TreeKeeper for Windows (TKW) was developed and is distributed by the Davey Resource Group based in Kent, Ohio. TKW was recently upgraded to Windows® and the MS-DOS® based version is no longer available. The Davey Resource Group prefers to limit their services to the United States, where there are over 30 communities using TKW.

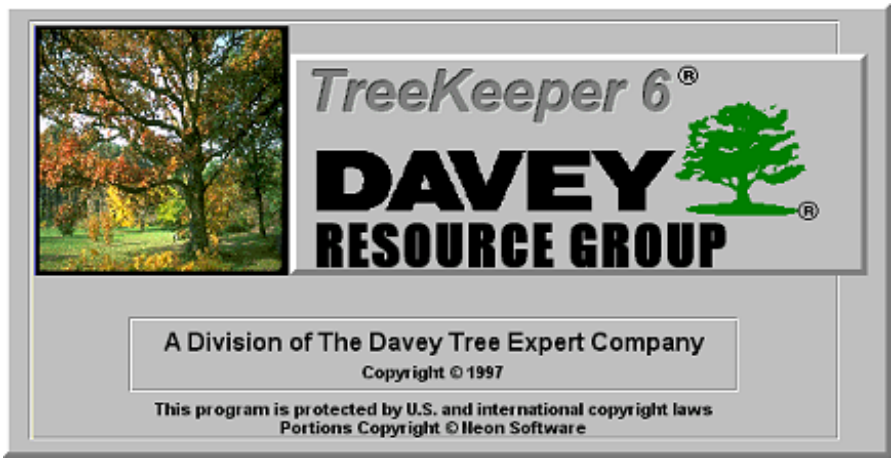


Figure 3.5.1: TreeKeeper for Windows splash screen.

Services

- Management plans
- Tree inventories
- Plant and soil testing
- Commercial applications testing
- Research and field evaluation
- GIS and GPS
- Production monitoring
- Communications technology

System requirements

- Windows® 95, 98, NT®
- 486 Processor
- 16 MB of RAM

TKW was primarily used on a Gateway$_{TM}$ G6-200 Pentium Pro® PC with Windows NT®. TKW was also used with Windows® 95 and 98 on a Gateway$_{TM}$ P5-166 Pentium® and a Gateway$_{TM}$ G6-300 Pentium® II, respectively. The directory for the demonstration version of TKW uses 17,038 KB of hard disk space including sample data. After entering data for 454 tree sites the directory size increased to 18,569 KB. Therefore 1,000 tree sites would require approximately 3,372 KB (3.29 MB).

Software cost

TKW is purchased from the Davey Resource Group for $5,000.00. A demonstration version is available.

Technical support

The demonstration version of TKW is provided with a 45 page training outline. The Davey Resource Group provides one day of onsite training and one year of free technical support with the purchase of their software. Additional support is charged at an hourly rate and can be purchased in multiple-hour packages.

Contact

Davey Resource Group
1500 North Mantua Street
P.O. Box 5193
Kent, OH 44240-5193

Phone: 1-800-447-1667
Email: info@davey.com
Internet: www.davey.com

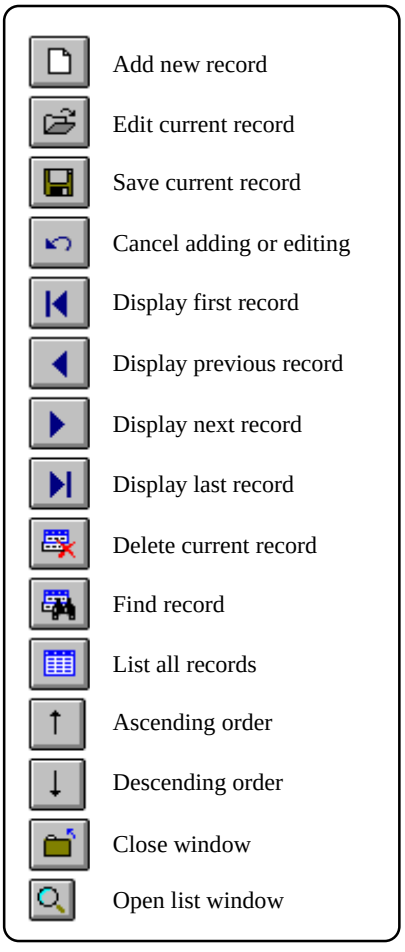


Figure 3.5.2: TKW command buttons and functions.

The **bold** text in the following description refers to window names indicated in the title bar of each window. *Italicized* text refers to either field names, field list selections, menu selections, checkboxes, or button names.

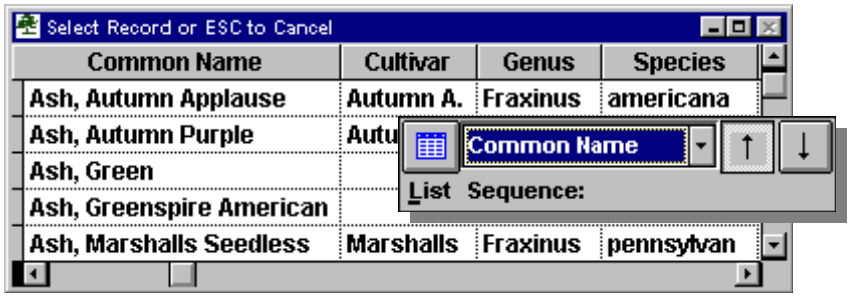


Figure 3.5.3: The sequence drop-down list and the sort order buttons control the order in which records are displayed in list windows and scrolled in the main window.

General operation

TKW command buttons and functions are indicated in Figure 3.5.2. Each window in TKW contains a *sequence* drop-down list which controls the sort order of records shown in the database list window (Figure 3.5.3). Fields in the *sequence* drop-down list vary according to the currently selected database. Figure 3.5.3 indicates the *common name* field in the tree species database sorted in ascending order. The selected *sequence* and its sort order also control the order in which records are scrolled using the *next* and *previous* buttons.

Defining users

An *user ID* and *password* must be entered when TKW is started, and are defined along with *user rights* through the **user information** window (Figure 3.5.4). Up to a 20 character *first* and *last name* are entered, along with up to an eight character *password* and a three character *user ID*. Users must be assigned to a *group*, which contains users with similar access privileges. A user can be designated as *group manager* and *system administrator*. Only administrators are able to access the administrative functions in TKW, although group managers are able to assign users to their group and assign group member access privileges. All users are granted the right to change their password. Nearly 90 databases and TKW command functions are listed in the lower portion of the **user information** window. User rights of either *full access*, *read only*, *add only*, *edit only*, *add and edit*, or *no access* can be assigned for each of these (Figure 3.5.5).

Figure 3.5.4: Users must be defined in order to gain access to the system. Users are assigned to a group which contains other users with similar access privileges.

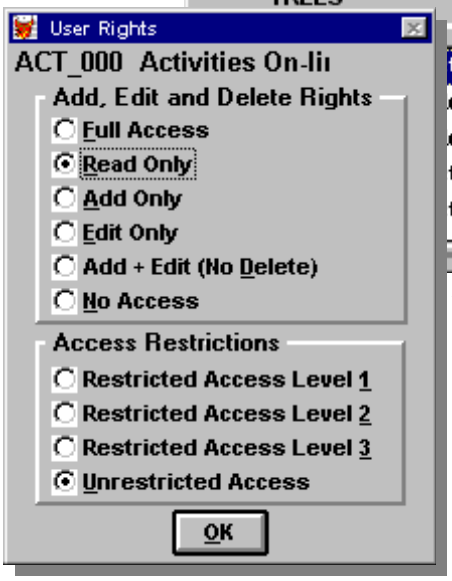


Figure 3.5.5: User rights can be assigned for nearly 90 databases and command functions listed in the user information window. Access restriction levels were not implemented in the version of TKW used in our study.

Figure 3.5.6: Security groups contain users with similar access privileges. Each user must be assigned to a group.

Defining security groups

Security groups contain users with similar access privileges and are defined by entering up to 15 character *group* name in the **security groups** window (Figure 3.5.6). This window is accessible only to system administrators.

System control

The **control table** window is used for setting the system format for *request numbers*, *next request number*, *next contact code*, *work order number* format, *next work order number*, *date* format, and *default units of measure* (Figure 3.5.7). *Linear*, *diameter*, *volume*, *height*, *weight*, and *time* units of measure can be set. Several units are included with the system and additional units can be defined. A *species pictures* checkbox indicates if species pictures are included with the system, however species pictures were not implemented in the version of TKW used in our study. The first heading line appearing on reports is not editable, however the second heading line can be entered in this window by the administrator. The **control table** window also contains release data which include the system serial and version number, build date, and maximum allowed number of users and trees. This window is accessible only to system administrators.

Setting a logon message

A utility is provided in the **administrator logon control** window for entering an administrative message dialog that appears during system startup (Figure 3.5.8). The dialog is active when the *display administrative message* checkbox is enabled. No user is allowed to access the system when the *force user logoff* checkbox is enabled. Only one administrative dialog message can be stored in the system. This window is accessible only to system administrators.

Reviewing logon data

The **logon control table** window is used for viewing past user logon data and forcing users to logoff the system (Figure 3.5.9). User logon data include *userid*, *logon date* and *time*, *logoff date* and *time*, whether the user is currently *logged on*, and whether

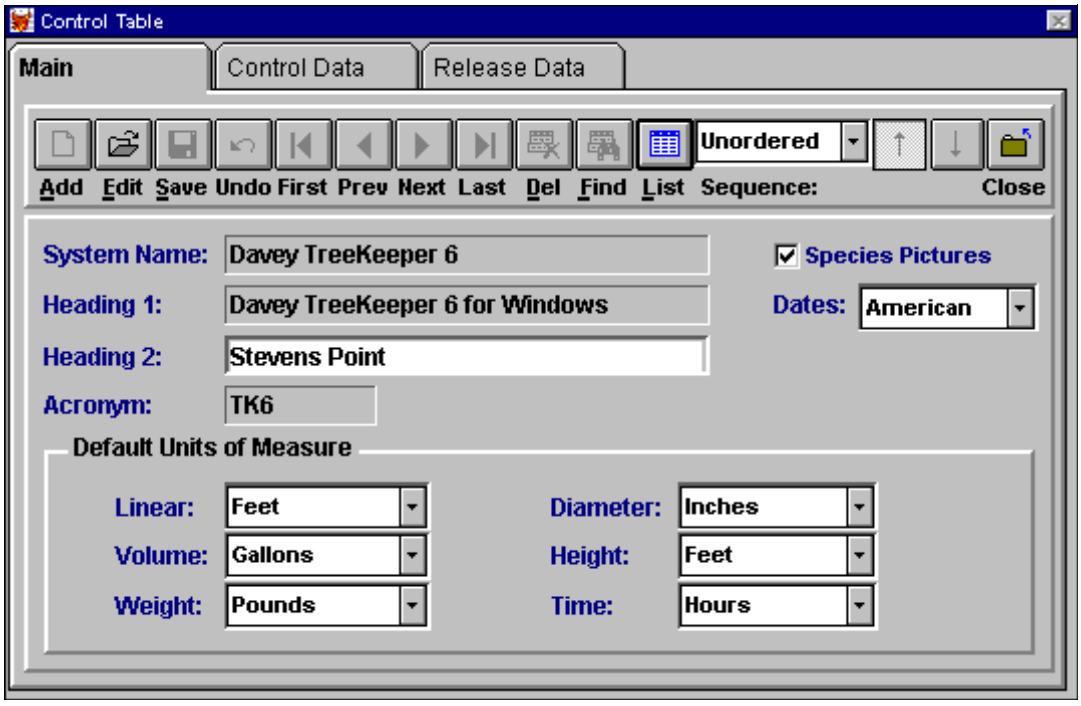


Figure 3.5.7: Administrators can set the system default units of measure, date format, heading text for reports, and formats for work requests and orders.

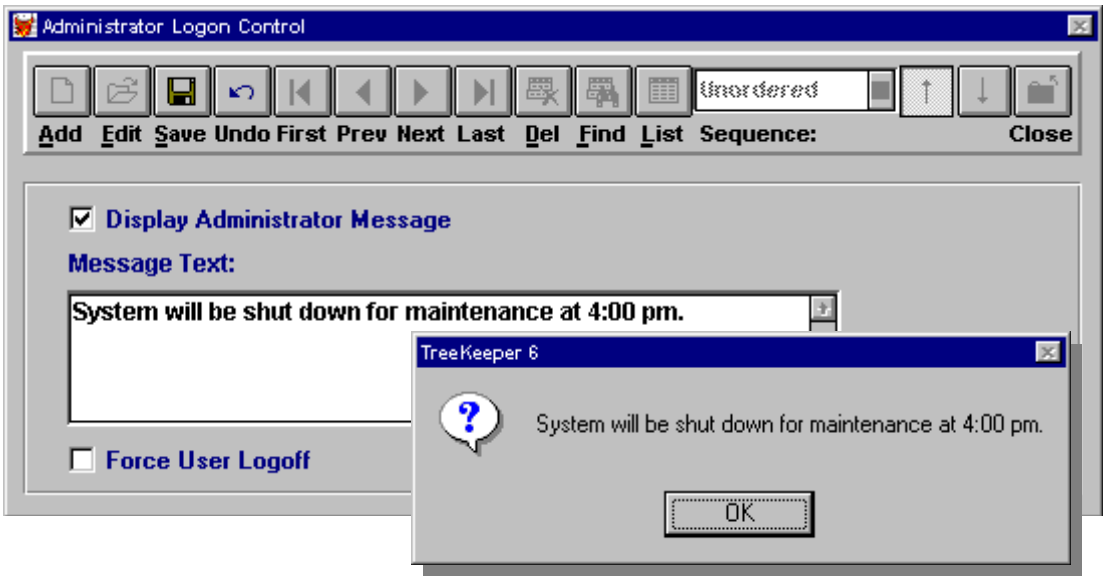


Figure 3.5.8: Administrators can have a dialog appear during system startup. Administrators can also prevent users from logging on.

the user has been *forced* to *logoff*. All logon data are shown from the time the system was built, although data can be purged from the system prior to a user-specified date. The **logon control table** window also indicates configuration data which include the TKW directory path, temporary file directory path, processor type, graphics card type, and amount of memory (RAM) used by the system. This window is accessible only to system administrators.

