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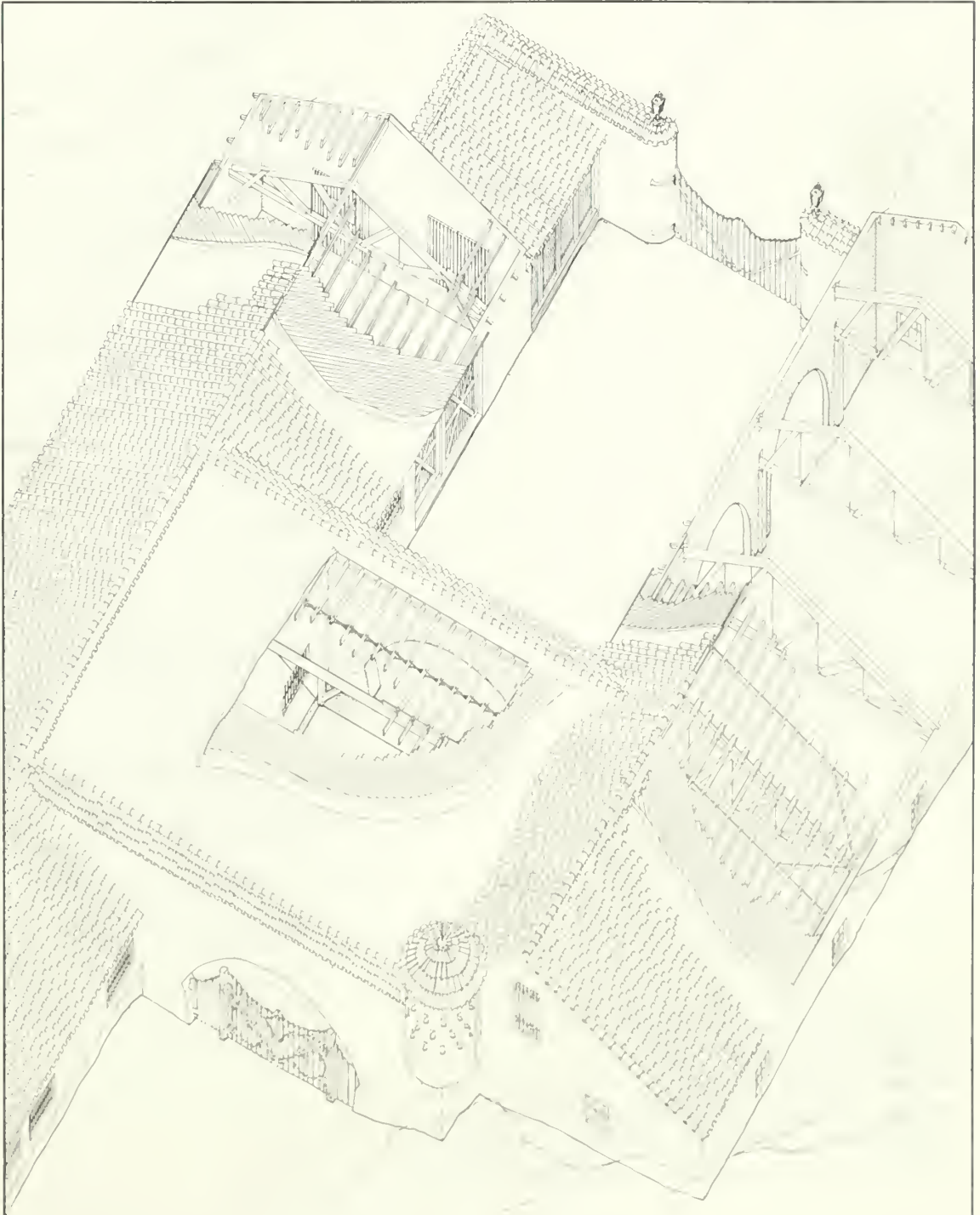
HISTORIC STRUCTURES PRESERVATION DATABASE

UNIVERSITY OF GEORGIA

APR 15 1988

User's Manual

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FORWARD to Version 1.0

Murphy has a law that pertains to computer programs. It states:

There is always one more "bug" to be eliminated.

This is particularly true of new software. We have tried to test this software extensively, but undoubtedly, those of you who will be using it will find things that don't work, or work improperly, or that could be improved.

Rather than attempt, by committee, to define what we would like the HSPD to be, contract for the software development, and then live forever with our mistakes unless and until costly revisions could subsequently be made, it was felt that the HSPD should be a database *by conservators for conservators*. As both a conservator and a programmer, I have made the first cut.

Even as you receive this software, there are improvements that I, personally, would like to make:

- More extensive subject references for the Bibliographic database.
- Searches within the information text itself.
- Graphic information to supplement the text.

That these are not included at the outset is due to several factors. Primarily, it is because the capabilities of the software used to develop *this* software, as well as my own, were unable to accomplish them when the project started. Both have improved since then. However, I could spend all my time keeping up with new innovations in computer technology and never get the system out to you. Also, you will have ideas that you would like to see incorporated. These may affect where we go from here.

So...

For a while, at least, the future development of the HSPD will be up to you. I want you to test it. I want to know about the problems you encounter, and any suggestions you may have for improvement. And, of course, I want your data to put in it.

One of the things you are going to discover is that there are various things that you will wish information about and the computer will not even accept the words. The master list of words the HSPD recognizes was culled from a number of sources, but of course, we couldn't possibly think of them all. The

program works on the basis of code numbers (which you normally never see) associated with the various words, so if we haven't programmed in a word and an associated code, you will get an error message. This could mean that we have made no provision whatever for the HSPD to contain the information you desire, or it may just mean that the system will only accept some other word (a synonym) rather than the word you are using. Regardless of the cause, we *want* to provide you with the information you are seeking, and we *want* you to be able to use the words you would normally use to locate that information. Please let us know about these omissions so that we can correct them.

I have stated that this is *your* system . . . well, at least, *our* system. As long as I am keeper of the HSPD, I remain firmly committed to this idea. I welcome your criticisms and suggestions. I may not be able to accommodate everyone's wish list, but I assure you, every suggestion will be seriously considered and implemented if it *can* be and if it results in an *overall improvement* to the system. Several suggestions from my first "guinea pigs" have already resulted in such changes. I hope you will help me make this a useful tool for all of us.

Periodically, there will be revisions. If there are minor problems, corrections may have to wait until there are enough of them to make issuing revised software worthwhile; if there are major problems, I will do my best to get corrections to you as soon as I can work them out.

Several other people have made significant contributions to the HSPD. I wish to acknowledge them so that they may share any credit that may be due the HSPD, and so that they may likewise shoulder some of the blame. They are:

Hugh Miller, Chief Historical Architect, WASO
Randy Biallas, Assistant Chief Historical Architect, WASO
Tony Crosby, Historical Architect, DSC
Bob Carper, Historical Architect, DSC

I especially wish to acknowledge the contributions of Mary Volkert, not only for her editing of this manual (any "errors" in punctuation are purely *my* responsibility - she pointed them out, but I refused to change them), but especially for the effort she made in researching and editing much of the reference data contained in the database, for her entry of *all* the data, and for her thoughtful help in designing the way the HSPD software and manual should work and look.

Dave Battle
January, 1988

CHAPTER 1 - THE HSPD

The Historic Structures Preservation Database (HSPD) is a computerized information base containing data about historic and prehistoric structures preservation technology and procedures. It is based on a commercial database software program known as "dBASEIII PLUS", and consists of programs and databases compatible with "dBASE III PLUS". The programs have been compiled, however, and it is not necessary to have the "dBASE III PLUS" software to use the HSPD system. It is designed to be used on a "PC" type microcomputer using the "MS-DOS" or equivalent operating system. See Chapter 2 for the specific system requirements.

The HSPD was begun in 1987 under the auspices of the Park Historic Architecture Division, WASO. It was designed and developed by David G. Battle, Senior Historical Architect, Denver Service Center (DSC), who has also been designated as the first "keeper" of the HSPD.

At the present time, the "official" users of the system consist of the Regional Historical Architects, the DSC Historic Architecture Section Chiefs and the Chief Historical Architect. The keeper's office has furnished 1 copy of this manual and 1 copy of the program and data diskettes to each of these offices. Undoubtedly, there will be additional users in the future.

Distribution

The HSPD is the first of what is envisioned to be a system of computerized tools for historic and prehistoric structures preservation. The HSPD is intended primarily for use by historical architects, architectural conservators and preservation specialists. It is being made available to the Regional Offices, WASO, the Williamsport Preservation Training Center and DSC. These offices may further copy and distribute the system as they see fit. Because distribution of the programs and data must initially be done by means of "floppy" diskettes, it would be impossible for the keeper's office to supply more than these offices with updates. Depending upon the success of the HSPD, other means of providing wider distribution could be made available in the future. This would probably involve the use of a centralized computer that could be accessed over the telephone by means of a modem.

Revisions

Periodically (two to three times a year), a printout of all additions or revisions to the database will be sent to the previously named offices, as well as to any other user who specifically requests to be on the review list and who continues to submit review comments. Reviewers will have 30 days from the time the review copies leave the keeper's office to get their comments back to him or her. This is a short time, but it is necessary in order to keep the data as current as possible. All comments received within that time will be considered before the revised diskettes are sent out. All comments received after the 30-day time period will be considered, but any revisions resulting from them can not be included until the next time diskettes are sent out.

Upon acceptance of any proposed additions or revisions to the data, programs or the manual, they will be incorporated into the HSPD. Data diskettes containing revisions to the data and (if necessary) the programs will be sent to the previously mentioned offices, as well as copies of any revisions to the manual. Until and unless the HSPD can be implemented on a centralized computer system, official users must then make one or more copies of each of the diskettes for their own use, and return the originals to the keeper's office to be used in the next update. (It would be too expensive for the keeper's office to continually furnish new diskettes with each update.) Failure to return the original diskettes in good condition, or to replace them with an equal number of new diskettes, could mean that the using office might not receive the next revision.

Submissions

The HSPD system depends upon you, the user. It is your system. Without your continued input, interest and suggestions, it will become obsolete and useless. It is each of us who are working on projects, doing research and developing new methodologies that must supply the data to the HSPD. At the same time, there are sometimes conflicting data and varying opinions to be considered, and in such cases, someone must make a final decision. That is the responsibility of the keeper of the HSPD.

Submissions of data will be accepted from anyone at any time, provided they meet the following conditions. First, they must be submitted in hardcopy form, or on 5-1/4-inch floppy diskettes and in ASCII format. The hardcopy format (Xerox's, clippings, a note on a table napkin, or whatever) doesn't matter. But, all submissions must have a complete bibliographic reference (if you are the source, that's fine, but we must know that too), it must be

legible, and it must be verifiable. All submissions will be reviewed by the keeper, and it is the Keeper's decision as to whether submissions can or will be entered into the system as additions or revisions to the existing data.

As with the data itself, suggestions as to how the system can be improved will always be welcomed and considered.

Using this Manual

The manual has been organized as follows:

- Chapter 1 - Information about the HSPD system in general and about the use of this manual.
- Chapter 2 - Information about installing the HSPD program, and about using the utilities included as part of the program. Once the HSPD software has been installed, you will seldom need to use the utilities, except for copying data to new diskettes, or updating your own hard disk files when updated floppy diskettes are issued.
- Chapter 3 - Instructions for the use of the system. For most purposes, this is the only chapter you need to read.
- Chapter 4 - Gives the background and rationale behind the development of the HSPD. You may find it helpful, however, in deciding what to enter when specifying the data you are seeking.
- Appendices - Words that can be used to specify the type of information being sought and structural component and/or problem associated with that component.

At various places throughout this manual, it is necessary to provide you with information about what you should type to use the HSPD system. Where you *must* enter something from the DOS prompt, which usually looks something like this:

```
C:\HSPD>
```

the text of what you must enter will be enclosed in a box such as this:



Once you have begun the HSPD system, however, the manual can only give suggestions as to an appropriate entry. Such suggestions are usually given in capital letters and are enclosed in single quotation marks (''). Where the manual discusses what you may see on the screen, the text is enclosed in double quotation marks ("").

Further information about appropriate data entry conventions will be given elsewhere in this manual.

CHAPTER 2 - INSTALLATION AND UTILITIES

The “Historic Structures Preservation Database” (HSPD) software consists of a diskette containing the HSPD program and associated lookup tables, a diskette containing an index that is used by the program to locate the various pieces of information, and one or more data diskettes for each of the data files contained in the system.

Although the HSPD system was designed for use by someone with little or no computer experience, it is necessary that the person installing the system at least have a basic knowledge of the capacities of the computer to be used, how to create and use directories (if a hard disk is to be used), and the ability to copy files and diskettes.

Minimum Requirements

To use the HSPD system, you must have a computer that uses the “MS-” or “PC- DOS” operating system, version 2.0 or later. It must also have a minimum of 512 kilobytes (“K”) of random access memory (“RAM”), at least two disk drives each with a minimum storage capacity of 360K (one of these may be a hard disk), and the HSPD program and data diskettes.

Installation Options

Depending upon the type of disk drive your computer has, there are several different ways the system can be installed.

If you are going to use the HSPD system frequently, the most advantageous installation is to have both the HSPD program and the data files installed on one or more hard disks. The advantages of this is that the system runs much faster, and it avoids the necessity of inserting and removing diskettes during execution. On the other hand, the data files have the potential to take up a large amount of disk space. If this is a factor, the second most advantageous installation is to place the HSPD programs on a hard disk, but use the data files from the floppy diskettes. A third option, if you have two floppy diskette drives, is to place the HSPD program diskette on one drive, and use the second drive for the data file diskettes. Using the data files from the flop-

py diskettes rather than copying them to a hard disk requires a lot of disk swapping, but it *will* work. The HSPD program will tell you what diskette to use, and when and where to use it, so the major considerations are just convenience and speed. The only firm requirement is that the HSPD program diskette be available at all times.

Installation Procedures

If you elect to install all or part of the system on a hard disk, you must install it in one or more directories on the disk. These can be of your own choosing. The data files need not reside in the same directory as the program (although it's usually more convenient if they do), but the data files may not be split up among several directories.

It is recommended, however, that you create a directory called "HSPD", and then install the HSPD program and the data files all in that directory. To make such a directory, type:

```
CD\
```

at the DOS prompt. Then type:

```
MD C:\HSPD
```

to create the HSPD directory.

You should then enter the HSPD directory itself. Typing:

```
CD C:\HSPD
```

will do this.

You must then install the program in the directory. The simplest way to do this is to insert the HSPD program diskette into drive A (or drive B if you wish), and type:

```
COPY A:*. * C:
```

(or 'COPY B:*. * C:' if you are using drive B) to copy all the files on that diskette to the HSPD directory. (This assumes that the hard disk is drive "C" and that you are placing the files in a directory named "HSPD"; if this is not the case, substitute the appropriate drive designation for the letter "C" and be sure you are in the proper directory before copying.)

