use the following example for the legend on the profile map:

Site
Hand-excavation Unit
Profile map
View to ____(i.e. north, east, south, west, northeast, southwest, etc)
Date
Initials
Scale 1:10 and drawn



The direction to be specified as the “view to” is the direction you are facing when looking at the profile wall. For example, if the direction you are facing is north when looking at the profile, record it as “View to the north.” Always record the direction that you, the observer, are facing when drawing the profile. Never use the direction the profile wall itself is facing.

The following materials are needed for mapping a profile wall:

- A line level
- Two ice picks or chaining pins with string attached
- Two 2-meter folding rulers (or one folding rule and a retractable tape)
- A sheet of graph paper and a clipboard
- A mechanical or #2 pencil (2H lead – NOT 4H or 6H)
- A 6” or 12” ruler with metric readings

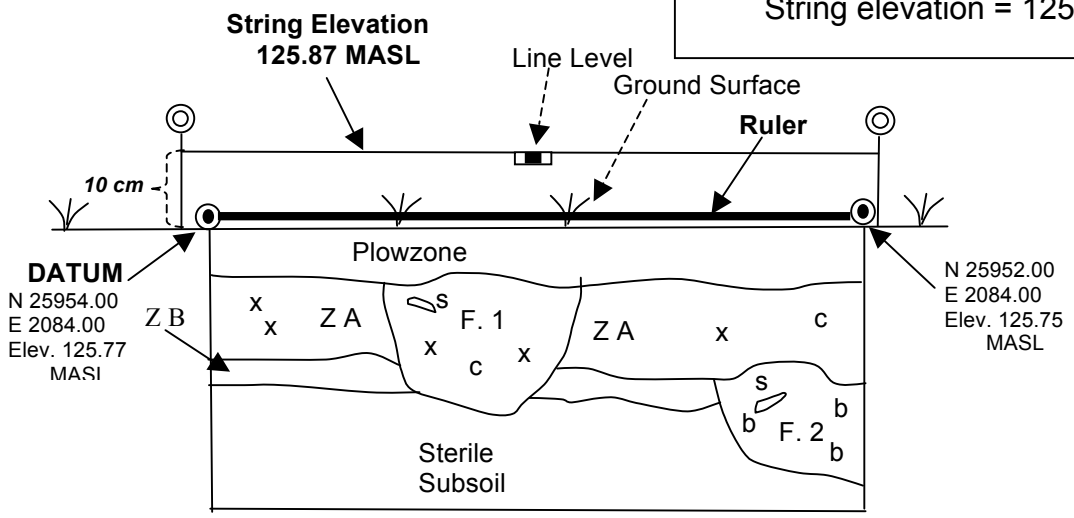
To set up for the profile map, the ice picks or chaining pins are placed about 10-20 cms on either side of the grid nails. A string tied to the upper ends of the picks or pins is stretched tight between these points. The line level is placed on the string that is then leveled by either pushing one or the other picks or pins further into the ground or

moving one of the picks higher up. The string should be *level and taut*. Using the datum nail with a second string, the elevation is then taken of the profile string and recorded (see Example below). Keep in mind that elevation strings cannot be accurately extended beyond 3 meters.

Next, lay a folding metric ruler between the picks/pins with the 0 cm mark of the ruler at the grid point on your left hand side. Next, draw a line equal to the distance between the two grid points to scale on the graph paper, using a ruler to ensure a straight line. The line drawn on the graph paper represents the string level line; the elevation of this line is labeled on the map. All subsequent measurements are measured down from this line. All feature and hand-excavation unit profiles are mapped at a scale of 1:10 unless a supervisor indicates otherwise. **Please double check** the distance between your grid points with what you have measured on your profile map. They should be the same length. A sample profile map can be found in Section 5.

Example – Mapping a Profile (East Wall)

Datum elevation = 125.77
String = +.10
String elevation = 125.87

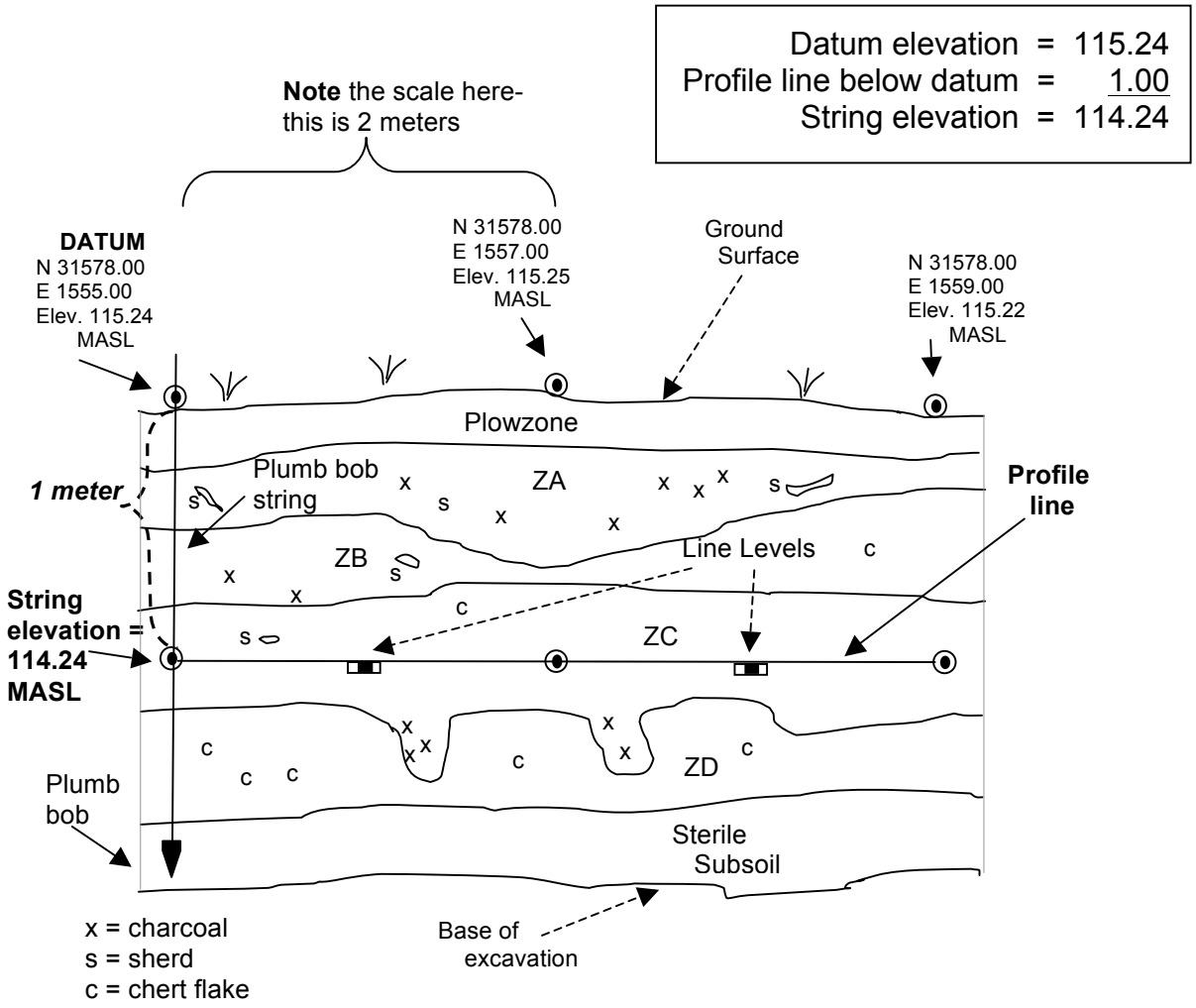


x = charcoal
s = sherd
c = chert flake
b = burned

The first measurements are taken at 10-20 cm intervals starting from left to right between the string line and the top of the unit (i.e. ground surface). These points are recorded on the graph paper and then connected. Then, the limits of the excavation and zones within the profile are mapped. All inscribed lines indicating rodent runs, roots, and artifactual material appearing in the profile face (e.g. ceramic sherds, chert flakes, charcoal) may also be mapped at the discretion of supervisory staff. Similar to the plan map, remember to include a key to any symbols used for artifacts mapped in the profile wall (e.g. x=charcoal, B=burned clay). Top and bottom elevations on the map are back-checked with those on the ground, and all lines are back-checked one final time.

In a situation where you have a tall profile (e.g., >2 m), you may want to set up your profile string horizontally along the length of the wall and measure above and below the line (see below). This will result in more accurate measurements of the stratigraphy. In order to set up for this, you drop a line (using a plumb bob) from your datum nail to one edge of the profile and place an ice pick/nail along this line at an even interval (e.g., 1 meter). Secure the pick in the profile wall and tie a string to the pick and tie another pick to the other end of the string. Place a line level in the middle of the string and stretch it out to the other edge of the profile wall, ensuring that the string is level. Once the string is level, push the pick into the other end of the profile wall. Record the exact horizontal and vertical coordinates of each of these mapping nails on your profile map. To map in stratigraphy and artifacts, simply measure above or below the profile line. Remember to include the ground surface and base of excavation.

Example – Mapping a Profile of a High Profile Wall (North Wall)



Upon completion of a hand-excavation unit profile map, the length of the cross-section line is checked on the plan map and on the profile map. These measurements must match. Likewise, the distance between grid points and the edges of unit on the plan and profile maps must also match. Before the excavator takes down the mapping line, a supervisor should review the profile map and then initial and date the excavator's profile map.

The supervisor is responsible for collecting Munsell soil colors and soil descriptions for the zones in the profile maps. Each zone will have a distinct Munsell soil color and soil description (e.g. 10YR 3/4; dark yellowish brown silty clay). This information should be recorded on your profile map in the following way:

Zone A – Midden: 10YR 3/4; silty clay w/ large amounts of charcoal and burned clay
Zone B – Buried A Horizon; 10YR 5/6; silty clay with 10YR 4/6 clay mottles
Sterile Subsoil – 10YR 6/2
Feature 1 – 10YR 4/4; silty clay with moderate amounts of charcoal flecks
Feature 2 – 10YR 4/6; silty clay with small amounts of burned clay

Munsell color designation (e.g. dark yellowish brown) does not need to be included; only the numerical designation (#YR #) is necessary along with descriptions of inclusions, size (small, medium, large) and density of mottles, size (small, medium, large) and density of charcoal, etc. If burning is present, make sure to specify the type of burning (e.g. oxidized soil, reduced soil, ash lens). Also identify the density and type of burned material (e.g. large amount of charcoal, small amount of burned nutshell, moderate amount of burned bone). Charcoal lenses and slump areas get zone letter designations. Sub-Zone designations (e.g. Zone A1, Zone A2, etc.) are determined by a supervisor and should only be used in situations of complicated stratigraphy. Descriptions of subzones should include the primary soil matrix color with the degree of mottling, charcoal, etc.

Checklist for Profile Maps:

- The entire hand-excavation unit profile being mapped should fit within the limits of the graph paper.
- Make sure each map has a complete legend that includes the site number, hand-excavation unit number, scale, direction, date, and key for any symbols or acronyms used.
- Each profile zone must have a designation and a soil description.
- Every profile map sheet must have the profile grid points clearly designated.
- Back check to ensure that the distance between the grid points matches between the profile map and the ground, and also between the profile map and the plan map. This procedure is the same as that used for the plan maps. Remap as necessary if these distances do not match.
- The unit of error is 2 cm.
- Label the profile line as such and indicate its elevation.
- If a profile extends over two or more map sheets, all drawn lines must match when the maps are joined together.

- Map all historic disturbances.
- The accuracy of profile maps must be checked and initialed in the field by a supervisor.

Once you have completed your profile maps, double-check all your paperwork. All paperwork – including maps – must be checked and initialed in the field by your supervisor. The final thing you will need to do – at least for testing situations – is to backfill your hand-excavation unit. This is a safety precaution to ensure that no humans or animals can get hurt by falling into your hand-excavation unit.

Mitigation

When we are excavating an archaeological site, typically we use heavy machinery to clear off the disturbed plowzone and expose the features. These cleared areas are usually called Excavation Blocks. Once the plowzone is removed, feature fill is usually observable on the clean, scraped surface. If this is not the case, or if an area of superimposed features is encountered, the stripped surface may be shovel scraped by crewmembers and supervisors. This allows for the definition of features based upon differences in soil color, soil texture, artifact concentrations, and shape of the stains. The limits of features are defined with the guidance of supervisory staff.

Plan maps

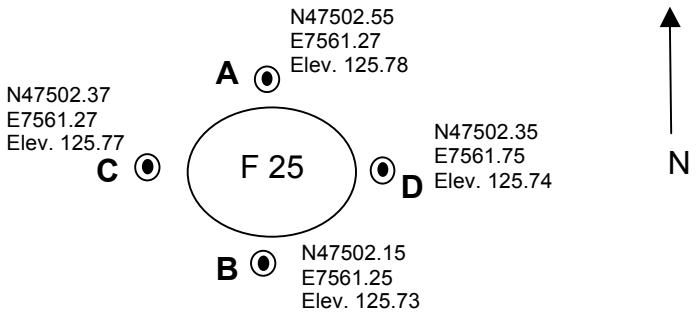
After features are defined, a total station is used to map all the feature reference locations (see Section 7). The total station calculates and records the coordinates of all reference nails using either arbitrary grid coordinates or UTM locations. The total station also records elevations that are described in Meters Above Sea Level (MASL). This information is then downloaded into the computer in the lab.

As mentioned in the Hand-excavation section, all grid points (horizontal coordinates) are mapped using the standard metric Northing Easting (Cartesian) grid, which is based on the UTM (Universal Transverse Mercator) system. The UTM grid is used on the USGS (United States Geological Survey) 7.5-minute quadrangle maps. In Illinois, the Northing consists of a seven-digit number, and the Easting consists of a six-place number. For purposes of the ISAS site grid, all the digits from the Northing and the Easting are used. Remember that the Northing numbers increase from south to north, and Easting numbers increase from west to east.

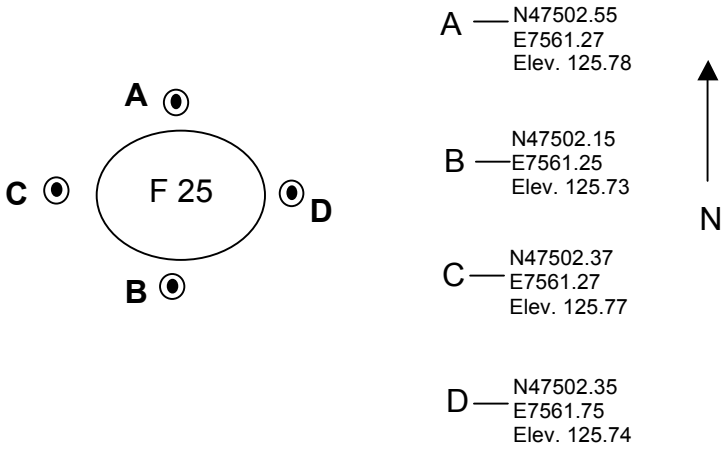
In cases where the features are widely scattered and discrete, 4 reference nails (A, B, C, D) are set outside the limits of each individual feature to form approximately perpendicular lines across the feature (see below). In such cases, you will use a 8 1/2 x 11 sheet of graph paper to record the feature plan and, at times, profile (if it fits on the page). It is critical that all four reference nails are accurately recorded on all plan maps and that at least two nails are accurately recorded on the profile maps since they function as reference points for digitizing the maps into the computer during the site analysis. The site cartographer will compute the Northing and Easting coordinates and elevations for the A, B, C, and D points and provide them to the site supervisors who will then provide them to you. Make sure to label the reference nails (e.g., A, B, etc), the

UTM coordinates, and elevations on the plan and profile map sheets. Since the UTM coordinates are long, you may make a list of the nails and their designated coordinates (see below). There may be certain exceptional times (e.g., time constraints) when it is not feasible to write the Northing and Easting coordinates on all the maps while in the field. In such cases, make sure that the A, B, C, D nails are on the map correctly. Ensure that the actual coordinates are recorded on all plan and profile maps as soon as possible once fieldwork is completed. Keep in mind that the later recording of information on field forms should ONLY occur when the immediate recording is totally impossible.

Example – Information for Plan Map of an Individual Feature on an 8 1/2 x 11 sheet of graph paper



Example – Alternative way to record coordinates for Plan Map of an Individual Feature on an 8 1/2 x 11 sheet of graph paper

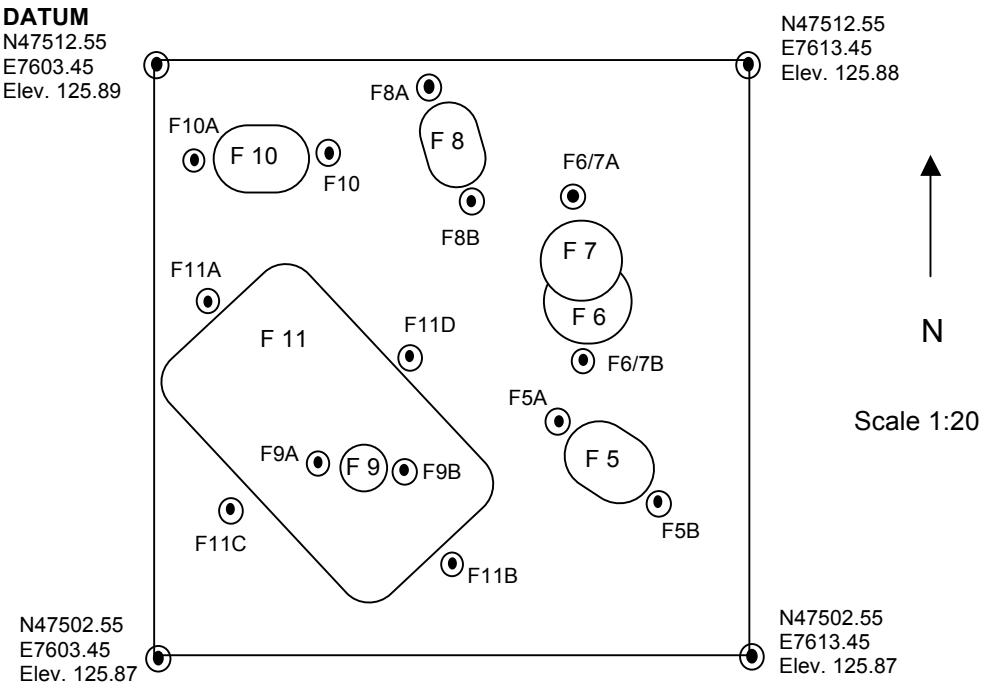


In situations where concentrations of features occur, the site director may choose to map the feature concentration on a larger sheet of graph paper (1 m x 1 m) to record the spatial distribution of the features. Generally, when using a 1:20 scale, you will be able to fit a 10 m x 10 m area on a single sheet of the larger graph paper. If using the larger sheets of graph paper, *it is critical that each individual large map MUST have at*

least four reference nails (A, B, C, D with precise grid coordinates and elevation) since they function as the central reference points when the plan map is digitized into the computer.

Since the grid points on these larger format plan maps function as the cartographic reference points, *you do not need to include four nails for each individual feature* included within this plan map unless the feature is very large (e.g., Mississippian wall trench structure, historic cellar). Features that are mapped on the larger 1 meter x 1 meter sheets require mapping of the A, B nails only since they would function as reference nails for the profile (see below in the profile section). A large complex of features may require the mapping of additional nails (e.g., C, D, E, and so on) for profiles. In this particular situation using large format maps, it is not necessary to calculate the individual Northing or Easting mapping coordinates for each feature nail since they can be calculated at the time the feature is digitized, although elevations should still be recorded on the map since these are used during feature excavation to determine feature depth.

Example – Information for Plan Map of Feature on a 1 m x 1 m sheet of graph paper

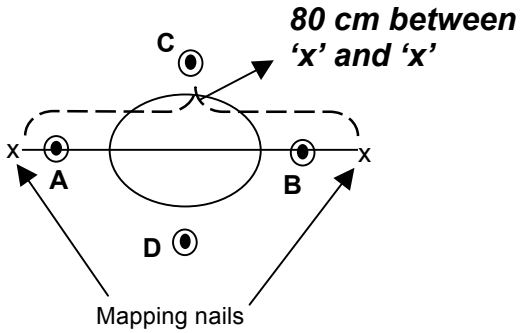


At times, your supervisor may choose to take a plan view photograph of the feature before excavation begins. This usually occurs when the feature is a structure or some other type of unique feature.

The following is a checklist of do's and don'ts:

1. When setting the A, B, C, D nails in, leave plenty of extra room (at least 20 cm on both sides) from the feature limits. This will allow for the possibility of slump zones or bell-shaped pits.

2. Nails are set on 5 or 10 cm intervals between A-B and C-D nails for easier mapping. For example, the distance between two nails should be 75 cm or 80 cm, not 77 cm.



3. A-B-C-D Nails are labeled with thick sharpie on the red flagging tape:

4. Pin flags are placed with each nail and labeled with the Feature number and nail letter (written on both sides of the flag). The flags and nails are **not** to be removed unless the feature has been shot in by the total station or you are directed by your supervisor.

5. C-D nails should be given the same care and precision as A-B nails while plan mapping. C-D nails also need to be set at 5 or 10 cm intervals (along A-B line and out from A-B line)

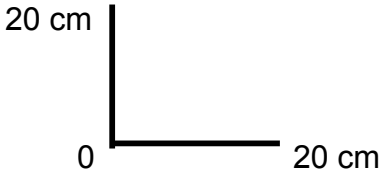
6. **Do not** tie string onto the A-B nails for profiling since this may cause the nails to shift location.

Before excavation of a feature begins, a plan map must be completed for the feature. A plan map is a 2- dimensional representation of the outline of the feature and is always drawn to scale. Features are mapped on individual 8.5 by 11 inch sheets of graph paper or larger (up to 1 meter^2) pre-cut sheets of graph paper. Each feature will have a unique number assigned to it which will be recorded on each of the reference nails. This feature number must be recorded on all paperwork and all maps pertaining to this feature.

Following are some basic mapping guidelines regarding what should be recorded on the graph paper paper (see sample map-Section 5, Figure 1):

1. Information block is to be printed dark and clear in the upper right hand corner of your sheet of graph paper. The following information should be included:
   Site
   EB and Initials
   Feature
   Map Type (Plan View)
   Date
   Scale 1:20 cm (or 1:10 cm in certain cases)
   North Arrow

2. Scale of plan maps is to be written out: 1:20 or 1:10 cm **and** drawn out:



3. Northing, Easting and elevation are filled in next to each nail on the plan map. This information is provided by the supervisor.
   N 17345.79
   E 1867.01
   Elev. 162.35

4. On the plan map, A, B, C, D nails are drawn as: 

5. Map **must** fit within the limits of graph paper and leave room for page number. Do not put any information on page edge or in margins.

6. Hand writing must be clear, clean, legible printing. Do not write on page edge or in the margins.

7. When orienting map to add the north arrow: First, line up A-B line of map parallel to the A-B of the feature on ground and **keep all metal away from compass** (including metal clip on clipboards). Hold the compass level to ensure needle floats freely. When North is established draw a straight line using the compass almost like the edge of a ruler. Arrow should be drawn under the information block in the upper right hand corner of the graph paper. North arrows should only look like this:

Generally one uses the A and B points as the feature profile points as well as a plan view mapping baseline. Begin mapping by laying out a metric tape from A to B, placing

zero on the tape at the A point. At every 10 –20 cm increment one measures the distance from the base line to the near and far edges of the feature's boundary. It is very important that all measurements be taken at a right angle (90°) to the mapping line. These measurements are transferred at a scale of 1:20 cm to the map sheet by making a dot at the proper location. Although this 1:20 cm scale is typically used for plan view maps, a site director may decide to use a 1:10 cm scale in certain circumstances. Any additional measurements necessary to draw the correct and accurate shape of the feature are also taken. When all necessary points have been plotted on the grid map, the dots must be connected in one easy motion. Then, the excavator must stand over the feature and compare the outline of the feature in the ground with the feature outline on the map to ensure that the feature outline is accurately represented by the map. The location of the profile points (A, B, C, D, as well as the coordinates as discussed above) for each feature must be mapped on this plan map. The excavator should then compare the distance between the profile points and the edges of the feature fill in the ground *and* on the map in order to ensure that they match. These procedures are applicable to all features. In some cases the boundary edge of features, particularly large ones, may overlap two or more map sheets. Remember that the boundaries of features that must be mapped on multiple map sheets will match perfectly when the sheets are placed together. If they do not, this problem must be rectified in the field.