System preferences

Administration, *environment*, *query default*, and other *preferences* are set in the **system preferences** window (Figure 3.5.10). Each of these are described below.

Administration preferences include logon control options, enabling users to force logoffs, and enabling transaction logging. The logon control option can be set to either *logon control not used*, *track only current logon status*, or *track logon history*. These control the amount of user logon data recorded in the **logon control table** (Figure 3.5.9). Each user transaction can be logged by enabling the user transaction logon option.

Query default preferences refer to work order queries, and can be set to include *all* trees, *street trees*, or *non street trees* in the *tree types* drop-down list. *Trees*, *stumps*, and *planting spaces* can be set to be

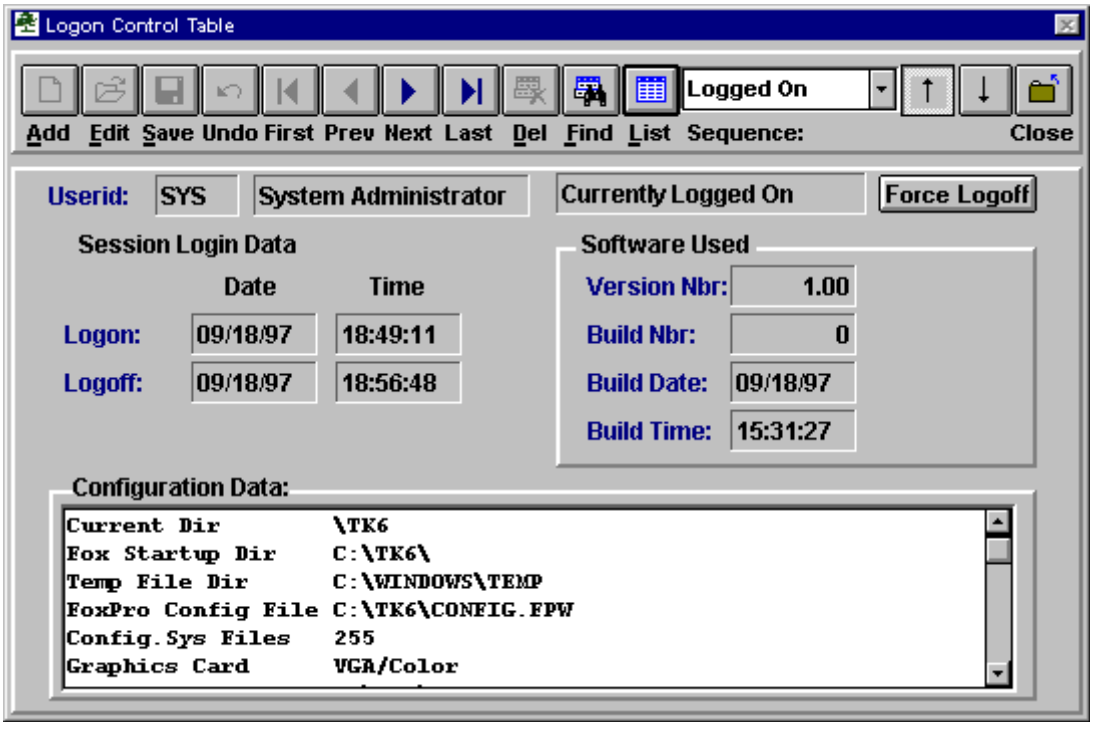


Figure 3.5.9: Administrators can view past user logon data and can force users to logoff the system.

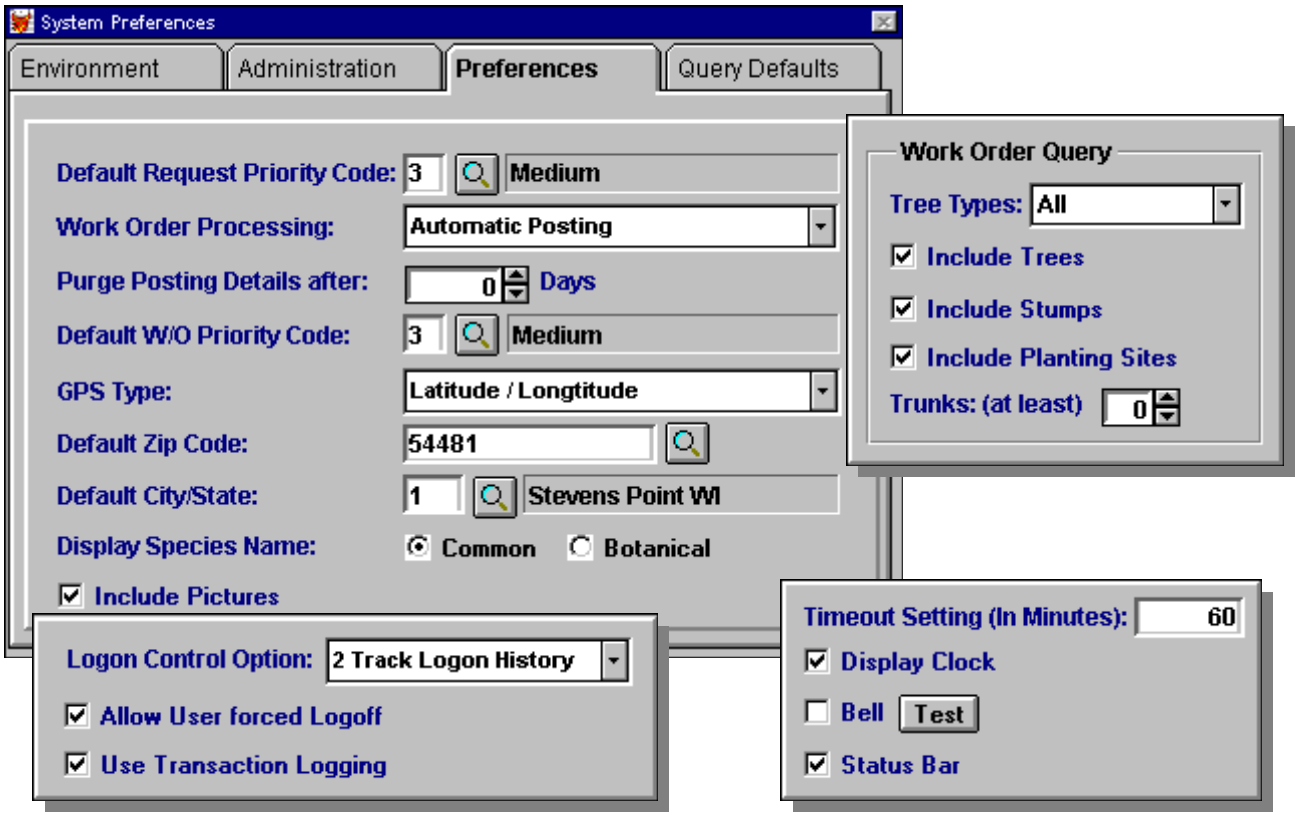


Figure 3.5.10: System preferences include setting default codes, work order query options, system display options, and logging options.

included or ignored in queries. A minimum number of *trunks* can be specified if desired query results are to only include trees with multiple trunks.

Environment preferences enable or disable the system *clock*, *status bar*, and *bell*. The *bell* sounds each time at the end of field editing if it is enabled. The system can be configured to shut down if it remains inactive for the specified *timeout setting*.

Other *preferences* include setting a *default request priority code* for new requests, either *automatic* or *manual* posting for *work order processing*, number of days to *purge posting details*, *default work order priority code* for new work orders, *GPS* coordinate *type*, *default zip code* for new addresses, *default city and state* for new addresses, display of either *common* or *botanical species* names, and whether species *pictures* are included in the species table.

Environment and *query defaults* settings are editable by any user. Users can also edit the display of species names. All other **system preferences** are accessible only to system administrators.

User favorites menu

Each user can define the selections under their *preferences* menu so that they can efficiently navigate to their most commonly used system windows (Figure 3.5.11). The **user favorites menu maintenance** window is used to select the *preferences* menu selections. Selections appear in the *preferences* menu in the order that they are added in this window.

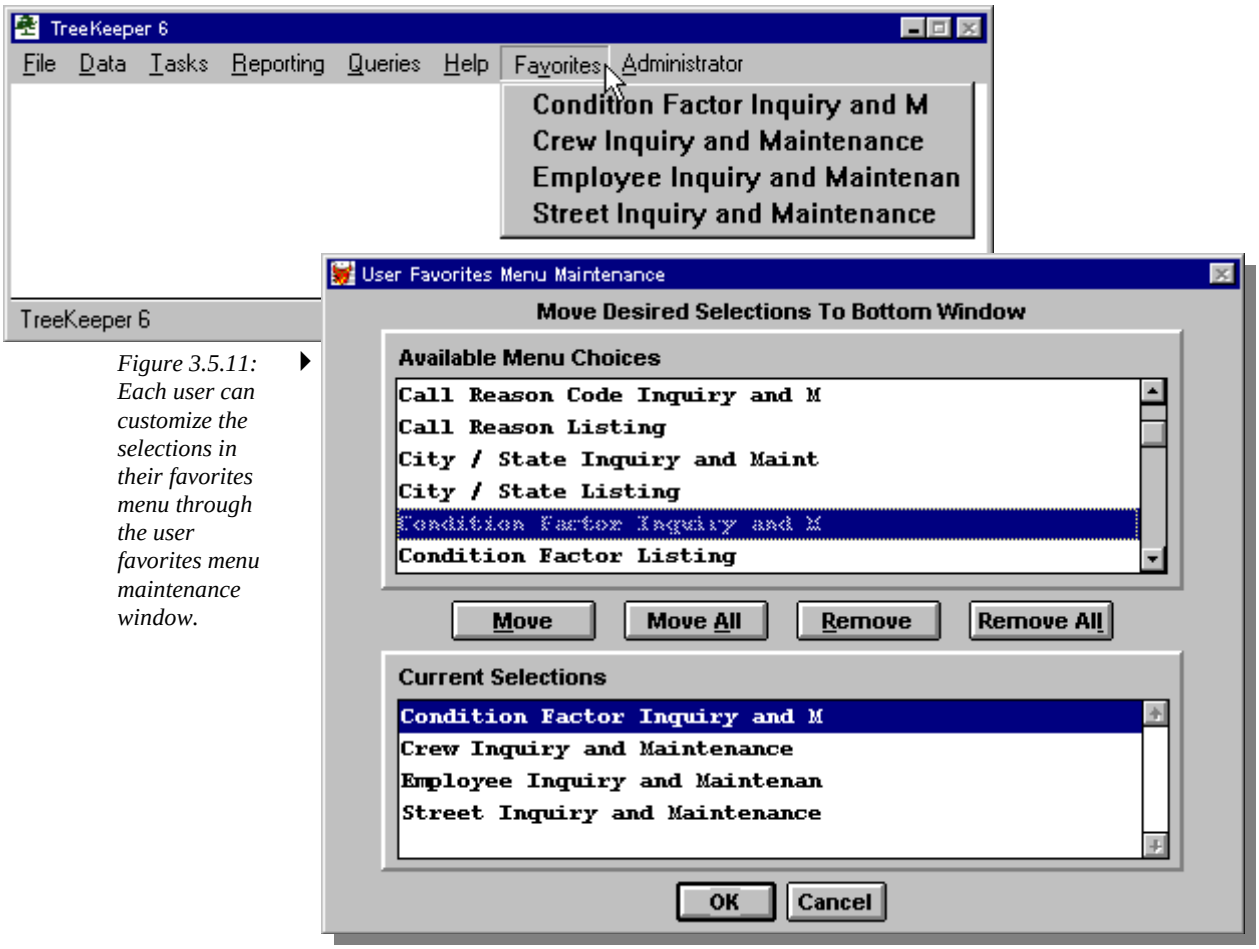


Figure 3.5.11: Each user can customize the selections in their favorites menu through the user favorites menu maintenance window.

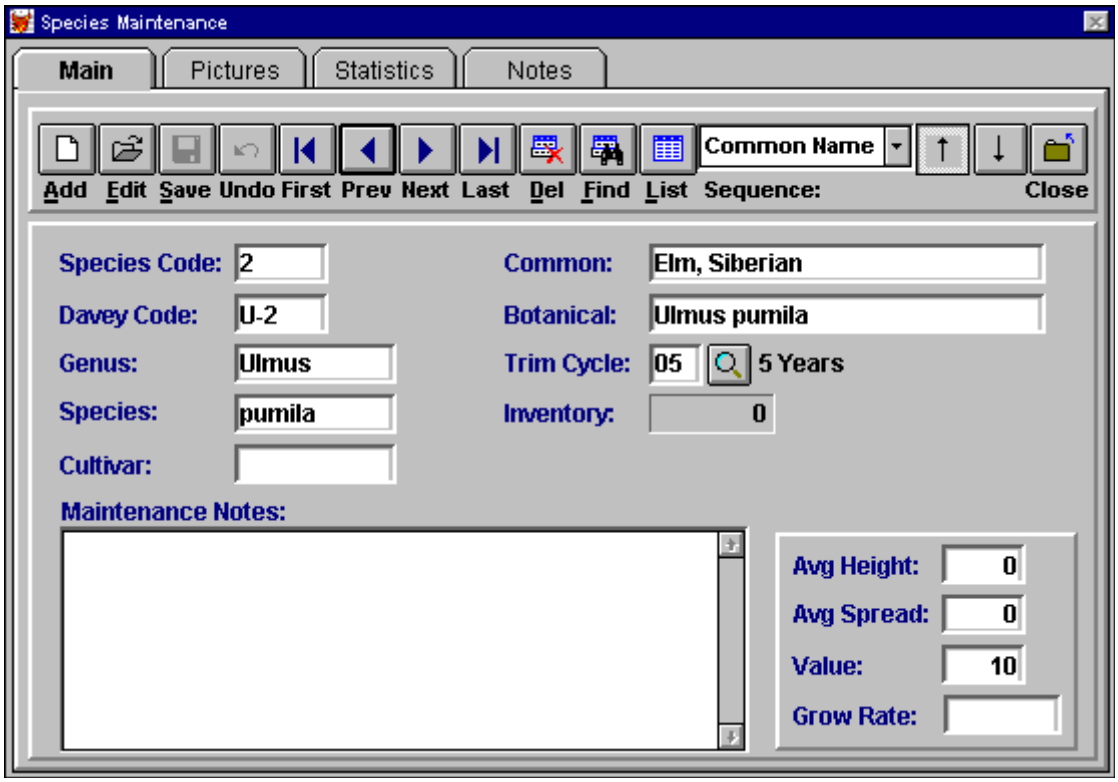


Figure 3.5.12: A species and davey code must be entered when defining species. Species statistics include counts and costs for closed and open work requests.