You may also install the data file by inserting each of the data file diskettes and the index file diskette into the same drive and again typing:

```
COPY A:*. * C:
```

after inserting each one until all the files have been loaded onto the hard disk. However, there is a utility in the HSPD program for copying the data and control files more easily. Its use will be covered shortly, so you may wish at this time to use the above procedure only for copying the HSPD program files to the hard disk.

If you elect to use the HSPD program and/or database files from floppy diskettes, you should first make backup diskettes. Otherwise, no other file copying is required.

Configuring the HSPD Program

You must now “configure” the HSPD program. This simply means that you must provide the information the computer needs to find the proper drives and directories for the various database files and to display the data properly. To accomplish this, you must run a configuration utility included as part of the HSPD program. To start the HSPD program, simply type:

```
HSPD
```

at the DOS prompt (be sure you are in the proper drive and directory first). This will bring up the title display and a prompt asking if you would like instructions. For now, answer 'N'. You will then see the main HSPD menu, illustrated below.



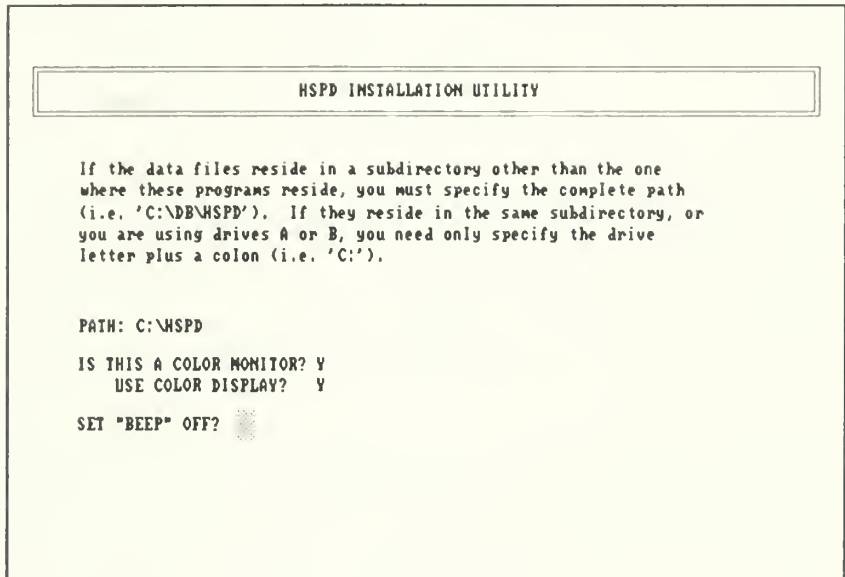
Figure 2.1
The main menu.
Enter the number corresponding to the operation you wish to perform.

Select option 2, "Run Utilities". You will then get the utilities menu, which looks like this:



Figure 2.2.
The utilities menu.

Select option 3. This will bring up a screen display that looks like the one shown below:



*Figure 2.3.
The Configuration
Screen is used to
specify where the data
files will be found,
how the screen dis-
plays are to appear,
and audible warnings
about important
operations.*

The cursor will be sitting at the box labelled "PATH:". The "path" tells the computer where to find the database files. If you intend to use the data files from floppy diskettes rather than placing them on a hard disk, simply type the name of the drive you will use followed by a colon (i.e., 'A:' or 'B:') into the box, and then press the "ENTER" key. Similarly, if you are going to keep them in the same hard disk directory as the HSPD program, you need only enter 'C:'. Otherwise, you must enter the complete path. This path consists of the drive name followed by a colon and a backslash, the name of the first-level subdirectory followed by another backslash, and the name of any lower-level subdirectory (if any) so that the last-named subdirectory is the one in which the data files reside. An example might look like this:

```
C : \MIKE\HSPD
```

If the default path that appears in the box is correct, you need only press the "ENTER" key to accept it.

After specifying the path, you will be asked if your computer has a color monitor. If it does, answer 'Y'. You will then be asked if you wish to use the color display. If you answer 'Y', the program will use various colors to highlight the screen displays; if you answer 'N', the screen will use only black and white. (Note: if your computer uses a color graphics card such as an "EGA" card with a monochrome monitor capable of displaying various shades, you may also wish to answer 'Y' to both questions.

Lastly, you will be asked if you wish to set the "beep" off. At various points in the program's execution, audible warnings of errors or things you should pay attention to are sounded. Some people find these warnings distracting. Although you can not shut the warnings associated with error messages off, answering 'Y' to this question will shut the other warnings off. Answering anything but 'Y' will leave all warning tones on.

Having specified your color preference or indicated that you do not have a color monitor, and indicated your preference regarding the "beep", you will be returned to the utilities menu. You do not have to run the configuration utility again unless you wish to change one of the settings for some reason.

Because other persons who may wish to use this system may not know how you configured the system, a place has been provided on the first page of the next chapter for you to note what they must enter to start the HSPD program.

Copying Data Files

If you wish to use the data files from a hard disk, and did not copy them to the hard disk by the method mentioned earlier, selecting option 2 on the utilities menu will allow you to do so.

You will first be asked to specify the name of the diskette drive to be used. Normally, this will be 'A' or 'B'. You will then be given a warning that the database files (if any) already residing in the drive and directory to which you are copying will be erased, and you will be asked to verify that this is OK. If you answer 'N', you will be returned to the utilities menu.

If you answer 'Y', you will be instructed to insert the index diskette into drive A. This diskette contains index files that tell the system which data file a particular piece of information is stored in. When you have inserted the index data diskette and pressed a key as instructed, the copying process will begin. While the copying is proceeding, the message "COPYING..." will be displayed. As each file is copied, the message "1 File(s) copied" will appear. When the process is complete, the word "COMPLETE" will be added, and, if you have not set the "beep" off, a tone will sound. Because it is absolutely necessary that the index be up to date, you must copy the index diskette each time you run this utility, regardless of whether you copy all of the data files or not.

```
COPYING DATA TO C:\HSPD\  
  
INSERT INDEX DISK INTO DRIVE A:  
Press any key to continue...  
  
COPYING...COMPLETE  
      1 File(s) copied  
      1 File(s) copied  
  
COPY REFERENCE FILE 1?
```

Figure 2.4.
The file copying
screen will tell you
what diskette to in-
sert, and where.

Normally, each time you install data files on a hard disk, you will want to install or update all of them. It is not necessary that you do so, however. Because there may be a reason that you don't want to copy or update all of them at any given time, you are given the option of copying or not copying each of the data files, as shown on the previous page.

The index files that you just copied contain a record of how many data files of each data type exist. (In order to be able to send you the data on 360 K diskettes, most data files have to be split up into several files of the same type of data, each one being placed on a separate diskette.) The program will go through all the data files it has a record of, asking you if you wish to copy each one. If you do wish to copy a particular file, insert the appropriate diskette and press a key when you have done so as instructed on the screen. You will get the same "COPYING..." and "COMPLETE" messages as before.

When the copying process is complete, you will be returned to the utilities menu.

Option 1 was provided because there may be occasions when you wish to duplicate a hard disk file on a floppy diskette. It works exactly like option 2.

Selecting option 4 will return you to the main menu, where you can then select option 1 to retrieve data from the files. This will be covered in the next chapter.

An HSPD Batch File

If people with little or no computer experience are to use this system, a batch file can make life easier for them. It allows the HSPD program to run from any hard disk directory simply by typing:

```
HSPD
```


To create this batch file, type the following:

```
CD C:\
COPY CON:HSPD.BAT
ECHO OFF
CLS
C:
CD C:\HSPD
HSPD
```

Then press function key “F6” (or simultaneously press the “Ctrl” and “C” keys. You should get the message, “1 File(s) copied”. If you check the contents of the root directory (“C:\”) by typing “DIR”, you should find that a file named “HSPD.BAT” now exists.

This batch file assumes that you have placed the HSPD program on drive “C” and in a directory named “HSPD”. If you did not place the HSPD program in a directory called “HSPD”, substitute the proper directory name after the backslash in the sixth line.

Some people configure their computer system to have all their batch files in a given directory. These are often named either “BATCH” or “BIN” (for “binary”). One could, of course, call it any legal name one likes. If you do this, however, there must be a statement in the “AUTOEXEC.BAT” file that says “PATH = C:\BATCH” or some variation thereon. You can modify your AUTOEXEC.BAT file to include this statement if it doesn’t already exist, but if you are not familiar with how to do it, it’s better to leave the HSPD.BAT file in the root directory where the above instructions will have created it.

CHAPTER 3 - USING THE HSPD

Starting the HSPD Program

If you installed the HSPD system according to the instructions in Chapter 2, you already know how to start the HSPD program, and whether it and the data files are all on a hard disk, or if one or both are being accessed from floppy diskettes. For those who don't, the two computer text boxes immediately below have been left blank to provide a place for the installer to describe just how use the system on your particular computer.

To access the proper drive to run the HSPD program, type:

If the drive name that the installer has entered in the box above is not 'A' or 'B', then the HSPD programs have been installed on a hard disk. This means that unless an "HSPD.BAT" file has been created, you must also be in the proper hard disk directory before you can start the program. To do this, type:

Once you are in the proper directory, or if an HSPD.BAT file has been created and properly installed, all you have to do to begin the HSPD system is to type:

If the data files are being accessed from the floppy diskettes, the program will tell you when and where to install them as they are needed.

Note:

The person installing the HSPD program should enter the necessary information for your particular installation into the blank boxes to the right.

The HSPD title page will then be displayed, which looks like this:

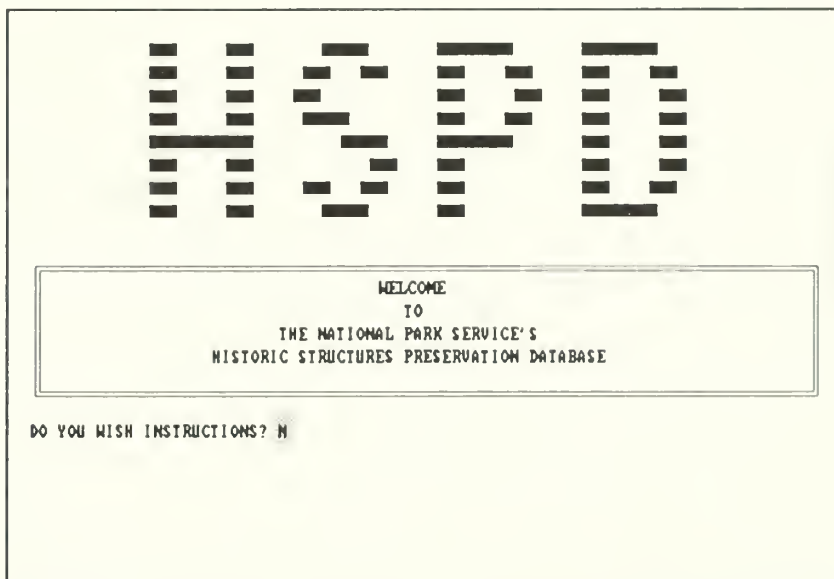


Figure 3.1
The title page.
Answering 'N' to the
"instructions" ques-
tion will allow you to
go directly to the
main menu.

Below the title, you are asked if you would like instructions. If you answer 'Y' to this question, you will be presented with a brief synopsis of how to use the system and information about how to obtain additional help if needed. The HSPD system contains a number of additional "HELP" screens to assist you in using it properly. More about these screens and how to access them will be covered in the section on "Function Keys".

If you answer 'N' to the instructions question, or after you have finished viewing them, the HSPD main menu will appear, as shown below.

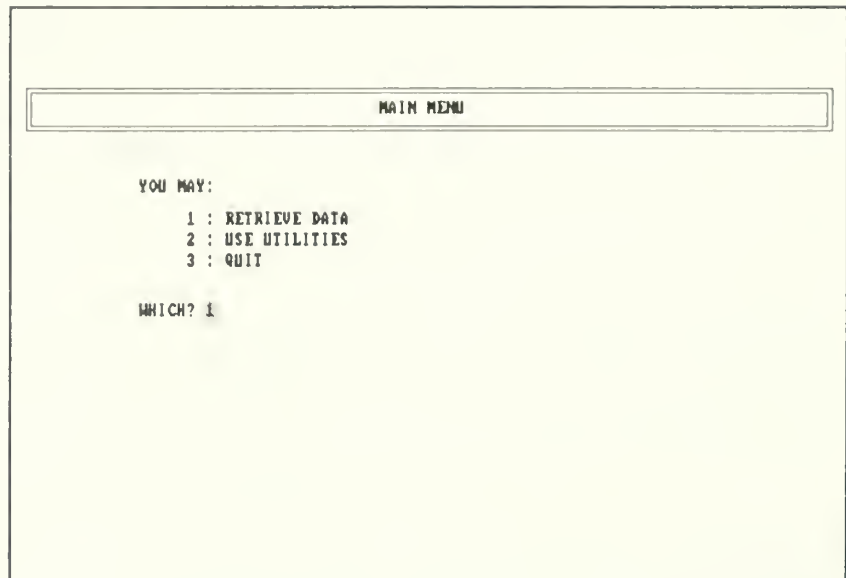


Figure 3.2.
The main menu.
Enter the number cor-
responding to the
operation you wish to
perform.

The main menu gives you three options. The first is to retrieve information from the database. The second is to use the utilities, which were described in Chapter 2. The third is to quit. If you elect to quit, you will be returned to the DOS prompt. You will be returned to the main menu after each set of data that you specify has been displayed or printed out, or after exiting from the utilities menu. This is so that you can exit from the HSPD system if you desire.

You will see that the cursor is at the box next to the question that asks "WHICH?", and that the box already has the number "1" in it. This means that option number 1 (to display the data on the screen) is the "default" choice, and to accept this choice, you need only press the "ENTER" or "RETURN" key. If you wish to quit, enter 3.

Data Entry Conventions

Before discussing what happens next, however, let's cover some of the "rules of the road" about how you respond to prompts and how you enter the information that tells the computer what to look for.

Every time there is something that you must enter, there will be a "box" like the one next to the "WHICH?" question on the main menu. Sometimes it will only have room for one character, as that one did; other times, the boxes will be somewhat larger. Sometimes there will already be something in the box - a "default" value. Other times, it will be blank. Whenever there is a default value, you can always use it simply by pressing the "RETURN" or "ENTER" key. You can also retype it if you prefer. In general, you will discover that the default value is structured to keep you from making mistakes that will take more time to recover from if wrong than the default option would if used unintentionally.