Checklist for Plan Maps:

- The entire feature or Excavation Block plan view being mapped should fit within the limits of the graph paper when ever possible (if not, then the lines must match with boundaries drawn on the adjacent sheet).
- Make sure each map has a complete legend that includes the site number, feature number, scale, north arrow, date, excavator initials, and key for any symbols (e.g.,, use of solid, dashed, and dotted lines requires that each one must be explained).
- Every plan map sheet—no matter its size or number of features that it contains—must have at least four reference points with known coordinates (A, B, C, and D points - make sure they are clearly designated with these letters or grid corners).
- Label the A, B, C, and D points or grid corners with their UTM coordinates and elevations—these numbers are obtained from the supervisor
- Double-check to ensure that the distance between the A-B and C-D points matches between the map and the ground. For additional accuracy, you may also check the A-C, A-D, B-C, B-D distances.
- Label the A-B profile line as such.
- Label the elevations for all mapping points.
- Map all historic and natural (e.g., rodent runs) disturbances.
- The accuracy of feature plan maps must be checked in the field by a supervisor.
- The unit of error is 2 cm.
- Recheck the distances between the edges of feature fill and both the A and B points after mapping the profile (see below). These measurements can often change due to shifting nails or modified feature limits that may necessitate additional modification of the map. Remember to record the date and your initials

on the plan map with an arrow pointing to the modified feature limits when remapping a feature.
- Map on the plan map any artifacts appearing on the bladed surface of the feature. Remember to include a key to any symbols used on the plan map (e.g., X=charcoal, B=burned clay)

PIT FEATURES

Paperwork

Before beginning excavation, you need to assemble the following forms:

- Bag Checklist
- Feature report
- Several excavation notes (at least one for each half of the feature being excavated)
- Sheet of 8 1/2 x 11 graph paper
- Continuation form for additional comments

Other forms you may need in the course of excavation (you do not need these at the beginning of excavation unless otherwise instructed by your supervisor) include:

- Daily Log form
- Second sheet of graph paper
- Piece plot form
- Artifact sketch form
- Photo log

Record the following information on the feature form and one of the excavation notes:

- The feature number
- Indicate which half is being dug first
- Date of excavation
- Feature datum elevation and location (e.g., 'A' nail)

Next assign a bag number for your first material bag on your bag checklist, then label a material bag with all the necessary information summarized earlier. Supervisory staff will instruct the crewmember regarding what half of the feature to excavate first, types of samples to collect, and be available for any questions during the excavation process. After these tasks are completed, one can start excavation.

Remember that in the process of excavating a prehistoric feature, we are destroying it. All that will remain after excavation are the samples collected in the field, the maps and profiles drawn by the excavator, the photographic record, and – most important of all – the excavation notes and records that you make during excavation. You must learn

to be observant and to record all observations in detail. This is a critical component of any excavation. Keep your supervisor informed of your observations and never hesitate to ask questions.

First Half Excavation

General pit features are usually excavated in half sections. This method allows for the excavator to better observe stratigraphic changes within the feature and results in a vertical profile that extends through the middle of the feature. To prepare the feature for excavation, you need to do the following:

1. Choose which nail (A or B) is to be your datum nail (whichever appears to have the highest elevation) and indicate it on the appropriate paperwork. Place a separate nail adjacent to whichever nail you selected for your datum and tie a string around this nail that will extend over the far edge if the feature. This will be your reference nail for recording depths of artifacts and zones within the feature.

2. String is tied to 2 additional new nails that are located 5 cm beyond the A-B points. The line formed by the string should intersect the A-B mapping nails. This divides the feature in half and helps guide you during excavation. DO NOT tie string around any A-B points.

3. The feature may be probed with a soil probe by a supervisor to obtain a preliminary indication of the number of fill zones (i.e., layers) involved and their approximate depths. After this has been done, excavation is begun on the half of the feature indicated by the supervisor.

The cross-sectioning of pit features is usually performed along the long axis except in cases where undetermined superpositioning may dictate alternative procedures. If possible set your profile up so that the sun will fall on it and illuminate the profile face.

Always keep in mind that there are multiple goals that can be accomplished while profiling pits, structures, or other features that include the temporal integrity of the deposits (eg., ensuring that your sampled material does not include mixing of materials with other features), and identifying superpositioning in situations of multiple features.

Profiling a single pit feature is fairly straightforward (Example 1). Dividing the pit in half will provide a profile that reveals the shape of the pit and will provide an unmixed excavated sample of artifactual and biological information.

In the case of superimposed features the placement of a profile line becomes more complex and may require a two - or even three - step process to collect the required information. In the case of two superimposed pits (Example 2) a profile line across the two will provide information on the sequence of superpositioning (which pit is earlier and which is later). However there is a good possibility that in removing one side of the superimposed pits you may mix the deposits. To obtain pure, unmixed samples from the two pits, each pit should be cut crossways (2b) to provide a clean unmixed sample and unmarred profile of the pit shape. After this is done you can cut a profile line as

shown in 2a across where the two pits overlap to determine the superpositioning sequence.

This same principle can be applied to Examples 3 and 4 to isolate unmixed samples and unmarred pit profiles first before profile cuts are made to determine the sequence of superpositioning.

Profiles can also (and often are) used as exploratory approaches to large blob type features with no clear definition. Such exploratory profile cuts should be abandoned once feature definition becomes clear within the blob.

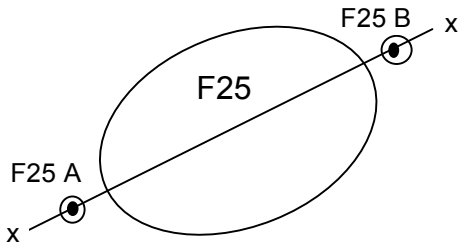
Remember that structures over 3 meters in length are excavated in quadrants (quarter-sections) and consequently have two profile lines that cross each other at right angles. One profile line runs down the center of the structures lengthwise and one runs down the center crosswise.

Always consult with your supervisor prior to beginning the excavation of the first portion of a feature to ensure that you are removing the appropriate section of the feature in the proper order.

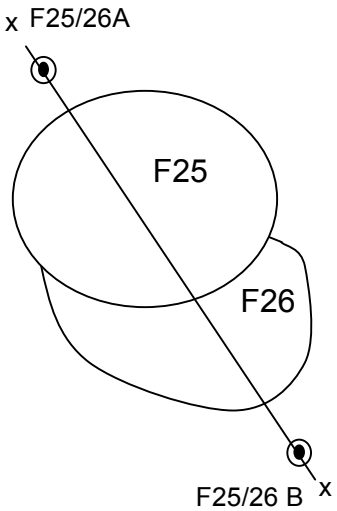
Some examples of cross-sections are provided below.

Examples – Cross- sectioning Features

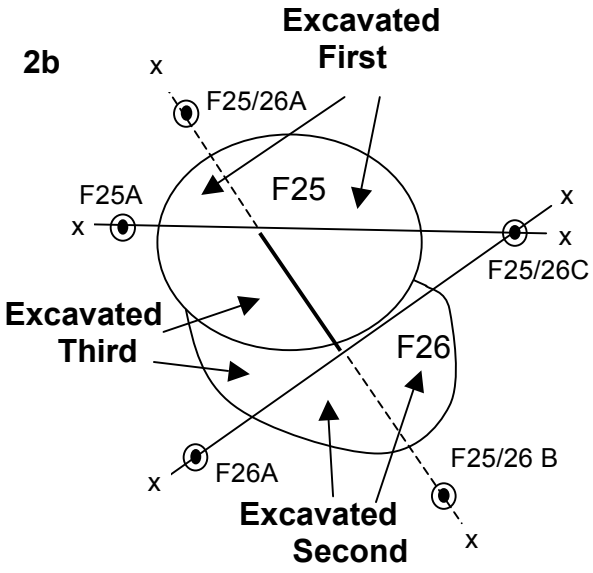
1

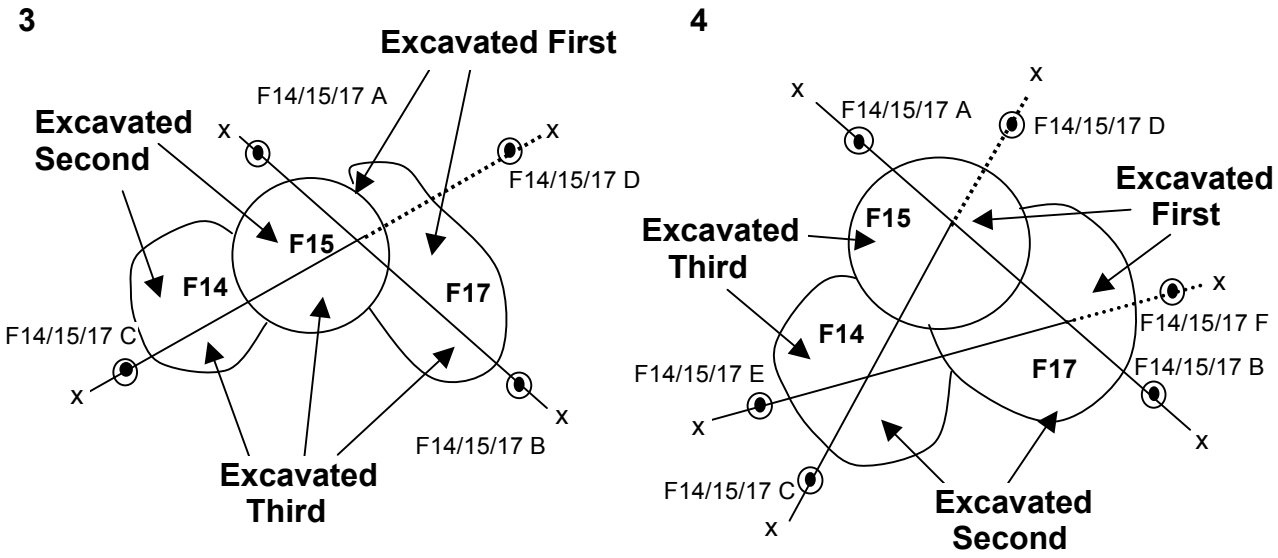


2



2b





The basic tools used for feature excavation are a shovel and a trowel. When using the shovel, the excavator should carefully skim thin layers of soil from the feature surface. Sometimes, the excavated soil will be sifted through a 1/4" screen and all cultural material collected in material bags. Your supervisor will let you know if you will need to screen the soil from your feature.

If you see or feel artifacts, you should stop using your shovel and use your trowel, bamboo tool (pointed chopstick or skewer), or fingers to investigate what object is being exposed. DO NOT pull an artifact out of the soil until you have verified what the artifact is (e.g., a sherd, chert flake, bone) and that it is not part of a larger concentration of artifacts. Certain artifact categories (e.g., whole ceramic vessels, exotic artifacts) as well as artifact or charcoal concentrations are best left in place until they have been added as piece plots (grid location and elevation) to the plan map. Such materials in a primary context - such as rock linings, hearths, tool caches- are very significant and deserve special attention. Always check with your supervisor if you are unsure about how to proceed.

Thicknesses of fill zones may vary within a feature. If, during the course of excavation, a zone different from those indicated by the soil probe is encountered, a supervisor should be called; this fill may represent a different, heretofore unrecognized, feature which is superimposed by the one being excavated. Similarly, if the limits of a feature change during excavation, consult a supervisor. An additional feature may be present, or the feature may be 'bell-shaped' (i.e., this is when the feature limits are wider at the bottom of the feature than the top). Your supervisor will explain what you will need to do in these situations.

Features being excavated must not be allowed to dry out. They should be sprayed with water as necessary, and the profile face as well as unexcavated portions of the feature should be covered with a suitably sized piece of tarp when attention is focused elsewhere. Excavation of the first half of the feature is completed when either sterile soil or another feature is encountered. When the bottom of the feature in the first half is

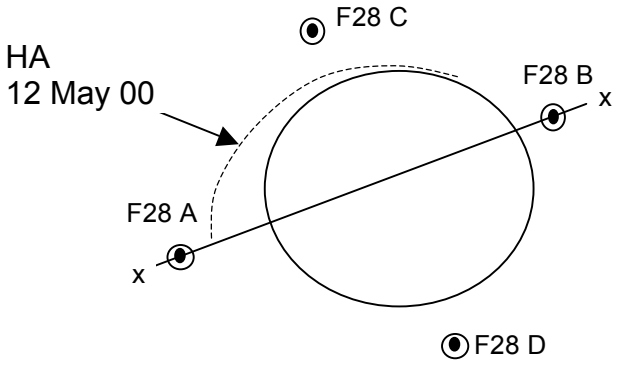
reached, the limits of the feature fill across the bottom and across the sides are exposed. Excavating an additional 5-10 cm beyond the feature limits significantly helps in defining feature shape and limits in the profile.

Upon completion of the first half of a feature, you need to do the following:

1. Fill out the necessary paperwork on the excavation of the first half (bag numbers, observations on the feature characteristics and materials)

2. Close all material bags and samples

3. If there is a significant discrepancy (i.e., 2 cm for a plan view map with 1:20 scale) between the original mapped feature boundaries and those revealed by the profile, you may need to redefine the feature limits by troweling the feature surface of the remaining second half and add the new feature boundaries to your plan map. Simply redrawing the feature boundary to connect to the previously drawn lines is guessing and can distort the true feature size and shape. Changes in the feature shape/size should be made by using a dashed line and you should initial and date the time the change was made (see Example below). **Never erase the original delineation!**



Profile Photography

Once the first half of a feature has been excavated, you will need to prepare the profile wall for a photograph. Remember to take into account the lighting conditions. There is no reason to prepare a profile for photography if the shadows or other light conditions effectively prevent a picture from being taken. Check with your supervisor first. If conditions are proper for photography then use your trowel to make a smooth vertical surface- make the profile wall as straight as you can. A smooth surface will facilitate the identification of zones within a feature as well as provide information on the superpositioning of features. Please keep in mind that profile walls can collapse particularly in certain types of soil such as sand. To avoid your profile wall collapsing, please observe the following tips:

- Never set heavy objects such as tool boxes or flot samples on the edge of your profile
- Never sit or kneel on the edge of your profile
- Do not cut the profile wall completely back until you are ready for photographs. For example, if you complete the first half of your feature15 minutes before lunch, you should cover up your profile and double-check your paperwork and material bags until lunch. Plan on preparing the profile wall for photographs first thing after your lunch break.

For profiles greater than one meter in depth, a plumb bob may be used to aid in cutting back the profile wall for photographs; this is done so that the profile wall is vertically straight from top to bottom. A straight wall for profiles less than one meter in depth can usually be visually estimated by standing over the profile wall and looking straight down upon it. In this way one can readily see where the profile needs to be cut to obtain a perfectly straight wall. Profile walls slanted either in or out will be inaccurate for mapping purposes. Once the profile wall has been cut back, it is troweled in one direction. It should not be troweled in several different directions as this may create the optical illusion of additional zones that are not, in fact, present in the wall. All loose dirt and excavation tools (e.g., tarps, buckets, trowels, paperwork) should be moved away from the feature before being photographed.

Once you have prepared the profile wall, you need to contact a supervisor to take photographs of the profile before you begin mapping. To prepare for profile photographs, the excavator needs chalk board/mug board, scale, compass, Photo log(s), sheet for shading if needed, and a North arrow. These are all stored in the camera box. The chalkboard must contain the information indicated in the following example:

Example – Chalkboard Information for Photograph

SITE #: 11MS778
FEATURE #: F 167
DATE: 7 July 02
Profile facing north

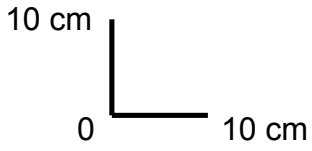
The chalkboard, scale, and North arrow must appear in the photograph. As of February 2004, we use primarily the digital cameras to record all field shots. Additional color slide photographs of unique or unusual features or materials may be taken with a 35 mm single lens reflex camera. We no longer use black and white film as a general rule. As the profile is being photographed, the excavator should fill out the Digital Photography Log form, and, if necessary, the 35 mm Photography Log (see Section 5 for an example) and record the log numbers for the photographs on the Feature Report. For particularly complex features such as house structures or a complex of superpositioned features, the field supervisor will want to take photographs throughout the excavation of the feature and/or surrounding features. A separate Photographic Record form is available for such situations where large numbers of photographs are being taken of a feature (see Section 5-Mitigation).

After photographs have been taken, the supervisor will then inscribe lines indicating zones on the profile wall. The uppermost or first zone excavated in the feature is designated Zone A. Use sequential letters (Zones B, C, D, etc.) to designate any subsequent zones encountered from top to bottom. Charcoal lenses and slumping episodes will receive their own zone designations. Once all zones are defined, the profile is mapped. The use of subzones (e.g., ZA1, ZA2) in a complex feature is determined only by a supervisor.

Profile Maps

Vertical profile maps are made for feature cross-sections. The profile map must fit within the parameters of the graph paper and leave room for a page number. If possible, try to use the same sheet of graph paper you used for the plan view. If the profile is too big, use a separate sheet of graph paper. Feature profiles are done at a scale of 1:10 cm. Use the following example for the legend on the profile map:

Site
EB and Initials
Feature
Profile map
View to ____(i.e., north, east, south, west, northeast, southwest, etc)
Date
Scale 1:10 and drawn



The direction to be specified as the “view to” is the direction you are facing when looking at the profile wall. For example, if the direction you are facing is north when looking at the profile, record it as “View to the north.” Always record the direction that you, the observer, is facing when drawing the profile. Never use the direction the profile wall itself is facing.

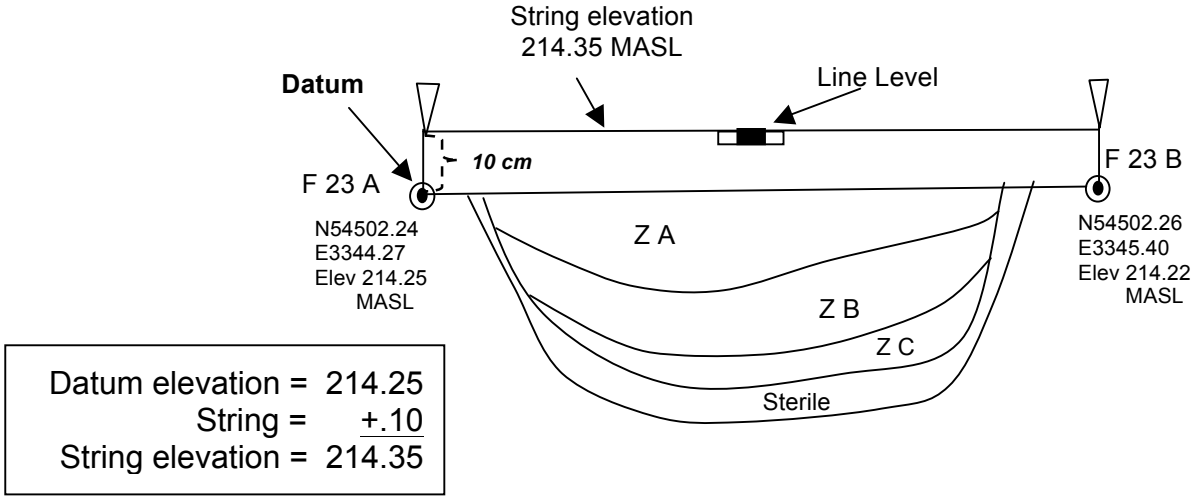
The following materials are needed for mapping a profile wall:

- A line level
- Two ice picks or chaining pins with string attached
- Two 2-meter folding rulers (or one folding rule and a retractable tape)
- A sheet of graph paper and a clipboard
- A mechanical or #2 pencil (2H lead – NOT 4H or 6H)
- A 6” or 12” ruler with metric readings

To set up for the profile map, the ice picks or chaining pins are placed about 10-20 cms on either side of the A-B nails. A string tied to the upper ends of the picks or pins is stretched tight between these points. The line level is placed on the string that is then leveled by either pushing one or the other picks or pins further into the ground or moving one of the picks higher up. The string should be *level and taut*. Using the datum nail with a second string, the elevation is then taken of the profile string and recorded. Keep in mind that elevation strings cannot be accurately extended beyond 3 meters.

Next, lay a folding metric ruler between the picks/pins with the 0 cm mark of the ruler at cross section point A. Next, draw a line equal to the distance between points A and B is then drawn *to scale* on the graph paper, using a ruler to ensure a straight line. The line drawn on the graph paper represents the string level line; the elevation of this line is labeled on the map. All subsequent measurements are measured down from this line. All feature and hand-excavated unit (HU) profiles are mapped at a scale of 1:10 unless a supervisor indicates otherwise. **Please double check** the distance between your A-B points with what you have measured on your profile map. They should be the same length. A sample profile map can be found in Section 5.

Example – Profile – Facing North



The first measurements are taken at 10-20 cm intervals starting from Point A and moving toward Point B between the string line and the top of the feature (i.e., ground surface). These points are recorded on the graph paper and then connected. Then, the limits of (1) excavation, (2) feature fill, and (3) zones within the fill, are mapped. All inscribed lines indicating rodent runs, roots, and artifactual material appearing in the profile face (e.g., ceramic sherds, chert flakes, charcoal) may also be mapped at the discretion of supervisory staff. Similar to the plan map, remember to include a key to any symbols used for artifacts mapped in the profile wall (e.g., x=charcoal, B=burned clay). Top and bottom elevations on the map are back-checked with those on the ground, and all lines are back-checked one final time. At this point, the profile points (A, B, etc.) are labeled with their UTM coordinates, taken straight from the plan map or Total Station notes.

Upon completion of a feature profile map, the length of the cross-section line is checked on the plan map and on the profile map. These measurements must match. Likewise, the distance between A and B points and the edges of feature fill on the plan and profile maps must also match. Before the excavator takes down the mapping line and begins excavating the second half of the feature a supervisor should review the profile map and first half feature notes then initial and date the excavator's profile map.

The supervisor is responsible for collecting Munsell soil colors and soil descriptions for the zones in the profile maps. Each zone will have a distinct Munsell soil color and soil description (e.g., 10YR 3/4; dark yellowish brown silty clay). This information should be recorded on your profile map in the following way:

Zone A – 10YR 3/4; silty clay
Zone B – 10YR 5/6; silty clay with 10YR 4/6 clay mottles
Zone C – 7.5YR 8/2; sand lens

Munsell color designation (e.g., dark yellowish brown) does not need to be included; only the numerical designation (#YR #) is necessary along with descriptions of inclusions, size and density of mottles, size and density of charcoal, etc. If burning is present, make sure to specify the type of burning (e.g., oxidized soil, reduced soil, ash lens). Also identify the density and type of burned material (e.g., large amount of charcoal, small amount of burned nutshell, moderate amount of burned bone). Charcoal lenses and slump areas get zone letter designations. Sub-Zone designations (e.g., Zone A1, Zone A2, etc.) are determined by a supervisor and should only be used in situations of complicated feature stratigraphy.