Defining tree descriptors

Tree descriptor databases include *species*, *hardware* types, and *trim cycles*, along with *diameter*, *condition*, and *height classes*. Each of these are described below.

Species information is defined in the **species maintenance** window (Figure 3.5.12). Species pictures and statistics are viewed, and maintenance logs are recorded in this window. Required fields include *species code* and *davey code*, each of which can be up to five characters. The *davey code* corresponds to the master species library maintained by the Davey Body of Knowledge. Other fields include *genus*, *species*, *cultivar*, and *common* and *botanical* names. *Genus*, *species*, and *cultivar* can each be up to ten characters. *Common* and *botanical* names can be 30 and 32 characters, respectively. *Average height*, *spread*, species *value* (CTLA valuation), and up to a ten character *grow rate* description can be entered. A species *trim cycle* code can be typed or selected from a list window. A non-editable *inventory* field is provided to indicate a count of trees for the species in the inventory. Species statistics include counts and costs for both closed and open work requests. Statistics can be indicated for the genus or species, and can be displayed for every year or individual years selectable from a drop-down list.

A *dbh code* and *description*, along with the *minimum*, *maximum*, and *average* diameters must be entered when defining *diameter classes* (Figure 3.5.13). *Dbh code* can be up to two characters and the *description* up to ten characters. Diameters can be recorded to one decimal place.

A *condition code*, *description*, and *valuation percentage* (CTLA valuation) must be entered when defining *condition classes* (Figure 3.5.13). The *condition code* must be one character and the *description* up to ten characters.

A *height code* and *description*, along with *minimum*, *maximum*, and *average heights* must be entered for each *height class* (Figure 3.5.13). The *height code* can be up to two characters and the *description* up to ten characters. *Minimum*, *maximum*, and *average* heights can be recorded to one decimal place.

Hardware configurations associated with trees are defined in the *hardware* type database (Figure 3.5.13). A *hardware type code*, *description*, and *short description* must be entered. The *hardware type code* can be up to two characters, the *description* up to 30 characters, and the *short description* up to 15 characters.

A *trim cycle code*, *description*, and *number of years* must be entered when defining *trim cycles* (Figure 3.5.13). The *trim cycle code* and *number of years* can each be up to two characters, and the *description* up to ten characters.

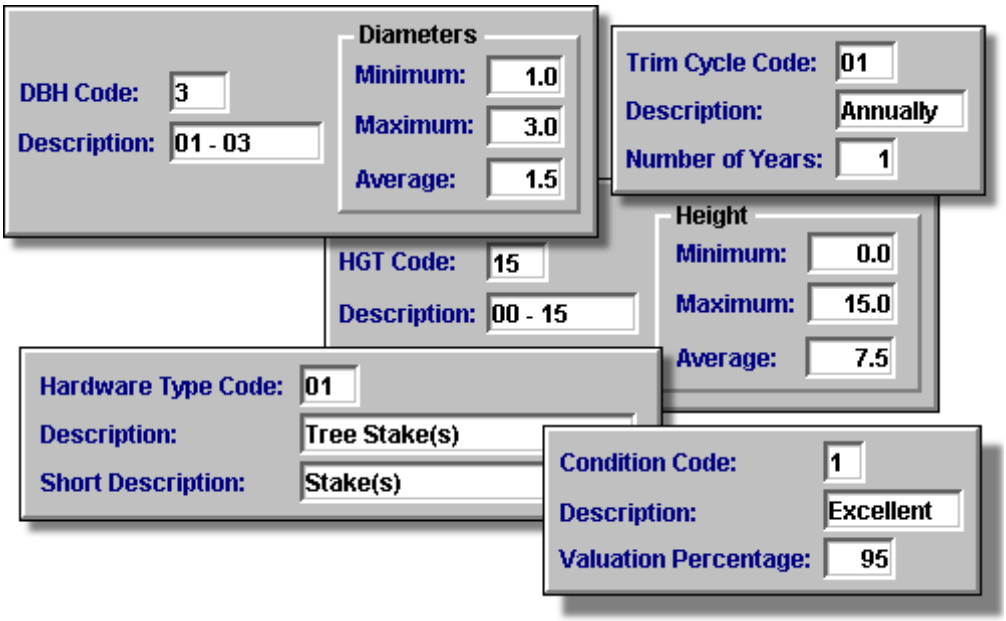


Figure 3.5.13: Tree descriptor databases include diameter, height, and condition classes. Databases of hardware types associated with trees and trim cycle periods can also be defined.

Defining site descriptors

Site descriptor databases include *grow space*, *conductor*, and *hardscape* damage types (Figure 3.5.14). *Grow spaces* are defined by entering a *growspace type* code and *description*. The *growspace type* can be up to two characters and the *description* up to 25 characters. For *hardscape* damage types up to a two character *hardscape damage code* and up to a 34 character *description* must be entered. *Conductor* types refer to utility line situations found at tree sites. A *conductor type code*, *description*, and *short description* must be entered. The *conductor type code* can be up to two characters, the *description* up to 29 characters, and the *short description* up to 14 characters.

Defining location descriptors

Location descriptor databases include *state and province*, *city and state*, *zip code*, *street*, and *address*. *Facility* databases are provided for non-street trees although are not described here. *State and province* information is provided with the system. A two character *code*, up to a 20 character *name*, and up to a 15 character *country* must be entered when defining additional *states and provinces* (Figure 3.5.15). For *city and state* a *city state code* and *city* name must be entered (Figure 3.5.15). *City state code* can be up to two characters and *city* name up to 20 characters. A *state* abbreviation can also be entered, and a list window appears if the entered abbreviation does not match those in the *state and province* database. In the *street* database a *street code*, *street* and *sort name*, *odd* and *even direction*, and *city* and *state name* must be entered (Figure 3.5.15). *Street code* can be up to five characters, and *street* and *sort name* can each be up to 20 characters. *Sort name* is automatically generated although can be edited. Either an *A* or *D* must be entered for the street number direction on both the odd and even sides. *City* and *state name* can be entered by either typing their code or selecting from a list window. *Addresses* can be defined during or prior to data entry. A *street number* and *code* must be entered (Figure 3.5.16). *City* and *state name*, *zip code*, and *property owner* information can also be entered. A *property owner* can be selected from the *contacts* database (described below). A checkbox is available for *fictitious* addresses which are used for properties without visible address numbers.

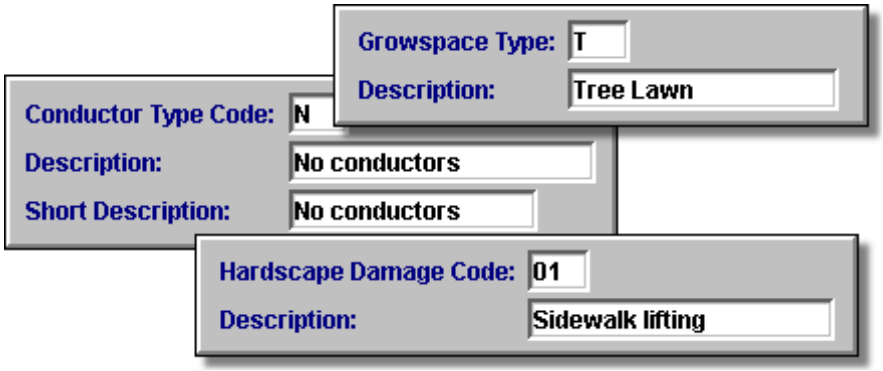


Figure 3.5.14: Site descriptor databases include grow space, conductor, and hardscape damage types.

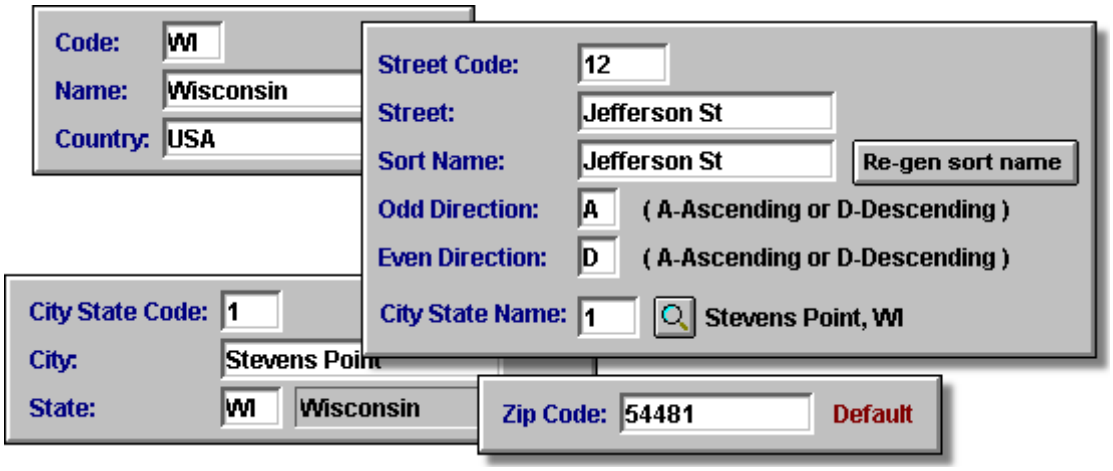


Figure 3.5.15: Location descriptor databases include state and province, city and state, zip code, and street.

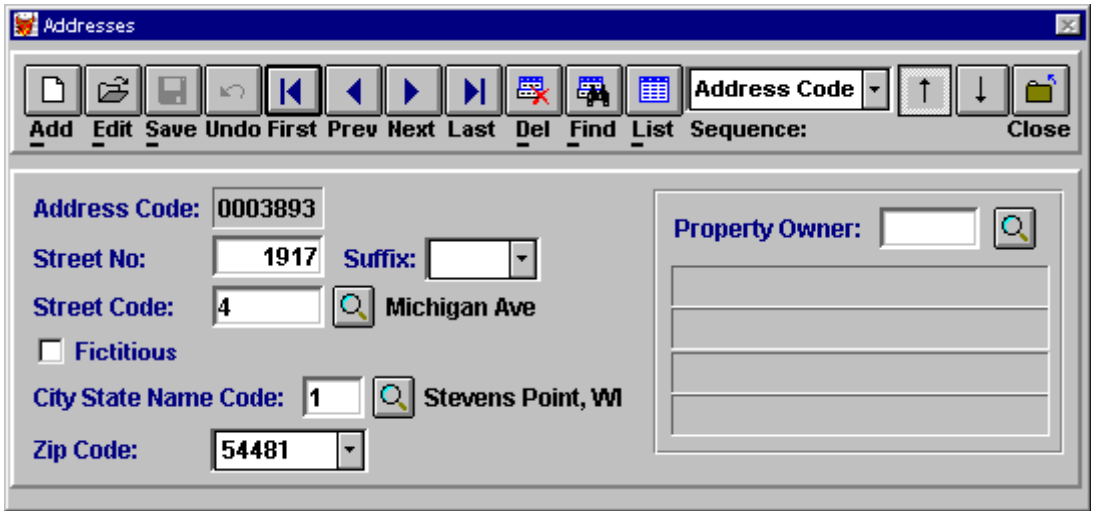


Figure 3.5.16: Addresses can be defined during or prior to data entry. A property owner can be selected from the contacts database for each address.

Defining vendors

The **vendors** window is used to define the vendors who provide supplies, contract work, or equipment to the agency (Figure 3.5.17). A *vendor ID* up to five characters and a *name* up to 35 characters must be entered. Entering contact information, including an *email* and a *web site* address, is optional. A list window is available for *state and province* abbreviations.

Defining job classes

Job classes are used for cost estimating purposes. Job class information includes *job code*, *description*, *cost per hour*, and *charge per hour* (Figure 3.5.18). The *job code* can be up to five characters and the *description* up to 35 characters. The *cost per hour* refers to the amount paid for work performed by resources of the specified job class. The *charge per hour* refers to the amount charged out to requested utilizing resources of the specified job class.

Defining employees

Information about company employees is recorded in the **employees** window (Figure 3.5.19). An *employee code* up to five characters, a *first* and *last* name, and a *job code* must be entered. Whether the employee is active must also be indicated. Other information that can be entered includes *middle* initial, *social security* number, *phone* number, hourly *rate*, *hire* and *termination dates*, *fulltime* or *seasonal* status, number of work hours per week, *from* and *to* availability dates for seasonal employees, and *comments*. *Hire* and *termination* dates must be entered if an employee is indicated as seasonal. *Rate* and *job class* information are used when employees are assigned to crews and the costs of work requests are calculated.