Now let's get something straight about this "RETURN" or "ENTER" key business. They are the same key. It's just that it is called "RETURN" on some computers, "ENTER" on others and, in fact, many don't say anything at all, but just have an arrow pointing to the left with a "hook" on the right end of the arrow. If what you type into a box fills it, you do not need to press the "ENTER" key; you will automatically be sent to the next box. However, if there is space left blank in it, you *must* press the "ENTER" key before you can move on, just to tell the computer that there's no more information to be put into that box at the moment.

At various places as you proceed through this chapter, you will be given instructions or suggestions as to what you should enter. These are always shown in capital letters enclosed by single quotation marks. This is just to help make things clear - it does not matter whether you enter your responses in upper or lower case letters. The computer will automatically convert lower-case letters to upper case, if necessary. (You do *not* enter the quotation marks, however.) In most cases, whatever you enter becomes the default.

In those blocks where you must enter various words to specify the information you desire, it also does not matter whether you use singular or plural words. In other words, regardless of whether you type something like 'DOOR' or 'DOORS', 'MOUSE' or 'MICE', the computer can *usually* figure it out. Also, you do not have to fill up the entire block - just use as much space as you need, though you can't enter anything longer than the space provided. You *do* need to spell the words correctly, however, and if you are typing over an earlier default value, you must delete any incorrect characters following the new entry.

Single-character responses require that you enter either a whole number (integer) or a 'Y' or 'N' response. If you enter a number outside the indicated range (i.e., you enter a '4' when there are only three choices indicated), the program will not proceed. If you enter anything but 'Y' or 'N' in response to a "yes or no" question, the result will either be interpreted as 'N' by the computer, or else it will not proceed until you *do* enter either a 'Y' or an 'N'.

Where you must enter words to specify the information you are seeking, the computer will check them against a master list of acceptable words for that category. If it is not a word contained on that master list (or perhaps you misspelled it), you will get a message telling you that it is not an acceptable entry. You can then either correct it, or try another word.



Figure 3.3
A typical error message indicating an unacceptable material specification.

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The first part of the report is a general introduction to the project. It describes the objectives of the study and the methods used to collect and analyze the data. The second part of the report is a detailed description of the results of the study. It includes a discussion of the findings and their implications for the field of research. The final part of the report is a conclusion and a list of references.

Year	Value
1990	100
1991	110
1992	120
1993	130
1994	140
1995	150
1996	160
1997	170
1998	180
1999	190
2000	200

The data shows a steady increase in the value of the variable over the period from 1990 to 2000. This suggests that the variable is positively correlated with time. The rate of increase appears to be constant, indicating a linear relationship.

Function Keys

Before proceeding on through the program, let's say a few words about the use of the "Function" keys. The function keys are usually labelled "F1", "F2", etc. and are normally located either in two vertical rows at the left side of the keyboard, or in a single row across the top. Most keyboards have either ten or twelve function keys. Only a few of them are used by the HSPD program.

Whenever the function keys are available, a menu of the keys that are active at that time and the action their use will cause will be displayed in the lower right-hand corner of the screen. See figure 3.5. At any time that the function keys are not activated, there will be no menu, and pressing them will have no special effect.

"Help"

The following sections in this chapter will discuss in detail the various specifiers you can or must enter in order to indicate the information you are seeking. However, if you don't have the manual handy and become confused as to what to enter, pressing function key 'F2' will allow you to obtain a brief explanation as to what the program is allowing you to enter.

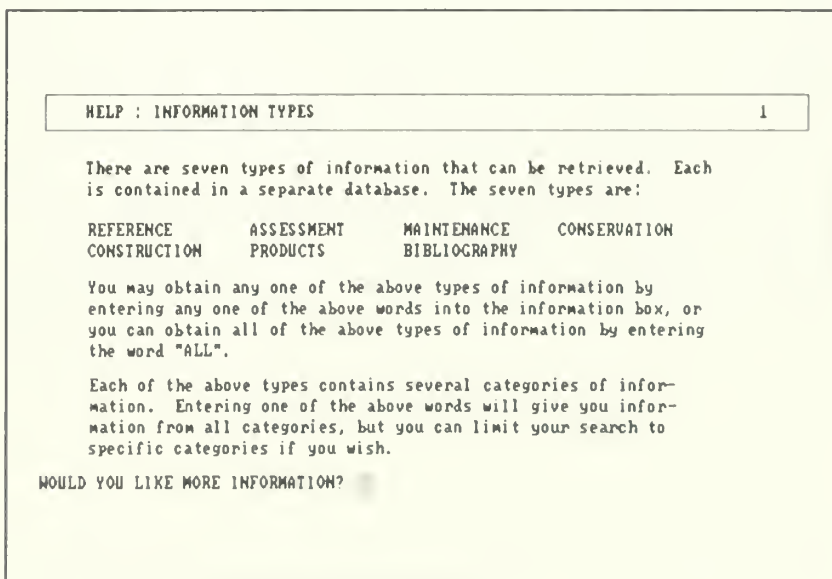


Figure 3.4
A typical help screen.

As soon as you are through reviewing the help screens, you will return to where you were and be allowed to continue.

“Cancel”

Pressing function key 'F3' whenever the menu indicates that it is available will allow you to cancel your current specification and return immediately to the main menu.

“Erase Line >”

The use of function key 'F7' will erase all of the characters on the current line to the right of the cursor, indicated by the arrow on the screen menu description. It is particularly handy if you wish to clear a default specification from a previous request, or enter a new specification that is shorter than the default. You can simply type over the existing word and then use this key to delete any remaining unwanted characters.

The PANIC Button

Normally, you should exit from the program by selecting the “Quit” option from the main menu. You can get there quickly by using the “Cancel” key whenever it is active.

In an emergency, however, you can also exit from the program immediately by simultaneously pressing the “Alt” and “C” keys. This will cause a cryptic “Q/A/I” (Quit/Abort/Ignore) prompt to appear in the upper right corner of the screen. Pressing either the “Q” or the “A” key will cause the program to terminate immediately and you will be returned to the DOS prompt. Entering an “I” will allow the program to continue if you change your mind.

This is an **emergency** procedure only. One should always exit the program via the “quit” option on the main menu if possible. Using the “Alt-C” method may cause problems with the computer settings and may make it necessary to “re-boot” the computer.

Information Types

The first thing that you must specify is the type of information you desire.



Enter type of INFORMATION you wish to RETRIEVE .
INFORMATION: MAINTENANCE

F2:HELP F3:CANCEL F7:ERASE LINE)

The screenshot shows a terminal window with a text prompt. The prompt asks the user to enter the type of information they wish to retrieve. The user has entered 'MAINTENANCE'. At the bottom of the window, there is a box containing function key instructions: F2:HELP, F3:CANCEL, and F7:ERASE LINE).

Figure 3.5
Specifying the information type.

There are seven types of information that you can obtain. Each type is contained in a separate database, and if you are using floppy diskettes, you will find that each database is on a separate diskette, or set of diskettes. The seven types are: assessment, maintenance, conservation, construction, products, re-reference, and bibliographic data. Additionally, each type (except the bibliography) has several categories of information. For instance, the reference database is essentially a computerized encyclopedia, and it can contain definitions, descriptions and information about potential threats to whatever you are seeking reference information about. If you specified the type of information (i.e., 'REFERENCE'), you would get all the information contained in all the categories under that type. In other words, if you entered 'REFERENCE' you would get a definition, a description and potential threats for whatever you specify. On the other hand, if you enter the category of information you desire, you will only get the information pertaining to that particular category, regardless of whether data pertaining to the other categories exists or not. To illustrate, if you enter 'DEFINITION' as the information type, you would only get the definition of whatever you specify. The computer can find the proper database for each category because no two databases contain identical categories.

You can take the information specification even one level further. Within each category of information, there is often a preservation activity about

which you wish information. You could, for instance, ask for information about “scrubbing” floors. If you entered the word “scrubbing” into the information box, the computer would accept it, and it would know that the data *ought* to exist under the “routine maintenance” category in the “maintenance” database. However, it can not tell whether there actually *is* any information there about “scrubbing” floors - only that there is *some* housekeeping information about maintaining floors. You are also more likely to find that the word “scrubbing” is, in fact, not used at all, but that there might well be information about “cleaning” floors.

There is one other entry you could make when specifying the information you desire. This is the word 'ALL'. This will cause all information in every category of every database except the reference database to be printed or displayed, provided it exists. If you wish, you can also include the reference data as well. The way to do this will be covered further on.

You **must** specify a valid information type. The program will not proceed until you specify the type of information you are seeking. It will also check to see if what you entered is valid, and if not, you will get a message similar to Figure 3.3 telling you so, and you will be required to enter a different specification. **Appendix A** contains a listing of the information or database types and categories, their definitions, and a list of other words you can use as information type specifiers as well.

Specifying What Information You are Seeking

Having successfully entered the information type, the screen will be expanded to look as shown below. The five items that have now been added allow you to specify the **subject** about which you wish to obtain information. The first four define some component of the structure, and the last item allows you to indicate a particular problem associated with that component, if you so desire.

```
Enter type of INFORMATION you wish to RETRIEVE .
INFORMATION: MAINTENANCE

Enter at least one of the following items to indicate what you wish to
MAINTAIN:
ELEMENT:
UNIT:      GUTTERS
MATERIAL:  METAL
TYPE:      HANGING
PROBLEM:   

F2:HELP  F3:CANCEL  F7:ERASE LINE
```

Figure 3.6
Entering the subject
specifiers.

You only need to specify one of the five items to create a valid specification. If you leave them all blank, the computer will dutifully go the appropriate database, but because you haven't told it what to look for, it will fiddle around a bit and return empty-handed, and all you will have accomplished is a waste of time. The more items you specify, the more detailed you can be about the information you wish to obtain. This will be discussed further in just a bit. First, though, let's cover just what each of the items mean.

Elements

An “element” is either a major component of a particular structure or the broad category to which a number of units may belong. An element could be a particular type of room, such as a kitchen or a bathroom. It could represent a particular feature of the structure or its surroundings such as a porch, dormer or road. More often, it is used to designate a structural component such as the roof, foundation or siding. The term “masonry”, as a category under which units such as brick and stone are grouped, is also considered by the HSPD to be an element.

Units

A “unit” is normally just a smaller component of the structure. Often, it is the piece or unit of which the element is comprised, such as a shingle or brick.

It is sometimes difficult to know whether something is an element or a unit and in some cases, what is an element in one specification may be a unit in another. For example, if you requested information about a dormer roof, the dormer would be the element and the roof would be the unit; however, if you asked for information about a roof shingle, the roof would now be the element, and the shingle would be the unit. The thing to remember is that the element is bigger than the unit; the unit is part of the element. Don't worry about it, however. Just remember that both the element and the unit refer to some component or area of the structure. **Appendices B and C** contain lists of words that can be used in specifying elements and units. They are listed according to what the HSPD normally considers them to be. However, if you enter an element as a unit and/or a unit as an element, the computer will sort them out. It will just take slightly longer. If you enter two specifiers that can only be elements, or two that can only be units, you will get a message saying that the particular combination of specifiers can't be used.

Materials

The “material” indicates what the “units” or “elements” are made of, such as wood, metal and stone. But you can also be more specific because you can indicate a particular material such as cedar, copper or granite. This is important, as will be demonstrated shortly. Almost any common building material can be specified. A more complete list of acceptable material specifications can be found in **Appendix D**.

There are two potential sources of confusion here. Hopefully, this explanation will help to eliminate them.

One problem is that we often think of things like *plaster* and *paint* as a material. This database considers plaster to be a rendering, and paint to be a finish, and as such, considers them to be *units*. The primary materials of which they consist (i.e. *gypsum* plaster or *oil* paint) would be the material specifier. Therefore, if you want information about *paint*, the term “paint” must be entered as a unit; if you want information about *painted surfaces*, the term “surface” must be entered as a unit, and the term “painted” as a type - see the section on “types”.

Secondly, if you look in Appendix A, you will see that under the products database, there is also a materials category; you could enter the word “material” as an **information type**. This would give you information about the building material (or component) you specified in the boxes we are now discussing. To illustrate, if you entered the word “material” as the information type, “shingle” as an element or unit, and “wood” as the material, you would get information about wood shingle products. The thing to remember is that the material specifier tells what the unit is made of; the material **category** of the products database talks about the structural unit or component itself.

Types

This is a term that can describe any one of the other specifiers - an adjective. For instance, you could specify a *seamed* metal roof in which the term “seamed” refers to the roof. On the other hand, you could specify a *hand-split* cedar shingle roof in which the term “handsplit” refers to the shingle. Similarly, the type could refer to the material, as in *crown* glass. Although there is no reason why it can't happen, the type almost never refers to the “problem”.

There is sometimes some confusion among elements, units and types. In the previous example about roof shingles, why isn't “roof” a type rather than an element? The answer is that the type usually refers to such things as how something was made or manufactured (as in *blown* glass), how it works or behaves (as in a *revolving* door or a *deciduous* tree), or, in a few cases, what it is made of (as in *sulfuric* acid where acid is the material and sulfuric is the type). The element usually tells where the unit is located. Again, a list of acceptable terms used as types are contained in **Appendix E**.

Some elements or units may be associated with what we have called “problems” (see the following section). An example might be a “termite shield”. You can enter the word “termite” as a type, but the computer will automatically associate it with the problem specifier. If you were to ask for the same data over again, you would see that the type specifier is now blank and the default problem is now “termite”.

Problems

Finally, there is often a problem associated with a particular component of a structure about which you might want specific information. An example might be *insects*, or even more specifically, *termites*. A “problems” list will be found in **Appendix F**.

As has already been mentioned, you can leave any or all of the above five specification items blank, but if you don't specify at least one, the specifications make no sense. (The exception to this is if you are seeking bibliographic data; this will be covered shortly.) Although you can leave them blank, once you enter something into any one of them, the computer will check to see if it is a valid entry for that particular specification; if it is not, you will get a message to that effect, and be required to change it before the program can proceed.

Once you specify an element, unit, material, type or problem, that becomes the “default”, and it will remain so until you either change it, delete it, or exit from the program. The only exception to this is that if you enter something as an “element” and the computer determines that it should be a “unit”, or vice versa, or if it determines that a “type” should be a “problem”, it will change it for you and *that* will become the default.

The words listed in the appendices are not the *only* words that can be used - they are just *typical* words. The system has been designed so that you can actually use almost any word that you would normally use in describing a structural component or preservation activity. If you can't decide what word to use, try using the word(s) you would normally use. Who knows? It might work!

Context

The reason for having you enter certain words as elements, units, materials, types or problems is to establish the **context** in which they are used. Some words, particularly those such as “trees” or “vegetation”, could be used in more than one place, depending upon that context. In other words, a tree, if it is considered to be a part of the resource, would be entered as a **unit**; if the tree is destroying the resource (i.e. a problem), then it is entered as a **problem**. Vegetation-related units and types are the major items that could, in some circumstances, be considered a problem. **Appendix G** contains an alphabetical listing of the words given in the other appendices, with a table of the context in which they may be used. Remember that not all words are listed. Those not listed are generally plural or singular forms of the ones that are listed, some common abbreviations, or less common synonyms for those given.