Checklist for Profile Maps:

- The entire feature or Excavation Block profile being mapped should fit within the limits of the graph paper.
- Make sure each map has a complete legend that includes the site number, feature number, scale, direction, date, and key for any symbols or acronyms used.
- Each profile zone must have a designation and a soil description.
- Every profile map sheet must have the profile points (A, B, etc.) clearly designated with these letters.
- Label the profile points with their grid coordinates—these numbers are obtained from the plan map or ask a supervisor for the field copy of the Total Station notes.
- For features, back check to ensure that the distance between the A and B points matches between the profile map and the ground, and also between the profile map and the plan map. This procedure is the same as that used for the plan maps. Remap as necessary if these distances do not match.
- The unit of error is 2 cm.
- Label the profile line as such and indicate its elevation.
- If a profile extends over two or more map sheets, all drawn lines must match when the maps are joined together.

- Map all historic disturbances.
- The accuracy of profile maps must be checked and initialed in the field by a supervisor.

Second Half Excavation

The second half of a feature is removed by the individual zones (e.g., A, B, C) defined in the profile wall. Use the same methods (shovel or trowel) employed in the first half unless otherwise directed by your supervisor. If the zones are thin, you will need to use your trowel to ensure that you do not inadvertently intrude into another zone. Keep material from each zone separate and give each bag a separate bag number. In addition, flotation samples are usually taken from each zone in the second half of the feature. Record all bag numbers and excavation strategies on your paperwork and the Bag Checklist. For example- for a feature with Zones A, B, C, and D, you will have at least 4 separate material bags assuming material is present in all 4 zones. Each bag will have a separate bag number (e.g., F39-5, Zone A, F39-6, Zone B, and so on). If no material was recovered from a zone, please indicate this in your field notes. In addition, you will have 4 separate flotation samples, each with its own bag number. If the zones are thin, you may not be able to get a 10 L sample- don't worry about it. Just collect as much soil as you can and record the estimated volume on the tags and paperwork. If a zone is encountered in either half of the feature that *does not* extend into the profile wall (e.g., small ash layer), a supervisor should be consulted. This zone will be mapped in plan view prior to its excavation.

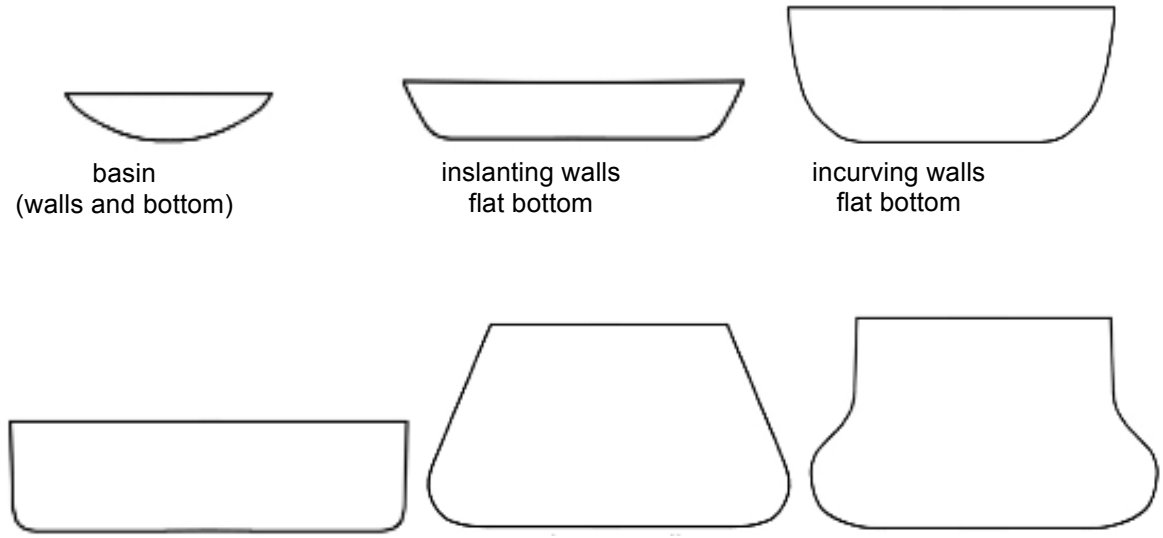
Upon completion of the second half excavation, fill out the remaining paperwork for the feature, doublecheck all the paperwork and make sure that the maps and paperwork are consistent and close up all the bags and samples. Have a supervisor doublecheck all your paperwork. *DO NOT* pull up any of the reference nails unless told to do so by your supervisor. There may be occasions where these nails will be used again for adjacent features (e.g., where you have a large number of features in a small area).

Examples of the paperwork you will need to fill out can be found in Section 5. Here are some tips for filling out the paperwork:

1. **Feature Forms**

- Fill out 'Length' and 'Width' categories after the profile has been completed. This will provide the most accurate measurements of the feature. Length is determined by the greatest distance between two opposing points parallel to the feature's long axis. Width is greatest distance between two points on the feature short axis. The length and width of structure features should be determined by measuring the distance between the midpoints of the long and short axes of the feature.
- Use the following descriptive definitions when describing the shape of the feature base and walls (see below). Please keep in mind that these are some of the most common feature types. If your feature shape does not fit into these categories, please ask your supervisor to help with the description.

Example – Feature Shape Definitions



- Under the 'Materials and Samples Collected' section, detail what kinds of materials were found during the course of excavation (e.g., ceramics, chert, fauna, diagnostic artifacts). Also indicate what type of samples were taken (e.g., charcoal, C-14, archaeomagnetic)- do not simply say 'yes' or put a checkmark.
- Summarize the Excavation Notes in the 'Comments Section'

2. Excavation Notes

- Each half of the feature gets an 'Excavation Notes' sheet which provides more detailed information on each section of the feature (e.g., materials encountered, observations during excavations, bag numbers, sketches of concentrations or artifacts).
- On the 'Feature' space record the feature number and the half you are working on. **Example**:

Feature: F8 N 1/2

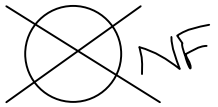
- Don't forget to fill out "Elevation" category.
- Include a **detailed** description of what you did and what was found. Include descriptions of the amount, density, and size of charcoal, diagnostics recovered, description of ceramics, type of soil, changes in soil color or texture, burned soil (redeposited vs. in situ burning; is it oxidized (red/orange) or reduced (dark grey-black-brown)), floral/fauna recovered, etc. Particularly when describing artifact distribution and soil characteristics in structures, indicate whether an item appears to be primarily deposited (i.e., complete storage jar, lithic scatter suggesting activity area) or redeposited (e.g., tossed in the structure after abandonment).

- Under the 'Feature or artifact sketches' you can draw or trace diagnostics (e.g., rims, points), feature profile, or concentrations within the feature.

3. Changes to paperwork

- Changes made to any notes or maps after completion of the feature should be crossed or Xed out but **never erased**. Note: this is different from mistakes that are made in your notes that can be erased.

F8-1 ~~Flot Sample~~ Material Bag



4. Completed Paperwork

- Completed paperwork is not turned in until all pages have been thoroughly filled out and double-checked.
- Have the supervisor review your paperwork. Always remember that your observations are a critical part of the scientific record. Take care that you record all excavation information responsibly.

STRUCTURES

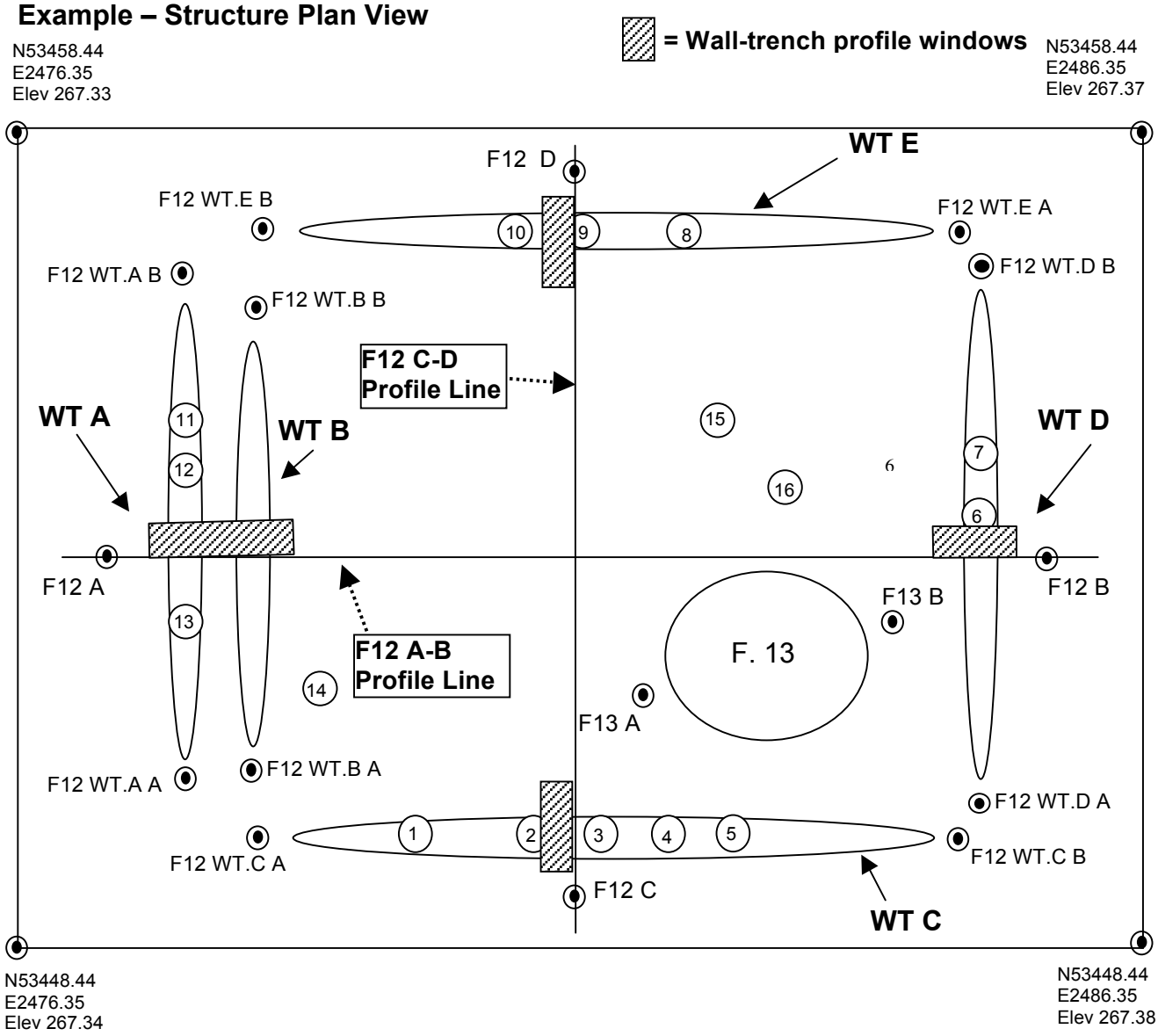
Excavation of structure features will be different than those for typical pit features. The reason for this is that structures tend to be much larger than pit features and frequently involve the excavation of several different types of internal features such as a house basin, internal support posts and features, hearths and wall trenches. In addition, there are several characteristics of structures that will require tighter control on where artifacts originate.

Structures represent the remains of a building that may have served a residential, ritual, or storage function. Zones within a structure may represent a number of cultural activities including living surfaces, reuse and rebuilding of a structure, and abandonment. This latter activity is usually indicated by evidence for erosion, presence of large amounts of common household debris tossed into the area of the structure, and/or the presence of burned logs that indicate the building burned down.

Generally a large, deep structure (e.g., larger than 3 meters and >30 cm in depth) is excavated in quadrants based upon two perpendicular profile lines (see below). Smaller structures can be excavated in halves. The determination of how to excavate a structure is determined by the field supervisor. If wall trenches are present, the profile line should extend beyond the outer limits of the wall-trench, but only excavated a 15-20 cm 'window' to get the cross-section of the wall trench. Other than this 15-20 cm window, DO NOT excavate the wall trenches at the same time you are working on the house basin quadrants. Wall trenches are treated as separate features (see below). The resulting profile maps result in a complete cross-section of the basin fill and should include any wall trenches that are present. At the discretion of the field supervisor, alternative excavation strategies may be employed when excavating house structures (e.g., in 6 segments). The limits of a structure are often determined by the presence of

basin fills (in subterranean houses), postmolds (stains in the soil representing the remains of posts), and/or the presence of wall trenches. Wall trenches are most commonly encountered in the late prehistoric period and are a result of digging shallow trenches that were used to align upright support posts (see example below). Within a structure, you will have a number of feature types: basin fill, intact house floors, storage pits, hearths, postmolds, and sometimes burials.

Example – Structure Plan View



Before beginning excavation of a structure, you must complete a plan map of all the visible aspects of the structure (e.g., wall trenches, posts, pits, etc) (see above example). The basic principle of mapping the structure is the same as making a plan map for a pit feature (see Plan View mapping above).

Similar to the excavation methods used for pit features, you will be using a shovel and a trowel to excavate each of the quadrants. Within the interior of the structure, you

may be shovel scraping down through basin fill. Frequently, much of the material in the upper levels of a house basin eroded and/or was deliberately discarded into the abandoned house basin through the years. The order in which the structure will be excavated will be determined by your supervisor (i.e., which quadrants are excavated first, how many flotation samples to take, the determination of zones etc). Structures can be complicated in that you may be shovel scraping the top zone (basin fill) and then suddenly see a circular stain in the ground. *Stop at this point and show a supervisor*. This may indicate the presence of a feature in the floor of the house. Similarly, if you begin to see a concentration of burned soil, fire-cracked rock, or artifacts, *stop and show your supervisor.* These may be signs of a hearth and/or activity areas on a house floor. Your supervisor will make the determination on how to proceed.

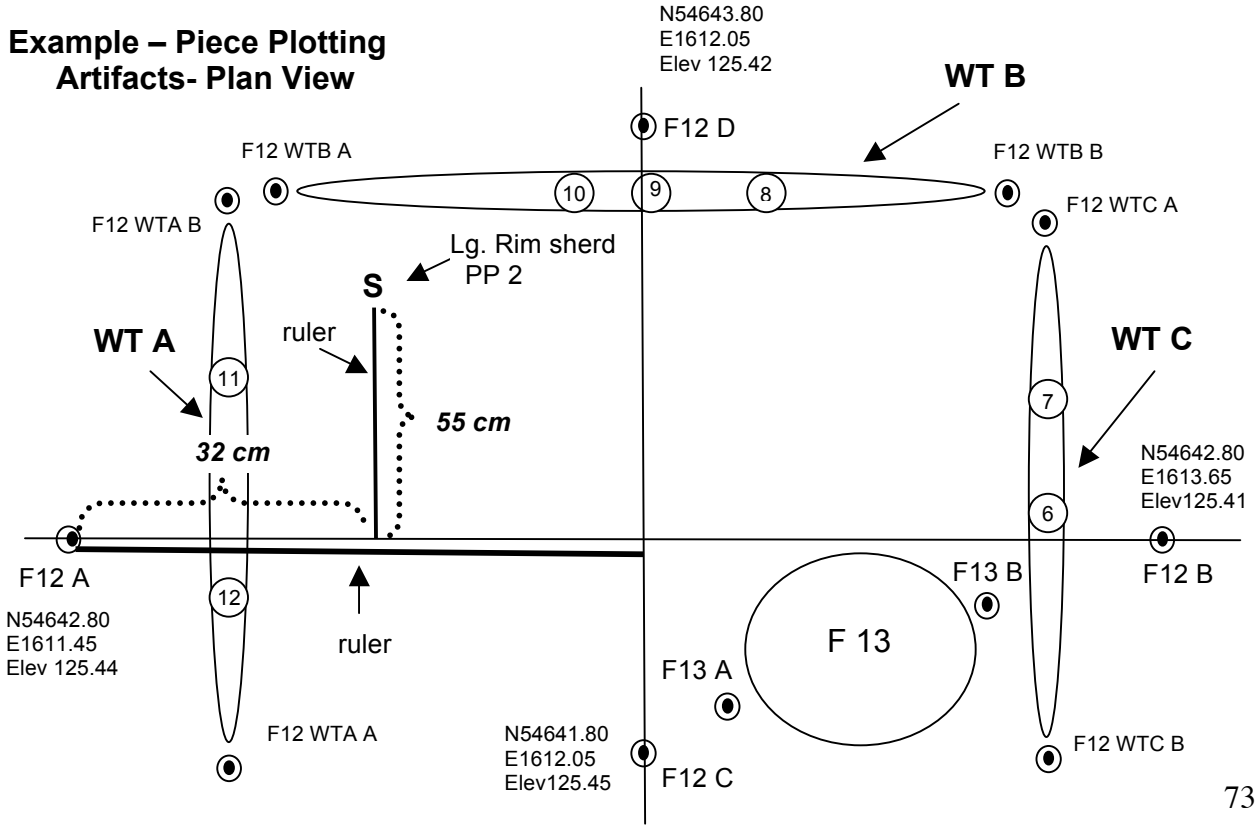
Material and flotation samples are to be assigned bag numbers using the same principle used for pit features. The same guidelines apply- make sure that you keep material from each excavation area separate by assigning it individual bag numbers.

Piece Plots

Materials associated with the floor of a structure are usually piece-plotted. A piece plot is when you map the location of particular artifacts/cultural materials onto your plan view map. This may be a single unique artifact or artifact concentration such as a chert concentration or large fragment of a ceramic vessel. The distribution of such piece plots aid in the analysis of the function of the structure because they frequently indicate activity areas such as tool manufacture or food preparation. Other materials that may be piece plotted include burned logs/thatch (this gives us information on the construction of the structure) and charcoal concentrations.

To piece plot an artifact, you need to map it on your plan view map measuring the distance from known points (see below).

Example – Piece Plotting Artifacts- Plan View

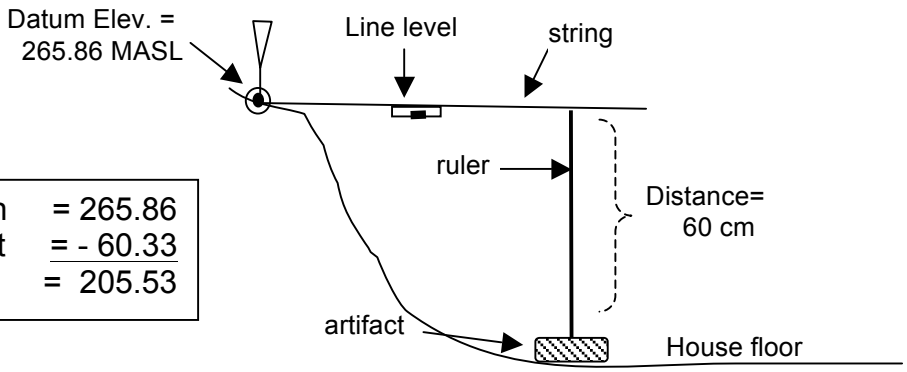


Elevations must also be recorded for the individual piece plots. These can be determined by measuring the depth below your datum point. Since your datum has a known elevation, you will need to pull the attached string and line level to just above the item to be piece plotted (see below). If the artifact is large or thick (e.g., > 2cm thick), you should always get an elevation from the base of the artifact in case it is resting on the original house floor. Also note whether the artifact is lying flat or is slanted. Once the line level indicates the string is level, you use a ruler to measure the distance between the string and the artifact. This distance is then subtracted from the elevation value of your datum. Keep in mind that elevation strings cannot be accurately extended beyond 3 meters.

Example - Piece Plotting Artifacts- Profile View

To get elevation:

Datum elevation	= 265.86
Depth of artifact	= - 60.33
Elevation of artifact	= 205.53



When you are doing piece plots within a structure, each mapped artifact/concentration will get a unique piece plot number starting with '1' (e.g., pp1, pp2, pp3). Each individual piece plot needs to be put in its own small bag/container with a label identifying the site, feature #, area of the feature (e.g., NW quadrant) and piece plot number. All piece plots from a particular section/quadrant of the structure will then be given one bag number *per day* from your Feature Bag Checklist. So for example, if you are working in the NW quadrant and have piece plotted 5 artifacts, the outside of your bag (containing all 5 individually bagged piece plots) should have the following information:

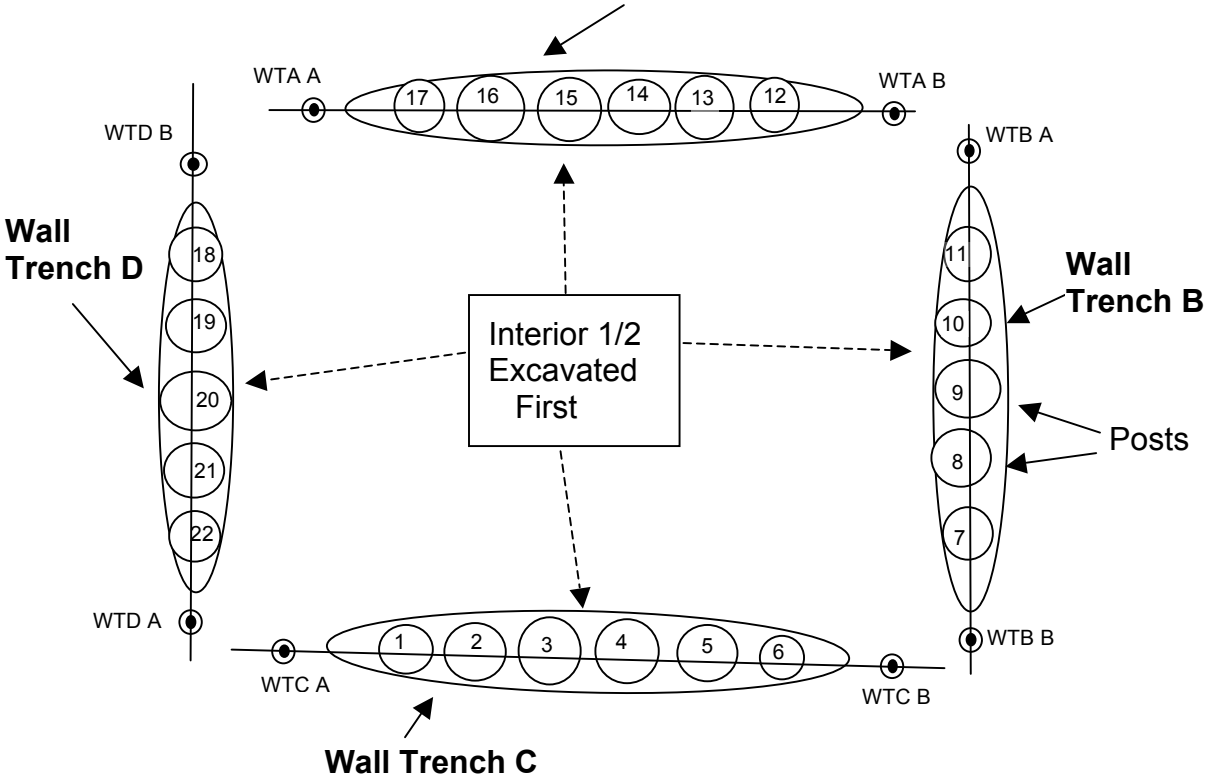
Example – Piece Plot Information on Material Bags

Site: 11S345
Feature/Unit: F17 Structure
Bag #: F17-1
Zone/Level: Zone A NW1/4
Date: 24 Mar 03
Initials: HD
Contains Piece Plots 1- 13

Wall trenches

After completion of the house basin and wall-trench cross-section profiles, an additional longitudinal profile of the individual wall-trenches of the wall trench is completed and mapped (see below). Each of the 4 profiles is mapped as per feature profile procedures. The profiles are mapped, and the wall trenches are then excavated. Post molds, when present, should be excavated individually and any recovered material kept separate. Note: Any of these examples may be done differently at the discretion of the supervisors.