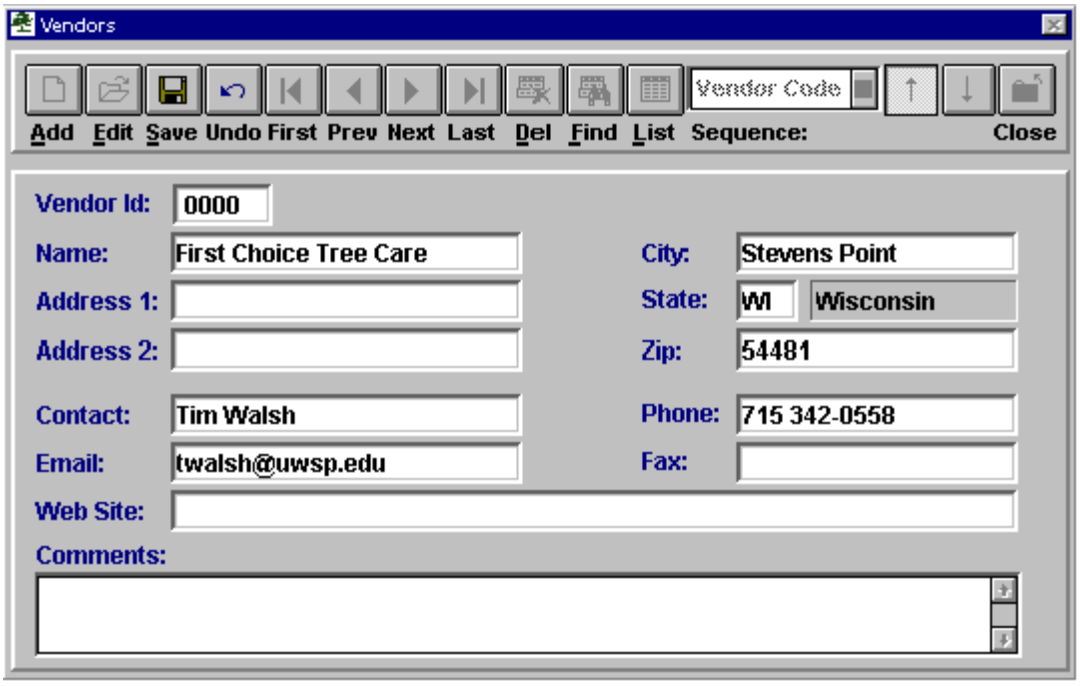


Figure 3.5.17: A database of vendors who supply contract work, equipment, or materials to the agency can be defined.

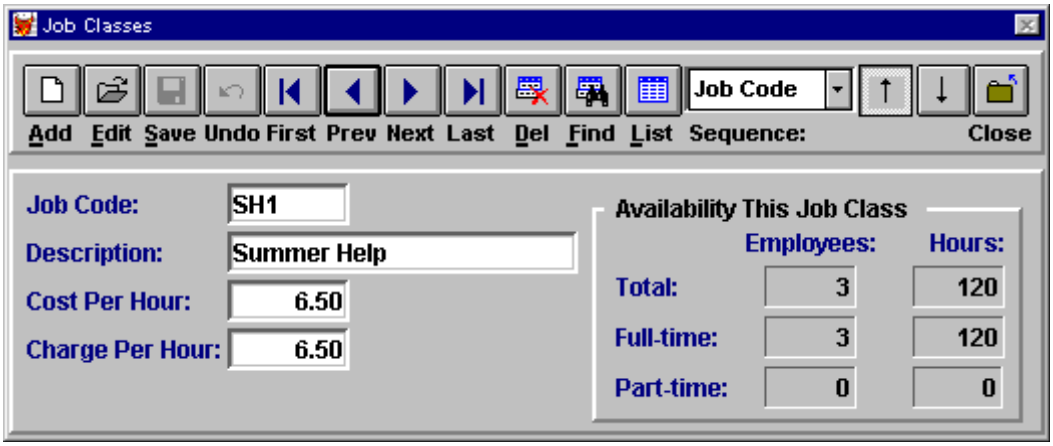


Figure 3.5.18: Job classes and their associated costs can be defined. The number of available hours for each job class is displayed after employees are defined, and can be used for planning purposes.

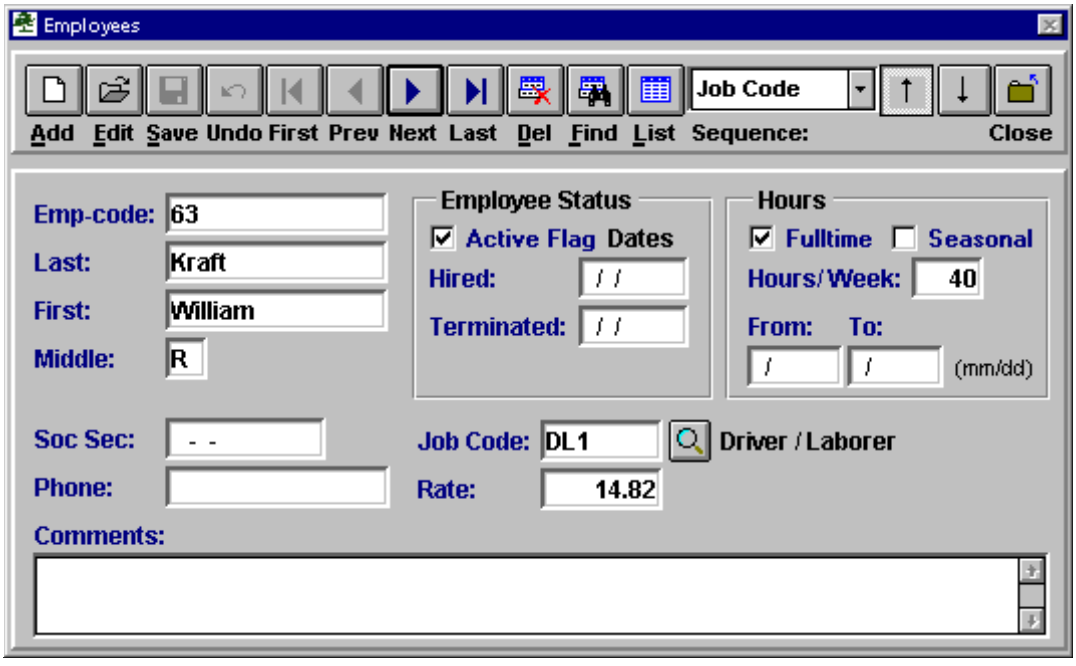


Figure 3.5.19: Employee data can be recorded, which include a job code and rate used for estimating costs of work requests.

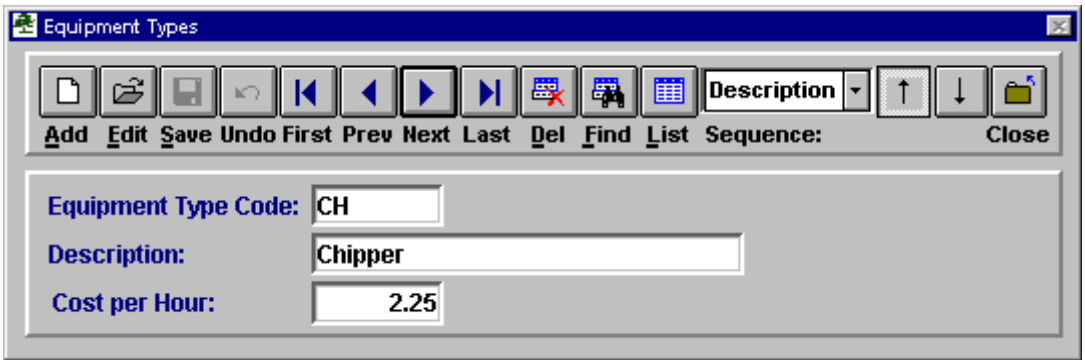


Figure 3.5.20: Equipment types must be defined before recording equipment information. A cost per hour is entered for cost estimating purposes.

Defining equipment types

Equipment types and their costs per hour are defined in the **equipment types** window (Figure 3.5.20). Equipment types must be assigned when inventorying equipment. An *equipment type code* up to two characters and up to a 30 character *description* must be entered. A *cost per hour* can be entered for cost estimating purposes.

Inventorying equipment

Descriptive information about equipment is recorded in the **equipment** window (Figure 3.5.21). An *equipment code*, *description*, and *type* must be entered. The *equipment code* can be up to 5 characters and the *description* up to 30 characters. The *equipment type code* can be entered directly or selected from a list window. Other information that can be entered includes *vendor*, *manufacturer*, *model*, *serial number*, *asset number*, *financial values*, *per hour rates*, whether the equipment was *leased* or *purchased*, *lease values*, and *comments*. For financial information a *purchase date* and *value*, *salvage date* and *value*, and *depreciation amount* can be entered. The *salvage date* refers to the date that the equipment is expected to be disposed of or fully depreciated. *Per hour rates* are used for estimating activities and assigning costs when posting work orders.

Defining supplies

A database of supplies used in activities (described below) is maintained for cost estimating purposes. A *supplies code* up to five characters and a *description* up to 35 characters must be entered (Figure 3.5.22). A *short description*, *unit of measure*, *cost*, *vendor*, and *comments* can also be entered.

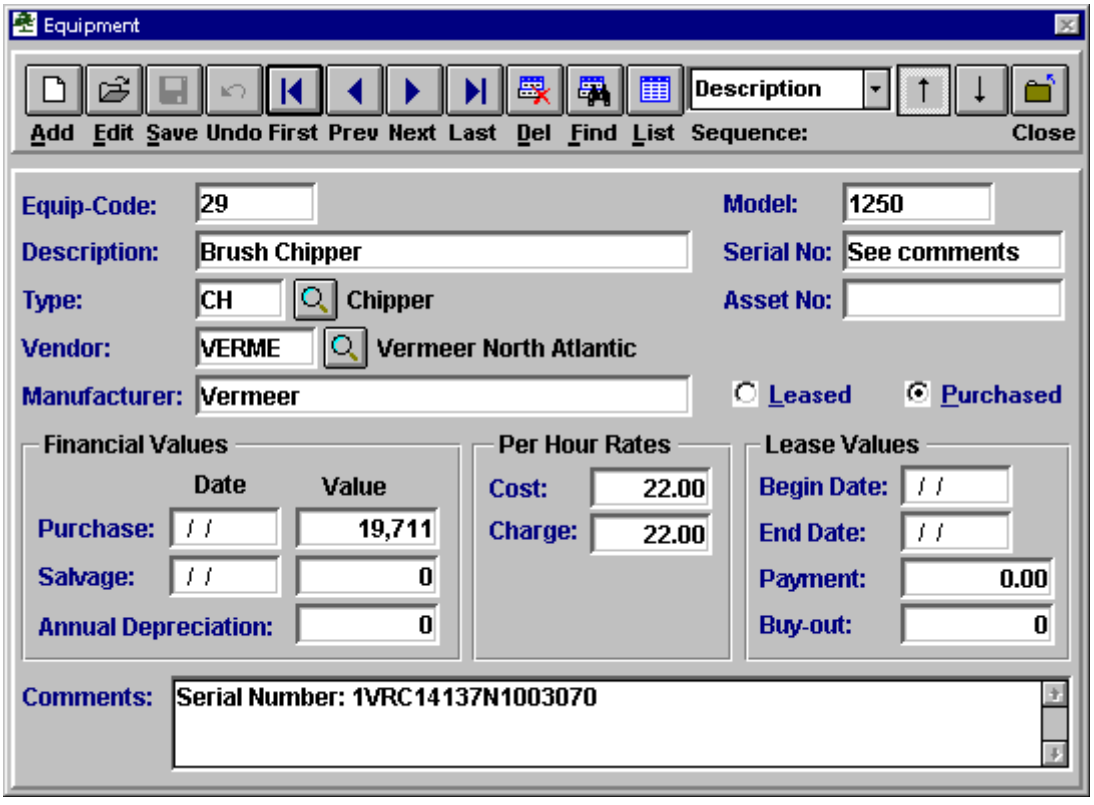


Figure 3.5.21: An inventory of equipment information can be maintained and per hour rates for equipment can be entered so the system can estimate costs of activities.

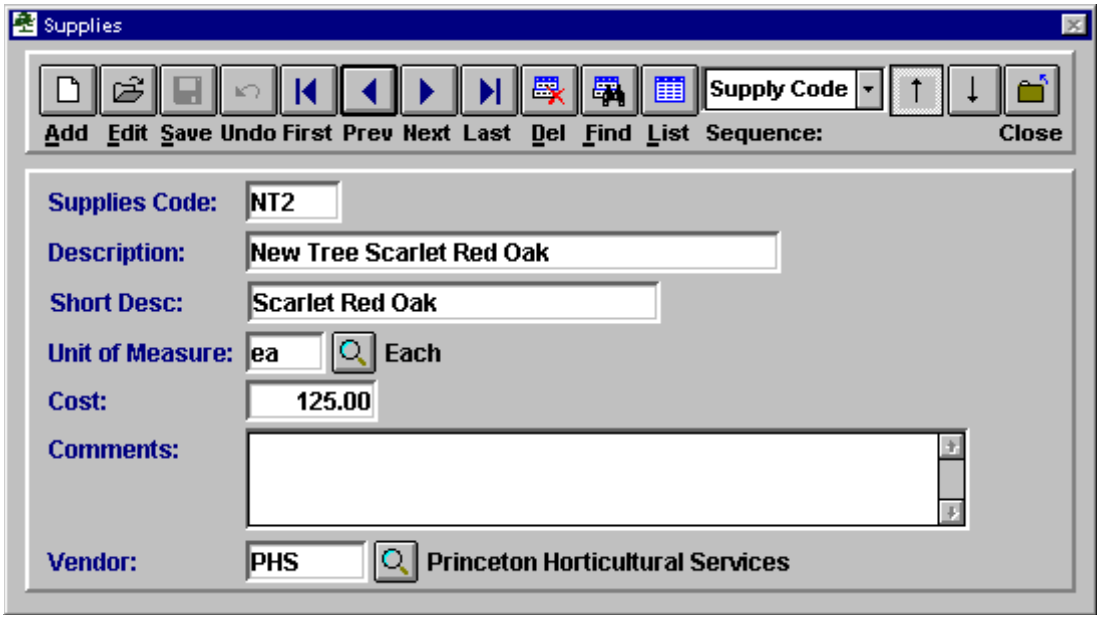


Figure 3.5.22: Descriptions, costs, and vendors for supplies used in activities can be defined.