Related Information

After specifying the information you desire, you will be asked if you include related information in the data to be retrieved.

```

Enter type of INFORMATION you wish to RETRIEVE .
INFORMATION: MAINTENANCE

Enter at least one of the following items to indicate what you wish to
MAINTAIN:
ELEMENT:
UNIT:      GUTTERS
MATERIAL: METAL
TYPE:     HANGING
PROBLEM:

RETRIEVE RELATED INFORMATION?  Y
RETRIEVE BIBLIOGRAPHY?       N
ANY CORRECTIONS?  Y

F2:HELP  F3:CANCEL  F7:ERASE LINE>

```

Figure 3.7.
You can request related and bibliographic information by answering 'Y' to the appropriate questions.

If you specified reference data, the initial default answer will be "N"; otherwise, it will be "Y". Regardless of the type of information you specified, you can change the default from one to the other, and thereafter, your answer will be the new default. Before you do so, however, let's discuss what this means.

The databases are built on a **hierarchy** of information. This means if you answer 'Y' to the related data question, the more detailed your specifications are, the more information you will receive. None of it will be redundant or repetitious.

To illustrate, if you requested information about inspecting *joists*, you would receive only the most general information that would be applicable to inspecting all joists, regardless of their material or construction. On the other hand, if you requested information on inspecting *trussed wood joists*, you might receive inspection information pertaining to joists, wood, wood joists, and trussed wood joists, each piece of information contributing to the whole picture. If you had specified trussed *pine* joists, you might have obtained information on joists, wood, pine, wood joists, pine joists, trussed wood joists, and trussed pine joists. Had you further specified a rot problem, you could have expanded each of the foregoing items with data pertaining to fungal attack. Furthermore, if you specified *assessment* information rather than inspection information, you could obtain not just inspection information on all of this, but also information about testing and analyzing the problem. Finally, had you specified 'ALL' information about the problem, you could have obtained everything pertaining to it that was contained under the various categories of the maintenance, conservation, construction and product types as well - potentially a very large body of knowledge indeed. (As was mentioned earlier, there is also a way to include the reference data as well. We'll cover that momentarily.) Some of the potential combinations might not make sense, however, or could not contain any more specific information than was already covered in a more general combination, so there would be no information pertaining to them. In that case, these combinations are simply skipped.

There may be times, however, when you wish only that information that pertains specifically to one thing in particular, and nothing else. If this is the case, enter 'N' to the related information question, but be aware that you may be missing some pertinent data.

On the other hand, if you are looking for a definition for a paneled wood door, you probably don't want definitions for *wood*, *doors*, *wood doors*, *paneled doors*, and *paneled wood doors*. Therefore, the initial default answer to the related data question if you specify reference information (or any of

the categories under the reference type) will be "N". If you do want all this information, however, you can get it by answering 'Y' to the related data question.

If you indicated that you want 'ALL' information about the specified subject, you will now be asked if you want to include the reference data. The initial default will be "N" because the "ALL" feature was included primarily as an easy way to obtain all of the pertinent information about preservation activities for the specified subject. However, if you insist on including the reference data, you may do so by answering 'Y' to this question. Once you do so, "Y" will continue to be the default until you either enter 'N', or change the information type to something else.

Including Bibliographic References

The next thing you are asked, is whether or not you wish to retrieve the bibliographic references. Although every effort is made to make the information contained in the HSPD as concise and detailed as possible, by its very nature it must be a synopsis. Therefore, all of information contained in it (except inspection instructions) is referenced to the source(s) from which it was obtained.

In most cases, one probably does not want to see the bibliography. For this reason, the initial default to this question is "N"; if you do, however, simply answer 'Y'.

Corrections

You have now entered all the data and answered all the questions necessary to obtain the information you desire, and a prompt asking, "ANY CORRECTIONS?" will appear. If you entered new specifications for any one of the items above, the default value will be "Y". If you accepted all of the default values without change (perhaps you want to view one of the categories again), it will be "N". If it is "Y" and you have no further corrections to make, enter 'N'; if it is already "N" and you wish to proceed, simply press the "ENTER" key. If you *do* wish to make further corrections, either enter or accept 'Y', which will take you back to the information specifier.

Accessing the Bibliographic Database

You can also access the bibliographic database itself. This is different than simply indicating that you want the bibliographic references for the data contained in the other databases, because that method will only reference the source of that particular information. The bibliographic database can contain other references as well, regardless of whether or not information from this source was actually used in the database. Moreover, you can search this database by author as well as subject.

To access the bibliographic database, enter 'BIBLIOGRAPHY' as the information type you desire. The screen will be expanded as shown below.

```
Enter type of INFORMATION you wish to RETRIEVE .
INFORMATION: BIBLIOGRAPHY
Enter at least one of the following items to indicate what you wish to
specify a BIBLIOGRAPHY for:
ELEMENT:
UNIT:      PAINT
MATERIAL:
TYPE:
PROBLEM:
LAST NAME: VANDERWALKER      FIRST:      MI:
PUBLICATION DATE:
ANY CORRECTIONS? Y

F2:HELP F3:CANCEL F7:ERASE LINE)
```

Figure 3.8.
Specifying search
criteria for the bibli-
ographic database.

As you can see, the five subject specification items are still there, but you are also given the opportunity to search for bibliographic data by author as well.

You do not need to enter anything in the subject boxes if you wish to search for all entries for a specific author. However, you can limit the search to information on a particular subject by a specific author by indicating that subject in one or more of the first five items as well as specifying the author. If you indicate a particular subject, but not an author, you will get all bibliographic entries about that subject.

It should be noted, however, that many works are somewhat general in nature, and contain information on a number of subjects. As these are general references and are contained only once in the bibliography, specifying a particular author *and* subject might not produce the desired information, even though the reference was actually contained in the database. Unless an author is extremely prolific, it is probably better to specify only the author; the annotations will usually inform you as to whether a particular work contains information of the type you desire.

Note also that in retrieving bibliographic data, you are not given the opportunity to include related topics as part of the search criteria.

Checking the Specifications

Once you indicate that there are no more corrections to be made, the screen will clear and you will get the message, "SPECIFICATIONS BEING CHECKED...PLEASE WAIT". The computer is checking your specifications against its master lists to be sure that what you entered is valid and, if it is, assembling the necessary codes to find the information you have requested. If any one of the specifications you have entered cannot be understood by the computer, it will stop the program, display a message similar to figure 3.3 telling you what specification is in error, and directing you to press any key to continue once you have read and understood the message.

When you do this, you will be sent back to re-enter your specifications. Note that whatever you entered last is now the default, so you need only correct the erroneous entry.

If your specifications are valid, the computer will display the message "SEARCHING..." and begin its search for the data.

Depending upon how the system has been installed, you may or may not get messages telling you to insert a particular diskette into a particular drive. (Obviously, you have to remove whatever diskette may already be in the drive before you install the specified one.) Install the diskettes as instructed, then press any key on the keyboard to continue.

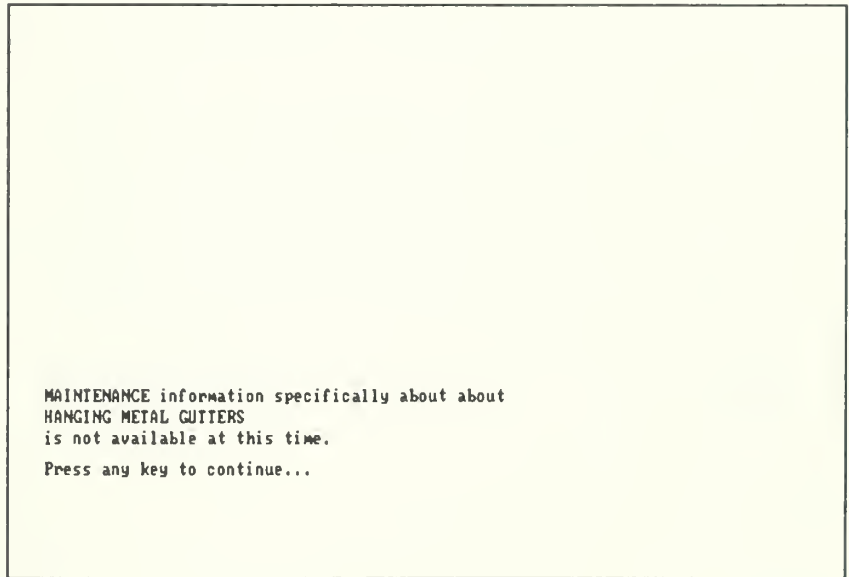
Figure 3.9.
If you using the data files from floppy diskettes, the program will tell you what diskette to use, and when and where to insert it.



Insert INDEX diskette into drive A.
Press any key when ready to continue...

The Data Displays

If you have specified that related data be displayed or printed but the computer cannot find anything pertaining to your specific request, it will provide you with as much information as it can, and then will display a message telling you that it could not locate the specific information pertaining to your request. This is just to let you know that it tried but couldn't find anything, rather than leave you wondering why you didn't get everything you asked for.



*Figure 3.10.
A typical message indicating unavailability of specific information.*

If the computer can't find *any* data pertaining to your request, or you indicated that you did not want to view related data and it can't find precisely what you asked for, you will get the same message. Regardless of the cause, just press any key on the computer keyboard, as instructed, to continue the program execution.

If the computer *can* find the data you requested, that data will either be displayed on the screen, or will be printed out on the printer. As the data is displayed on the screen, the display may pause periodically with a message to "Press any key to continue...". This is simply to prevent the data from scrolling past you on the screen before you can read it. If you are sending the data to the printer, you will not receive any such messages, even though the data will scroll quickly by on the screen.

REPAIR : METAL GUTTERS

Joints which have opened or cracked must be re-riveted and/or re-soldered. Reproduce appearance of original joints and seams. (Chambers 1985, 07630)

Patching: When a gutter is punctured, repair by working out distortions. Rivet in a patch allowing 1 inch of new material beyond the break and re-soldering. Place patch on the outside of the gutter to not obstruct the water flow. (Chambers 1985, 07631)

Fatigue damage should not be repaired with solder to fill stress cracks because solder has a different coefficient of expansion than the metal and soon breaks. (Chambers 1985, 07633)

Painted gutters should be primed immediately after patching, followed by a finish coat in 24 hours and a second finish coat in 2 weeks. (Chambers 1985, 07631)

Use only fasteners, hangers, etc. of the same material to prevent galvanic corrosion.

Press any key to continue...

F3: CANCEL

Figure 3.11.
A typical display of a
page of information..

One thing that sometimes happens in the screen display mode is that some of the data will flash by and then go on without stopping, preventing you from reading it. This normally means that back when you were entering the data specifications you may have held one of the keys down too long, or pressed it once too often, and the computer thinks you have told it to proceed immediately. If this happens, you may have to go back and use the default values to call up the information again. This seldom happens after you get used to the system.

Often, after the information you requested has been displayed, you will get a message like that shown below. This has been included to inform you about related information that the computer cannot automatically include as part of the data set you have requested. Because space is limited, a form of shorthand notation has been adopted to tell you what box the specifiers given should go in. "I" stands for information, "E" for element, "U" for unit, "M" for material, "T" for type and "P" for problem. The specifiers will normally tell you precisely what to enter, or they will give you a more general reference such as "M: SPECIFIC SPECIES". In this latter instance, it is telling you that, rather than just specifying something like "wood" as the material, you could also use a specific species of wood, such as "cedar". If the references don't tell you what information type to use (i.e., there is no "I:" reference), it usually means to use the one you are already using, or that there is relative information under several types.



```
See Also: I:Soldering; M:Metals, Specific Metals
          I:Routine Maint.; U:Surfaces; M:Specific Materials
```

Press any key to continue...

F3: CANCEL

*Figure 3.12.
References to related
information that cannot
automatically be
included as part of re-
quested data.*

If the database contains ASTM standards, federal specifications or other standards or references on the specified subject, that information will be displayed next.

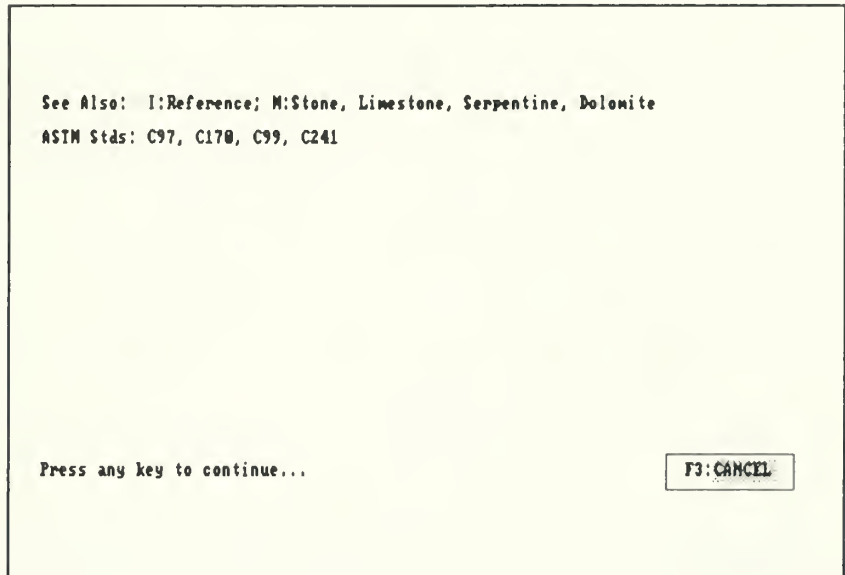


Figure 3.13.
Typical references to
pertinent standards.

Occasionally, remarks pertaining to the database record will be displayed. They usually contain information of a temporary nature that either the user or the keeper may find pertinent to the record, but that does not belong elsewhere in one of the records. Often, it is an editorial comment about needed data revisions.



Figure 3.14.
Typical Remarks.

The “See Also” references, ASTM standards, Federal Specifications, “Other” standards and any remarks will be displayed only if a particular record contains that information.

Finally, if you requested that bibliographic references on the subject also be given, or you requested bibliographic information in the first place, it will be displayed as shown below.

BIBLIOGRAPHIC REFERENCES:

VANDERWALKER, FRED N.
House Painting Methods with the Brush and Spray Gun
Fredrick J. Drake & Co.
Wilmette, Ill. 1945

VIEW ANNOTATIONS FOR THIS REFERENCE?

Figure 3.15.
Typical bibliographic
data..

If the bibliographic reference has been annotated, you will be given the opportunity to view it. If you wish to do so, answer 'Y' to the "VIEW ANNOTATIONS?" question (which will only appear if there *is* an annotation).