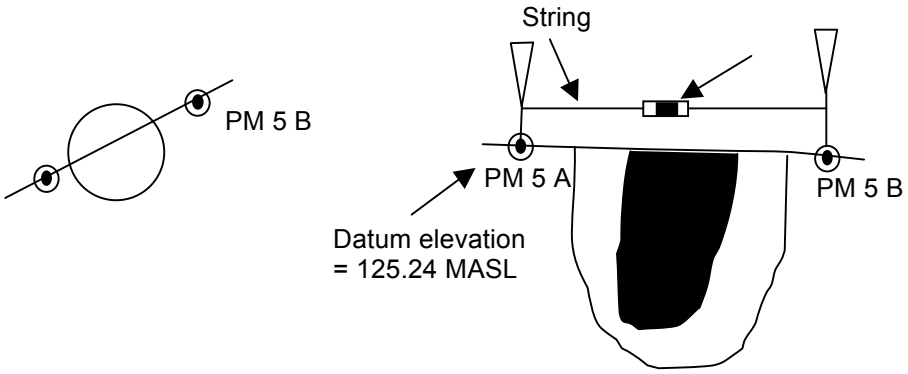
Example – Wall Trench Excavation



Postmolds

Postmold numbers are assigned only to small, narrow, and sometimes deep stains associated with structure walls. Generally the excavation of a postmold involves making a plan map of the postmold, excavating the half selected by the supervisor, and making a profile map of the shape, depth, and slant of the post. When excavating structural posts, you need to use a postmold form (see Section 5). Isolated posts not associated with structure walls are assigned a feature number and are excavated using the same procedures as pit features.

Example – Postmold Plan and Profile Views



5 Field Forms

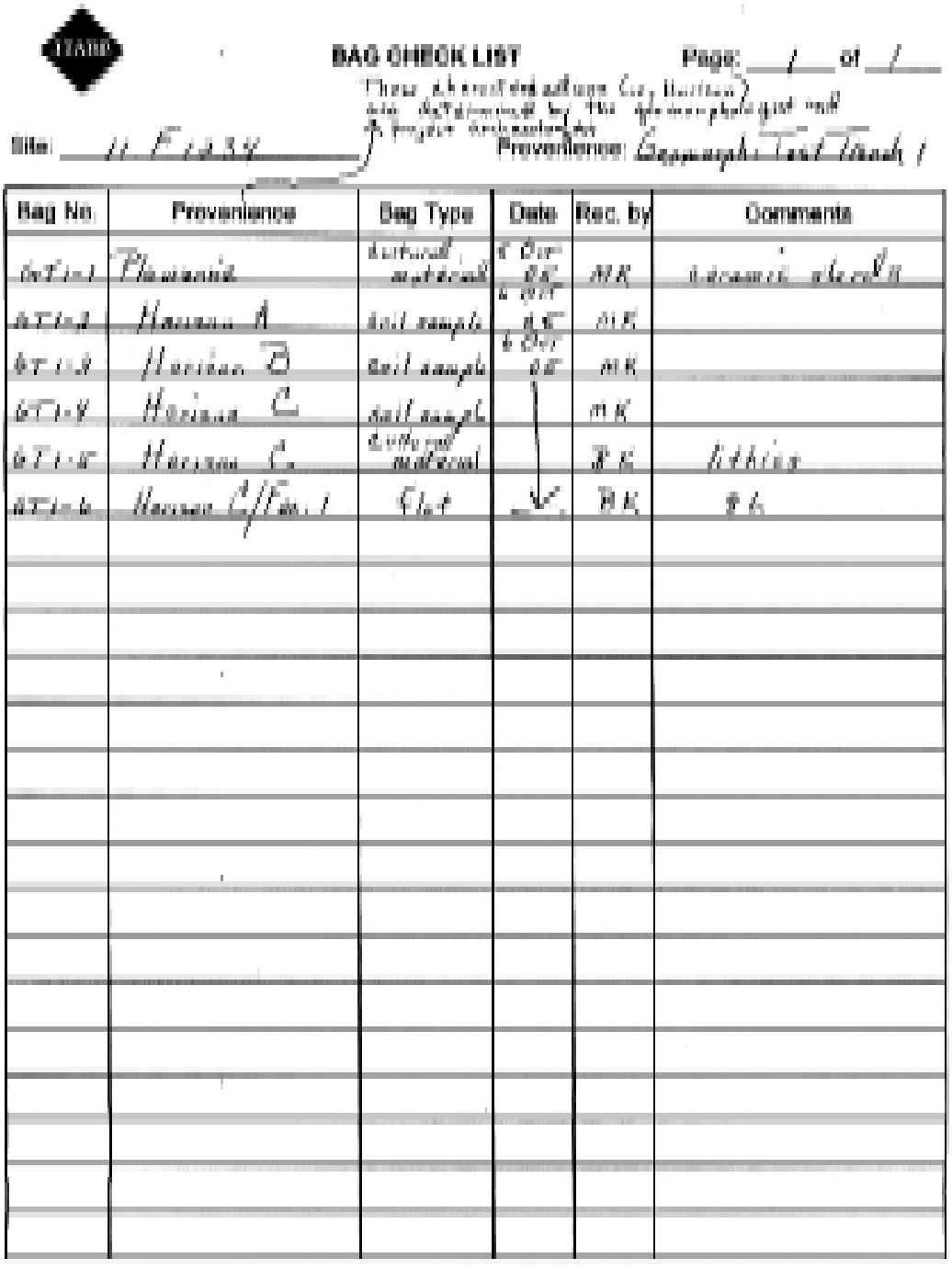
BAG CHECKLIST EXAMPLES

SURVEILLANCE CHECKLIST

Project _____
County _____

Page 1 of 5C

Bag #	Site #	Provenience Units/Description	Contents	Date	Rec by	Comments
1	[illegible]	[illegible]	[illegible]	[illegible]	PT	
2	[illegible]	[illegible]	[illegible]	[illegible]	PT	[illegible]
3	[illegible]	[illegible]	[illegible]	[illegible]	PT/DW	
4	[illegible]	[illegible]	[illegible]	[illegible]	PT/DW	
5	[illegible]	[illegible]	[illegible]	[illegible]	DW/CM	
6	[illegible]	[illegible]	[illegible]	[illegible]	DW	
7	[illegible]	[illegible]	[illegible]	[illegible]	DW	
8	[illegible]	[illegible]	[illegible]	[illegible]	KL	
9	[illegible]	[illegible]	[illegible]	[illegible]	KL	
10	[illegible]	[illegible]	[illegible]	[illegible]	KL	
11	[illegible]	[illegible]	[illegible]	[illegible]	PT	[illegible]
12	[illegible]	[illegible]	[illegible]	[illegible]	TM	
13	[illegible]	[illegible]	[illegible]	[illegible]	TM	
14	[illegible]	[illegible]	[illegible]	[illegible]	KS	
15	[illegible]	[illegible]	[illegible]	[illegible]	KS	
16	[illegible]	[illegible]	[illegible]	[illegible]	KS	
17	[illegible]	[illegible]	[illegible]	[illegible]	MS	
18	[illegible]	[illegible]	[illegible]	[illegible]	MS	
19	[illegible]	[illegible]	[illegible]	[illegible]	PT	[illegible]
20	[illegible]	[illegible]	[illegible]	[illegible]	PT	[illegible]



STARD

BAG CHECK LIST Page: 1 of 1

These abbreviations (i.e., Harrison) will be determined by the archaeologist and project archaeologist

Site: 11 E 1234 Provenience: Geomagnetic Test Trench 1

Bag No.	Provenience	Bag Type	Date	Rec. by	Comments
bT1-1	Planview	Cultural material	6 Oct 05	MK	Ceramic sherd
bT1-2	Harrison A	Soil sample	6 Oct 05	MK	
bT1-3	Harrison B	Soil sample	6 Oct 05	MK	
bT1-4	Harrison C	Soil sample		MK	
bT1-5	Harrison C	Cultural material		MK	Lithics
bT1-6	Harrison C/Feat 1	Float	✓	MK	FS

ITARP

BAG CHECK LIST

Page: 1 of ____

Site: 11 F1334

Provenience: Hand excavation Unit 1 (HU1)

Bag No.	Provenience	Bag Type	Date	Rec. by	Comments
HU1-1	Level 1 0-10 cm	material	20 Aug 08	KM/JL	glass, chert [illegible]
HU1-2	Level 2 10-20 cm	material	20 Aug 08	↓	chert, sherds
HU1-3	Level 2 10-20 cm	flat	20 Aug 08		10 L
HU1-4	Level 3 20-30 cm	material	26 Aug 08		FCR, chert, bone
HU1-5	Level 3 20-30 cm	flat	↓		10 L
HU1-6	Level 3 [illegible] cm	flat			4 L = nut shell [illegible]
HU1-7	Level 3 [illegible] cm	material			FCR concentration
HU1-8	Level 4 30-40 cm	material			chert
HU1-9	Level 4 30-40 cm	flat	↓	↓	10 L

BAG CHECK LIST Page: 5 of ____

Site: 11 F 1234 Provenience: Fea 5 (includes pipe plots)

Bag No.	Provenience	Bag Type	Date	Rec. by	Comments
5-1	NW¼, pp 1-15	material	3 Oct 05	DL	bifaces, scrapers, with debitage, ground stone
5-2	NW¼, pp 16-30	material	3 Oct 05	DL	" " "
5-3	NW¼, pp 31-50	material	4 Oct 05	SK	FCR ceramics, charcoal
5-4	SE¼, pp 51-70	material	4 Oct 05	DL	FCR, charcoal, debitage
5-5	NW¼	flot	4 Oct 05	DL	10 L
5-6	SW¼	flot	5 Oct 05	SK	10 L
5-7	NE¼, pp 71-100	material	6 Oct 05	KM	debitage, ceramic drill, FCR
5-8	NE¼, pp 101-107	material	6 Oct 05	KM	ceramic pipe, debitage
5-9	SE¼	material	6 Oct 05	DL	FCR, debitage, ceramic
5-10	NE¼	material	8 Oct 05	KM	" " "
5-11	NE¼	material	8 Oct 05	KM	" " "
5-12	NW¼	shot	9 Oct 05	DL	nutshell concentration
5-13	West Trench 1	shot	10 Oct 05	SK	charcoal
5-14	West Trench 2	material	10 Oct 05	SK	chert, ceramic

ITARD **BAG CHECK LIST** Page: 1 of ____

Site: 11 F 1234 Provenience: Plowzone (900)

Bag No.	Provenience	Bag Type	Date	Rec. by	Comments
900-1	EB1 N ½	material	27 Sept 05	KL	chert, FCR
900-2	EB1 S ½	material	27 Sept 05	KL	chert
900-3	EB1 N ½	material	29 Sept 05	KL	sherds, FCR
900-4	EB1 S ½	material	29 Sept 05	KL	Biface, sherds
900-5	EB2 entire	↓	1 Oct 05	JK	chert
900-6	EB2 backdirt		1 Oct 05	JK	scraper, rims
900-7	EB2 entire		2 Oct 05	JK	FC chert
900-8	EB1 west Backdirt		2 Oct 05	JK	Biface, celt frag
900-9	EB2 Backdirt		3 Oct 05	JK	rim, drill

ISASD

BAG CHECK LIST Page: 1 of 1

Site: 11 F 1284 Provenience: Below plowzone/on Feature 702

Bag No.	Provenience	Bag Type	Date	Rec. by	Comments
702-1	20cm wide at Fea. 10	material	6 Sept 02	KL	3 bifaces
702-2	20cm between Fea. 10 & 12	material	7 Sept 02	CB	Flakes, shards
702-3	10cm south of Fea. 12	material	10 Sept 02	KL	mano

BAG CHECK LIST Page: 1 of ____

Site: [illegible] Provenience: Surface (888)

Bag No.	Provenience	Bag Type	Date	Rec. by	Comments
888-1	General Surface N ½ of site	material	9 Sept 05	TS	glass, historic ceramics, sherds, FCR, chert
888-2	General Surface S ½ of site	↓	9 Sept 05	TS	↓
888-3	[illegible]		10 Oct 05	KL	
888-4	[illegible]		10 Oct 05	TS	
888-5	[illegible]		11 Oct 05	KL	
888-6	[illegible]		11 Oct 05	TS	
888-7	[illegible]		11 Oct 05	TS	
888-8	surface [illegible] on N side of site		14 Oct 05	TS	Biface

Post Mold Form

Site: 11F1231 Feature: 5 Recorded by: DM Supervisor's Approval: SL

Comments: _____

Postmold #	Sketch	Diameters	Elevations Top	Elevations Bottom	Depth	Soil Descriptions and Comments
PM1						
PM2						
PM3						
PM4						
PM5						
PM6						
PM7						
PM8						

Note: Black out excavated portion of postmold on plan map (eg. ◔).

PHASE I SURVEY FIELDNOTES

STATE WIDE SURVEY FIELD NOTES OUTLINE

A. Header at top of each page

1. Project Number, Project Title/Name, and County or Counties (centered in border at top of page).
2. Page Number (preferably in upper right corner of border at top of page). Should be numbered consecutively throughout the book(s) for that year.

B. Sub-headers on first line of page (all but #1 only need on first entry for each day)

1. Date-military style (e.g., 24 Feb 2001) **on top line of every page (or clearly set off from rest of text in other parts of pages as necessary)**.
2. General weather overview for AM and PM (it informs about survey visibility and general ability to do work).
3. Personnel-initials of everyone working that day (be consistent in use).
4. Field time: number of person days or hours for each workday.

C. Text of notes. Need not be lengthy, just thorough. Need to have enough information that will allow someone else to use the notes to complete the ASSR. Although some information is available from topographic maps and artifacts collections, it is the field observations that flesh out the details needed for interpretation and evaluation.

1. Brief topographical description of project area (e.g., project area traverses level, upland prairie area; project area crosses formerly wooded heavily dissected uplands) and its major features. Note areas that are unsuitable for survey (steep slopes and residentially or commercially developed places) either on a sketch map or in text if there are not too many (give location if in text). Basically, give details that would not be apparent from looking at a quad map.
2. Discuss what survey techniques (Pedestrian Survey (Ped), Shovel Test (ST), Auger Test (AT), cutbank examination, raking, etc. If this is different than any of the standard methods then describe in detail. Also indicate what interval you used in each tract you examine. If you use the same interval everywhere, clearly say so up front. You may also want to explain why you did or did not use a certain method in some situations (e.g., did not auger test in bottoms because terrace is too old to have deeply buried deposits).
3. Note the survey conditions (ground cover, wash, % visibility) for each tract you investigate. If there are quite a few tracts, you probably should just do a quick sketch map that has some landmarks on it. This needs to be in the notebook because the GPS field books do not get curated with the other project info and are often in the field when some ASSRs are written.
4. Keep a detailed shovel or auger test record either in the supervisor's notebook, a separate ST/AT notebook, or on standard forms. In addition to

the basic soil profile information (include depths of zones, brief soil descriptions, material), you should make a note about how far each test is from other ones (e.g., ST tests were placed at 5 meter intervals in 3 transects, OR single transect of tests at 2 meter intervals) and general information about what the landscape position (e.g., west shoulder of ridge; ridge apex; bottom of swale) of each test. If the tests are in redundant setting types, such as flat floodplain or prairie, just say this up front in a note. A sketch of the topography and rough location of transects and tests (e.g., ST) is a quick and easy way to illustrate this information.

5. Discussion of sites/finds if there are any (if not -clearly say so). Make sure this information stands out in text. Could be in a narrative paragraph or tabular presentation. Always include the field # and bag #s used for each site. It is helpful to underline the site/find # and write a small description for each one.

    a. *Isolates (single artifact) or find spots (less than six non-diagnostic artifacts)*. Clearly state what you found, where materials came from (not only test # and soil information [e.g., plowzone] but also important landscape/slope information (many observations are not obvious from a GPS-based topographic plot), and why you think this material is isolated rather than part of a site (i.e., how did you determine that this is an isolate [e.g., did additional shovel tests at 5m intervals in the cardinal directions around ST B5 but found nothing). Are there any modern factors that may have isolated this material from other nearby sites/finds? If so, discuss how they might be related. Again, this section need not be lengthy; succinct with the necessary details is fine and often a sentence or two will suffice.
    b. *Sites*. Several critical observations need to be made in the notes so we can interpret and evaluate the sites.
        1. *First*, what is the landform and scatter to slope position (i.e., what slope segment[s] is/are the scatter[s] found) of the site? Is there any evidence for erosion (e.g., B horizon exposed at surface) or site burial (e.g., did you find artifacts in sub-plowzone contexts? If so, where were they located? Identify test #, strata, and inclusive depths.
        2. *Secondly*, what is the scatter density and artifact composition like? Did you follow the scatter or site limits out? If not, explain why. Is the scatter density even (e.g., few open areas or breaks) or uneven (e.g., widely dispersed artifacts over a given area)? Are there any concentrations evident? All concentrationbs should be mapped and collected separately. Did you collect the site in distinct areas? If so, how did you define them and what were their artifact compositions and scatter configurations like? Was there any FCR or burnt limestone present that could suggest feature locations? What if anything was **not collected** from the site?

3. *Thirdly*, did you recover any diagnostic material? Remember to shoot all diagnostic locations with GPS unless there is a staggering number (e.g., if there are large quantities of sherds,-then only record the rims or decorated/diagnostic examples). Trace/sketch identifiable diagnostic lithics and ceramics into notebook as well. How does the diagnostic material relate to the rest of the site or individual scatter areas (e.g., did you find a point near the debris scatter or well within it)?
4. *Finally*, describe the association of the site to the ROW. Is part or all of the site within the proposed ROW or survey area? **What part of the site is within the ROW** (i.e., is it the densest area or an ephemeral part)?

6. Identify anybody you speak to in the field and summarize what info they offer about **relevant** topics (i.e., historical information, collections, find locations, project information, property access, major concerns with IDOT or project. Always include the date you spoke to them. This probably should be in a note set off from rest of text. If they have a collection, try to get their address and phone number, and also put this information into the notes for future reference. If a collection is small, trace the identifiable artifacts into the notebook. Be sure to use clean pages and include relevant information about the collector (i.e., name, address, phone number, and general location of collecting area). Also comment in your notes about artifacts in the collection that you did not trace. If they have large collections, see if they are amenable to having them recorded and try to get some digital photos or arrange a meeting to do so if sounds worthwhile. If the photographs and data collection occur at a later time, please indicate the later date in your notes as well.

7. On the last page of notes for a given project, write “END PROJECT” so anyone looking through the notebook will know that they have seen all the notes for this project. MAKE SURE YOUR NOTEBOOK IS XEROXED FREQUENTLY AND COPIES ARE GIVEN TO THE LAB SUPERVISOR TO BE FILED. *Remember to make a copy of the notes for each specific ISAS project.* When you xerox your notebook, make a dated notation at the bottom of the last page that you have copied (preferably circled in red ink (e.g., end copy 3 Mar 00) so you can keep track of your copying.

Field Site Form

Project #		**IAS#**
Project Name		**F.S.#**
County		**GPS#**
Topo Name		
1/4's		**Elevation**
Sect	**TWP**	**RNG**
Property Owner		
Address		
Ground Cover		
Visibility		
Topography		
Nearest Water		
Survey Method		
Collection Technique		
Damage to Site		
Survey Date		
Cultural Affiliation		
Bag Numbers		
Materials		
Sketch		

ITARP

Isolated Find Form

Project#	**F.S.#**
Project Name	**GPS#**
County	**Date**
Topography	**Bag #**
Material	

Project#	**F.S.#**
Project Name	**GPS#**
County	**Date**
Topography	**Bag #**
Material	

Project#	**F.S.#**
Project Name	**GPS#**
County	**Date**
Topography	**Bag #**
Material	

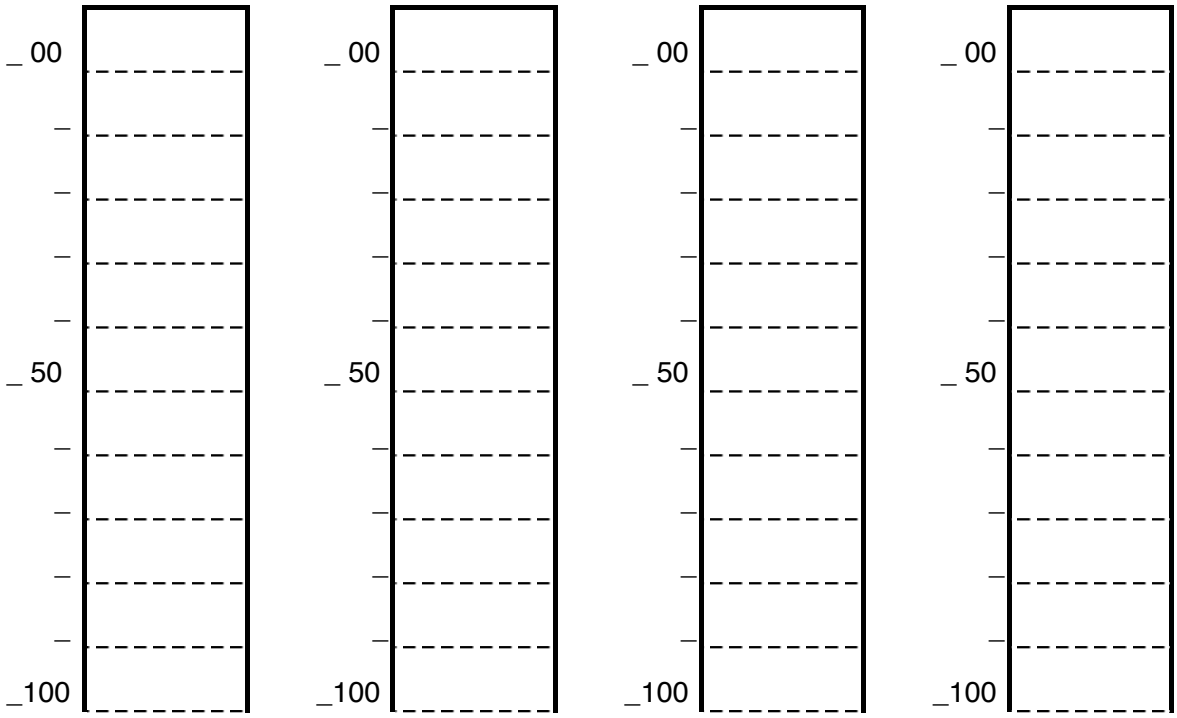
Project#	**F.S.#**
Project Name	**GPS#**
County	**Date**
Topography	**Bag #**
Material	