Defining contract crews

Contract crew information includes *cost per hour*, *charge per hour*, and number of *contract hours available* (Figure 3.5.23). This information is used when estimating request resources. A *contract crew code* up to five characters must be entered. Up to a 34 character *description* can be entered, and a *vendor* code can be entered directly or selected from a list window.

Defining work crews

Up to a six character *crew code* and up to a 35 character *description* must be entered when defining in-house work crews. Crew resources are viewed in the **crew details** window (Figure 3.5.24). A separate **crew detail maintenance** window is used to add resources to crews (Figure 3.5.25). Either a *profile* or *real* crew can be created, depending on the amount of detail desired. A *profile* crew is defined by *labor* (*job classes*) and *equipment types*, whereas a *real* crew is defined by *employees* and *equipment*. *Contract crews* can be combined with in-house work crews.

Defining work priorities

Work priority codes are defined in the **priorities** window (Figure 3.5.26). A one character *priority code* and up to a 15 character *description* must be entered. The system associates higher priority work with lower *priority code* numbers. A default number of days for *requests* and *work orders* is entered so the system can schedule the begin date for the work.

Defining activity groups

Activity group codes are used to identify groups of work activities, such as pruning and planting (Figure 3.5.27). Up to a two character *activity group code*, up to a 30 character *description*, and up to 15 character *short description* must be entered.

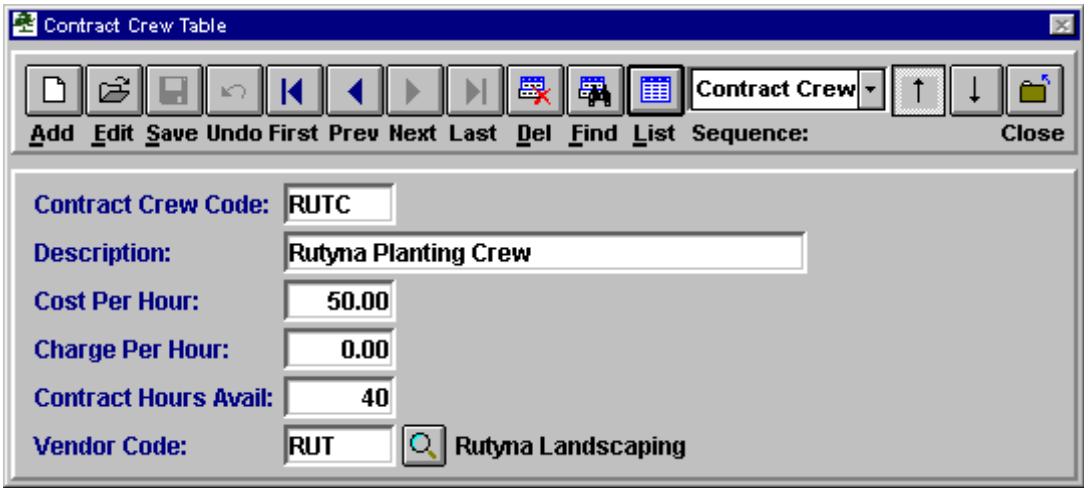


Figure 3.5.23: A database of contract crew information can be maintained for cost estimating purposes.

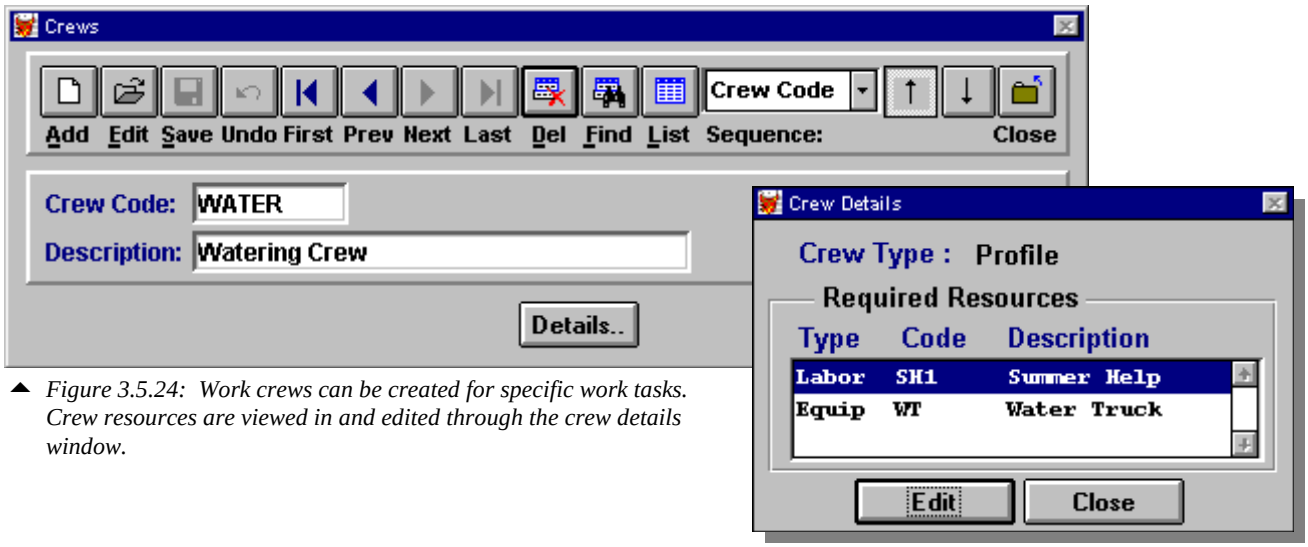


Figure 3.5.24: Work crews can be created for specific work tasks. Crew resources are viewed in and edited through the crew details window.

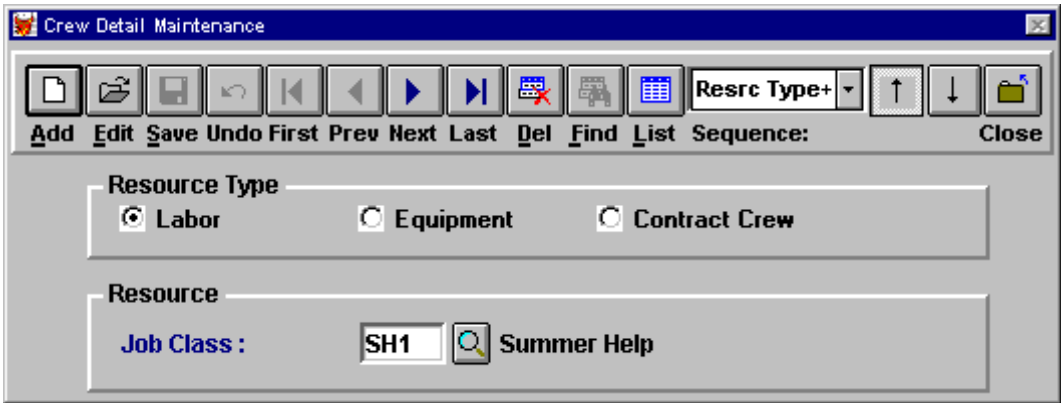


Figure 3.5.25: Crew resources include labor (job classes), equipment, and contract crews. This window is accessible through the crew details window.

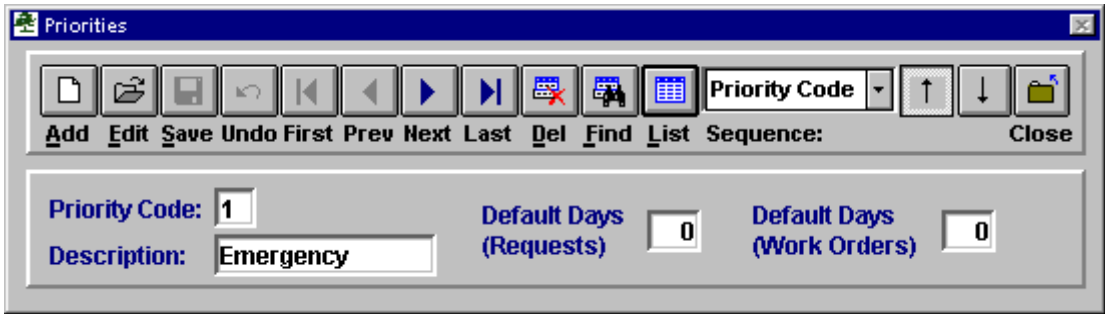


Figure 3.5.26: Work priority codes and the number of days the system uses to schedule the work can be defined.

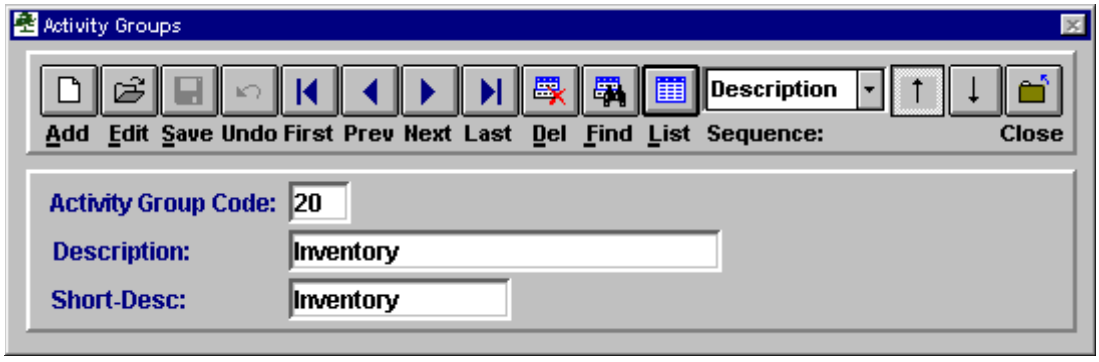


Figure 3.5.27: A database can be maintained for types of work activities.

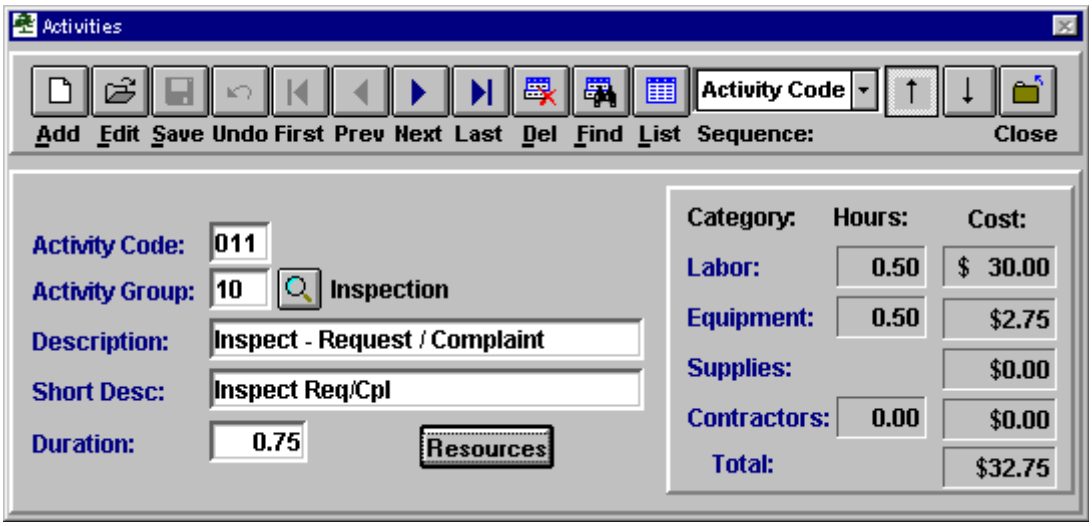


Figure 3.5.28: Costs, hours, and resources can be assigned to activities.

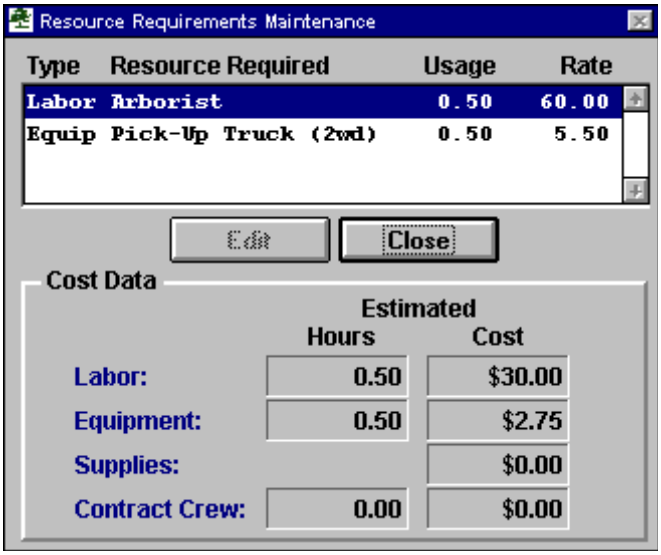


Figure 3.5.29: Activity resources are viewed in and edited through the resource requirements maintenance window.

Defining activities

Activities are reoccurring tasks that combine activity groups with costs, hours, and resources. Resources include contractors, equipment, job classes, and supplies. An *activity code*, *group*, *description*, *short description*, and *duration* must be entered when defining activities (Figure 3.5.28). The *activity code* can be up to three characters, the *description* up to 20 characters, and the *short description* up to 15 characters. The *duration* represents the time required to complete the activity. Resources along with their costs and hours are added to activities through the **resource requirements maintenance** window (Figure 3.5.29).