Figure 1 shows the results of the regression analysis. The dependent variable is the logarithm of the number of employees in the firm. The independent variables are the logarithm of the firm's sales, the logarithm of the firm's assets, and the logarithm of the firm's age. The results show that the logarithm of sales is positively correlated with the logarithm of the number of employees, while the logarithm of assets and the logarithm of age are negatively correlated with the logarithm of the number of employees.



Figure 1
Logarithmic regression

The logarithmic regression model is estimated as follows: $\ln(N) = \alpha + \beta_1 \ln(S) + \beta_2 \ln(A) + \beta_3 \ln(T) + \epsilon$, where N is the number of employees, S is sales, A is assets, and T is age. The results show that the logarithm of sales is positively correlated with the logarithm of the number of employees, while the logarithm of assets and the logarithm of age are negatively correlated with the logarithm of the number of employees.

A typical annotation looks like this:

Good treatise on standard painting practices at a time when hand-mixed and tinted paints were giving way to factory-mixed paints.
Many formulas for hand-mixed and tinted paints, including whitewashes. Also, a good discussion of brush types and characteristics, especially natural bristle brushes.

Library Source: Cunningham Memorial Library
Indiana State University
Terre Haute, Indiana 47809
BT320.v3 1945

Note: The book indicates that the author has also published the following titles, which may be articles published in the "American Painter and Decorator" magazine prior to 1945:
"Interior Wall Decoration"
"Mixing of Color and Paints"
"Wood Finishing, Plain and Decorative"
"New Stencils and their Use"

Press any key to continue...

F3: CANCEL

Figure 3.16.
A Bibliographic An-
notation.

After viewing the annotation, press any key to continue as instructed. If you answer 'N' to this question, or after you are finished viewing the annotations, the next bibliographic reference (if there is one) will appear.

Printing the Data

When all of the data pertaining to your request has been displayed, you will be returned to the Main Menu. First, however, you will be asked if you wish to print the data. If you do, answer 'Y'. If you have not already printed data in this session, you will then be asked if the printer is ready. Check its status, ready it if necessary, and answer 'Y'. If, for some reason, there is a problem with the printer, or you change your mind, answering 'N' will return you to the main menu where you could then opt to redisplay this or other data on the screen, use the utilities, or quit.

Assuming, however, that you do elect to print the data, the computer will repeat the data search, but this time send the data to the printer. (This process will be faster, because the program does not have to check the specifications, and you do not have to tell it to proceed after viewing each screen.)

DEFINITION : TERMITE

Insects that destroy wood by eating the wood fiber. Termites are social insects that exist in most parts of the U.S., but they are most destructive in the coastal states and in the southwest. Termites can enter wood through the ground or above the ground, although the subterranean type is most common in the U.S. (Swit 1985, 510)

DESCRIPTION : TERMITE

Dampwood Termite: (West Coast of North America only.) Colonies located in damp, often decaying wood material, with incipient brown rot or mechanical damage facilitating entry and establishment. Once established, activities can extend into sound and relatively dry wood. Wood-to-earth contact, or wood which is continually wet, usually is required. They do not tunnel through soil or build shelter tubes to new material.

Subterranean Termites: Colonies located in deadwood or cellulose debris underground in moist, warm soil. Construct flattened, earthen shelter tubes over surface of foundation walls and use as passageways between wood, which they eat, and soil, where they get essential moisture. Subterranean termites are found in nearly every state and are responsible for most of termite damage. Worker members of colony cause the destruction. Usually in late April or early May, they swarm from the colony and start new colonies. They do not come in on the lumber but from ground nests after building is constructed. Eat out center and leave exterior shell.

Dry-Wood Termites: Found only in narrow strip of boundary territory from central California around southern edge of U.S. to Virginia. Fewer in number than subterranean and do not multiply as rapidly. Have ability to live in dry wood without outside moisture or contact with ground. (Chambers 1985, 06312)

Vast bulk of the damage done to wood houses by insects is caused by subterranean termites. There are actually 13 species of termites in the U.S. that cause damage to houses. These 13 can be sorted into three basic groups: drywood termites; dampwood termites; and--most omnipresent--the subterranean termites. Although termites tend to shun the colder climates of the northernmost states (e.g., Maine, Montana), for all practical purposes consider that every old house presents a potential meal for one or more species of termite.

Termite colonies spread by swarming; winged adults take to the air from mature colonies to seek greener pastures (so to speak). In most cases, it requires 3 to 4 years for a colony of subterranean termites to grow big enough to throw off swarmers.

Moisture is vital to the life of a termite. Drywood termites manage to get sufficient water from the wood that is continually moist--usually wood that is in direct contact with the soil.

Figure 3.17.
A typical data
printout.

Because this is primarily an information program, the printout is not formatted - it is simply a hardcopy of the information displayed on the screen. It also assumes that your printer is using either continuous-feed paper, or is equipped with an automatic sheet-feeder.

When the printout is complete, you will be asked if you wish to advance the paper once the printing process is complete. This allows you to advance continuous feed paper to a point where you can separate your printout without having to use printer controls or knobs. It lessens the possibility of printer problems if you will want to print out more data. Each time you enter a 'Y', it will advance the paper another page; any other character except 'N' will have no effect; 'N' will return you to the main menu. From there, you can either quit or start the process over again.

That's all there is to it. Once you have tried it a few times, you will discover that it is much easier to do than it was to read about.

CHAPTER 4 - DEVELOPMENT OF THE HSPD

The first three chapters and Appendices A through F provide the instructions necessary to use the information contained in the HSPD system.

This chapter documents the development process and rationale behind the system. It is presented as Chapter 4 because, while it may be of relatively little interest to many users, it contains information of benefit to those entering data and maintaining the system and may help them understand the following chapters, which discuss those processes.

Background

The Historic Structures Preservation Database (HSPD) can trace its origin to the early 1970s, when it was recognized that there was a need for some means to provide preservation maintenance information about the historic and prehistoric structures in the parks to the staffs of those parks. The vehicle for this was called the "Historic Structure Preservation Guide" (HSPG). At that time, however, HSPGs were viewed as project-related documents, and were only prepared if the structure had been restored or undergone major preservation work.

By the late 1970s, it was apparent that all historic and prehistoric structures that were to be preserved as part of the cultural patrimony ought to have such guidance. It was also clear that the existing guideline was inadequate. The author, who was then the Regional Historical Architect for the Southwest Region of the National Park Service, attempted to clarify in his own mind what such a document should contain, and drafted a tentative guideline for consideration. This guideline proposed the use of a modified form of the Construction Specifications Institute's "master-format" used by many architectural firms.

At about the same time, the Servicewide Cultural Resources Management Guidelines (NPS-28) were in their draft stages. Input from throughout the Park Service was solicited on a number of topics, including the HSPG. Apparently, little thought had been given to a revised HSPG up to that time, ex-

cept by the author, and while he had submitted his guideline only as a starting point, it became incorporated almost verbatim into "NPS-28".

Since that time, a number of people, including the author, have produced HSPGs according to that guideline. Several problems have become apparent, however.

1. The construction specifications format is not really the best format for these documents.
2. There is not much written information about maintenance practices readily available, and even less pertaining specifically to historic and prehistoric structures. Consequently, the production of HSPGs has been time-consuming and expensive, requiring a considerable amount of original research.
3. There is virtually no possibility of ever being able to produce customized HSPGs for each historic or prehistoric structure, or even for each major group of structures within all the parks in accordance with those guidelines. Furthermore, new materials and technology, as well as environmental and legal considerations, tend to make the documents that are produced obsolete almost as soon as they are written.

Nevertheless, a number of HSPGs have been written, mostly according to the guideline that was now part of NPS-28. Regardless of their success (or lack of it) as maintenance management tools, a lot of good information has been produced.

In 1982, a meeting was held in Santa Fe to discuss the future direction of HSPGs. By this time, computer technology had also made great progress. It was decided that a computerized database, consisting of the preservation maintenance information that had been developed during the preparation of the HSPGs and completed as of that time, should be undertaken. The intent was to bring all this information together in one place, where everyone could find it, and to have a place where new data could also be accumulated. There was the additional thought that by computerizing, perhaps someday each park could have access to any pertinent information as soon as it was developed or updated. Because, by its very nature, such a database must be somewhat generic in its content, it can't contain information specific to any one park. Even so, while this might not always tell a park staff *everything* it needs to know about its resources, it would tell them a *lot*, and that is a *lot* more information than most would have without it.

The architectural firm of Chambers & Chambers was selected to undertake this task, which they completed by the end of 1986. The result was a compendium of information on 190 topics, assembled using "Peachtext 5000" software and occupying approximately 13 data diskettes. Because the NPS-28 guideline still required that an HSPG be written in construction specification format, the database was prepared accordingly. Despite some shortcomings, the resulting body of knowledge, assembled in one place, was a tremendous accomplishment, even though it represents only a small portion of the needed information.

Because "dBASE III PLUS" has been adopted as the Service's standard for PC database software, it was difficult to implement the system in "Peachtext 5000". Moreover, the realization that interactive computer access to the information contained in the database would make it more usable, and the fact that the Construction Specifications Institute (CSI) format was not well suited to such access, resulted in the author's being assigned the task of attempting to produce a viable interactive database system.

As work began, it became almost immediately apparent that such a system could provide not only maintenance information, but information pertaining to the entire range of technical preservation problems. It also became apparent that other agencies and institutions could make use of this information, and that to limit it only to the purposes of producing HSPGs would be wasteful. Consequently, the HSPD came into being as a separate, but related entity.

The HSPD still contains the preservation maintenance information of the original database, but it also has the capacity to contain a greater variety of information. It can be accessed and used by its own software, which is the subject of *this* manual, but it can also be used by other software programs as well. For instance, separate software for the production of HSPGs is being developed that can use the HSPD databases to obtain the information it needs, but the HSPG software also has a number of extended capabilities specific to HSPGs that have nothing to do with the use or maintenance of this database. Conceivably, other programs could similarly be developed. This manual, however, pertains only to the HSPD itself.

Design Constraints

The author was presented with several “givens” at the beginning of the project. These were:

1. The system, as a database system, must be based on the “dBASE III PLUS” software, because that is the Service standard;
2. It must be flexible enough to “relate” to other NPS databases;
3. It must be “user friendly” and capable of “interacting” with the user;
4. It should, if possible, be a “smart” system.

The Data Specifiers

The first thing that was done was to review existing databases. This included not only the Chambers & Chambers database, but a list of work activities associated with the NPS Maintenance Management program, and several non-computerized lists as well. From these sources, an attempt was made to determine what words, and how many, were necessary to describe what work was to be done, what it was to be done to, and why.

Assuming that the work was to be performed on buildings or ruins of buildings (not always the case), it was found that four words were usually adequate, five were needed if one wanted to address a specific problem, and six were occasionally needed if the location of the item to be worked on was an important consideration.

The first thing that had to be indicated or specified was what type of information was required. Normally, this could refer to some action or activity to be done to the structure. Occasionally, however, it could also be information about a component of the structure as well. In any event, it was some sort of information, so that's what the first specifier was called.

The second thing to be indicated was what the information pertained to. Usually, a single word, such as “floor” would suffice, but occasionally, the location on that floor (as part of a porch, for instance) could become important, because porch floors are subject to problems that interior floors are not. Thus, two words were needed, the word referring to the larger component of the structure being called the “element”, and the smaller, the “unit”.

It was also apparent that what was a "unit" in one instance could become an "element" in another, as when, for instance, one wished to refer to a floor board, where "floor" was now the element, and "board" was the unit. This could be confusing, so the system had to be "smart" enough that the computer could either figure it out or guide the user to a correct entry.

Thirdly, the system has to be told what the unit is made out of - the **material**. Thus, "material" became the third specifier.

Fourthly, it was determined that there was a need for a specifier to qualify the others - an adjective. To keep things simple, this was named the "**type**" specifier. The "type" usually refers to either the unit or the material, and on rarer occasions, to the element or problem (which we'll discuss shortly). Although this might at first seem confusing, it was found that the context is usually so obvious to both the user and the person entering the data, that it is not a problem. Whether one is concerned with *blown* glass or *revolving* doors, the meaning is clear.

Finally, there is often a potential threat or hazard associated with a particular structural component, and toward which many activities were directed at overcoming. Again, striving for simplicity, this sixth specifier was termed the "**problem**".

Tests indicated that about 80 percent of the items contained in the other databases could be addressed by these six terms, and of those that could not, most were too specific or were otherwise inappropriate for inclusion in this database anyway.

It was completely within the realm of possibility to have constructed the system so that one could have typed in something like, "I want to inspect all of the carved wooden posts on my porch for dry rot", and have the computer be able to handle it. On the face of it, this may seem simpler. However, this would mean that the computer would have to check all 16 words in that sentence against every master list (only 6 words would be used). This would take much longer to evaluate, and in addition, some strict rules of "syntax" would have to be imposed that the user would have learn. Therefore, the "prompt" system was selected because it was both faster and, in fact, more "user friendly" than unstructured entries.

As a final effort to make the system as "user-friendly" as possible, a series of "help" screens were installed. They provide abbreviated instructions as to how to operate the system and suggestions as to some possible entries that could be made from wherever the user is at when he or she requests the help.

The Data Hierarchy

In reviewing the content of the Chambers & Chambers database, and HSPGs that had been written according to the NPS-28 guideline as well, it was found that a lot of space was devoted to referencing other sections of the document. There were references to “broadscope” and “narrowscope” sections, and occasionally, there were even references to “midscope” sections. This resulted in a considerable amount of repetition from one section to the next. If this were to be an “interactive” system, such manual references to other sections would have to be minimized. At least with a printed document, you can keep your thumb in one page as you flip to the other. On the computer screen, this is much more difficult.

However, it was reasoned that if there were such things as broad, mid and narrow scopes, each one should logically build on the other. Thus, at the broadest level of information, one could have information about “shingles”, for example. At a “broad mid-level” range, one might find information about such things as roof or siding shingles, wood or asphalt shingles, handsplit or sawn shingles, to name a few examples. At an narrower, but still “mid-level” range, one might find information pertinent only to handsplit cedar roof shingles, and nothing else. To be even more specific, one might wish to specify a particular problem with those shingles, such as if squirrels were eating them. From this, the “hierarchy” principle evolved.

Using the hierarchy principle, if one specified information about repairing shingles, he or she would get information that pertains to every shingle, no matter what it is made of or where it is installed. If that were qualified further as being a **wood shingle**, one would get the above very general information, but also the more specific information about wood shingles, without regard to how or where they are used. If **roof shingles** were specified, one would again get the general information, but he or she would also get information about all types of shingles that pertain only to their application on roofs. If data about **wood roof shingles** were specified, all of the above, plus data that pertains specifically to wood roof shingles would be provided, and so on. Of course, when one gets to the level of the squirrel problem, he or she could also be inundated with a lot of irrelevant information, so there is also a way to limit how much data one receives.