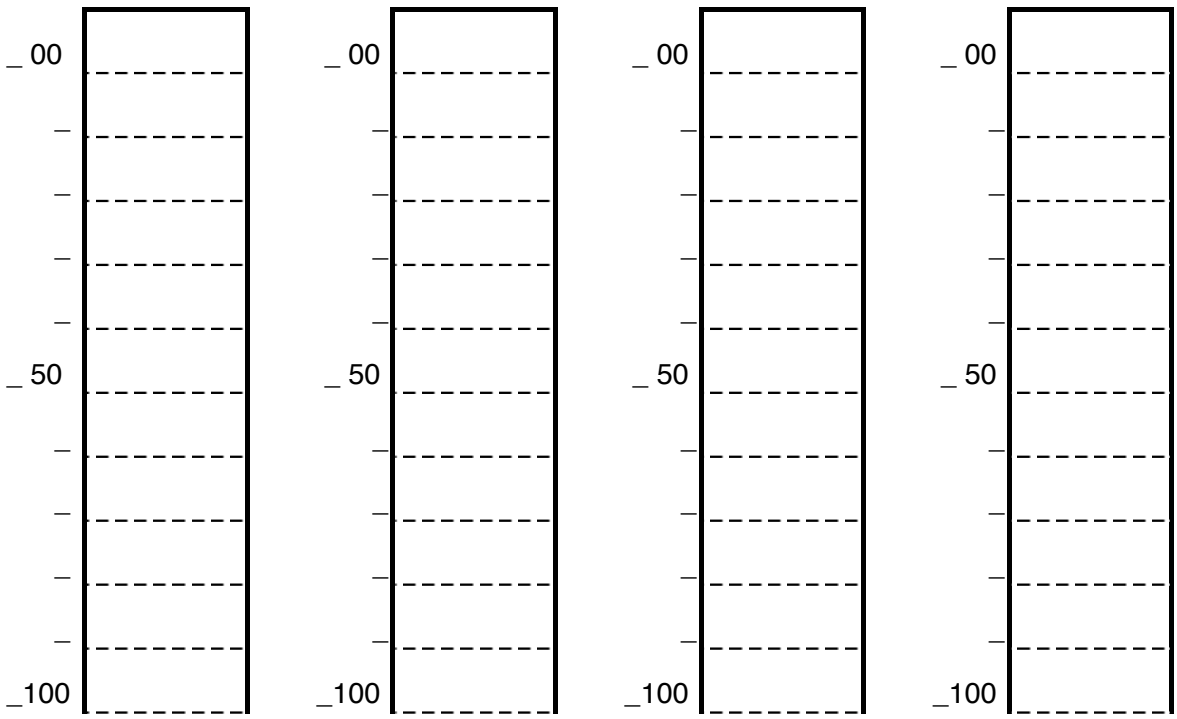
Project#	**F.S.#**
Project Name	**GPS#**
County	**Date**
Topography	**Bag #**
Material	

POSTHOLE/AUGER/SHOVEL TEST FORM

Site: _____ Recorder:_____

Project _____ Date: _____





HAND-EXCAVATED UNIT FORM EXAMPLES

•

ITARP

BAG CHECK LIST Page: 3 of 3

Site: 11 F 82 Provenience: H U 3

Bag No.	Provenience	Bag Type	Date	Rec. by	Comments
HU3-1	midden	material	24 Apr 03	KB/MS	point, point tips, sherds, flakes, FCR
HU3-2	midden - SW 1/4	flot	24 Apr 03	KB/MS	10 L
HU3-3	midden	material	25 Apr 03	KB/MS	pt, perforator?, dec. sherd, sherds, FCR, flakes
HU3-4	midden - SW 1/4	flot	25 Apr 03	KB/MS	10 L - area outside of feature

FEATURE FORM EXAMPLES

ITARP

FEATURE REPORT

Page 1 of 6

FEA. NO.: 186
FEA. CLASS: PIT
SITE: 115658 FEA.CLUSTER:
EXCAVATION BLOCK: EBB GRID SQUARE: COMPONENT: Late Woodland?
LOCATION: Pt. A: N 11877.93 E 1996.66 Pt. B: N 11879.57 E 1997.59
Pt. C: N 11879.43 E 1996.66 Pt. D: N 11878.14 E 1997.65
DATUM NAIL: (A) N 11877.93 E 1996.66 DATUM ELEVATION: 196.42 MASL
DEFINED AT: Below Pz MAX. DEPTH: 24 cm
TOP ELEVATION: (+1cm) 196.43 BOTTOM ELEVATION: (-23cm) 196.19
PLAN SHAPE: Circular PLAN PHOTOS: DATE: — DISK # — #SHOTS
LENGTH: 126 cm ORIENT: SW-NE WIDTH: 118cm ORIENT: SE-NW
PROFILE SHAPE: SIDEWALLS Inslanting BASE flat
HALF EXCAVATED FIRST: NE 1/2 NO. FILL ZONES: 2
EXTENT OF BELLING: FEA. VOLUME:
PROFILE PHOTOS: DATE/INITIALS: 14 Sept 01/JK DISK# 5 #SHOTS 3
OTHER PHOTOS: DISK# #SHOTS SLIDE? ROLL# EXP.
PROFILE CHECKED: KR
SUPERIMPOSED ON: BY:
ASSOCIATED WITH/NEARBY FEATURES: F182, 190

METHOD OF EXCAVATION TROWELED: ✓ SHOVEL-SCRAPED: ✓
SCREENED: ✓ MESH SIZE: 1/4"

MATERIAL AND SAMPLES COLLECTED

LITHICS: chert, FCR, hematite (?) DIAGNOSTICS: —
CERAMICS: — RIMS: DEC. SHERDS: —
FAUNA: BAGGED — IN FLOT:
FLORAL: Botanical sample C14: —
FLOTATION: METHOD 1 sample/zone - SW 1/2 only # FLOT SAMPLES 2
SOIL: — OTHER: —

COMMENTS: F. 186 was a circular pit with outslanting side walls and a flat base. In profile, - 2 fill zones appeared. Z.A = main zone, Z.B = slump zone No diagnostics were recovered.

EXCAVATED BY: KR DATE: 14 Sept 01
RECORDED BY: KR DATE: 14 Sept 01
DATE COPIED: 20 Sept 01 SUPERVISOR'S APPROVAL: DB

5/06

EXCAVATION NOTES

Page 2 of 6

SITE: 11S654 FEATURE: F186, E½

DATUM NAIL: A: N1177.95 E1196.66 DATUM ELEVATION: 196.48

TOP ELEVATION: 196.43 BOTTOM ELEVATION: 196.19

FLOT. BAG#	AMT.	ZONE	1/2	MAT. BAG#	ZONE	1/2	CONTENTS
				186-1	All	E	Chert flakes

MISC. BAG #: CONTENTS:

MISC. BAG #: CONTENTS:

COMMENTS AND SKETCH MAPS:

F186 was a circular pit in plan view. I skimmed out the E½ of this feature first and recovered only chert flakes. I noticed light charcoal and burnt clay flecking throughout the excavation of the E½ (samples present were too small to collect). In profile, slump zones appeared on both sides of pit.

EXCAVATED BY: KR DATE STARTED: 11 Sept 01 DATE FINISHED: 12 Sept 01

RECORDED BY: KR DATE: 12 Sept 01

5/98

EXCAVATION NOTES Page 3 of 6

SITE: 11 S 658 FEATURE: F186 W1/2

DATUM NAIL: 11 N 1177.88 E 1896.66 DATUM ELEVATION: 196.43

TOP ELEVATION: 196.43 BOTTOM ELEVATION: 196.19

FLOT BAG#	AMT.	ZONE	F 1/2	MAT. BAG#	ZONE	F 1/2	CONTENTS
186-2	10L	A	W	186-3	A	W	chert, FCR, botanical, hematite
186-4	10L	B	W				

MISC. BAG #: CONTENTS:

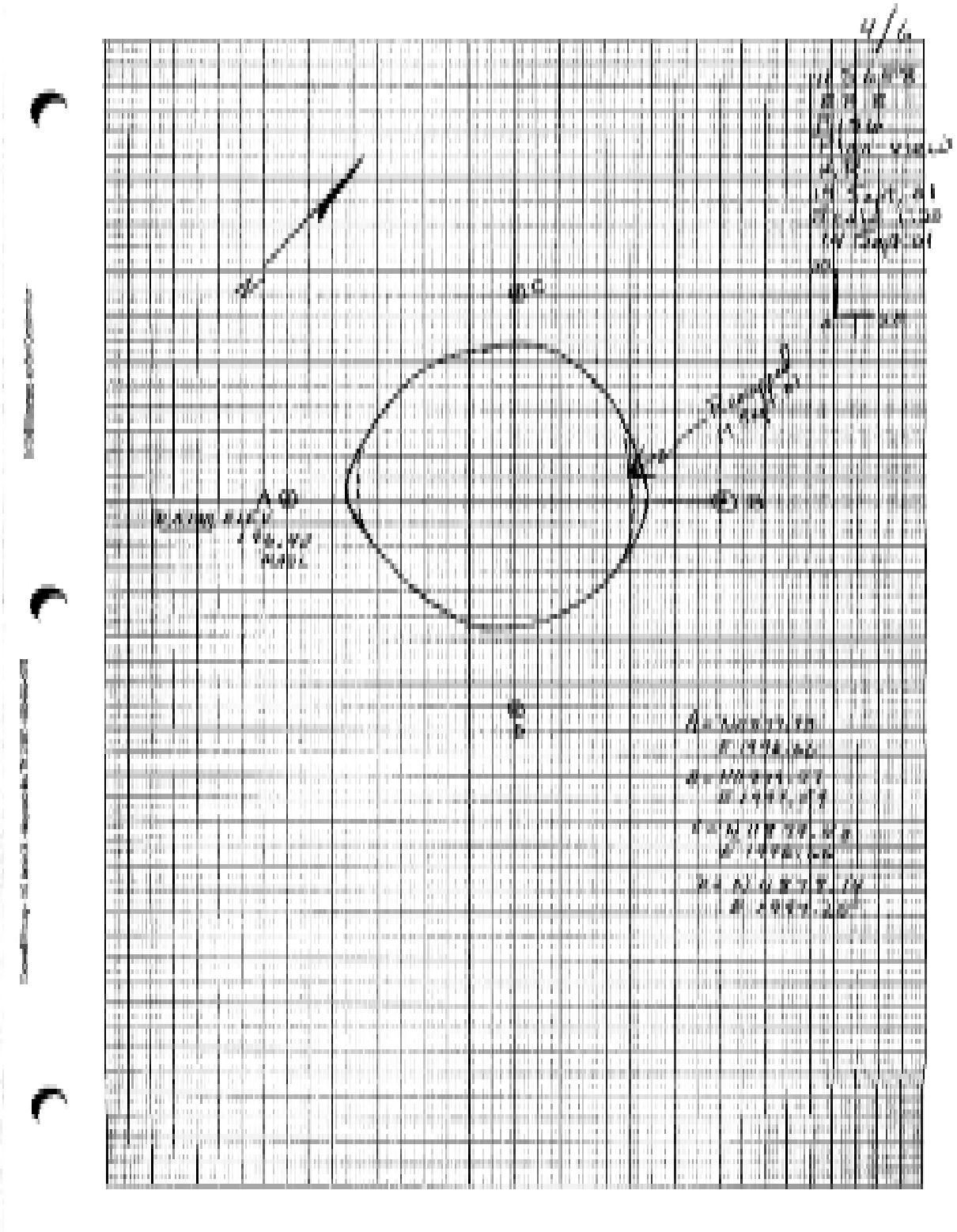
MISC. BAG #: CONTENTS:

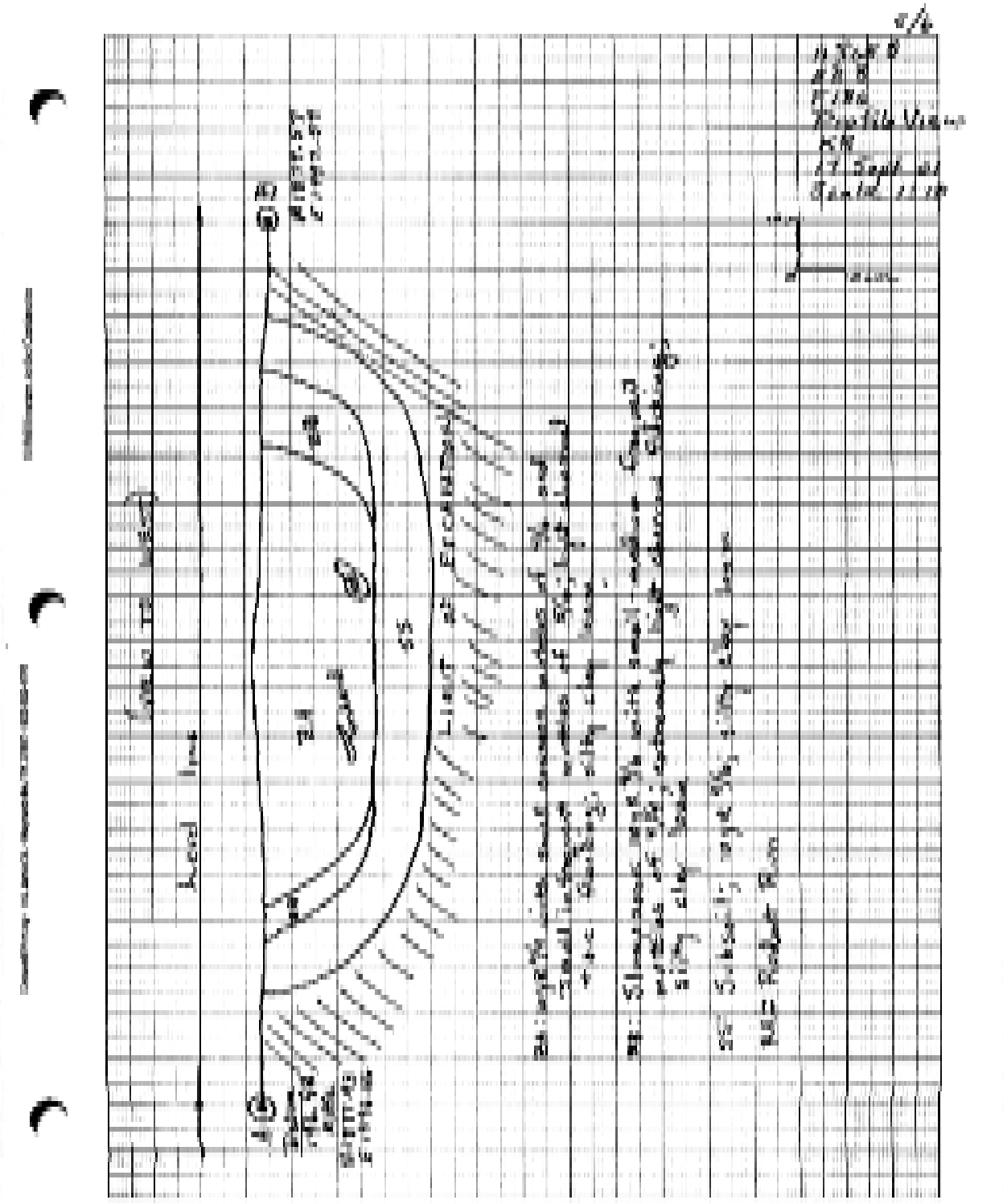
COMMENTS AND SKETCH MAPS:

I skimmed out this second half and took 1 flot per zone (total flots taken 2). I recovered chert, flakes, FCR, a botanical sample (appeared to be wood charcoal) and a sizeable mass of possible hematite (all material was from Z.A). Charcoal and burnt clay flecking still appeared throughout Z.A and very light charcoal flecking appeared in Z.B. No diagnostics were recovered.

EXCAVATED BY: KR DATE STARTED: 17 Sept 01 DATE FINISHED: 17 Sept 01

RECORDED BY: KR DATE: 17 Sept 01





BURIAL EXCAVATION FORM EXAMPLES

Burial Notification Form

Site Name_____ Site No. _____County _____
Project Name_____ ISAS Log No. _____
Caller's Name and Title_____ Date_____
Description_____

_____

_____

ISAS Notification

Date and Time of Telephone Call to Project Director_____
phone voice-mail e-mail

Nature of Contact (talked in person, voice mail, or e-mail message)_____

Date and Time of Telephone Call to ISAS Director_____
phone voice-mail e-mail

Nature of Contact (talked in person, voice mail, or e-mail message)_____

County Coroner Notification

Date and Time of Telephone Call_____
phone voice-mail e-mail

Name of Staff Member Contacted_____

Nature of Contact (talked in person or voice mail message)_____

Comments_____

_____

_____

IHPA Notification

Date and Time of Telephone Call_____

Name of Staff Member Contacted_____

Nature of Contact (talked in person, voice mail, or e-mail message)_____

Comments_____

_____

***Date this form was faxed to the ISAS Burial Coordinator_____

ITARP Burial Excavation Form — Part I: Archaeology/ Use of a single form for a skeleton only [illegible]

Site Name/# Oak Tree Site / [illegible] **Feature/Burial** 3 **Skeleton #** 1 & 2 [illegible]
Observer(s) [illegible] **Field Supervisor** [illegible]
Date [illegible]

Feature Description: Elliptical-shaped feature located west of the wall-trench structure. Two individuals in this feature (extended) parallel to each other. Possible mat lining [illegible] preserved at bottom of feature.

Depths
DATUM [illegible] **Top of feature** [illegible] **Base of feature** [illegible]

Feature Dimensions and Orientation
Orientation of long axis [illegible] (N-S, E-W, etc.)
Maximum length [illegible] cm
Minimum length [illegible] cm

Soil Characteristics/Grave Fill
Color silty loam
Texture [illegible] mottles of [illegible] silty clay w/ charcoal flecks

Excavation Procedures and Interpretations
Describe excavation technique: Originally found while shovel skimming 1st half of feature; remainder of excavation used trowel, bamboo pick, spoon, grapefruit knife

Discuss associated remains or features: May be associated with nearby wall-trench structure ([illegible]) based on similar temporal diagnostics in both features that suggest Mississippian period. [illegible] is located to the right (north) of [illegible]

Discuss natural or cultural disturbances: Clear evidence of rodent disturbance throughout northeast end of feature. Some rodent gnawing on bones (legs)

Feature interpretations: Definitely functioned as a grave. Very little general habitation debris in feature fill. Base of feature lined with probable mat (?) defined by soil discoloration. Bodies were placed directly on mat at the same time.

Associated Artifacts (brief descriptions, estimated count)
Ceramics —
Lithics 1 Cahokia-notched projectile point
Ground Stone 1 celt
Fauna deer antler fragment
Materials in feature fill 2 small [illegible] body sherds, [illegible] flakes

Feature Photographs (prior to bone exposure)
Color: Roll # (exp. #s) [illegible]
Digital: Disc # / # shots [illegible]

ITARP Burial Excavation Form — Part II: Osteology

Site Name/# [illegible] Feature/Burial [illegible] Skeleton # 1
Observer(s) [illegible] Field Supervisor [illegible] Date [illegible]

Type of Burial
Primary ✓
Secondary
Cremation
Isolated element(s)

Burial Position
Extended ✓
Semi-Flexed
Tightly Flexed
Indeterminate
Other (describe)

Body Deposition
Supine (on back) ✓
Prone (on front)
On Left Side
On Right Side
Indeterminate
Other

Arm Position
Extended ✓
Folded
Crossed
Indeterminate

Describe location of right and left hands: [illegible]

Body Orientation (N, S, E, W) Top of cranium [illegible] Vertebral column [illegible]

Degree of Flexure
(relative to Anatomical Position—0°)

	Right	Left
Shoulder	0	0
Elbow	0	0
Hip	0	0
Knee	0	0

Additional Position Information

	Right	Left
Forearm (prone or supine)	prone	supine
Cranium (side down)	Right	
Other		

Sex (circle one) Female F? ? M? Male Juvenile (indeterminate)

Measurements (in mm or cm)
Head of femur (maximum diameter) 40 R 4? L
Head of humerus (vertical diameter) R L

	Right	Left
Humerus	[illegible]	[illegible]
Radius	[illegible]	[illegible]
Ulna	[illegible]	[illegible]
Femur	[illegible]	[illegible]
Tibia	[illegible]	[illegible]
Fibula	[illegible]	—

Age
Fetal (<0 years)
Infant (0-3 yrs)
Young Child (3-6 yrs)
Older Child (6-12 yrs)
Adolescent (12-20 yrs)
Yng. Adult (20-35 yrs) ✓ [illegible]
Mid. Adult (35-50 yrs)
Old Adult (>50 yrs)
Adult (>20 yrs)
Juvenile (<20 yrs)

Taphonomy (Preservation and Burning)

Preservation	Poor (grainy)	Fair (mesh)	Good (fragile)	Excellent (strong)	Burned*	Preservation	Poor (grainy)	Fair (mesh)	Good (fragile)	Excellent (strong)	Burned*
Cranium				✓		Humerus				✓	
Face				✓		Ulna				✓	
Mandible				✓		Radius				✓	
Neck			✓			Hands			✓		
Upper Spine			✓			Pelvis			✓		
Lower Spine			✓			Pubic Bones			✓		
Ribs			✓			Femur				✓	
Clavicles			✓	✓		Tibia				✓	
Scapulae			✓			Fibula				✓	
						Feet			✓		

*1= brown/black; 2=gray; 3=gray/white

1

OSTEOLOGY FORM, PAGE 2

Site Name/# Oak Tree Site / [illegible] Feature/Burial [illegible] Skeleton # 1

Observer(s) [illegible] Field Supervisor [illegible] Date [illegible]

Taphonomy, continued

Discuss animal gnawing, breakage, cultural modification, etc. Rodent gnawing on lateral surface of [illegible] tibia

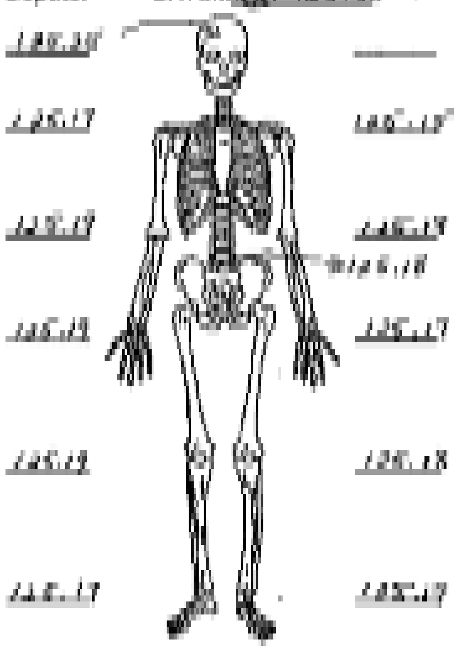
Observed Pathology: [illegible] (mostly active) along anterior surface of [illegible] tibia & femora

Inventory and Articulation

If bones are disarticulated, mark joints with ||.

Mark bones that are absent with X.

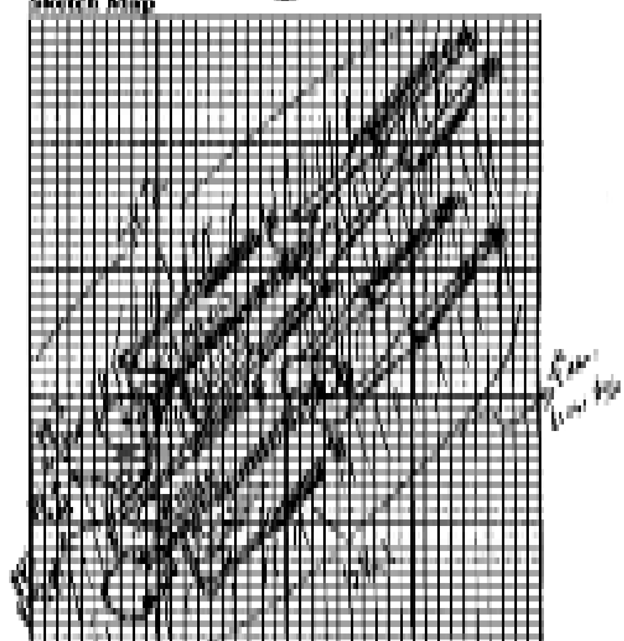
Depths: DATUM [illegible] MASL



Record unique observations on skeleton diagram

Sketch Map

North



Photographs

Color: Roll # [illegible] Exposures [illegible]

Digital: Disc # [illegible] Images [illegible]

[illegible]

Bag Inventory

Bag or Block	Description	Bag or Block	Description
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]		[illegible]
[illegible]	[illegible]		
[illegible]	[illegible]		
[illegible]	[illegible]		

3

OSTEOLOGY FORM, PAGE 3

Site Name/# [illegible] **Feature/Burial** 3 **Skeleton #** 1

Observer(s) [illegible] **Field Supervisor** [illegible] **Date** [illegible]

Field Observations (summarize burial context and osteological observations)

Sk 1 appears to be that of a young adult female (age based on partial fusion of iliac crest & dental attrition) (sex based on femoral head diameter, greater sciatic notch, occipital, mastoid, supra-orbital ridges). Overall preservation very good - most elements present. Slight periostitis (?) on both femora & tibia - unsure if it was active at death - may have contributed to death?

