

## Introduction to Micro PAVER V4.1






August 1998

## Micro PAVER

Developed by:

The U.S. Army Construction  
Engineering Research  
Laboratories (CERL)

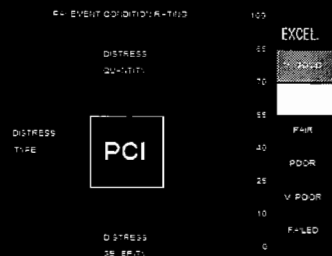
**Micro PAVER has been developed  
and is continuously being upgraded  
through funding by:**

- U.S. Army 
- U.S. Navy 
- U.S. Air Force 
- Federal Aviation Administration (FAA) 
- Federal Highway Administration (FHWA) 

## Micro PAVER

- Is a pavement management system
- Provides a consistent method for pavement condition rating
- A tool for determining M&R needs and priorities
- Calculates optimal time for repair by predicting future pavement condition.

## Pavement Condition Index (PCI) Concept

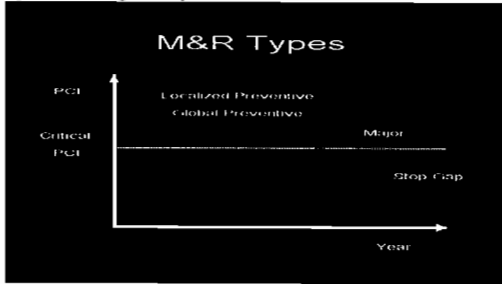


The PCI is used in Micro PAVER for pavement condition rating. It is determined based on existing distresses in the pavement. It agrees closely with the collective judgment of experienced pavement maintenance engineers.

## ASTM Standard D 5340

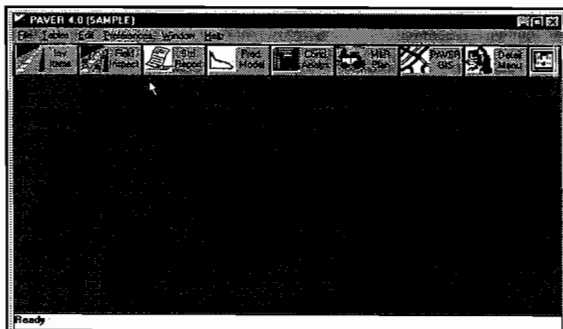
ASTM adopted the PCI as a condition standard for Airfield condition rating

By performing preventive maintenance while the pavement is still above the critical PCI, we avoid the high cost of reconstruction associated with increasing rates of deterioration at the end of a pavement's life cycle. The critical PCI concept is used to generate Work Plans and perform budget analysis.

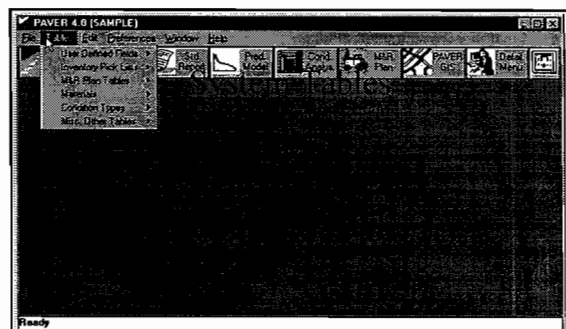


## Features of Micro PAVER V4.1

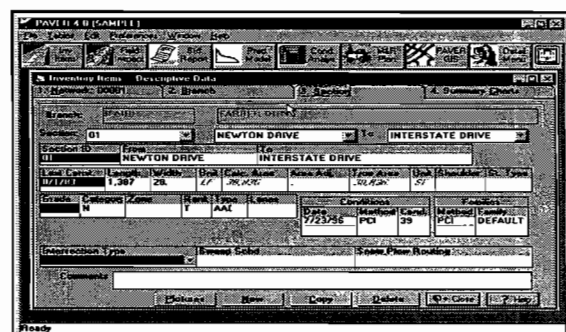
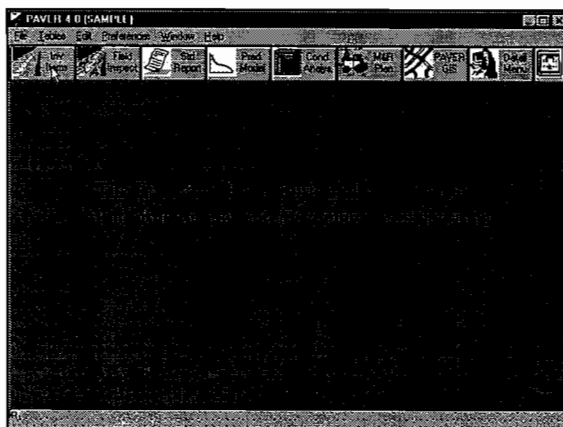
- Micro PAVER desktop
- Inventory Items
- Field inspection
- Standard Reports
- Prediction Modeling
- Condition Analysis
- Maintenance & Repair Work Planning
- PAVER - GIS interface
- Detail Menu