To take things a bit further, however, there are also several types of information one might want about all of the above. One might want to know how to inspect for it, or to control the *#@!! squirrels, or to replace the shingles they ate - the **information type**.

To solve the information type problem, it was decided that each type of information should be contained within a separate database. At present, there are seven databases. With the exception of the Bibliography, each of these are further divided into several categories of related information. See Appendix A for a list of the information types and categories, and their definitions.

Within each category of information, one finds that there are even further divisions, pertaining to individual kinds of information, or, most frequently, activities. The present level of development of the HSPD software does not allow the user to search for information to a greater level of detail than the individual category because "dBASE III PLUS" cannot do so without the program becoming extraordinarily cumbersome, memory consumptive and slow. Although the compiled version of the HSPD provides more potential for this level of search, this compilation is a recent part of the HSPD development, and it has not been possible to include such capabilities into the first version. Nevertheless, allowance has been made for this eventuality, and to make the system truly "user friendly", the *words* are usable even if, at the present time, one also has to do some manual searching through the data. Thus, while one can be quite specific in entering the kind of information he or she wants, the computer can only take one to the category where it ought to exist; the individual must take it from there. Still, when the time comes that a search to that level can be made, the data will be ready.

Language Considerations

In order for the computer to know what database to look in for the specified information, or how to build this hierarchy of information, master lists of words, and their meanings, had to be established. This has caused some problems, because the English language is a masterpiece of non-precision. At the same time, to make the system as "user friendly" as possible, it was felt that one had to be able to enter **words** rather than codes, and that these should be, as nearly as possible, the words normally used in describing the information being sought. As has already been mentioned, the computer has only limited capabilities for handling syntax and context. Context has been artificially established for words used to indicate the structural component and threat by requiring the user to enter them as items with predetermined meanings. This means that the word "tree", as a unit, indicates a part of the resource, something to be cared for. The word "tree", entered as a problem, generally indicates something threatening the primary resource and that ought to be corrected.

There is more of a problem however, when one tries to specify the information type, because the same information specifier could refer to several different databases. For instance, the word “replace” could have meaning as a *preservation* activity, where it might refer to a delicate operation involving the replacement of something that had been displaced. On the other hand, it could equally well refer to a *periodic maintenance* operation of replacing the storm windows with screens. Each one is a category in a different data base. One might say, “What difference does it make? Replacing a window screen hardly has the same connotation as replacing a broken finger from a piece of statuary!” Unfortunately, it does make a difference, because computers have neither the memory capacity nor the computational speed (believe it or not) of the human brain. Therefore, it is necessary to categorize, and categorization means that each word specifying a piece of information must point to one, and only one, category, and that category must be unique within all the information types. This means, that if the word “replace” is associated with the routine maintenance category (as it has been), and if you use “replace” as an information type, you will only be taken to the routine maintenance category of the maintenance database. While this may cause a bit of initial confusion, it should not be a serious problem.

What this has led to, though, is a need to use familiar words in a slightly different way than they have been before. To illustrate: we have traditionally separated activities we call “housekeeping” from other types of maintenance. If we were to keep this distinction, it would mean that if the activity “cleaning” were associated with the housekeeping category, it could not be used with respect to any other type of maintenance. But there are a number of “cleaning” operations that are not associated with housekeeping. Moreover, isn’t housekeeping really a form of routine maintenance? Thus, you will see in Appendix A that there is no maintenance category called “housekeeping”; it has been incorporated as part of the routine maintenance category. You will also see that “periodic” maintenance has been defined to mean those types of maintenance activities that recur on a predictable schedule, whether that be monthly, seasonally or annually. Activities such as painting, repointing, reroofing, etc., have been grouped under the preservation category because, while there might be an average period or cycle for these activities, the goal of preservation activities is to make them last as long as possible, and they are therefore not truly periodic activities. One should note, however, that these distinctions are for the purpose of the program operation and have nothing whatsoever to do with NPS funding categories, such as the “cyclic” maintenance fund.

The names that have been selected for the various databases (information types) may also seem slightly strange, and again, this is a necessity of the

computer system. The term “conservation” has been selected as the information type or database that include the categories “protection”, “stabilization” and “preservation”. The same word cannot be used as both a type and a category, but it still needed to be logically related. These were the best terms we could come up with.

While the conventions that have just been discussed allow the system to appear “smart” to the user, the success of this system actually depends upon the skill of those entering and editing the data. The hierarchy system works only if the data is broken down and entered at the appropriate level, and in the proper database. Although it has been possible to incorporate a few computerized aids to assist with this, it remains primarily a process of analysis that must rest with the keeper and his or her staff.

The Compiled Program

After the system had been developed and tested using the “dBASE III PLUS” software, it was decided to “compile” the HSPD program. By compiling the program, “dBASE III PLUS” is no longer required to be resident in the computer in order to use the system. Nevertheless, the database files themselves remain fully compatible with “dBASE III PLUS” and can be accessed either by “dBASE III +” itself or by other systems using the “dBASE III PLUS” environment.

There were two reasons for compiling the HSPD software. The major one was speed. Accessing the data can be very slow on the older “PC” type machines in the “dBASE III PLUS” environment. While the compiled version is still slow on those machines, compilation has nonetheless increased the speed of access significantly. The second reason was that it enables the system to be run on computers that do not have a hard disk drive. Otherwise, it would have been possible to run the system only on machines having hard disks or, at the very least, machines having two floppy diskette drives, one of which would have had to have a 1.2 megabyte capacity. While installing the system on a hard disk is still the only practical way to use the system with any frequency, the HSPD *can* be run on any two-drive “IBM-compatible” system that has at least 512 kilobytes of random-access memory.

Future Directions

New innovations in computer hardware and software will undoubtedly offer new opportunities before this system is really mature. For instance, one of the major limitations at the present time is that we are unable to include graphic illustrations as part of the database. Perhaps these innovations will force abandonment of this particular software, and development of a new, more powerful system. Hopefully, however, with the data contained in this database, and by the way it is contained, such new developments will be able to build on this first try without having to completely re-enter or re-edit the data. If that is possible, and if, in the meantime, this system proves useful to preservationists, then it will have been a success.

APPENDIX A - INFORMATION TYPE AND CATEGORY SPECIFIERS

Each general type of information is contained in a separate database. Database names are indicated by an asterisk (*), and information specifiers that represent categories within each type are indented. Other words that may be entered as information specifiers are given below the definitions. Any word shown in bold capital letters can be entered as an information specifier.

ALL	All information types (or databases).
REFERENCE *	Provides definitions, descriptions and potential threats to anything you can specify in the database, except the information types (which is why those definitions are presented here).
DEFINITIONS	Defines words and terms as they pertain to the information contained in, or used by, this database.
DESCRIPTIONS	Where applicable, provides physical descriptions, characteristics and properties of specified terms.
THREATS	Where applicable, identifies potential threats or problems associated with the specified components or materials.
ASSESSMENT *	Measures to determine and record the existing condition of a structure, to determine whether a real or potential problem exists, and to analyze the nature of such problems.
INSPECTION	A systematic investigation of the structure and its components to determine the need for conservation or maintenance. Although it is normally considered to be a maintenance activity, it has been separated from that category in this database for ease of access to the data. Other: CHECK, EXAMINE
RECORD(S)	Measures or documents used to record the existing condition and location of the structure and its components. Other: DRAW, IDENTIFY, MARK, PHOTOGRAPH, SKETCH

TESTS	<p>Methods or procedures to determine the existing condition of the structure, the quality of materials to be used in conservation or maintenance activities, or long-range investigations to warn of undetected or potential deterioration.</p> <p>Other: MONITOR</p>
ANALYSIS	<p>Procedures for determining what the outcome of inspections, tests, monitoring, etc., mean.</p> <p>Other: EVALUATE, DETERMINE</p>
MAINTENANCE *	<p>Measures of a predictably recurring nature including housekeeping, groundskeeping, service and janitorial activities; routine and periodic work intended to mitigate wear and deterioration without altering the appearance of the structure; repair (including replacement-in-kind) of broken or worn-out elements or surfaces so as to keep the existing appearance and function of a structure. Usually involves nonspecialized skills.</p>
CONTROL	<p>Removal or exclusion of conditions, materials or pests that may threaten a structure or site, visitors or staff, or generally detract from its appearance</p> <p>Other: PREVENT</p>
ROUTINE MAINTENANCE	<p>Maintenance activities that tend to occur on a daily, weekly, or monthly schedule, or some variation thereon, even though they may vary seasonally.</p> <p>Other: ADJUST, DUST, FEED, EMPTY, LUBRICATE, MOW, SWEEP, TRIM, WASHING, WATER, VACUUM</p>
PERIODIC MAINTENANCE	<p>Maintenance activities that tend to occur on a predictable period or schedule. Although this schedule may extend over a number of years, it also includes activities recurring on a seasonal or annual basis, such as fertilizing the lawns, servicing the furnace, or installing screen or storm windows.</p> <p>Other: CLEAN, CHANGE, DEFROST, DRAIN, FERTILIZE, FLUSH, GRADE, INSTALL, RAKE, REMOVE, ROTATE, SEAL, SERVICE</p>

REPAIR	<p>Minor work involving the structural fabric that does not involve substantive alteration or change in its material, appearance or workmanship.</p> <p>Other: REASSEMBLE, REATTACH, REGLAZE, REHANG, REPLACE, RESOLDER, REWELD, STRAIGHTEN, UNCLOG</p>
CONSERVATION *	<p>Work that is non-recurring, or at least is intended to last as long as possible and therefore has no predictable cycle, or work that involves specialized craft skills beyond what are considered to be normal maintenance skills.</p>
PROTECTION	<p>Measures used to protect the resource from damage, loss, or attack. When associated with stabilization, preservation and sometimes maintenance activities, also includes temporary measures to protect the structure, other resources, workers and the public from damage or injury.</p> <p>Other: PREVENTION</p>
STABILIZATION	<p>Measures designed to reestablish a weather-resistant enclosure or the structural stability of unsafe or deteriorated structures while maintaining the essential form as it exists at the present. May be temporary in nature, intended to prevent further deterioration until more substantive preservation work can be planned and carried out.</p> <p>Other: MOTHBALL, RESUPPORT, SHORE, SUPPORT</p>
PRESERVATION	<p>Measures to sustain the existing form, integrity and material of a structure, or the existing form and vegetative cover of a site. It is more substantive work than maintenance, and usually requires specialized skills.</p> <p>Other: CAP, CAULK, COMPACT, CONSOLIDATE, GROUT, PAINT, PATCH, POINT, REGROUT, RELAY, REPOINT, RESURFACE</p>
CONSTRUCTION *	<p>Major work to the structure that results in a change in the existing material, workmanship or appearance.</p> <p>Other: ALTER</p>

ADDITION	<p>Addition of something to the structure that did not exist before work began. It usually refers to the addition of some manufactured item to a structure, but could also refer to the addition of a new item to the structure or the site.</p> <p>Other: ATTACH, BUILD, CONNECT, CREATE, ERECT, MOUNT</p>
REHABILITATION	<p>Measures to return a structure to a state of utility through repair or alteration that makes possible an efficient contemporary use while preserving those portions or features of the structure that are significant.</p> <p>Other: INSULATE, RETROFIT</p>
RESTORATION	<p>Measures to accurately recover the form and details of a structure and its setting as it appeared at a particular period of time by means of the removal of later work or the replacement of missing earlier work.</p>
RELOCATION	<p>Placement of all or part of a structure at a location where it did not previously exist.</p> <p>Other: ARRANGE, MOVE, REARRANGE, TRANSFER</p>
RECONSTRUCTION	<p>Measures to reproduce by new construction the exact form and detail of a vanished structure, or any part thereof, as it appeared at a specific period of time.</p> <p>Other: REBUILD</p>
PRODUCTS *	<p>This database type contains information pertaining to recommended materials for a specified activity as well as information about storing and handling them, quality control, how it should be made, and equipment needed to perform the activity.</p>
STORAGE & HANDLING	<p>Specific information about how certain materials are to be stored or handled to ensure they are undamaged, uncontaminated, and do not constitute a hazard to the resource or environment.</p> <p>Other: LOAD, STACK, UNLOAD</p>
QUALITY CONTROL	<p>Information as to how to ensure that you are getting the right material or proper workmanship.</p> <p>Other: ENSURE. (Note: you cannot use the word "control" with this category, because it refers to a category under maintenance.)</p>

MATERIALS	This category provides information about building, conservation or maintenance materials in general, rather than what they are made of.
FABRICATION	This category provides information about how the material or component is to be made, assembled, mixed, etc. Other: ASSEMBLE, MAKE, MANUFACTURE, MIX
EQUIPMENT	Information about the equipment and tools needed to make or install the materials. Other: TOOLS
BIBLIOGRAPHY *	Contains complete bibliographic references for all information contained in all databases of the system. It may also contain bibliographic references on various subjects even though the data was not specifically used in assembling the information.

APPENDIX B - ELEMENT SPECIFIERS

Element specifiers marked with an asterisk (*) can also be units in some instances.

A	AIR CONDITIONING	ATTIC
	APSE	ATRIUM
	AREA	AUDITORIUM
	ARTWORK	
B	BALCONY	BEDROOM
	BASEMENT	BELFRY
	BATHROOM	BELVEDERE
	BATTLEMENT	BUTTRESS
C	CABINTRY	COLLECTIONS
	CEILING*	COMMUNICATION
	CELLAR	SYSTEM
	CHAPEL	COURTYARD
	CHOIR	CRAWLSPACE
	CLASSROOM	CRYPT
D	DECK	DOME
	DEN	DOOR*
	DINING ROOM	DORMER
E	ELECTRICAL SYSTEM	EQUIPMENT
	ENTABLATURE	
F	FEATURES	FOUNDATION
	FLASHING*	FRAME
	FLOOR*	FURNISHINGS
	FOUNDATION	
G	GABLE	GARDEN
H	HALL	HEATING SYSTEM
	HARDWARE	HVAC SYSTEM
J	JOINTS	

K	KITCHEN	
L	LANTERN LAWN	LIVING ROOM
M	MASONRY	
N	NAVE	
O	OFFICE OPENINGS	ORCHARD ORCHESTRA
P	PANTRY PARLOR PLUMBING SYSTEM	PORCH PROSCENIUM PROTECTION SYSTEM
R	RENDERING REST ROOM	ROOF*
S	SIDING* SITE SPACE SPIRE STAGE STAIR*	STEEPLE STOOP STRUCTURAL SYSTEM STUDY
T	TOWER TRANSEPT	TRIM TURRET
U	UTILITY ROOM	
V	VEGETATION VERANDA	VINYARD
W	WALL*	WINDOW*

APPENDIX C - UNIT SPECIFIERS

Unit specifiers marked with an asterisk (*) are normally considered to be elements but, in some instances, can be a unit.