Sk 1 was located just north of Sk 2 & both individuals had been interred at the same time as indicated by the absence of any intrusive pit, both individuals laying on parallel [illegible] lying on pattern of feature [illegible] identified by dark discoloration of thin layer of soil immediately below the individuals.

Cannot discern who associated artifacts (celt, projectile point, antler) belong to since they are located between the 2 crania. Assume these items are associated with both individuals.

Sk 2 appears to be a probable female mid-adult (see notes for Sk 2).

Both burials probably contemporaneous with nearby wall-trench structure (F8) - red-slipped ceramics found both in burial fill & within structure. Thus project already in Mississippian period.

3

ITARP Burial Excavation Form — Part II: Osteology

Site Name/# Oak Tree Site / [illegible] Feature/Burial 5 Skeleton # 2
Observer(s) [illegible] Field Supervisor [illegible] Date [illegible] Aug 09

Type of Burial		Burial Position		Body Deposition		Arm Position	
Primary	✓	Extended	✓	Supine (on back)	✓	Extended	✓
Secondary		Semi-Flexed		Prone (on front)		Folded	
Cremation		Tightly Flexed		On Left Side		Crossed	
Isolated element(s)		Indeterminate		On Right Side		Indeterminate	
		Other (describe)		Indeterminate			
				Other			

Describe location of right and left hands: Next to R+L pelvis

Body Orientation (N, S, E, W) Top of cranium [illegible] Vertebral column [illegible]

Degree of Flexure
(relative to Anatomical Position—0°)

	Right	Left
Shoulder	0	0
Elbow	0	0
Hip	0	0
Knee	0	0

Additional Position Information

	Right	Left
Forearm (prone or supine)	prone	prone
Cranium (side down)	occipital	
Other		

Sex (circle one) Female (F?) ? M? Male Juvenile (indeterminate)

Measurements (in mm or cm)
Head of femur (maximum diameter) 43 R 43 L
Head of humerus (vertical diameter) ____ R ____ L

	Right	Left
Humerus	308	326
Radius	225	223
Ulna	240	236
Femur	401	411
Tibia	336	340
Fibula	330	337

Age

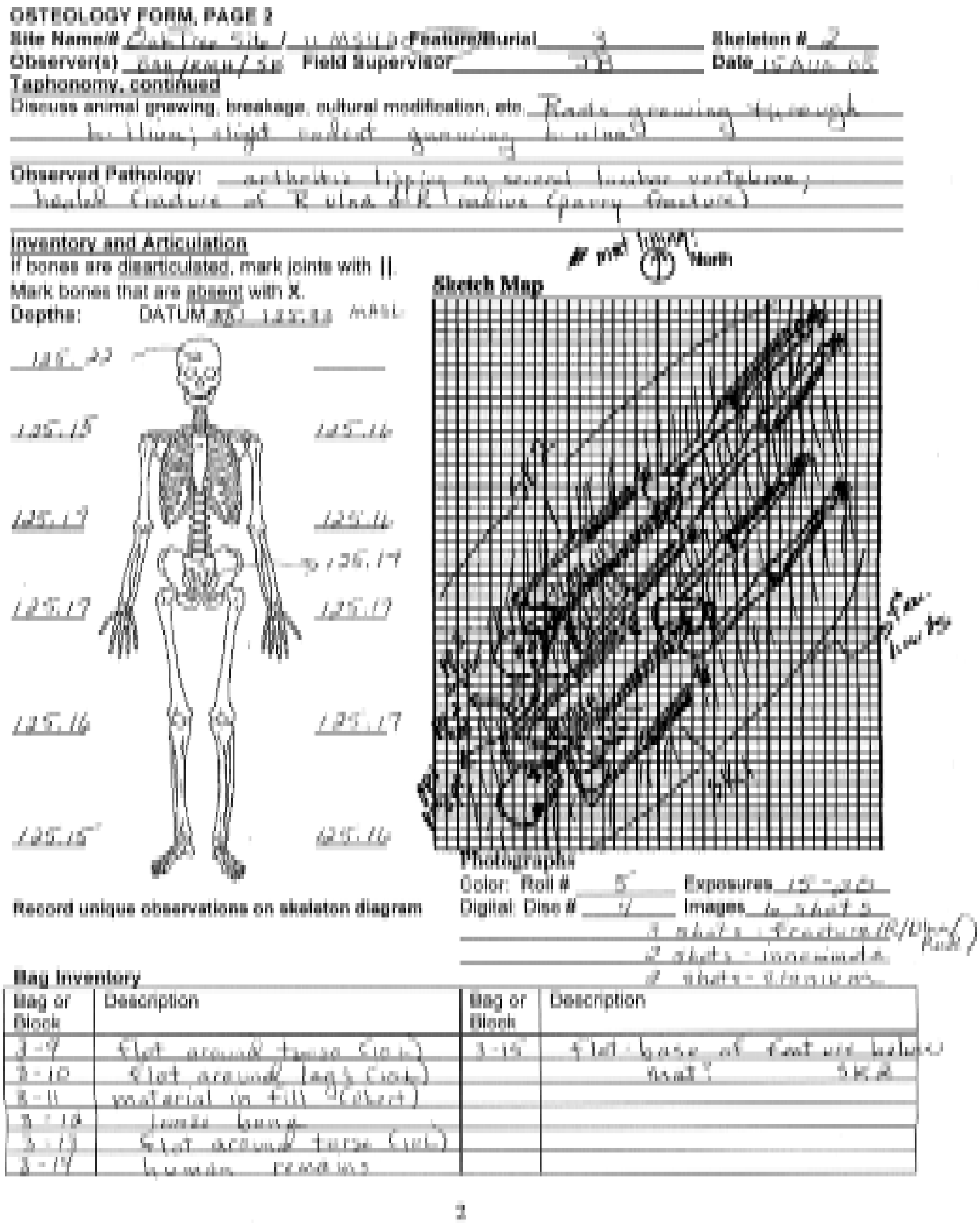
Fetal (<0 years)	
Infant (0-3 yrs)	
Young Child (3-6 yrs)	
Older Child (6-12 yrs)	
Adolescent (12-20 yrs)	
Yng. Adult (20-35 yrs)	
Mid. Adult (35-50 yrs)	✓ [illegible]
Old Adult (>50 yrs)	
Adult (>20 yrs)	
Juvenile (<20 yrs)	

Taphonomy (Preservation and Burning)

Preservation	Poor (ghost)	Fair (meal)	Good (fragile)	Excellent (strong)	Burned *	Preservation	Poor (ghost)	Fair (meal)	Good (fragile)	Excellent (strong)	Burned *
Cranium				✓		Humerus				✓	
Face				✓		Ulna				✓	
Mandible				✓		Radius				✓	
Neck			✓			Hands			✓		
Upper Spine			✓			Pelvis			✓		
Lower Spine				✓		Pubic bones			✓		
Ribs			✓			Femur				✓	
Clavicles				✓		Tibia				✓	
Scapulae			✓			Fibula				✓	
						Feet			✓		

*1= brown/black; 2=gray; 3=gray/white

1



OSTEOLOGY FORM, PAGE 2

Site Name/# Oak Tree Site / 11 MS [illegible] **Feature/Burial** 3 **Skeleton #** 2

Observer(s) [illegible] **Field Supervisor** [illegible] **Date** [illegible]

Taphonomy, continued

Discuss animal gnawing, breakage, cultural modification, etc. Roots growing through [illegible] ilium; slight rodent gnawing [illegible]

Observed Pathology: arthritic lipping on several lumbar vertebrae; healed fracture of R ulna & R radius (parry fracture)

Inventory and Articulation

If bones are disarticulated, mark joints with ||.
Mark bones that are absent with X.
Depths: DATUM [illegible] 125.[illegible] masl

125.22, 125.15, 125.16, 125.17, 125.16, 125.19, 125.19, 125.19, 125.16, 125.17, 125.15, 125.16

Sketch Map North

Photographs
Color: Roll # 5 Exposures 15-20
Digital: Disc # [illegible] Images [illegible]

Record unique observations on skeleton diagram

Bag Inventory

Bag or Block	Description	Bag or Block	Description
3-9	Flot around torso (10 L)	3-15	Flot: base of feet [illegible] below head? SKR
3-10	Flot around legs (10 L)		
3-11	material in fill (chert)		
3-12	loose bone		
3-13	Flot around torso (10 L)		
3-14	human remains		

2

OSTEOLOGY FORM, PAGE 3

Site Name/# Oak Tree Site / 11MS[illegible] **Feature/Burial** 3 **Skeleton #** 2

Observer(s) [illegible] **Field Supervisor** [illegible] **Date** [illegible]

Field Observations (summarize burial context and osteological observations):

SK 2 appears to be a mid-adult female(?) – age based on arthritic lipping, auricular surface, and dental attrition; sex based on greater sciatic notch, femoral head diameter, occipital, and glabella. Overall preservation good – most elements are present. Arthritic lipping most significant on lumbar verts, but also some lipping on distal R+L femora & R/L tibiae. Well-healed fracture on distal ⅓ of the R ulna & R radius – appears to be a parry fracture that occurred well before death.

SK 2 was located just north of SK 1 – both were clearly interred at the same time (no intrusive features) – both individuals were placed on a possible mat lining ([illegible] mat identified by a dk brown thin layer of silty clay loam immediately below the individuals) – Associated artifacts (celt, proj. pt, antler) are interpreted as being associated with both SK 1 + SK 2.

Both burials assumed to be roughly contemporaneous with a nearby wall-trench structure (F [illegible]). Red-slipped ceramics are found in burial fill and within Fea. [illegible]. The celt and proj. pt. suggest a Mississippian affiliation for the burials.

3

PHOTOGRAPHIC FORM EXAMPLES

Digital Photo Log

Site _____ Disk # _____

Exp. Number (don't fill out)	No. of shots	Date	Site	Conditions	Dir. Of Photo	Subject	Initials

SUPPLEMENTAL PHOTOGRAPHIC RECORD FOR FEATURES

SITE # _____ **SUBJECT** _____

Subject	Date	Digital disk #	# shots	Exposure # (don't fill out)	Color Slide Roll #	Exp. #

6 Global Positioning System (GPS)

ISAS uses the Global Positioning System (GPS) as a means of determining the location of archaeological sites and project areas while in the field. This could be the location and extent of a prehistoric debris scatter, the location of an isolated projectile point, the proposed alignment of a new road, or even the precise positions of mapping points used by the Total Station.

GPS is a means of navigation and position location based on triangulation (actually positions are based on three-dimensional trilateration because no angles are used in the computation of positions) from a constellation of 24 satellites currently in orbit above the Earth. These satellites transmit radio signals that are received by a device called a "GPS receiver" that is carried by ISAS personnel during survey and, sometimes, excavation. This hand-held unit receives the radio signals and, using the time it takes for the radio signal to reach the receiver, calculates the distance from the satellite. Generally, a minimum of four satellites is necessary to calculate a specific location although more than four satellites may be accessed by the device. Larger numbers of satellites do not necessarily improve the ability of the GPS unit to determine location.

While there are many different brand names of GPS receiver, we use three different models of Trimble GeoExplorer GPS–GIS Data Loggers. These particular receivers allow us to map objects on the ground as lines (fences, project limits, or field edges), polygons (site limits), or point locations (isolated artifacts). This data is stored on the GPS receiver and later transferred to a computer where the data is integrated with our GIS system.

Given the constantly changing technology and variety of GPS units ISAS is currently using, we do not provide details on how each type of GPS unit works. Field supervisors need to ensure that field crews are instructed on how to use the GPS units while they are in the field.

Trimble GeoExplorer 1 and 2

Trimble GeoExplorer 3

Keep in mind that the GPS receiver can't determine locations when under moderate to heavy leaf cover. Consequently, work in wooded areas is limited to late fall through

early spring. The unit works by receiving radio signals from satellites so the more of the sky and horizon that is unobstructed the better. Also try to stay clear of overhead power lines and metal barns and silos as they can severely distort and degrade the signal.

7 The Total Station and SDR

The Total Station is an electronic surveying device which calculates and records the coordinates of places on the ground using either arbitrary grid coordinates or UTM locations. The total station also records elevation. The main purpose of using a total station for archaeological fieldwork is to impose a Cartesian grid (X-northing, Y-easting, Z-elevation) on the site to locate every artifact and feature in 3-D space and to make topographic maps of the site. Topographic maps record the position of natural and human-made features on the earth's surface. Some things that are mapped at an archaeological site include feature nails, streams, roads, excavation units, artifacts, features, and any other important features of the landscape. Data collected by the total station is downloaded to a computer from which the site map is created.

What is a Total Station?

A total station (a.k.a. EDM, transit, theodolite, the instrument) is the ultimate in survey instruments. A total station combines a digital theodolite and an EDM that work together with a microprocessor to rapidly and accurately perform tasks. With this combination, the total station can measure horizontal and vertical angles, slope, and horizontal and vertical distances. A total station can also have a built-in calculator that performs trigonometric calculations, as well as an onboard electronic field notebook used for storing data. ISAS uses external survey data recorders (SDR) to store all data. The total station and SDR also interface with a computer for data transfer.

EDM (Electronic Distance Measuring Device): An EDM is a device mounted on the top of the total station that sends out a infrared laser. The EDM measures the time it takes for the laser to travel from the EDM to a prism, bounce off the prism, then return to the EDM. This measurement is displayed as distance, but it is really a measurement of time. Very accurate distance measurements are possible using an EDM.

Theodolite (Transit): A theodolite measures horizontal and vertical angles. Horizontal angles are measured along a level horizontal axis. Vertical angles are measured along a level vertical axis.

<u>Components of a Total Station</u>

Tripod: The three-legged base that the total station instrument is mounted on.

Plumb Bob: Used to center the tripod over a point (an optical plummet on the instrument is also be used).

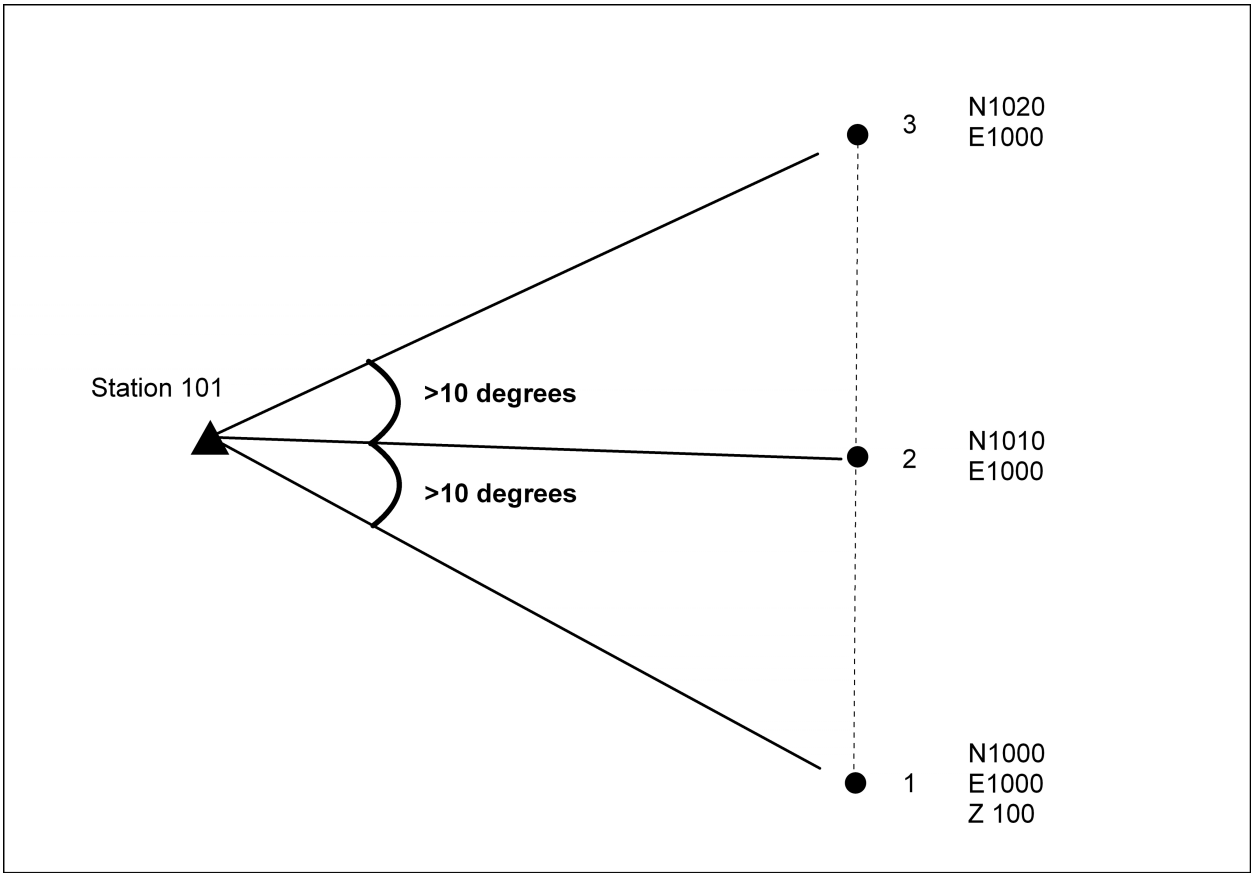
Total Station Instrument: The electronic unit that combines the EDM, theodolite, and field notebook.

Survey Data Recorder (SDR): Portable field data collector.

Prism and Rod: A prism is mounted on a graduated rod. The EDM reflects an infrared laser off the prism. The rod has a circle level to keep the rod plumb.

Setting up the Total Station and SDR

1. If using the resection method use the 10-degree rule to aid in choosing an appropriate location (See below). Set up the tripod with the base plate leveled and press the legs firmly into the ground. Attach the Total Station. Do not try to precisely level the base at this stage, although, a level tripod will make the job of leveling the Total Station a bit easier.



If setting the Instrument over a known point roughly set the tripod over the point by holding two legs and set the third past the point. Move the two legs that you are holding until the top of the tripod is approximately over the point. Make sure that the top of the tripod is roughly level. Press the legs of the tripod firmly into the ground. Screw the instrument onto the tripod. Make sure that the leveling screws are even. If they are not even, screw each one of the screws so that it is in the middle of its leg. Look through the optical plummet and determine its location relative to the point (you sometimes have to place your foot next to the point to determine its location). Adjust the location of the tripod (if necessary) to find the point in the optical plummet by lifting two legs and

pivoting the instrument on the third leg while looking through the optical plummet. Center the optical plummet exactly on the point.

2. Level the Total Station. Start by leveling the lower circular bubble (the course level). Loosening the leg screws and adjusting the legs to move the bubble into the black circle can easily achieve this. Either shorten the tripod leg closest to the off center direction of the bubble (or lengthen the leg farthest from the off center direction). The next step is to level the bubble in the plate level (the fine level) using the three point leveling technique. Loosen the horizontal lock-down and rotate the instrument so the plate bubble level is parallel to a line between any two leveling feet. Gently turn the leveling foot screws to center the bubble. Then rotate the instrument 90 degrees so the plate bubble level is perpendicular to the line of the two leveling feet first used. Using the third leveling foot screw center the bubble. Turn the instrument another 90 degrees and check to see that the bubble remains centered. If the bubble is off-center, perform the following.

Turn the two leveling foot screws used first equally in opposite directions to remove half of the displacement. Rotate the instrument another 90 degrees and use the third foot to remove half the displacement. Repeat as necessary.

If setting the Instrument over a known point check the optical plummet. If it is slightly off of the point, loosen the instrument's attachment screw on the tripod. Carefully slide the instrument exactly over the point while looking through the optical plummet. Do not rotate the instrument. Tighten the clamp. Then re-level the instrument.

3. Turn on the Total Station. On the older instruments, the display will flash the battery level (3 is 100 to 90% charged and 0 is 10 to 1% charged). On both the older and new instruments, a horizontal and vertical angle of zero degrees will be displayed. The instrument must now be indexed. This is accomplished by rotating the scope a full 360 degrees (a beep will be heard) and rotating the instrument a full 360 degrees (another beep will be heard). Either the scope or the instrument may be indexed first. On the newer instrument, the battery level is continuously displayed after indexing.

4. Attach the SDR to the data input port on the Total Station and turn on the SDR by pressing the I/O button. The SDR screen will open the main menu of last active job. The screen will display the job name, the last station used and the number of free records. The number of free records should minimally be above 500 for a job of any size. If you do not see this screen press the clear button until you do.

To work with a different job press the "FUNC" softkey and use the arrow buttons to scroll down to "JOB". Press the "OK" button and a list of current jobs stored on the SDR is displayed. Scroll down to the desired job and press the "OK" button again.

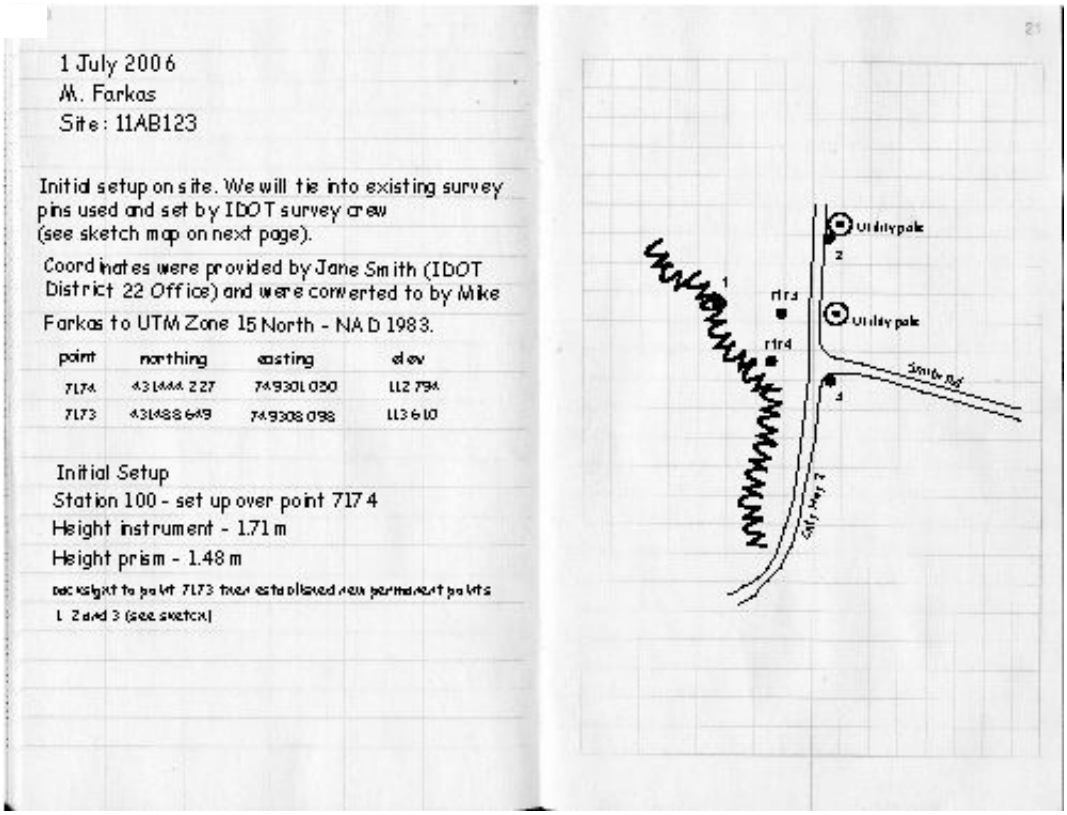
7. Measure and record the instrument and target heights (the target height can be altered during the job, however, you still need to record it at this point). The instrument height is measured from the ground surface to the small hole located on the side of the Total Station opposite the battery (measure to the nearest half cm). The target height is measured from the base of the pole foot (with a foot attached) to the center of the prism.