Defining contact reasons

Contact reasons refer to reasons why callers contact the agency. A *reason code* and *description* must be entered, and can be up to two and 30 characters, respectively (Figure 3.5.30). Contact *reason codes* are used for call processing (described below).

Defining contact actions

Contact actions refer to actions to be taken as a result of a call. An *action code* and *description* must be entered, and can be up to two and 30 characters, respectively (Figure 3.5.31). Contact *action codes* are used for call processing (described below).

Other databases

Other TKW databases include *departments* and *units of measure* (Figure 3.5.32). A *department code* and *description* must be entered when defining departments. The *department code* can be up to five characters and the *description* up to 30 characters. A *contact* name up to 30 characters, *phone number*, and *extension* can also be entered. The system default *units of measure* are specified in the **control table** window (Figure 3.5.7). Additional *units of measure* can be defined by entering a *unit of measure code* up to three characters and a *description* up to 15 characters (Figure 3.5.32). A *partial quantities allowed* checkbox is available for units that are not whole numbers.

Figure 3.5.30: The contact reason database contains codes and descriptions of why callers contact the agency.

Figure 3.5.31: The actions to be taken as a result of a call are defined in the contact actions window.

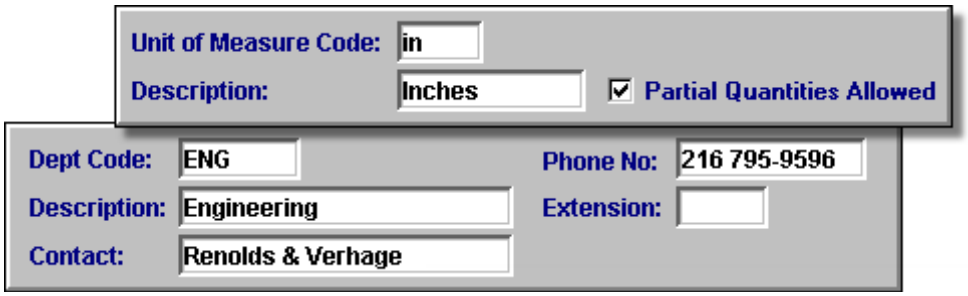


Figure 3.5.32: Other definable databases include units of measure and departmental information.

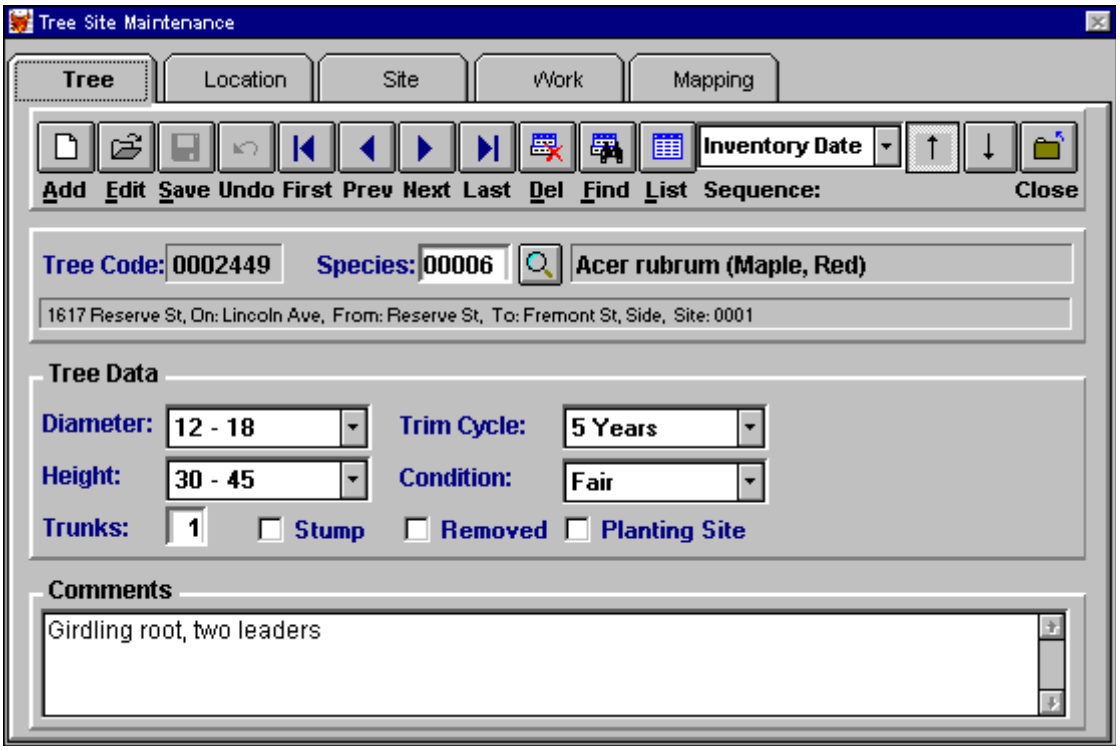


Figure 3.5.33: The tree site maintenance window is used for viewing, adding, and editing tree, location, and site descriptor information. Coordinate data can be entered when the system is interfaced with a GIS. Work details for tree sites can be viewed in this window.

Adding tree sites

Tree descriptor fields include *species* code, *diameter*, *height*, *number of trunks*, and *condition* (Figure 3.5.33). Only species *code* is required and can be selected from a list window. *Diameter*, *height*, and *condition* are selected from drop-down lists. A *trim cycle* can be entered along with *comments* about the tree site. Checkboxes are available to indicate if the site contains a *stump*, if the tree should be *removed*, or if the site is available for planting.

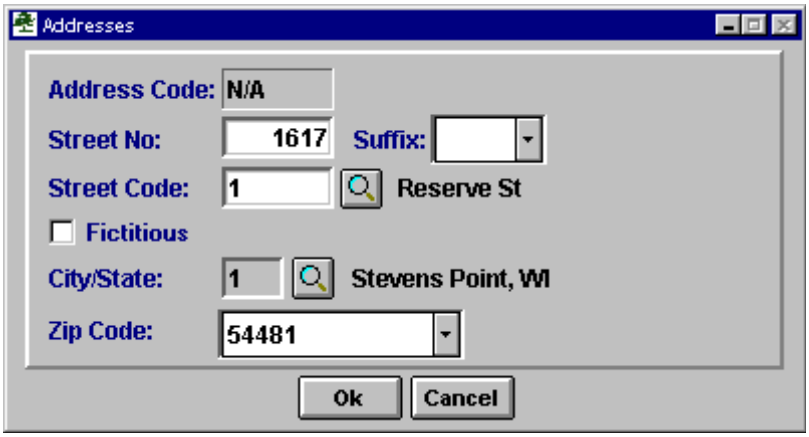


Figure 3.5.34: Location data including street number and code, city and state, and zip code must be entered for each tree site.

Entering location data is required, and include *location type*, *street number*, *street code*, *city and state*, *zip code*, *side*, *site number*, and *on*, *from*, and *to* streets. A *location type* of either *street tree* or *facility tree* must be selected before entering location data. Facilities refer to areas containing non-street trees, such as parks. When adding location data a dialog appears asking to use data and the next site number from the currently selected record. If the existing data are not used a *street number*, *code*, *city and state*, and *zip code* are entered in the **addresses** window if the address is not present in the address database (Figure 3.5.34). A tree location *side* of either *front*, *side*, *rear*, *median*, *sub-street*, or *other* must be selected in the **street location selection** window (Figure 3.5.35). The *on*, *from*, and *to* streets must be typed, however a list window appears if an exact match is not found in the street database. The *on* street refers to the street where the tree is physically located, and the *from* and *to* streets refer to the cross streets at the lower and upper end of the block, respectively. A *site* sequence *number* must also be entered.

Site descriptor fields include *growspace type*, *conductors*, *hardscape damage*, *location value*, and *minimum growth size* (Figure 3.5.36). Entering site description data is optional. Other data that can be entered include *hardware*, *preferred* planting *species* for planting sites, *inventory date*, and the employee who inventoried the site. *Hardware* is selected from a drop-

Figure 3.5.35: Tree site side and number, along with on, from, and to streets must be entered for each tree site.

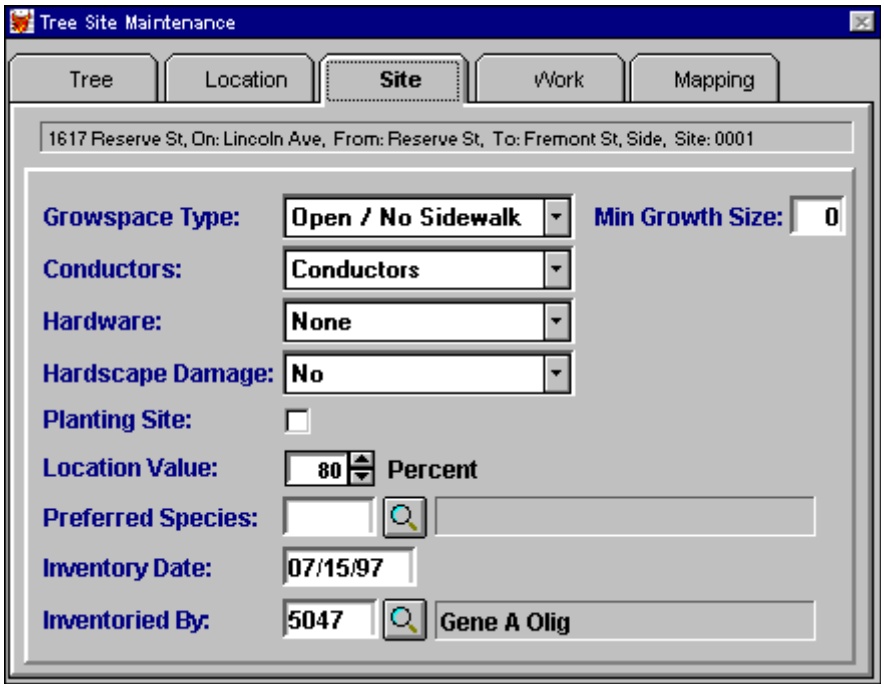


Figure 3.5.36: Entering site description information including growspace type, conductors, hardscape damage, location value, and minimum growth size is optional. A preferred species can be selected for planting sites.

down list, and *preferred species* and *inventoried by* data can be either typed or selected from list windows.

Work request and completed work information can only be viewed in the **tree site maintenance** window. Information includes *activities*, *request* and *work order numbers*, *labor hours* and *costs*, *equipment hours* and *costs*, and *supply* and *contract costs*.

TKW has GIS interface capabilities which were not used in this study. Fields are provided for entering coordinate values and an identification number for the tree site in the **tree site maintenance** window.

Recording contacts

Contacts refer to any person who has contacted the department to receive information, and are defined in the **contacts** window (Figure 3.5.37). A contact *code* is automatically entered when adding a contact and is the only required field. The default contact *code* starting number can be defined in the **control table** window (Figure 3.5.7). *First* and *last* name fields can each be up to 20 characters, and a *middle* initial and *salutation* can be entered. Fields are also provided for entering a *home* and *work* phone number, along with a work *extension* and the phone number *preference*. Contact address information can either be searched and selected from a list window, or added to the address database through the **contacts** window.

Creating projects

Projects can be created for emergency and other events (Figure 3.5.38). A *project code*, *description*, and *short description* must be entered. A *date range* is entered so that requests can be added to the project. Request statistics in this window include *counts*, *costs*, and *hours* for both *open* and *closed requests*. This information is used for tracking project progress and estimating future project costs.

Adding work requests

A contact is either selected from or added to the contact database before a work request is added (Figure 3.5.39). Contacts can be searched by *last name*, *telephone*, or *street* in the **locate contact** window. Request information is entered in the **call processing** window after the contact is selected (Figure 3.5.40). Contact and tree information are displayed, along with the *last request* date and the number of past *contacts*, *requests*, and *open requests*. Information for