A	ABUTMENT	ARRESTER	
	ANCHOR	ASHPIT	
	ANNUNCIATOR	AUDIO/VISUAL	
	APPLIANCE	EQUIP.	
	AQUASTAT	AUGER	
	ARCH	AWNING	
	B	BALUSTRADE	BLOCK
BARGEBOARD		BOARD	
BARREL		BOILER	
BARRIER		BOLT	
BAR		BOSS	
BASEBOARD		BOX	
BEAM		BRACE	
BELL		BRACKET	
BENCH		BRICK	
BIN		BURNER	
BLIND			
C		CABINET	CHUTE
		CANALE	CIRCUIT BREAKER
	CANOPY	CISTERN	
	CAP	CLEANOUT	
	CARILLON	CLOCK	
	CARPET	CLOSER	
	CARVING	COLUMN	
	CASING	COMPRESSOR	
	CATWALK	CONDUCTOR	
	CAULKING	CONDUIT	
	CEILING*	CONNECTOR	
	CHIMNEY	CONVEYOR	
	CHINKING	COPING	
	CHLORINATOR	CORBEL	

C cont.	CORNICE	CRIBBING
	CORRAL	CRICKET
	COUNTER	CROSS
	CRANE	CULVERT
	CRIB	CURB
D	DAMPER	DOWNPOUT
	DAMPPROOFING	DRAIN
	DEHUMIDIFIER	DRAPERY
	DENTIL	DRIP
	DETECTOR	DRIVE
	DIFFUSER	DUCT
	DOOR*	DUMBWAITER
E	EAVE	EVAPORATOR
	ELEVATOR	EXCHANGER
	ESCALATOR	EXHIBIT
	ESCUTCHEON	EXTINGUISHER
F	FAN	FIXTURE
	FASCIA	FLAGPOLE
	FASTENER	FLOOR*
	FENCE	FLUE
	FERN	FOOTING
	FIELD	FORGE
	FILTER	FOUNTAIN
	FINIAL	FURNACE
	FIREPLACE	FURNITURE
G	GATE	GRILL
	GAUGE	GROUND
	GENERATOR	GUARD
	GIRDER	GUTTER
	GLAZING	GUY
	GRATE	
H	HANDLE	HEATER
	HASP	HINGE
	HATCH	HOIST
	HEAD	HUMIDISTAT
	HEARTH	HYDRANT
I	INCINERATOR	INSCRIPTION
	INLET	INSULATION

J	JOIST	
K	KNOB	
L	LADDER	LIFT
	LATCH	LOCK
	LATTICE	LOG
	LEADER	LOUVER
	LEAFING	
M	MANHOLE	METER
	MANTLE	MIRROR
	MARQUEE	MOLDING
	MASONRY	MORTAR
	MEDALLION	MOSAIC
	MEMBRANE	
O	OPENING	OVEN
	OUTLET	
P	PADLOCK	PLAQUE
	PAINT	PLASTER
	PAINTING	PLATE
	PANEL	PLATING
	PARGING	POOL
	PATH	POST
	PIER	POT
	PILASTER	PULL
	PILING	PUMP
	PIPE	PURLIN
	PIVOT	PUTTY
	PLANK	
R	RACEWAY	RECEPTACLE
	RACK	REGISTER
	RADIATOR	REGLET
	RAFTER	REVETMENT
	RAIL	RIDGE
	RAMP	ROOF*
S	SCALE	SEATING
	SCREEN	SEWER
	SCUTTLE	SHAKE
	SEALANT	SHEATHING

S cont.

SHELF
SHIELD
SHINGLE
SHRUB
SHUTTER
SIDING*
SIGN
SILL
SIREN
SOFTENER
SKYLIGHT
SLAB
SOFFIT

SPANDREL
SPINDLE
SPLASH
STAIR*
STALL
STANDPIPE
STATUE
STEP
STONE
STOP
STUCCO
SURROUND
SWITCH

T

TANK
TAPESTRY
TERRA COTTA
THERMOSTAT
THRESHOLD
TILE
TIMER
TRACERY

TRAIL
TRANSFORMER
TREE
TRELLIS
TROUGH
TRUSS
TUNNEL

V

VALLEY
VALVE
VARNISH

VAULT
VENT
VINE

W

WAINSCOT
WALK
WALL*
WEATHERSTRIPPING

WELL
WINCH
WINDOW*
WIRING

APPENDIX D - MATERIAL SPECIFIERS

A	ACRYLIC	ALUMINUM
	ADOBE	ASBESTOS
	ALABASTER	ASH
	ALDER	ASPEN
	ALKYD	ASPHALT
B	BAMBOO	BIRCH
	BASALT	BITUMEN
	BASSWOOD	BOXWOOD
	BEECH	BRASS
	BINDERS	
C	CANE	COMPOSITES
	CEDAR	CONCRETE
	CEMENT	COPPER
	CHALK	COQUINA
	CHERRY	CORAL
	CHERT	COTTON
	CHESTNUT	COWHIDE
	CHROMIUM	CREOSOTE
	CLAY	CYPRESS
D	DEERSKIN	DUNG
E	EARTH	EPOXY
	EBONY	EUCALYPTUS
	ELM	
F	FIBERGLASS	FLINT
	FIR	FORMICA
G	GLASS	GRASS
	GLUE	GRAVEL
	GOLD	GYPSUM
	GRANITE	

H	HAIR HAY	HEMP HICKORY
I	IRON	
L	LATEX LEAD LEATHER LIME LINDEN	LIMESTONE LINOLEUM LINSEED OIL LOCUST
M	MAGNESIUM MAHOGANY MAPLE MARBLE MESQUITE	METAL MICA MINERALS MUD
N	NEOPRENE NICKEL	NYLON
O	OAK	OIL
P	PALM PAPER PEWTER PINE PISE	PLASTIC POLYVINYL CHLORIDE PRESERVATIVES PUTTY
Q	QUARTZ	
R	RATTAN RAYON REDWOOD REED	RESIN ROSEWOOD RUBBER
S	SAND SANDSTONE SERPENTINE SHEEPSKIN SHELLAC SILK SILVER SLATE SOD	SOLDER SOLVENTS SOYBEAN OIL SPRUCE STAIN STEEL STONE STRAW SYCAMORE

Year	Month	Day	Event
1970	Jan	1	...
1970	Jan	2	...
1970	Jan	3	...
1970	Jan	4	...
1970	Jan	5	...
1970	Jan	6	...
1970	Jan	7	...
1970	Jan	8	...
1970	Jan	9	...
1970	Jan	10	...
1970	Jan	11	...
1970	Jan	12	...
1970	Jan	13	...
1970	Jan	14	...
1970	Jan	15	...
1970	Jan	16	...
1970	Jan	17	...
1970	Jan	18	...
1970	Jan	19	...
1970	Jan	20	...
1970	Jan	21	...
1970	Jan	22	...
1970	Jan	23	...
1970	Jan	24	...
1970	Jan	25	...
1970	Jan	26	...
1970	Jan	27	...
1970	Jan	28	...
1970	Jan	29	...
1970	Jan	30	...
1970	Jan	31	...

T

TARPAPER
TEAK
TERNE
TERRAZZO
TI LEAF

TIN
TUFA
TUFF
TUNG OIL
TURPENTINE

V

VINYL

W

WALNUT
WAX

WOOD
WOOL

Z

ZINC

APPENDIX E - TYPE SPECIFIERS

Type specifiers marked with an asterisk (*) are normally considered by the HSPD to be problem specifiers, but may also be used as type specifiers, as in *termite* shields. The HSPD program will automatically reassign the term as a problem specifier, however.

A	ACCORDION ANNEALED	ANODIZED AWNING
B	BUILT-UP BATT BEADED BEE* BEVELED BIFOLD BIRD* BLANKET	BLOWN BOARD & BATTEN BONDED BRACED BREAKER BRUSHED BUILT-UP BUTTED
C	CASEMENT CAST CESS CHAIR CIRCULATING COAL	COBBLE COMBUSTION CONTRACTION CORRUGATED CROWN CUT
D	DECIDUOUS DOUBLE HUNG DOVETAIL	DRAIN DRIED DRY
E	EMBOSSSED ETCHED EVERGREEN	EXPANSION EXTINGUISHING EXTRUDED
F	FIRE* FINISHED FIXED FLAG FLITCH FLOATED	FLOWER FLUSH FOAMED FRAMED FRUIT FUSE

APPENDIX B - TYPE SPECIFICATIONS

The quality model and its results are presented in the table below. The quality model is based on the quality requirements table. The table below is divided into two parts: the quality requirements and the quality results.

Quality Requirement	Quality Result	Quality Score
RELIABLE	RELIABLE	5
ACCURATE	ACCURATE	5
FAST	FAST	5
SECURE	SECURE	5
EFFICIENT	EFFICIENT	5
ADAPTIVE	ADAPTIVE	5
INTEROPERABLE	INTEROPERABLE	5
SCALABLE	SCALABLE	5
AVAILABLE	AVAILABLE	5
COMPREHENSIVE	COMPREHENSIVE	5
INTEGRATED	INTEGRATED	5
EXTENSIBLE	EXTENSIBLE	5
PORTABLE	PORTABLE	5
REUSABLE	REUSABLE	5
CONFIGURABLE	CONFIGURABLE	5
MONITORABLE	MONITORABLE	5
TESTABLE	TESTABLE	5
DOCUMENTED	DOCUMENTED	5
STANDARDIZED	STANDARDIZED	5
SECURE	SECURE	5
ACCURATE	ACCURATE	5
FAST	FAST	5
SECURE	SECURE	5
EFFICIENT	EFFICIENT	5
ADAPTIVE	ADAPTIVE	5
INTEROPERABLE	INTEROPERABLE	5
SCALABLE	SCALABLE	5
AVAILABLE	AVAILABLE	5
COMPREHENSIVE	COMPREHENSIVE	5
INTEGRATED	INTEGRATED	5
EXTENSIBLE	EXTENSIBLE	5
PORTABLE	PORTABLE	5
REUSABLE	REUSABLE	5
CONFIGURABLE	CONFIGURABLE	5
MONITORABLE	MONITORABLE	5
TESTABLE	TESTABLE	5
DOCUMENTED	DOCUMENTED	5
STANDARDIZED	STANDARDIZED	5

G	GALVANIZED GAS GASOLINE	GLAZED GRAB GRAINED
H	HAND HANGING HEAT	HEWN HOPPER HYDROCHLORIC
I	ICE IGNEOUS	INSECT*
J	JALOUSIE	
L	LAMINATED LAPPED LAYERED	LEACH LIGHTNING* LOUVERED
M	MARBLEIZED MITERED MOISTURE*	MORTICED MOVEABLE MURIATIC
N	NOTCHED	
O	OILED	OVERHEAD
P	PAINTED PANELED PANIC PARGED PARQUET PIVOTED PLANED PLASTERED	POURED PREFABRICATED PREFORMED PRESSED PRESSURE PROPANE PUNCHEON
R	RAIN* REINFORCED RELIEF	REVOLVING ROLLED ROUGH
S	SAFETY SAWN SCARFED SCREENED SCRIBED SCULPTED SEAMED	SEDIMENTARY SEGMENTED SEPTIC SINGLE HUNG SLIDING SNOW* SOLAR

Item No.	Description	Quantity
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50

S cont.

SOLID
SPLASH
SPLINED
SPLIT
SPRAYED
STAINLESS
STAMPED
STEAM

STENCILLED
STORM*
SULFURIC
SUMP
SUPPRESSANT
SUSPENDED
SWINGING

T

TAMPED
TEMPERED
TENONED
TERMITE*

THATCHED
THERMAL
TILTING
TONGUE & GROOVE

U

ULTRA VIOLET

V

VAPOR*
VEGETABLE

VENEERED

W

WATER*
WATTLE & DAUB

WELDED
WROUGHT

APPENDIX F - PROBLEM SPECIFIERS

Problem specifiers marked with an asterisk (*) typify words that the HSPD normally considers to be problem specifiers, but that may also be used as type specifiers, as in a *termite* shield.

A	ACID ALGAE ALLIGATORING	ANTS* AVALANCHE
B	BEES* BEETLE BENDING BIRDS*	BLEEDING BLISTERING BREAKAGE BRUSH
C	CHEMICAL CONDENSATION CONSUMPTION	CONTRACTION CORROSION CRAZING
D	DAMPNESS DEHYDRATION DEMOLITION DETERIORATION DEW	DIRT DISASTER DISTORTION DRY ROT DUST
E	EARTHQUAKE EFFLORESCENCE ELECTROLYSIS EROSION	EVAPORATION EXCREMENT EXPANSION EXPLOSION
F	FADING FIRE* FLAKING FLOOD	FRACTURE FROST* FUNGUS
G	GOPHERS GRASS GRASSHOPPERS	GRIT GUANO

APPENDIX F - PROBLEM SPECIFICATIONS

F-1 through F-10 are listed in the table below. The table lists the problem number, the problem title, and the page number where the problem is located.