STARTING A NEW JOB WITH THE TOTAL STATION

1. Before you set up the Total Station you need to establish points of known location (resection or control points) from which the site grid will be based. You also need to decide whether the site will be mapped in real world coordinates (UTM) or an arbitrary grid. If you will be setting up the job in real world coordinates you need to have either IDOT provided points or you need to set up your own and record the positions through high accuracy GPS. This process is fairly involved and should ideally be planned at least a day or two in advance of setting up the Total Station (Coordinate with your resident lead surveyor/GPS tech or contact Mike Farkas).

When establishing an arbitrary site grid, the surveyor will set out three points in a straight line (magnetic north-south or east-west) spaced 10 meters apart. Use a compass and non-magnetic tape and try to set the line as straight as possible. Setting the line on as level a stretch of ground as feasible also helps insure the accuracy of the data. Drive a large spike or nail firmly into the ground and label and mark each (Resection Point #1, etc) with flagging tape and a lath (use this method for setting and marking points for both arbitrary and real world set-ups).

2. Detailed, accurate notes are essential. Are you setting up an arbitrary grid. Is it aligned to magnetic north? How did you establish the grid (tape and compass, GPS points, IDOT provided??). How did you tie in the elevation? All of this information is critical and must be clearly stated in the Total Station notebook and on the Total Station Information Form (see example below). It's best to clearly state what you did and how you did it. Please print legibly!



1 July 2006
M. Farkas
Site: 11AB123

Initial setup on site. We will tie into existing survey pins used and set by IDOT survey crew (see sketch map on next page).

Coordinates were provided by Jane Smith (IDOT District 22 Office) and were converted to by Mike Farkas to UTM Zone 15 North - NAD 1983.

point	northing	easting	elev
7174	4316444.227	749301.030	112.794
7173	4316488.649	749308.098	113.610

Initial Setup
Station 100 - set up over point 7174
Height instrument - 1.71 m
Height prism - 1.48 m
backsight to point 7173 then established new permanent points 1, 2 and 3 (see sketch)

3. After establishing the known points, it is time to setup the Total Station (See Setting Up The Total Station and SDR). If this is a job based on an arbitrary grid the total station should be placed perpendicular to the mid-point of the line created by the arbitrary baseline at a distance not more than 10 meters from the mid-point. In order for the resection to be successful, the angles generated by lines drawn from the Total Station to each of the resection points must exceed 10 degrees.

When setting up the Total Station on a site with real world coordinates you will either perform a resection (locating a new station using triangulation), or backsight (setting up using two known locations). When performing a resection from real world coordinate points, the location of the Total Station is again determined by the angles between the instrument and each of the resection points. Just as in the previous example, in order for the resection to be successful the angles generated by lines drawn from the Total Station to each of the resection points must be greater than 10 degrees (See above figure).

NOTE: Steps 3 and 4 can be performed before you setup the Total Station in your vehicle or even in the warmth and safety of your lab. In addition, due to the differing ages of the SDR's the menu items may be in different orders on each but the names and steps followed are identical.

4. Turn the SDR on and press the "FUNC" softkey. Scroll down to JOB and press the "OK" button. The screen will display all the jobs currently stored in the SDR. Press the "NEW" softkey (F1) usually located at the bottom left of the display and a screen with "Create Job" at the top will appear. Type the job name into the appropriate box (**always include the site number in the name**) and press the "OK" key when done. The SDR will now prompt you for notes. Add any additional descriptive text for the job and press the "OK" button to store the information in the SDR file. The SDR will again prompt you for a note. Add additional information or press the "Clear" button and you will be back in the "FUNC" menu.

5. At this point, you have a job in the SDR but no coordinates from which you will calculate the Total Station's position. You now need to enter the coordinates of your known points (either arbitrary or real). Press the "SURV" softkey and use the down arrow button to scroll the list until "Keyboard input" is highlighted. Press the "OK" button and highlight "Key in cords" and press "OK" once again. A screen now displays with "Pt" (point number) at the top followed by "North", East", Elev", and "Cd" (Code). Enter the appropriate point number (**all resection and control points must be numbered between 1 and 99**) and use the down arrow button to scroll to each of the next three and enter the values. Don't type anything in the "Cd" line, then press "OK" which inputs the point and coordinates and brings up a fresh screen into which you will enter the next point and location. Repeat this until all your points are entered then press the "Clear" button twice to bring you back to the "FUNC" menu.

6. At this point, the SDR must be attached to the Total Station and both must be turned on. Scroll up to "Resection" and press the "OK" button.

THE RESECTION

(Locating A New Station Using Triangulation)

1. If not already in the resection menu, enter the “SURV” menu by pressing the appropriate softkey. Scroll through the list and press “OK” when “Resection” is highlighted. A screen appears with spaces for the station number (stations begin with 100 and are sequentially numbered), theo height, and code. Enter the station number you want to use or create in the “Stn” box and the height of the instrument in the “Theo ht” box (height is entered in meters i.e. 1.52). Do not enter a code in the “Cd” box. Press the “OK” button and a screen will appear with the words “Pre-enter points” across the top.

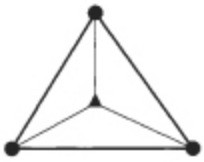
2. Enter the resection points that you plan to use in the same order you plan to shoot them by typing the number and hitting the “OK” button. Once you have at least three points entered press “OK” again and the SDR will tell you to take the first shot on F1 (face 1 on the Total Station, corresponds to V1 on the instrument) to the first point entered after you have taken the shot you must enter the target height then press “OK” to input the shot.

3. The SDR will prompt you to shoot the three points (or more if you entered more than three) in the same order you specified in the resection menu. After the last shot is inputted, the SDR screen will prompt you to turn the face over and hit any key when ready. Just do what it asks and rotate the scope and the plate so the V2 (face 2) now faces you and the horizontal and vertical control knobs are on the opposite side of the instrument.

4. The SDR will now prompt you to shoot the points again but in reverse order this time (1, 2, 3 from F1 and 3, 2 1 from F2). After you have inputted the last shot a screen will appear with three options. Scroll down and highlight “Calculate resection” and press “OK”. After a few moments, the screen will display the location of the current station (the location of the Total Station) and if the coordinates and elevation seem reasonable hit “OK”. However, if after calculating the resection the screen returns to the previous menu rather than displaying coordinates you probably did not follow the 10-degree rule. In this case, break down the Total Station, move to a new position, and start with a new station.

▶ EXPLANATION Precaution when performing resection

- In some cases it is impossible to calculate the coordinates of an unknown point (instrument station) if the unknown point and three or more known points are arranged on the edge of a single circle.



- An arrangement such as that shown on the left is desirable.

△▲: Unknown point
○●: Known point

- It is sometimes impossible to perform a correct calculation in a case such as that on the left.

①

②

③

- When they are on the edge of a single circle, take one of the following measures.

① Move the instrument station as close as possible to the center of the triangle.
② Observe one more known point which is not on the circle.
③ Perform a distance measurement on at least one of the three points.

- In some cases it is impossible to calculate the coordinates of the instrument station if the included angle between the known points is too small. It is difficult to imagine that the longer the distance between the instrument station and the known points, the narrower the included angle between the known points. Be careful because the points can easily be aligned on the edge of a single circle.

Note: On the reverse order shots taken from F2 the SDR may emit a warning chirp and display an error message showing vertical and/or horizontal errors. It is telling you that there is a discrepancy between the shot from F1 and the back-sight shot from F2. You have the option of accepting the error and moving on to the next shot or retaking the shot. Small errors in very windy conditions are almost unavoidable so it is recommended you accept the error. However, if a large degree or distance error is returned even after repeating the shot you need to check the coordinates of the points entered into the SDR and check that you are indeed shooting to the points specified from the resection menu.

5. Press the “Clear” key taking you back to the “SURV” menu. You will want to set the auto point numbering feature at this time. Once you know what shot number you will begin with press the “FUNC” softkey, scroll down to “Configure reading” and press “OK”. In the box labeled “Auto pt num” enter the next shot number you plan to take and press “OK”. This takes you back to the “FUNC” menu. Press the “SURV” softkey, scroll to “Topography” and press “OK”. Do not forget to turn the face back to V1 on the Total Station. You are now ready to shoot!

BACK-SHOOTING WITH THE TOTAL STATION

(Setting Up Using Two Known Locations)

1. Set-up the Total Station as previously described over a known site using the plumb bob and the optical plummet to precisely align on the known point. Choose either a known backsight point that has been previously shot in or one whose coordinates have been keyboard input into the SDR.

2. Press the “SURV” softkey, select “Topography” from the list and press “OK”. If this is a new job and you have previously keyboard input the known points select the station (point number) you are set-up over and the corresponding coordinates will appear. You will need to enter the instrument height in the “Theo ht” box, and then press “OK”. The next screen will say “Confirm orientation”. It will have the station you are set-up over listed so you must now enter the point number (or station number) of the backsight point. Enter the point number in the box adjacent to “BS pt” and press “OK”. You should now take a regular shot to the backsight point. After taking the shot, the angle error will be displayed. The error should not be excessive. (If the instrument is not precisely set up and leveled plumb above the station this method can be much less accurate than the resection method). You are now ready to shoot!

SETTING OUT POINTS

1. While working on a job you may want to set out points at a predefined location such as old points from a previous year or grid points across a site. This is performed through the “COGO” menu (COordinate GeOmetery) which is accessed pressing the “COGO” softkey. This is F3 on most of the SDRs.

2. If the desired points have not been recorded previously, you must select the "Keyboard Input" submenu then "Key in Coords". You will be prompted to enter a point number, east coordinate, and north coordinate for each location. You do not need to enter an elevation since that will be determined by the Total station. As you enter each point, press "OK". After all your points are entered press clear twice and you are back at the "COGO" menu.

3. Now select "Set Out Coords" from the menu. It will ask you to confirm the current station. If the current station is correct press "OK", otherwise type in the station number and press "OK". Type in the first point number of the location you are locating and use the down arrow to enter the point and move to the next line. Repeat this until all the numbers are listed for setting out.

4. Next use the arrow keys and highlight the first point number you want to locate. Press "OK" and the SDR will display the angle and distance to the point. The angle is not the true observation to the point. Rather, it is a reference azimuth that you need to rotate the Total Station to the point. In other words, when the angle is 0 the scope is pointing at the location. Send the assistant out with the target to the approximate location of the point and take a shot. The SDR will now display the in and out distances as well as the left and right distance from the target to the actual location. Move the target the specified distances and shoot again. Repeat this process until you are satisfied with the placement, and then press "OK". The SDR will ask you to store the actual coordinates of the point. If you say YES, the actual position will be stored. If you answer NO, the keyboard input location will be the only data stored for that point.

Repeat this process until all the locations are set.

THE POINT NUMBER CONTROL CONCEPT

We use number ranges to control data in the field just as you would for controlling data in a database. This keeps certain groups of data (shots) are grouped together in the SDR and makes it easier for the cartographer and field crew to read and work with the data in the lab.

SHOT #	DESC
1-99	Resection and map control points
100-500	Stations
501-999	Grid points set out during COGO
1000-2000	Topographic data
2001-3000	Line-work (roads, excavation blocks, ROW limits, etc….)
3001-4000	Feature mapping points (A, B, C, D nails)
4001-4999	Piece plots
5000-5999	Post mold numbers
Etc	
Etc	

The above groups can be made larger, but remember that piece plots **WILL ALWAYS START WITH 4000**. Other number groups may be defined to track other types of shots such as buried horizons, midden definition, etc.

CODE SYNTAX FOR SDR

As the Sokkia Map program is obsolete and no longer supported by the manufacturer, we will no longer use most of the old SDR codes. Specifically, those codes that were used by the Sokkia Map program to draw, close, or end lines and curves are no longer necessary and should be eliminated.

Feature, TU, or EB unit designations should now be incorporated into the shot entry and the "NOTE" command not used.

In theses examples the *old system is italicized* and the **new is bold.**

To shoot in feature mapping points use the following syntax:

OLD
For mapping nail A of feature 20:
F NUM 20A
For mapping nail B of feature 20:
F NUM 20B

NEW
For mapping nail A of feature 20:
F20A
For mapping nail B of feature 20:
F20B

OLD
To map a test unit or any type of polygon:
NOTE DESC TU1 or NOTE DESC EB4 etc
TU START
TU
TU
TU CLOSE

NEW
To map a test unit or any type of polygon:
TU1
TU1

TU1
TU1

OLD
To map any type of straight line:
RDEDGE START
RDEDGE
RDEDGE
RDEDGE CLOSE

NEW
To map any type of straight line:
RDEDGE
RDEDGE
RDEDGE
RDEDGE

A few additional points to consider

While our Total Stations are very accurate instruments, they do have limits and built-in error. For example, the infrared laser is susceptible to atmospheric distortion. The speed of light in air changes with the density of the air, therefore, a 10 degree change in temperature over the course of the day can equal 1 cm over a distance of 250 m. By taking regular highly accurate temperature and barometric pressure reading we could control for most of this type of error, however, this is not realistic given or equipment and level of training. Also the optics of our instruments is accurate to 5 degrees. This equates to ± 1 cm error over 200 meters.

The point of this is to remind the operator that small errors are inherently present but. Add any error caused by a less-precise setup to those described above and it is possible to have have several cm errors over the distance of 100-200 meters. For these reasons you should, whenever possible, avoid taking shots over great distances. This is especially true when shooting control points, for example, on a nearby site. In this case it is preferable to use the backsight method and transfer the grid through several setups to the new site.

Section 8 "Excavations of Burials" has been superseded. If you unexpectedly encounter a burial in the field, contact Kris Hedman, ISAS Human Skeletal Analyst for instructions on how to proceed.

8 Excavation of burials

Excavation and analyses of human burials depend primarily on the quality of skeletal preservation. For well-preserved burials, the primary objective is to remove the remains from the ground with minimal damage. For poorly preserved remains, it is essential to record as much information as possible prior to removal from the ground. *The key point to remember is: the poorer the condition of the material, the greater the value of the field data*. ISAS procedure requires the presence of at least one state-certified Skeletal Analyst to be present during the excavation of all human burials.

Once remains are removed from the ground, they are subject to a variety of hazards, such as drying out and breakage. For this reason, it is vital to record as much information as possible while the remains are in their original archaeological context. The following information should be recorded when the skeleton is exposed (before removal): estimations of the age and sex of the individual, the presence of pathologies, pre- and post-mortem damage to the skeleton (such as evidence of mortal wounds, removal of body parts as war trophies, location of excavation damage, perimortem cutmarks, etc.), and certain measurements long bones.

In the state of Illinois, the law regarding discovery and excavation of unregistered human remains is known as the Human Skeletal Remains Protection Act (20 ILCS 3440). This law and associated state and federal regulations as well as ISAS policy (accessible on the ISAS Internal Web site) stipulate that a skeletal analyst who is certified by the state of Illinois must be present and involved with the excavation and removal of all unregistered human remains- whether prehistoric or historic (older than 100 years). Consequently, these guidelines are designed for experienced field personnel who are assisting the skeletal analysts in the excavation of human remains. It is important that the excavator and the skeletal analyst work closely together to ensure that all the information regarding context, associated cultural materials, and feature information are recorded on the appropriate field forms before removal of the burial.

The excavation of human remains is an emotionally and politically sensitive issue that is controlled by state and federal law. All ISAS personnel involved in such activities will carry out the process in a respectful manner and in accordance with ISAS procedures and policies. Given the sensitive nature of burial excavation, absolutely ***NO PERSONAL PHOTOGRAPHS*** *are allowed by any crew member or visitor. Personnel not complying with such policies and laws are subject to disciplinary action up to and including termination of their job.*

The following field forms MUST be filled out and checked by a supervisor and/or skeletal analyst BEFORE the remains are removed from the ground.

1. Feature/level report
2. Burial report, part I

3. Burial map

The following forms will be completed by the skeletal analyst:

4. Burial report, part II -this includes the skeletal inventory, depths of human remains, degree of articulation, burial position, measurements of skeletal elements and field observations regarding age, sex, pathology, and taphonomy

Discovery of Human Remains

When human remains or possible human remains are encountered at a site, the excavator should:

1. Stop excavation of the feature and notify the supervisor; once the supervisor has seen the human remains, protect the exposed elements by covering with a tarp or empty flot bag, Carefully place a thick layer of dirt over the plastic to hold it down and then cover with a screen to prevent any crushing of the exposed element(s). IHPA and the state law require the remains to be left in situ if it is possible to avoid disturbing them. Do not expose the remains to direct sunlight for a prolonged period of time.
2. Once the supervisor has confirmed human remains are present, he/she should follow the ISAS protocol for discovery of human remains (see attached memo). This involves:
    a. Site supervisor/director calling the local Field Station Coordinator
    b. Field Station Coordinator determines whether the Site Director or Coordinator calls the following individuals (see below). In many cases, it may be best for the Site Director to call since he/she is most familiar with the site and the context of the remains. Check with your Field Station Coordinator on the protocol for this situation.
        i. Director of ISAS
        ii. IHPA
        iii. Local county coroner
3. The individual making the above calls should fill out the Burial Notification Form (this can be found in Section 5 as well as the ISAS Internal web site). This form will be a record of who made the calls, who was contacted, the type of communication (e.g., phone, email), the individual who took the message, and when the calls were made. A copy of this form should be faxed to the ISAS Skeletal Analyst in charge of all burial records.
4. The County Coroner's office has authority over any unidentified human remains until the burial is identified as prehistoric or older than 100 years.
5. If the burial appears to be historic and older than 100 years, the Site Director must determine whether it is part of a registered cemetery. Each ISAS Division lab should have a list of registered and unregistered cemeteries in Illinois obtained from the Illinois State Comptroller's Office. For more information, see Section 5.

6. Excavation of any burial cannot proceed until approval has been obtained from IHPA, the archaeologist at IDOT, and the Director of ISAS to excavate the burial.
7. Once this approval is granted, contact the Skeletal Analyst(s) at ISAS and make arrangements for the excavation and removal of remains.

Excavation

ISAS policy regarding the excavation of burials requires the presence of a Skeletal Analyst at the site to evaluate the context of the burial, make observations, and oversee the completion of the burial excavation. Field personnel may be asked to assist with the excavation of a burial. Only designated individuals who have experience in the excavation of human remains and/or burials will assist in the initial excavation of human remains when a skeletal analyst is not present on the site. Such instances are unusual, but occasionally occur when isolated human elements are encountered in general habitation features. Although the early stage of excavation may be conducted by field personnel, the final completion of the burial excavation is conducted by an ISAS Skeletal Analyst. When the skeletal analyst is present, additional field personnel may be asked to assist with the burial excavation. Burials are assigned both a feature number and a sequential skeleton number. If multiple individuals are present, each identified individual will have a unique skeleton number.

Burials should be carefully excavated to prevent damage to the bones. Bone from archaeological deposits is friable and easily damaged by careless excavation techniques.

Step–by-step burial excavation

1. Complete a plan map of feature limits and get field notes in order prior to beginning excavation under the direction of the skeletal analyst or field supervisor. The site supervisor, crew chief, or skeletal analyst will assign individual skeleton numbers to the burials that should be recorded on all notes, bags, and photographs.
2. Carefully excavate around the outer edge of the human remains to define the limits of the burial; this will aid in the excavation of the burial by helping to identify burial orientation and position. Don't begin completely exposing the remains until you have determined the burial position and limits of the skeleton.
3. Slowly excavate downward, maintained a level surface, leaving bones and artifacts on matrix pedestals when necessary.
4. Once burial orientation and position have been identified, the excavator may begin carefully exposing the more durable skeletal elements (e.g.,, long bones of the legs, arms, cranial vault) using wood or bamboo implements, spoons, and knives. Refrain from cleaning the bone surface repeatedly as this may dry out the bone too quickly. Leave the more thorough cleaning until immediately before the photograph.

5. Once you begin exposing the burial, flotation samples should be taken of all the soil directly around the human remains. Please indicate on the flot tags which area of the skeleton the soil is from (e.g., pelvis area, cranium). This will allow for identifying areas within the burial that contain fragile and/or poorly preserved specimens, such as fetal remains or kidney stones. Flots from burials are identified by red flagging tape inserted between the two plastic flot bags as well as tied around the top of the flot sample.
6. Please keep the exposed bone covered when you are not working on it to prevent excessive drying of the skeletal elements.
7. Avoid exposing delicate areas that are critical for assessing age and sex of the individual (such as the pelvis, face and the teeth). The skeletal analyst will expose these areas.
8. In the case of poor preservation, the skeletal analyst may decide to remove the remains in matrix pedestals. If this is the case, excavate the pedestals ~5-10 cm below the burial to help maintain stability of the pedestal during transport to Champaign.
9. If the sun is bright, a tarp or small tent should be set up over the entire burial to prevent drying.
10. **If artifacts (e.g., vessels, tools) are associated with the burial, they should always be removed from the site before the end of the day to avoid the chance of looting.** If it is late in the day, the excavator should sketch the item(s) on their plan map and take a digital image of location and position before removing the items for safe-keeping at the lab overnight. The artifacts can be brought back into the field the following day and replaced in their original position for final documentation and mapping.
11. When excavation is complete, the excavator should complete all pertinent feature forms and the Burial Report I form (see below for instructions for this form).
12. Prepare photo board, north arrow, and scale for photographing excavated burial. Fill in photo information on Burial Report Part I.
13. Draw plan view map of the burial (1:10 scale) and label the bones in the map.
14. Have supervisor/skeletal analyst check paper work.
15. The ISAS Skeletal Analyst will be responsible for recording all available information about the human remains on Burial Report II.
16. Under supervision of skeletal analyst, remove burial bone by bone (for well preserved burials) or in blocks (for poorly preserved burials), labeling foil *before* removing the bone it will hold.
17. If possible, take depth measurements along the centerline of the long axis of the feature floor after the burial and feature fill has been removed to record the shape of the feature floor. Typically, it is not possible to get a traditional feature profile during burial excavation, but at least we can record the general feature shape (e.g., flat-bottomed, basin).
18. Take feature flotation sample from beneath the burial
19. Compile paperwork (staple or clip together), double check to make sure *all* forms and maps are present
20. Give *all* forms to your supervisor

Tools and Consolidation: It is preferable to use wood or bamboo picks when excavating around human remains. However, some soils with high clay content make this impossible. In cases where metal tools (i.e., trowels, knives, spoons) are used, please use caution when adjacent to bone.