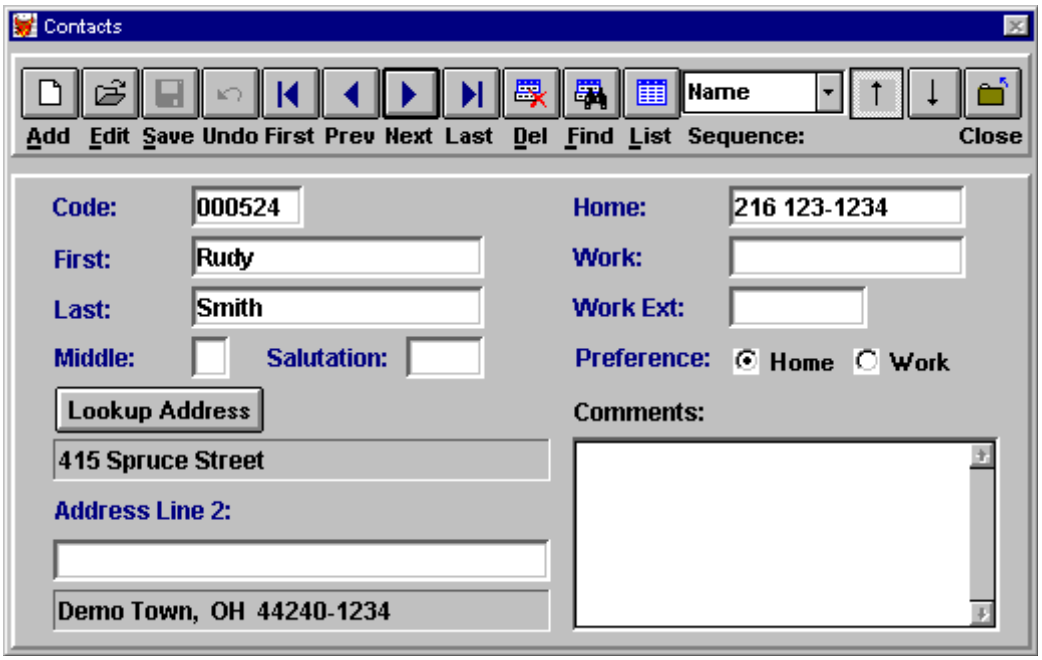
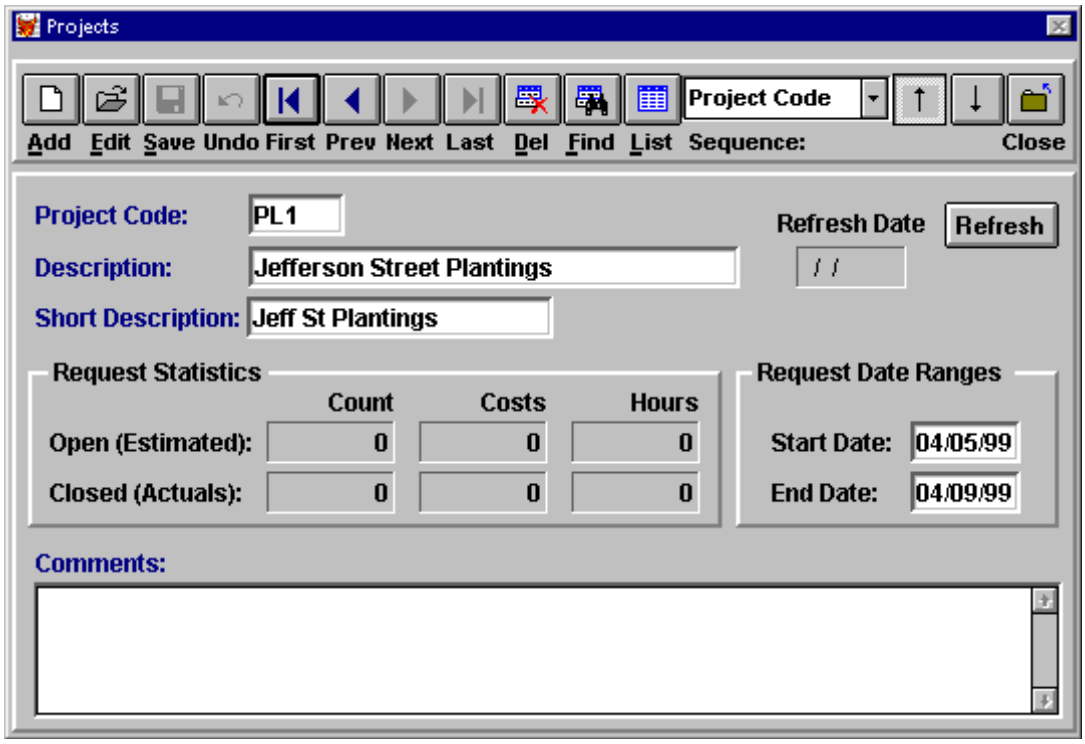


Figure 3.5.37: Contact information includes caller names, addresses, and phone numbers.

Figure 3.5.38: Projects can be created for work events. Work request statistics are indicated for requests associated with projects.



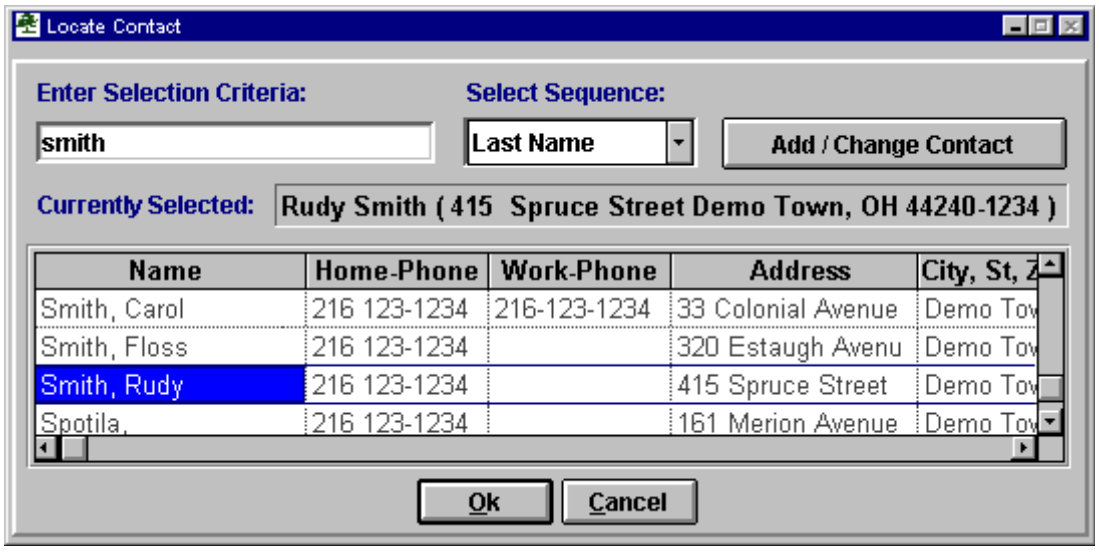


Figure 3.5.39: A contact is selected before recording a work request. Contacts can be searched by last name, phone number, or street name.

past *contacts*, *requests*, and *open requests* can be viewed in separate windows. A *call reason* and *action* are selected from drop-down lists, and *comments* can be entered. The request is initiated in a separate window by entering a request *priority* and *required by date*. A project can be selected if one is associated with the request. One or several activities are assigned to the request for either the selected tree or all trees at the address. An *immediate dispatch* command is available for printing the request information. A *followup* command is available for recording comments for calls associated with past requests.

Request maintenance

The **request maintenance** window is used for processing requests to become work orders, and contains *main*, *detail*, and *status* information screens (Figure 3.5.41). *Main* information includes *request number*, *date*, *project code*, *priority*, *status* (*open* or *closed*), request *taken by*, and caller *contact* information. Fields can be edited in the *main* screen if desired. *Detail* information includes *activity*, *status*, *location*, *site* number, *species*, and *diameter*. Additional tree site information can be viewed in a separate window, along with past work information. Work requests can be deleted, work can be added, and resources can be added through the *details* screen. *Status* information includes *required*

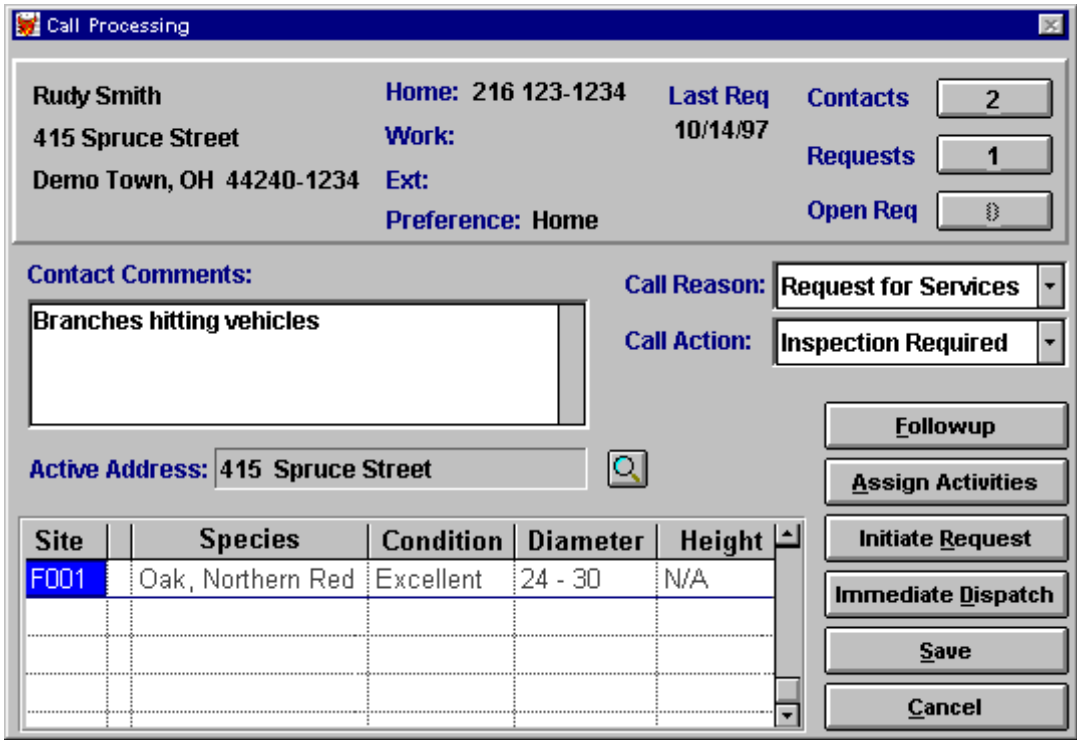


Figure 3.5.40: The call processing window is used for recording request information. Past request information at the contact address can be viewed through this window.

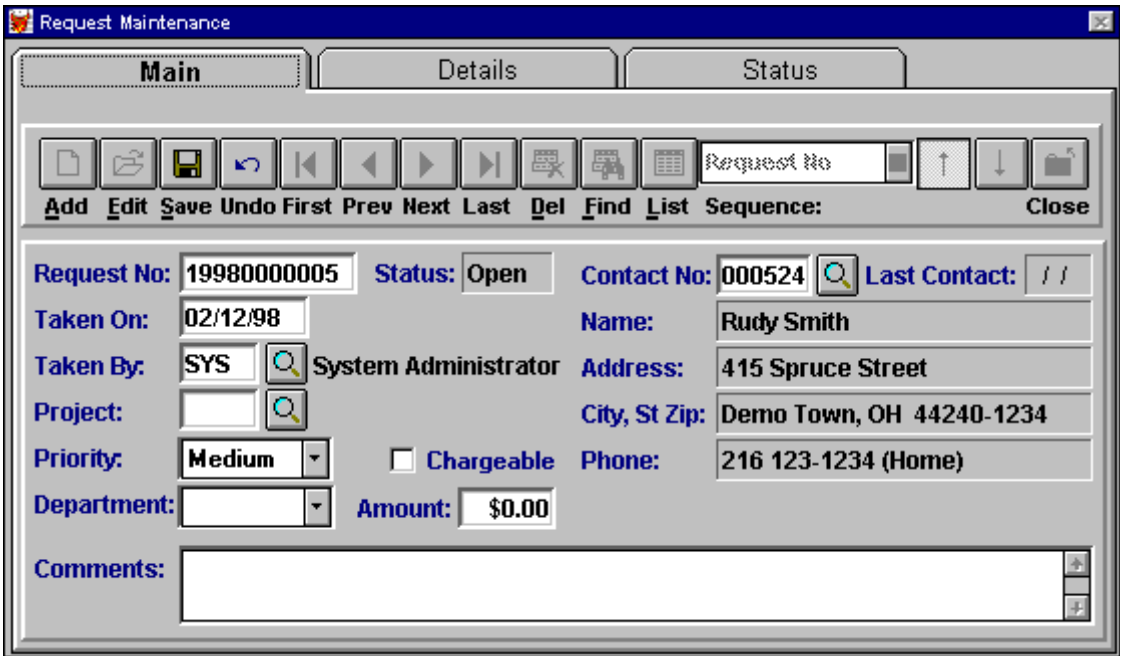


Figure 3.5.41: The request maintenance window is used for editing and processing requests to become work orders.

by, *scheduled begin* and *end*, and *actual begin* and *end dates*. Statistics and cost data are indicated in the *status* screen, and include *estimated* and *actual hours* along with *costs* for *labor*, *equipment*, and *supplies*.

Work order maintenance

The **work order header** window allows for viewing, printing, adding, editing, and deleting work orders (Figure 3.5.42). The work order *priority*, *crew*, *scheduled beginning and ending dates*, and *comments* can be entered. The crew and work order details are viewed, edited, and added through separate windows. A query builder is used to add activities and requests to the work order. The **work order header** window indicates estimated costs and hours for open work orders, and actual costs and hours for closed work orders. Estimations are based on the resources defined to the selected activity types. Actual hours are entered in a separate window when work orders are closed. Work order printouts can be sorted by location, block, or address. Output contains work order information as well as tree and site information. Options are provided to include crew and supply information along with work comments in the output.

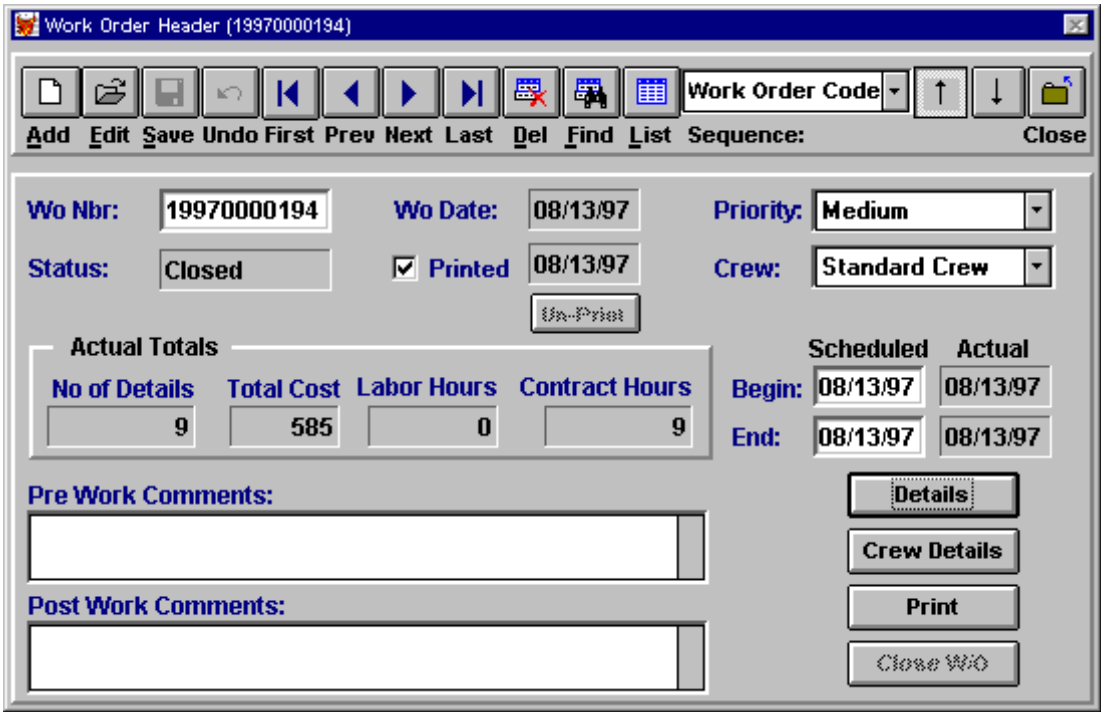


Figure 3.5.42: Work orders are created in the work order header window. Either actual or estimated costs and hours are indicated depending on whether the work order is open or closed.