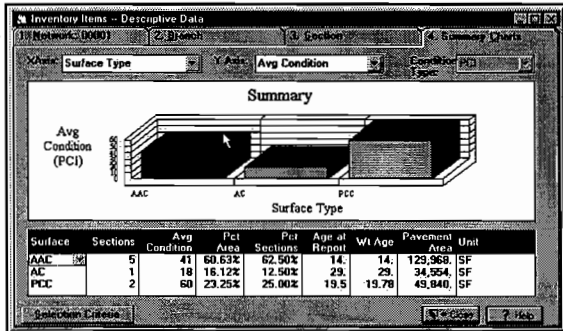
The Micro PAVER desktop design places the most frequently used options on menu buttons. Full system capabilities are listed in the Detail Menu button.



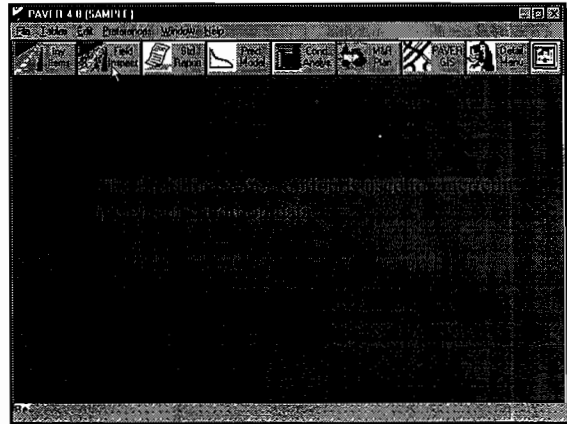
System tables are used across databases. Default tables are available with the Micro PAVER release, but additional tables can be added by users.



In the PAVER hierarchy, a pavement management section is defined as part of a branch (street or runway), which in turn is defined as part of a network. The user is allowed to define up to three fields for each, at the section, branch, or network levels.



The summary chart allows for graph/table viewing of any X and Y variables. For example, Surface Type (X) VS. Average Condition (Y).



Network ID: 00001 Branch ID: IFARB Section ID: 01  
 Branch Name: FARMER DRIVE  
 Section Length: 1.387 LF Section Width: 29 LF Section Area: 39.839 SF  
 Load: 50 Climate: 32 Other: 18  
 Random Surveged: 4 Additional Surveged: 0 Total Samples: 14  
 Date: 7/23/96 Section PCI: 37 Std Dev.: 22.47

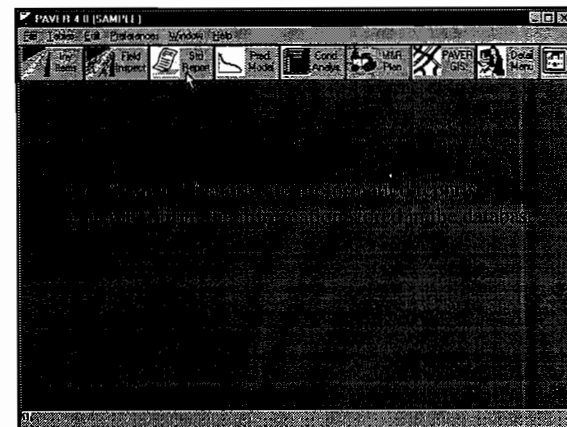
Pavement distress type, severity, and quantity can be entered for each inspected sample.

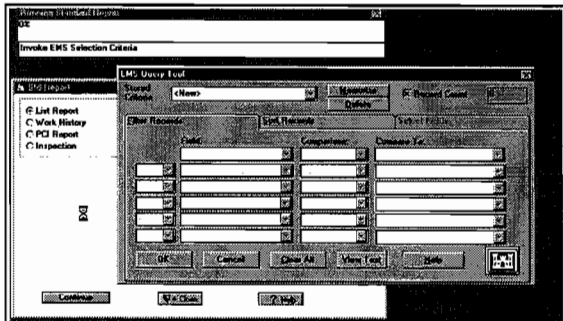
ID	Description	Severity	Count	Area	PCI
10	1 ALLIGATOR CR	Low	100	SF	6.43
10	1 ALLIGATOR CR	Medium	90	SF	3.22
10	1 ALLIGATOR CR	Medium	90	SF	3.22
10	4 BUMPS/SAGS	Low	3	LF	.11
10	7 EDGE CR	Low	99	LF	3.54
10	7 EDGE CR	Medium	17	LF	.61

The user can calculate the PCI of a section at any time during the inspection. The calculation produces the PCI, extrapolated section distresses from sample data, and percentages of load, climate, and other related deduct values.

Method	Value
PCI	37
Rider	
SM	
Shoulder	
Overall	

By selecting the condition button on the inspection menu, the user can enter a condition rating method other than the PCI.