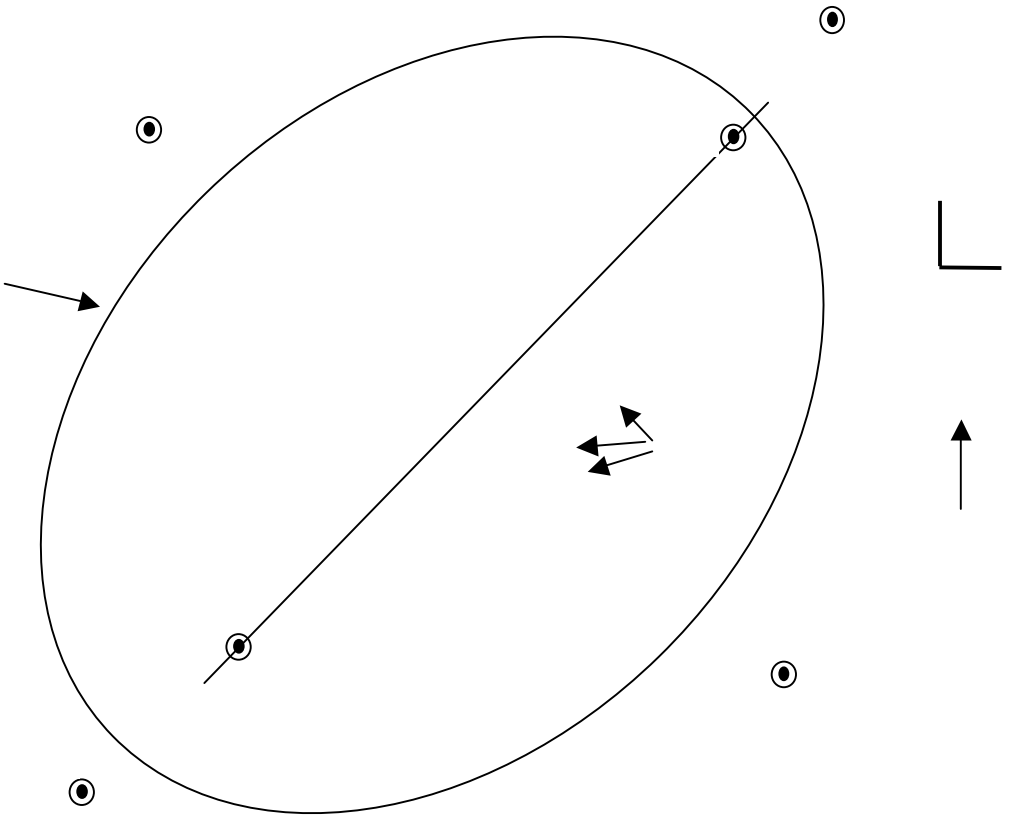
At times, a preservative may be used on fragile bones during excavation to prevent them from crumbling or splitting. Elements that frequently need to be treated with a preservative during excavation include teeth, the pelvis, vertebrae, and the articular ends of longbones. The use of a preservative in the field is to be decided by the attendant skeletal analyst.

Burial Map

Burials are mapped using the same techniques you would use to map features. Two additional grid nails may be placed at either end of the burial along the long axis of the feature (see example below). This will enable the field personnel to complete the map more efficiently- particularly if the burial is located more than 10 cm below the feature surface. The grid coordinates and the elevations of the nails should be recorded on the field map as well as on the burial forms. The plan view map should be drawn with the aid of meter sticks to create a grid. This is more accurate than estimating the locations and positions of the bones. The map should always include:

- the feature datum
- a north arrow, to indicate the burial orientation
- the site, feature, and burial numbers.
- the date, name or initials of excavator(s)
- indication of pit outline and limits of excavation
- position of burial goods
- label bones present (to aid in interpreting the drawing), such as pelvis, right femur, ribs, teeth, etc.
- a scale, to indicate the relationship between centimeters on the graph paper and actual distances; generally burials are mapped in a 1:10 scale
- a key indicating various objects in the map: bone might be represented by open or unfilled sketch lines, firecracked rock by solid or filled in sketch lines, chert by hatching the sketches in area, etc.

If more than one individual is present in a burial, then individuals should be drawn in different colors. Colored pencils should be available from supervisors.



Photography

Photography of burials should follow the same procedures established for non-mortuary features. Digital photos and color slides should be taken of the burial and recorded in the field photo logs (both digital and 35mm), the feature forms, and the Burial report I and II forms. Prepare the photo board (either a small blackboard or a menu board) with the site, feature, and skeleton numbers and the date. The photo board, a north arrow (placed to point to magnetic north) and a scale must be shown with the burial. Additional close-up images of the burial may be requested by the skeletal analyst to document age, sex, pathology and/or taphonomy. Close-up photographs of associated artifacts should also be taken. *To reiterate, no field personnel or visitors are allowed to take personal photographs of any burials or burial excavation. Photographs of burials are only taken as part of the field documentation.*

Removing Burial

Extreme care must be taken in removing the remains from the ground. Removal of human remains can only occur after the skeletal analyst and site supervisor/crew chief has reviewed all the forms and maps and is present to direct burial removal. Excavation protocol for the removal of human remains will be determined on a case-by-case basis.

1. If the remains are poorly preserved and taken out in pedestals, use the following procedures:
    a. The individual pedestals should be identified as 'A', 'B', etc., and the outlines of the pedestal limits should be precisely recorded on the burial map.
    b. To remove a pedestal, carefully dig around the part to be removed, keeping its lower portions encased in matrix. Lift slowly and avoid breaking the block into smaller pieces (it may take two people).
    c. Before final removal of a pedestal, a tiny ball of foil or a tack should be inserted into the north end of the pedestal and recorded on the plan map. This will aid in orienting the pedestal in the lab for situations where the remains are almost unrecognizable in the field.
    d. Pedestals should be covered in heavy-duty aluminum foil. Label the outside surface of the foil with the site number, feature number, bag number, skeleton number, pedestal identification, date and excavator. You may need several layers of foil depending on the size of the pedestal.
2. Well- preserved remains may be picked up and placed in either foil pouches or paper bags. The exterior of the bags/foil should include the site number, feature number, bag number, skeleton number, date, excavator and identified element(s). The skeletal analyst may still want to remove the cranium, pelvis, and ribs in pedestals. This will be determined on a case-by-case basis.
3. All human remains should be placed carefully in boxes cushioned in such a way as to avoid any crushing of pedestals or bone. These will be transported directly to the Champaign ISAS Laboratory for analysis.

Important points to remember are:

- Have foil labeled and ready before removing a bone from the ground (don't write on foil once it contains a bone).
- Always carefully loosen the bone from the ground and lift bones out from underneath them, **NEVER** pull or force bones out of the matrix.
- All foil packages must be labeled with site, feature, and burial numbers, bag #, and element and side. Generally each individual skeleton will be assigned a unique bag numbers. Isolated piece plots and miscellaneous loose bone may be assigned a separate bag number than the actual skeleton.
- All bones from one individual must be boxed together and kept separate from bones from other individuals.
- The box must be labeled with the site, feature, and burial numbers.
- On the outside of the box, any special information can be noted as well (such as "cranium *en bloc*").

Feature Report / Excavation notes

General This form is filled out for a burial feature, just as you would for other features like a fire pit, midden pit, or house floor (Section 5). Burials are assigned both a feature number **and** a skeleton number. Features containing multiple individuals will

have skeleton numbers assigned for each individual. Feature numbers are assigned by the field supervisor. Either the field supervisor or the skeletal analyst will assign the skeleton numbers once the number of individuals present is determined. Feature and skeleton numbers should be indicated at the top of the form.

Flot samples Ordinarily, flotation samples are taken for all the soil immediately around the human remains. An additional flot sample is also taken of the soil immediately below the human remains after the remains have been removed. These flot samples ensure that all fragments of human remains are recovered from the field. In addition, we have at times been able to identify additional individuals (e.g., infants) based upon the presence of enamel fragments from the flotation samples.

If a feature contains more than one individual, please try to maintain separate flot samples for the soil around each individual. When this is not possible, you may begin a separate flot for the combined soil from both individuals- this should be labeled as ' Feature …-Combined soil from around Skeletons 1 and 2'. Please identify approximate areas where the flots are from – e.g., Flot samples taken from the pelvic area of a skeleton are tagged "Pelvic Flot". Both the feature and skeleton numbers are indicated on the tag as well. The number and contents of the flot samples are also recorded on the level report form. To make the identification of burial flots easier, all burial flots should have a large piece of red flagging tape placed in between the inner and outer flot bags as well as another strip of red flagging tape tied around the top of the sample.

Soil Description and Sketch Map Soil and fill descriptions are also recorded, citing the type of fill, general color, hardness, and grain size. A sketch map (with a north arrow) and general notes should also be included. At the bottom of the form, the excavator's name, the dates the burials was started and finished, the name of the individual recording the form, and the supervisor's initials must all be filled out.

Burial Report - Part I

This form provides a brief, one-page summary for the skeletal analyst regarding the context of the burial(s) and should be filled out by the crew member(s) excavating the features since they are most familiar with the feature context. Although most of the information required on this form is self-explanatory (i.e., Site name and #, Excavators, Supervisors, Date, Feature dimensions, Datum, Photographs, Soil characteristics), details on the information needed for number of the categories are discussed further below.

Feature Description As with the feature report, the site, feature and burial numbers must be filled out. Feature information should be only briefly stated (see example in Section 5). If additional skeletons are found in a burial, their presence should be noted.

Excavation Procedures and Interpretations

Excavation Technique Discuss how the feature and burial were excavated (e.g., what tools). In some cases the feature will not be recognized as a burial prior to excavation- please include this information (e.g., burial identified with shovel

during excavation of first half of feature- after discovery, excavation procedure modified to burial excavation using trowel, bamboo picks, and spoons)

Associated Remains or Features Describe any associated features or burials. For example, a burial may be associated with nearby graves or charnel/house structures. Indicate what this is based upon (e.g., similar diagnostic material, proximity). Also indicate if additional individuals are present in same feature. If burial is clearly a later intrusion (such as within or beneath a house floor), please indicate this as well.

Natural or cultural disturbances Discuss any type of disturbance here. Natural disturbances would be rodents or tree roots. Please indicate approximately where the disturbance is present in the feature (e.g., around the legs). Cultural disturbances would include intrusive prehistoric or historic features, looting, and heavy machinery.

Feature interpretations Describe the main function of the feature (e.g., definite grave, general habitation feature with burial located towards the top of the feature). Describe general characteristics of the burial(s) (e.g., 2 individuals placed side-by-side, single individual, central feature of a charnel house, ossuary feature [this is a feature with a large number of primary and secondary individuals clearly interred at the same time]). Also include any non-artifact information on feature characteristics here such as mat linings, associated logs, soil discolorations (eg from hematite/red ochre).

Associated Artifacts A brief description of the types of artifacts clearly associated with the burial(s) should be recorded here. Materials (e.g., chert flakes, sherds, FCR) found within the feature fill that are NOT clearly associated with the burial are recorded below the basic material categories. Sometimes, particularly in cases of rodent disturbance, associated artifacts (e.g., utilized flakes) may be displaced from their primary locations and appear to be part of the general fill. Having this information on this form helps the Skeletal Analyst evaluate the association of all materials from the feature.

It is very important to include as much information about the context of the burial as you can. Describe the burial as completely as you can, including:

- any damage to the skeleton noted **prior** to excavation (such as heavy equipment damage, whether or not a pit outline was observed, etc.)
- whether the individual appears to have been holding or wearing something
- a description of damage that occurred to the skeleton **during** excavation and/or removal
- anything you find that *might* be important.

Burial Report - Part II-Filled out by Skeletal Analyst

The following information is to be recorded by the Skeletal Analyst:

Type of Burial
- Primary = individual is predominately articulated; some elements may not be articulated due to rodents and/or roots
- Secondary = individual is predominately non-articulated and often in a tight cluster or with some patterned orientation of elements; frequently referred to as 'bundle burial'; may have some articulation present along vertebral column or occasional joints such as knees or elbow
- Cremation = Refers to examples where fire was deliberately used as part of the mortuary treatment; does not include incidental burning of isolated elements
- Isolated = only a few isolated elements present; typically not in a mortuary context (e.g., habitation feature)

Burial Position
- Extended = Body is laid out in anatomical position with legs oriented straight with the torso
- Semi-flexed = Same as extended only legs are both bent at the hips in a 45 – 90 degree angle and knees are bent as well (what degree?)
- Tightly flexed = Legs are bent close to the torso; 'fetal position'
- Indeterminate = Generally used in cases where poor preservation limits ability to identify burial position (e.g., only cranium and humerus present on anatomical position, but legs are not present or they are disturbed)

Body Deposition – predominately refers to position of the torso
- Supine = Individual is laid on their backs
- Prone = Individual is laid face down on the front of the torso
- On left side
- On right side
- Indeterminate
- Other

Arm Position
- Extended = Arms extended in anatomical position at the sides of the torso
- Folded = Arms are bent upwards across the chest (i.e., Egyptian pharaohs)
- Crossed = Lower arms are extended but cross each other in the area of the pelvis
- Indeterminate

Body Orientation
- Top of head = Refers to the direction the top of the head is pointing (N, NE, E, SE, S, SW, W, NW)

Vertebral column = Refers to the direction the vertebral column is oriented (e.g., NW-SE)

Degree of flexure

Additional Position Information
Forearm = Prone or Supine
Cranium (side down) = Right, Left, Front, Base, Posterior
Other = Describe here any unusual position characteristics (e.g., legs unnaturally bent, arms extended above head)

Sex = field estimate based on observable criteria (e.g., cranial (mastoid process, occipital, mandible, supraorbital ridge, glabella, overall shape) and postcranial (sciatic notch, pubic symphysis, pubis, femoral head measurements, overall size of elements)

Measurements – to be taken prior to removal of elements from matrix. These serve as field estimates that can later be double-checked during analysis. Add additional measurements (e.g., cranial breadth) as possible.
Head of femur
Head of humerus
Long bone lengths

Age estimate- consider all observable criteria such as dental development, dental attrition, epiphyseal closure, length of long bones (subadult), auricular surface, pubic symphysis, presence/absence of arthritis

Taphonomy
Preservation of individual skeletal elements; categories consist of poor, fair, good, excellent
Burning – distinguish by element and color (1 = brown/black, 2 = grey, 3 = white); indicate if multiple colors are present
Describe gnawing (rodent or carnivore), breakage (antemortem and/or postmortem), cultural modification (e.g., cranial deformation, modified teeth)
Briefly summarize any observable pathology (e.g.,, periostitis, infection, arthritis, fracture, et)

Depths below datum – clearly indicate datum elevation and where datum is (e.g.,, F15A)

Sketch map- include body orientation, north arrow, any associated artifacts or burials\

Photographs – list all photos taken- digital and color slide

Bag numbers – record all bag numbers and descriptions of any materials/samples relating to burial

Skeletal Part Inventory This page shows a somewhat schematic representation of the human skeleton, including different views of the cranium. This form is used as a visual *inventory* of what bones were present in the burial (for various reasons, burials do not always include the whole skeleton). To begin, be sure to fill in the feature/burial numbers. Indicate how you will be filling in the form (Are you marking bones present, or bones absent?). Typically we will record the elements present. Also, indicate on the form which joints were articulated.

Depth This form is also used to record the *depth* of the burial below the scraped ground surface. Depth measurements are made using a meter stick, or tape measure, and a line level. The line (with attached level) is pegged at the burial's datum point, and depth of the major joints (cranium-neck, shoulders, elbows, wrists, hips, knees, and ankles) are filled in next to each joint for both right and left sides.

Maximum Length Measurements Measurements of the major longbones and the cranium are made on this sheet as well. The bones should be measured while they are still in the ground. A tape measure should be used for this. The bones are measured for their *maximum length*. Figure 10 illustrates the points that are used to measure maximum length of the cranium, femur, humerus, and tibia. These field estimates are critical. If the bones do not survive excavation in a whole state, then these values are the only data we have for estimating the stature of the individual. Maximum length measurements should be taken of the cranium, the humerus (upper arm bone), the femur (thigh bone), and the tibia (the shin bone). If only one of a paired bone is measured, be sure to indicate which one was measured (right femur, left tibia, etc.).

Appendix A. Definitions

Types of Sites:

Campsite – an archaeological site that was occupied on a seasonal or short-term basis
Cemetery – a location separate from a habitation area where multiple individuals are buried.
Habitation – an archaeological site where a human group has lived and conducted normal daily activities for a significant period.
Quarry – an archaeological site where lithic raw materials have been mined.
Ritual – an archaeological site that is used mainly for ceremonial purposes.

Types of Materials:

Ceramics – artifacts made from fired clay; pottery and pipes are examples of these artifacts; often a temper (material added to clay for an even distribution of heat) is used to prevent breaking of the clay.
Chert – a fine-grained, mainly opaque, silicate rock that is used as raw materials for chipped stone artifacts.
Faunal – a Latin term that refers to animal remains.
FCR (Fire-Cracked Rock) – rocks which have been cracked or broken by the heat of a fire.
Floral – a Latin term refers to plants.
Rough Rock – refers to lithic materials other than chert and pebbles; materials such as limestone, granite, and basalt are examples of rough rocks.

General Terms:

A-B-C-D points - designated points that run across the feature/structure; or two points that bisect a section of a feature/structure to create a profile.
Archaeomagnetic sample – samples of burned soil from features such as baked clay structures (ovens, kilns, and hearths) collected for Archaeomagnetic dating. There are very specific methods for collecting these samples in the field.
Archaeomagnetic Dating – This method is based on the principle that burned soil will retain the magnetic signature of the earth at the time of burning. Since the magnetic forces in the earth have changed through time, theoretically scientists can match up burned soil samples with the magnetic record and estimate the time when the burning event occurred.
Auger Test - a subsurface detection method using either a hand or machine-powered core to determine the depth and character of archaeological deposits.
Burial – a human or animal interment; can be a ‘primary’ interment (body buried only once) or ‘secondary’ interment (a body was buried initially for specific time period and later then exhumed, cleaned, and reburied).

Datum – a fixed reference point from which horizontal and vertical measurements are taken.

Elevation – a measurement of vertical distance in mapping; elevations taken from the Total Station are based on MASL (Meters Above Sea Level), thus elevations on the A-B nails/or points and the grid nails are MASL.

Excavation Block – refers to an area that has been machine-scraped and can be any size. Purpose is to quickly and efficiently expose subsurface features.

Feature – evidence of human activities visible as disturbances in the soil or material concentration; are produced by digging pits for storage, setting posts for houses, or by constructing a hearth for cooking; often distinguished by soil discolorations and/or artifacts.

Flotation - the process of recovering small particles of organic material by immersing sediment samples in water or other fluids and skimming off the particles which float on the surface; materials that float on the surface are called Light Fractions, and these are botanicals such as seeds and charcoal. Materials other than the light fractions are called Heavy Fractions and these materials are commonly lithics, ceramics, and faunal remains.

Flotation (flot) sample - a soil sample collected from a level/zone for flotation.

GPS – stands for Global Positioning System and is used to locate sites on a map. This is a radio navigation system that allows users to determine an exact location, velocity, and time 24 hours a day, in all weather conditions, anywhere in the world. It works via satellite and information downloaded into a computer.

Grid – a network of uniformly spaced squares that divides a site into units based on the metric system.

Hand-excavated unit (HU) - a defined unit of measure for the purpose of recovering archaeological material. Generally determined within a grid system.

Hearth – a burned area at a habitation site that functioned as a cooking and/or heating area. It is usually found at the bottom zones; can be easily identified because of its distinct matrix (dark and reddish burnt soil, charcoal-filled, and some burnt materials).

In situ – the original location of deposition that has not been disturbed; generally used to describe the context of artifacts.

Level – an excavation layer, which may correspond to strata or zone.

Line level - a small spirit–bubble designed for suspension on a string used in archaeology to establish level horizontal lines for mapping profiles.

Material Bag - a bag of artifacts (ceramics, chert, fauna, and others) collected during excavation.

Midden – a deposit marking a former habitation site that represents a living surface. Identified by soil discolorations and cultural materials. May be present across an entire site or only in small areas. Typically reflects the everyday refuse of the site occupants.

Mitigation – refers to the excavation of sites that are to be impacted by construction or development within a project area.

Phase I – in the federal and state historic preservation system refers to the survey of a project area to identify all historic properties and archaeological sites that are present.

Phase II - in the federal and state historic preservation system refers to the testing and evaluation of all historic properties and archaeological sites within a project area to determine which ones meet the criteria for listing on the National Register of Historic Places.

Phase III - in the federal and state historic preservation system refers to the excavation or preservation of all historic properties and archaeological sites within a project area to that are determined to meet the critieria for listing on the National Register of Historic Places. Often referred to as "mitigation" when it involves excavations.

Piece Plot – refers to specific artifacts that are found on a surface whose specific horizontal and vertical location is mapped on the plan map.

Plan Map – a map of an archaeological feature and/or and excavation unit that is based on horizontal location within a site grid system.

Plowzone – the top layer of the soil strata disturbed through plowing.

Postmold – the impression, stain, or cavity left in the ground by a rotted or burned wooden post.

Primary context - refers to materials that are found where they were originally deposited (e.g., undisturbed by later taphonomic or cultural activities)

Profile – a vertical section or exposure of the ground showing different layers/zones within a feature or excavation unit.

Provenience – specific location of an artifact (feature number, layer, zone, or level).

Radiocarbon Dating (C-14 Dating) - C14 or radiocarbon is an unstable carbon found on organic remains. The method is based on the set rate of decay of C14. The amount of C14 in the carbon of the sample is then compared to the amount of carbon of the living tissue.

Radiocarbon (C-14) sample - organic material, usually charcoal, nutshell, or bone collected for radiocarbon dating.

Shovel scraping - carefully shaving off thin layers of soil from features or units using shovels while making sure to keep all areas level so as to avoid mixing zones. Also used to assist in defining features on machine scraped surfaces

Shovel Test – subsurface tests using a shovel; used during Phase I surveys to identify the presence or absence of prehistoric or historic occupation.

Soil Probe - a device used to find the vertical depth of a feature/structure and number of zones by looking at a cross section of the stratigraphy. Often referred to as an Oakfield probe.

Soil sample – a quantity of soil or sediments collected for physical or chemical analysis.

Sterile-soil - layer of soil that has no indication of cultural activities.

Structure – remains of a house or building.

Superposition – the principle that under stable conditions layers on the bottom of a deposit were laid down first and hence are older than the layers on top.

Survey - the systematic examination of the ground surface in search of archaeological sites.

Total Station – a Transit device combined with GPS to produce topographic, maps, grids, and elevations of features and artifacts. Information is downloaded into a computer to make maps.

Transit - an optical surveying instrument directly mounted on a tripod to produce topographic maps – rarely used anymore.

Triangulation – a ruler-based mapping system using the Pythagorean theorem that states that in any right triangle, the square of the hypotenuse is equal to the sum of the squares of the other two sides. Archaeologists can use it to lay out squares when no transit is available. All you need to know is that in a one meter square the hypotenuse is 1.414; a two meter square's hypotenuse is 2.828. Can also be used to piece plot artifacts within squares by measuring from two corner nails.

Zone - a layer of soil. Usually thought to represent a separate depositional event of artifacts and fill within a feature.

Appendix B. ISAS Tool Kits- Contents

Tool Kit Contents: these items were issued to you by ISAS and you are responsible for having them present in your tool box at all times.

1	Trowel (blade not to exceed 6”-Marshalltown preferred- forged, not welded)
2	6” Rulers
1	12” Ruler
1	Sharpie Marker
2	Metric Folding Rulers
2	Ice Picks or Chaining Pins with String
3	Line Levels
4	Pencils (2H lead if mechanical-not 4H or 6H)
5	Sharpened Chopsticks
1	File

Tool Kit Additions: these items are strongly recommended for you to add to your tool kit (and are usually kept in the ISAS vehicles)

Extra String
Red Nails
Extra Sharpie(s) and Pencils(s)
Material Bags
Flot Kits
Little White Nails (for defining)
Rubber Bands
Foil
Small Vial(s) or Box(es)
Cotton/Tissue/Bubble Wrap
Pocket Knife
Compass
Gloves
Tape Measure
Plumb bob

Supplies kept in truck
Shovels
Hoes
Buckets
Chaining Pins
Material containers (boxes, vials)
Forms
Graph Paper
Dustpans
Files for sharpening shovels, trowels