Listings

Listings can be created for each of the databases in TKW. Tree descriptor database listings include *species*, *diameter classes*, *condition classes*, *height classes*, *hardware types*, and *trim cycles*. Site descriptor database listings include *grow space types*, *hardscape damage types*, and *conductors*. Listings can also be created for *project*, *contact*, *contract crew*, *supply*, *vendor*, *employee*, *job class*, *equipment*, *equipment type*, *activity* and *activity group*, in-house *crew*, *work priority*, and all *location* descriptor databases. After selecting a database, a field is chosen as a basis for sorting the output. Listings can be either previewed or printed, and the preformatted layout contains all data corresponding to the selected database.

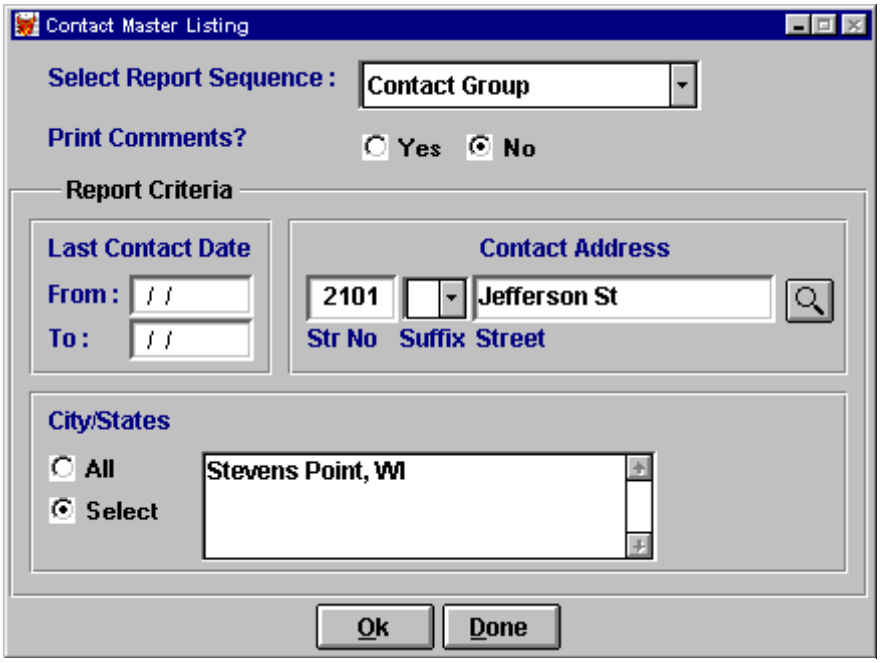


Figure 3.5.43: A contact listing can be sorted and filtered to provide user specified output in either a preview or a printout.

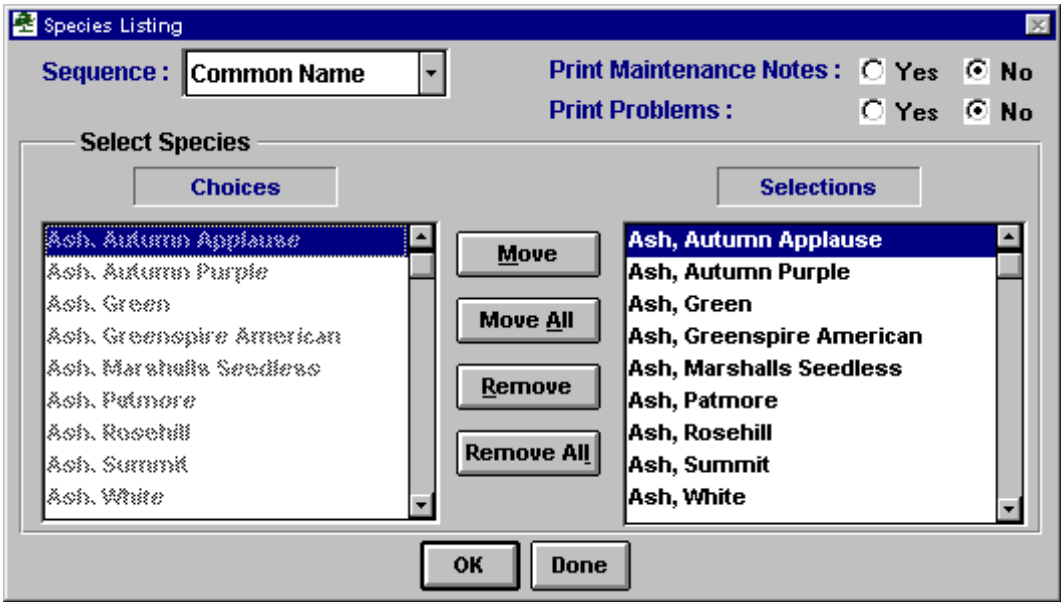
Only *contact* and *species* database listings can be filtered to provide user specified output. Criteria used to filter *contact* listings include *contact address* and *street number*, *from* and *to contact dates*, and *city and state* (Figure 3.5.43). *Species* database listings can be filtered to include only specified species (Figure 3.5.44). *Maintenance* and *problems* comments can be included with the listing, however species statistics can not.

Queries and filtering

Queries can be performed on either tree site or work data. The **query** window contains *location*, *tree site*, and *work criteria* selections that are used for filtering data (Figure 3.5.45). The query can be performed on *tree types* of *all* trees, *street* trees, or *facility* trees. A combination of *trees*, *planting sites*, and *stumps* can be selected within the chosen *tree type*.

The **query** window is also used when filtering other reports in TKW. When the **query** window is opened all criteria are selected by default. Criteria are filtered by using either **criteria** or **selection screens** (Figure 3.5.46). Output can be sorted by field, and can be either previewed, printed, or saved to file. File formats include text, Excel, and Lotus 123.

Figure 3.5.44: Species listings indicate information in the species database in either a preview or a printout. Species to include in the listing can be specified.



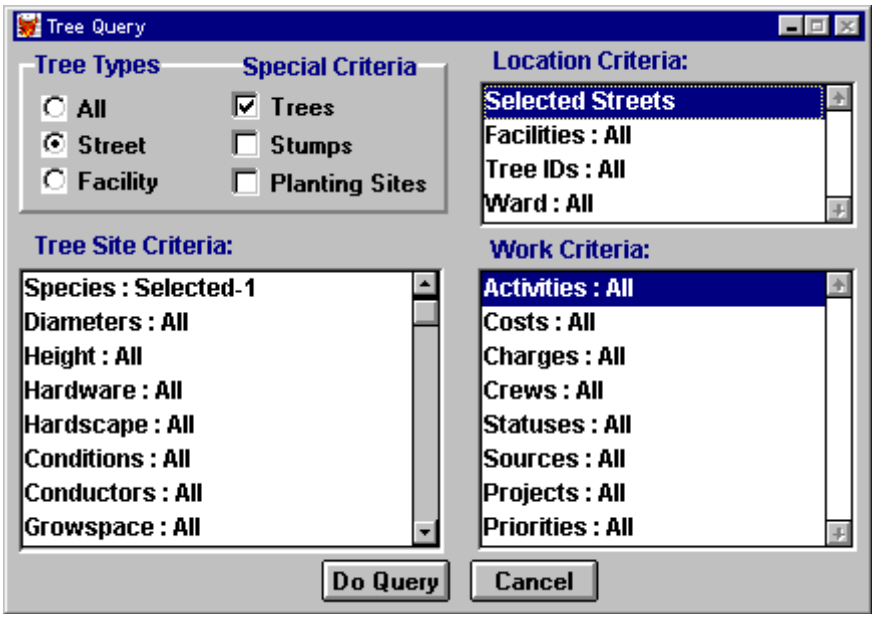


Figure 3.5.45: Queries can be performed on either tree site or work data. Specific criteria are selected in separate screens accessed through this window. All criteria are selected by default when the query window is opened.

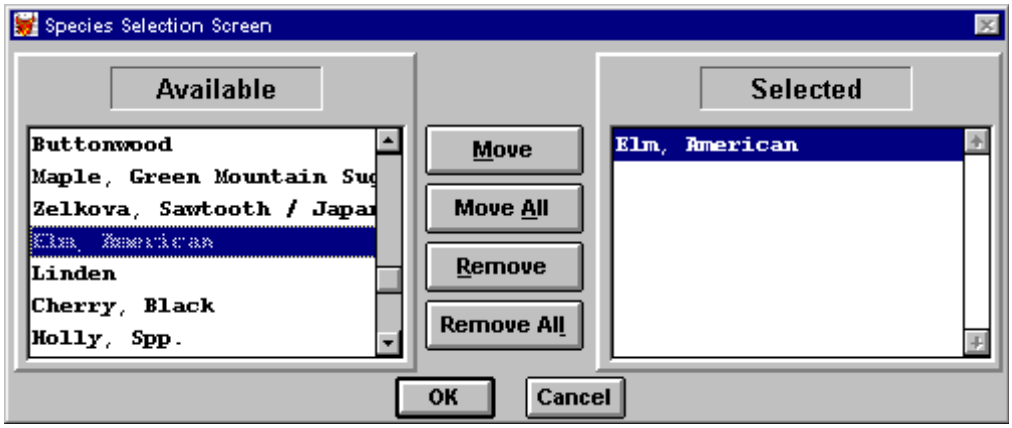


Figure 3.5.46: An example of a selection screen accessed through the query window. Desired selections are moved to the right side of the screen.

Frequency reports

Frequency reports include *tree sites*, *work details*, and *work time series*. *Work time series* reports indicate *estimated costs* and *hours*, and *actual costs* and *hours* for work orders. Up to two fields are selected for the report in the **tree site frequency report** setup window. In the example shown *condition* and *species* fields are selected to create a report of the number of species in each condition class (Figure 3.5.47). A sort order can be selected, and output can be previewed, printed, or saved to file (Figure 3.5.48). Frequency reports can be filtered by using the **query** window (Figure 3.5.45). A bar and pie chart can be included in addition to the tabular listing, although can not be saved to file.

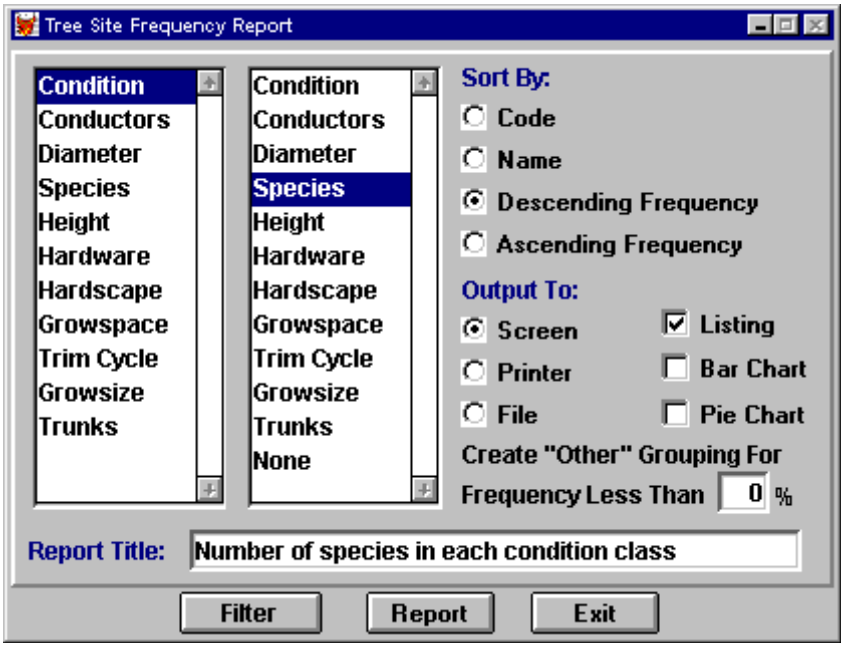


Figure 3.5.47: Frequency report setup requires selecting up to two fields in pick lists. Output can be filtered and sorted, and a title can be entered.

Microsoft Excel - Freq.xls

File Edit View Insert Format Tools Data Window Help

A1 = code

	A	B	C	D	E
1	code	desc	total		
2	OTHER	Other	501		
3	00009	Maple Spp.	488		
4	00022	Oak, Pin	398		
5	00011	Unknown	333		
6	00021	Oak, Northern Red	330		
7	25	Vacant	156		
8	00033	Ash, White	106		
9	00040	Buttonwood	94		
10	00015	Sweetgum, American	80		
11	00044	Linden	51		
12	00026	Pear, Bradford	51		
13	00006	Maple, Red	48		
14	00047	Maple, Norway	47		
15	00023	Oak, Willow	38		
16	00042	Zelkova, Sawtooth / Japanese	37		
17	15	Ash, Marshalls Seedless	32		
18	00007	Maple, Silver	32		
19	00043	Elm, American	29		

FREQ

Ready NUM

Figure 3.5.48: A species frequency report indicating species code, description, and frequency. TKW can save reports as text, or in either Excel or Lotus 123 spreadsheet formats.