Problem Number	Problem Title	Page Number
F-1
F-2
F-3
F-4
F-5
F-6
F-7
F-8
F-9
F-10

H	HAIL HUMANS	HUMIDITY
I	ICE IMPACT	INSECTS*
J	JACKING	
L	LEAKAGE LICHEN LIFTING	LIGHTNING LOAD
M	MANURE MICE MILDEW MOISTURE*	MOLD MOSS MOVEMENT
N	NEGLECT	
O	OVERBURDEN	OXIDATION
P	PEELING PIGEON PLANTS	POLLUTANT PRESSURE
R	RADIATION RAIN* RATS REMOVAL	RISING DAMP RODENTS ROT RUST
S	SAGS SALT SECRETION SEEPAGE SEPARATION SETTLEMENT SHOCK SLIDES SNOW	SOILING SOOT STAINS STORMS* SQUIRREL SUBFLORESCENCE SUBSIDANCE SWALLOWS
T	TERMITES* THALLOPHYTES	THEFT TREES
U	ULTRA-VIOLET RADIATION	

V

VANDALISM
VEGETATION

VIBRATION

W

WAR
WATER
WEAR
WEATHER
WEEDS

WEIGHT
WET ROT
WIND
WOODPECKER

1947	1948
1949	1950
1951	1952
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2095	2096
2097	2098
2099	2100

APPENDIX G - ALPHABETICAL LIST OF SPECIFIERS AND CONTEXT

SPECIFIER	INFO	ELEM	UNIT	MATL	TYPE	PROB
A						
ABUTMENT			U			
ACCORDION					T	
ACID						P
ACRYLIC				M		
ADDITION	I					
ADJUST	I					
ADOBE				M		
AIR CONDITIONING		E				
AISLE		E				
ALABASTER				M		
ALDER				M		
ALGAE						P
ALKYD				M		
ALL	I					
ALLIGATORING						P
ALTER	I					
ALUMINUM				M		
ANALYSIS	I					
ANCHORS			U			
ANNEALED					T	
ANNUNCIATOR			U			
ANODIZED					T	
ANT					T	P
APPLIANCE			U			
APSE		E				
AQUASTAT			U			
ARCH			U			
AREA		E				
ARRANGE	I					
ARRESTER			U			

APPENDIX C - ALPHABETICAL LIST OF SPECIFIERS AND CONTEXT

Code	Context	Specifier
1		ALPHABET
2		ALPHABET
3		ALPHABET
4		ALPHABET
5		ALPHABET
6		ALPHABET
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9		ALPHABET
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100		ALPHABET

ARTWORK	E				
ASBESTOS			M		
ASH			M		
ASHPIT		U			
ASPEN			M		
ASPHALT			M		
ASSEMBLE	I				
ASSESSMENT	I				
ATRIUM		E			
ATTACH	I				
ATTIC		E			
AUDIO/VISUAL EQUIP.			U		
AUDITORIUM		E			
AUGER			U		
AVALANCHE					P
AWNING U				T	
B					
BALCONY		E			
BALUSTRADE			U		
BAMBOO				M	
BAR			U		
BARGEBOARD			U		
BARREL			U		
BARRIER			U		
BASALT				M	
BASEBOARD			U		
BASEMENT		E			
BASSWOOD				M	
BATHROOM		E			
BATT					T
BATTLEMENT		E			
BEADED					T
BEAM			U		
BEDROOM		E			
BEE					T P
BEECH				M	
BEETLE					P
BELFRY		E			
BELL			U		
BELVEDERE		E			
BEVELED					T
BIBLIOGRAPHY	I				

7	10	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100															
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BIFOLD				T	
BIN		U			
BINDER			M		
BIRCH			M		
BIRD				T	P
BITUMEN			M		
BLANKET				T	
BLEEDING					P
BLINDS		U			
BLISTERING					P
BLOCK		U			
BLOWN				T	
BOARD & BATTEN				T	
BOARDS		U			
BOILER		U			
BOLT		U			
BONDED				T	
BOSSSES		U			
BOX		U		T	
BOXWOOD			M		
BRACE		U			
BRACED				T	
BRACKET		U			
BRASS			M		
BREAKAGE					P
BREAKER				T	
BRICK		U			
BRUSH					P
BRUSHED				T	
BUILD	I				
BUILT-UP				T	
BURNER		U			
BUTTED				T	
BUTTRESS		E			
C					
CABINETRY		E			
CANALE		U			
CANE			M		
CANOPY		U			
CAP	I	U			
CARILLON		U			
CARPET		U			

CARVINGS			U		
CASEMENT					T
CASING			U		
CAST					T
CATWALK			U		
CAULK	I				
CAULKING			U		
CEDAR				M	
CEILING		E	U		
CELLAR		E			
CEMENT				M	
CESS					T
CHAIR					T
CHALK				M	
CHANGE	I				
CHAPEL		E			
CHECK	I				
CHEMICALS					P
CHERRY				M	
CHERT				M	
CHESTNUT				M	
CHIMNEY			U		
CHINKING			U		
CHLORINATOR			U		
CHOIR		E			
CHROMIUM				M	
CHUTE			U		
CIRCUIT BREAKER			U		
CIRCULATING					T
CISTERN			U		
CLASSROOM		E			
CLAY				M	
CLEAN	I				
CLEANOUT			U		
CLOCK			U		
CLOSER			U		
COAL					T
COBBLE					T
COLLECTION		E			
COLUMN			U		
COMBUSTION					T
COMMUNICATION SYSTEM		E			
COMPACT	I				

COMPOSITE				M	
COMPRESSOR			U		
CONCRETE				M	
CONDENSATION					P
CONDUCTOR			U		
CONDUIT			U		
CONNECT	I				
CONNECTOR			U		
CONSERVATION	I				
CONSOLIDATE	I				
CONSTRUCTION	I				
CONSUMPTION					P
CONTRACTION					T P
CONTROL	I				
CONVEYOR			U		
COPING			U		
COPPER				M	
COQUINA				M	
CORAL				M	
CORBEL			U		
CORNICE			U		
CORRAL			U		
CORROSION					P
CORRUGATED					T
COTTON				M	
COUNTER			U		
COURTYARD		E			
COVERING			U		
COWHIDE				M	
CRANE			U		
CRAWLSPACE		E			
CRAZING					P
CREATE	I				
CREOSOTE				M	
CRIB			U		
CRIBBING			U		
CRICKET			U		
CROSS			U		
CROWN					T
CRYPT		E			
CULVERT			U		
CURB			U		
CUT					T

CYPRESS

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D

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ELEVATOR				U		
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EVALUATE	I					
EVAPORATION						P
EVAPORATOR				U		
EVERGREEN						T
EXAMINE	I					
EXCHANGER				U		
EXCRETION						P
EXHIBIT				U		
EXPANSION						T P
EXPLOSION						P
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EXTRUDED						T

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FRUIT				T	
FUNGUS					P
FURNACE		U			
FURNISHINGS	E				
FURNITURE		U			
FUSE				T	
G					
GABLE	E				
GALVANIZED				T	
GARAGE	E				
GARDEN	E				
GAS				T	
GASOLINE				T	
GATE		U			
GAUGE		U			
GENERATOR		U			
GIRDER		U			
GLASS			M		
GLAZED				T	
GLAZING		U			
GLUE			M		
GOLD			M		
GOPHER					P
GRAB				T	
GRADE	I				
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GRASS			M		P
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GRAVEL			M		
GRILLE		U			
GRIT					P
GROUND		U			
GROUT	I				
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GUARD		U			
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HVAC SYSTEM

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INSTALL	I				
INSULATE	I				
INSULATION		U			
IRON			M		
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JALOUSIE				T	
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JOIST		U			
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LAMINATED				T	
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LAPPED				T	
LATCH		U			
LATEX			M		
LATTICE		U			
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LEACH				T	
LEAD			M		
LEAFING		U			
LEAKAGE					P
LEATHER			M		
LICHEN					P
LIFT		U			
LIFTING					P
LIGHTNING				T	P
LIME			M		
LIMESTONE			M		
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LUBRICATE				
M				
MAGNESIUM			M	
MAHOGANY			M	
MAINTENANCE	I			
MAKE	I			
MANHOLE		U		
MANTEL		U		
MANUFACTURE	I			
MANURE				P
MAPLE			M	
MARBLE			M	
MARBLEIZED				T
MARK	I			
MARQUEE		U		
MASONITE			M	
MASONRY		E		
MATERIALS	I			
MEDALLION		U		
MEMBRANE		U		
MESQUITE			M	
METAL			M	
METAMORPHIC				T
METER		U		
MICA			M	
MICE				P
MILDEW				P
MINERAL			M	
MIRROR		U		
MITERED				T
MIX	I			
MOISTURE				P
MOLD				P
MOLDINGS		U		
MONITOR	I			

MORTAR		U		
MORTICED			T	
MOSAICS		U		
MOSS				P
MOTHBALL	I			
MOUNT	I			
MOVE	I			
MOVEABLE			T	
MOVEMENT				P
MOW	I			
MUD		M		
MURIATIC			T	
N				
NAVE		E		
NEGLECT				P
NEOPRENE		M		
NICKEL		M		
NOTCHED			T	
NYLON		M		
O				
OAK			M	
OFFICE		E		
OILED			T	
OILS			M	
OPENINGS		E		
ORCHARD		E		
ORCHESTRA		E		
OUTLET		U		
OVEN		U		
OVERBURDEN				P
OVERHEAD			T	
OXIDATION				P
P				
PADLOCK		U		
PAINT	I	U		
PAINTED			T	
PAINTINGS		U		
PALM			M	
PANEL		U		

PANELED					T
PANIC					T
PANTRY		E			
PAPER				M	
PARGED					T
PARGING			U		
PARKING		E			
PARLOR		E			
PARQUET					T
PATCH	I				
PATH			U		
PEAR				M	
PEELING					P
PERIODIC MAINTENANCE	I				
PEST					T P
PESTICIDE				M	
PEWTER				M	
PHOTOGRAPH	I				
PIER			U		
PIGEON					P
PILASTERS			U		
PILINGS			U		
PINE				M	
PIPE			U		
PISE				M	
PIVOT			U		
PIVOTED					T
PLANED					T
PLANK			U		
PLANTS					P
PLAQUE			U		
PLASTER			U		
PLASTERED					T
PLASTIC				M	
PLATE			U		
PLATING			U		
PLUMBING SYSTEM		E			
PLYWOOD				M	
POINT					
POLLUTANTS					P
POLYVINYL CHLORIDE				M	
POOL			U		
POPLAR				M	

MEMORANDUM
TO: [Name]
FROM: [Name]
SUBJECT: [Subject]

1. [Text]

2. [Text]

3. [Text]

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30. [Text]

[Faint, mostly illegible text in the main body of the page]

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PREFABRICATED				T
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PRESERVATION	I			
PRESERVATIVES			M	
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PRESSURE				T P
PREVENT	I			
PREVENTION	I			
PRODUCTS	I			
PROPANE				T
PROSCENIUM		E		
PROTECTION	I			
PROTECTION SYSTEM		E		
PULL			U	
PUMP			U	
PUNCHEON				T
PURLIN			U	
PUTTIES			U *****	
Q				
QUALITY	I			
QUARTZ			M	
R				
RACEWAY			U	
RACK			U	
RADIATION				P
RADIATOR			U	
RAFTER			U	
RAIL			U	
RAIN				P
RAKE	I			
RAMP			U	
RAT				P
RATTAN			M	
RAYON			M	
REARRANGE	I			
REASSEMBLE	I			

REATTACH	I				
REBUILD	I				
RECEPTACLE			U		
RECONSTRUCTION	I				
RECORDS	I				
REDWOOD				M	
REED				M	
REFERENCE	I				
REGISTER			U		
REGLAZE	I				
REGLET			U		
REGROUT	I				
REHABILITATION	I				
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RELAY	I				
RELIEF					T
RELOCATION	I				
REMOVAL					P
REMOVE	I				
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REPLACE	I				
REPOINT	I				
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RESOLDER	I				
REST ROOM		E			
RESTORATION	I				
RESUPPORT	I				
RESURFACE	I				
RETAINING					T
RETROFIT	I				
REVTMENT			U		
REVOLVING					T
REWELD	I				
RIDGE			U		
RIDGEBOARD			U		
RISING DAMP					P
ROAD		E			
RODENTS					P
ROLLED					T
ROOF		E	U		
ROSEWOOD				M	

ROT				P
ROTATE	I			
ROUGH			T	
ROUTINE MAINTENANCE	I			
RUBBER		M		
RUST				P
S				
SAFETY			T	
SAGS				P
SALTS				P
SAND		M		
SANDSTONE		M		
SAWN			T	
SCALE		U		
SCARFED			T	
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SCREENED			T	
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SCUTTLE		U		
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SEATING		U		
SECRETION				P
SEDIMENTARY			T	
SEEPAGE				P
SEGMENTED			T	
SEPARATION				P
SEPTIC			T	
SERPENTINE		M		
SERVICE	I			
SETTLEMENT				P
SEWER		U		
SHAKE		U		
SHEEPSKIN			M	
SHELF		U		
SHELLACS		U		
SHIELD		U		
SHINGLE		U		
SHOCK				P
SHORE	I			

DATE	DESCRIPTION	AMOUNT	BALANCE
1950-01-01	OPENING BALANCE		100.00
1950-01-15	PAYROLL	50.00	150.00
1950-01-30	RENT	20.00	130.00
1950-02-15	SALES	75.00	205.00
1950-02-28	EXPENSES	30.00	175.00
1950-03-15	RECEIPTS	60.00	235.00
1950-03-31	CLOSING BALANCE		235.00

SHRUB						U			
SHUTTER						U			
SIDING			E			U			
SIGN						U			
SILK							M		
SILL						U			
SILVER							M		
SINGLE HUNG								T	
SIREN						U			
SITE			E						
SKETCH	I								
SKYLIGHT						U			
SLAB						U			
SLATE							M		
SLIDES									P
SLIDING								T	
SNOW									P
SOD							M		
SOFFIT						U			
SOFTENER						U			
SOILING									P
SOLAR								T	
SOLDER							M		
SOLID								T	
SOLVENT							M		
SOOT									P
SOYBEAN OIL							M		
SPACE			E						
SPANDREL						U			
SPINDLE						U			
SPIRE			E						
SPLASH						U		T	
SPLINED								T	
SPLIT								T	
SPRAYED								T	
SPRUCE							M		
SQUIRREL									P
STABILIZATION	I								
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STAGE			E						
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STEAM				T	
STEEL			M		
STEEPLE	E				
STENCILLED				T	
STEP		U			
STONE		U	M		
STOOP	E				
STOP		U			
STORAGE & HANDLING	I				
STORM				T	P
STRAIGHTEN	I				
STRAW			M		
STRUCTURAL SYSTEM	E				
STUCCO		U			
STUCCOED				T	
STUDY	E				
SUBFLORESCENCE					P
SUBSIDANCE					P
SULFURIC				T	
SUMP				T	
SUPPORT	I				
SUPPRESSANT				T	
SURFACE	E				
SURROUND		U			
SUSPENDED				T	
SWALLOW					P
SWEEP	I				
SWINGING				T	
SWITCH		U			
SYCAMORE			M		
T					
TAMPED				T	
TANK		U			
TAPESTRY		U			
TARPAPER			M		
TEAK			M		
TEMPERED				T	
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STALL

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STOCKING & HANDLING

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THALLOPHYTES					P
THATCHED					T
THEFT					P
THERMAL					T
THERMOSTAT			U		
THREATS	I				
THRESHOLD			U		
TI LEAF				M	
TILE			U		
TILTING					T
TIMER			U		
TIN				M	
TONGUE & GROOVE					T
TOOLS	I				
TOWER		E			
TRACERY			U		
TRAIL			U		
TRANSEPT		E			
TRANSFER	I				
TRANSFORMER			U		
TREES			U		P
TRELLIS			U		
TRIM	I				
TRIM		E			
TROUGH			U		
TRUSS			U		
TUFA				M	
TUFF				M	
TUNG OIL				M	
TUNNEL			U		
TURPENTINE				M	
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U					
ULTRA VIOLET					T P
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UTILITY ROOM

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VACUUM

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VALVE

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VEGETATION

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WATTLE & DAUB

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WAX

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WEATHER

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WEATHERSTRIPPING

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WELDED

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WHITEWASHES

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WINCH

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WIND

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WINDOW

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WIRING

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WOOD

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WOODPECKER

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WOOL

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WROUGHT

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UTILITY WORK

WALTON

WALY

WALVE

WALWORTH

WALY

WALY

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WALY & HALL

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WALY & HALL

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