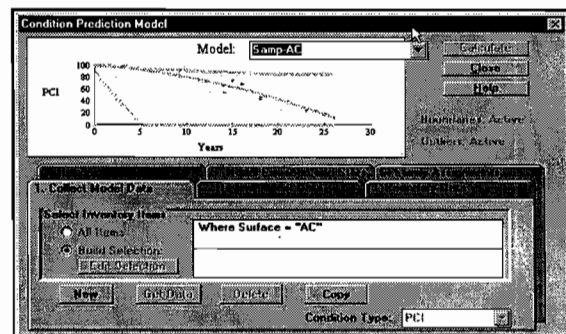
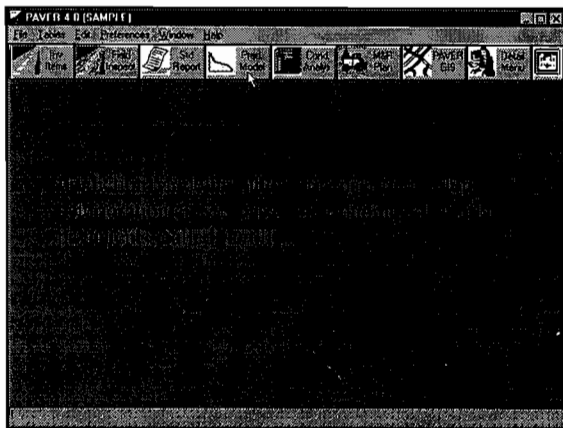
An EMS (Engineered Management System) query tool is available to customize the output of the reports to represent specific elements of the database. An EMS tool is a tool that is used throughout EMS's, such as RAILER and SEWER, to maintain a similar look and feel.

**Branch Listing Report**  
*Pavement Database: SAMPLE*

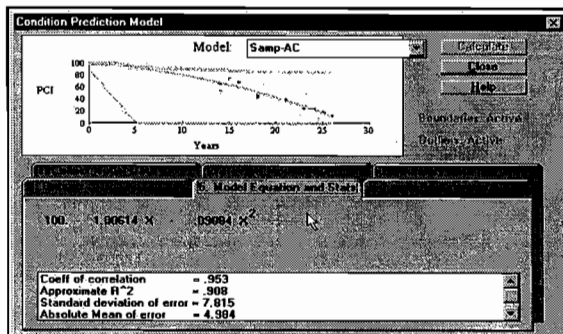
Report Date: 6/20/97  
 Site Name:  
 Selection Criteria: All  
 Sort Criteria: None

Network ID	WMA	Comments			
0000	USCERS				
Branch ID	WMA	Use	Distance	Area	Area
2450	PAVING DRIVE	ROADWAY	1	38,000	
7488	35,370.0P				
1018	SEBASTIAN DRIVE	ROADWAY	3	65,200	
2040	63,884.0P				
1020	SEYMOUR DRIVE	ROADWAY	1	26,000	
1027	SEYMOUR DRIVE	ROADWAY	1	29,078	
1028	29,078.0P				
1022	RESEARCH ROAD	ROADWAY	2	48,000	
1023	48,000.0P				
Branch Count:	2				
Branch Area:	214,262	0P			

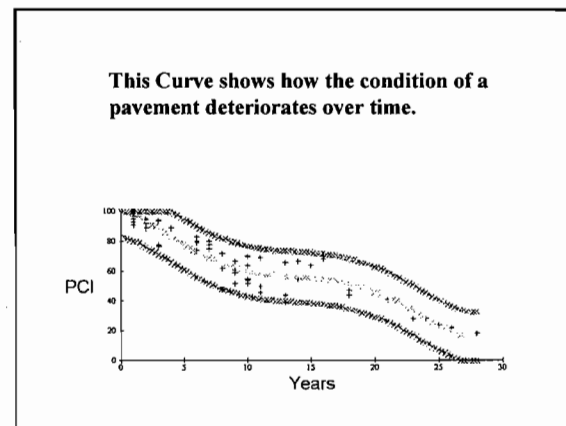
The standard reports that are generated can be viewed either as an Excel spreadsheet, or formatted as a printed page.

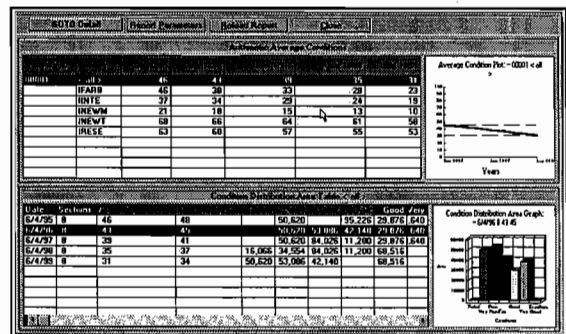


In this example, a curve is generated to represent all the AC surfaces in the network.

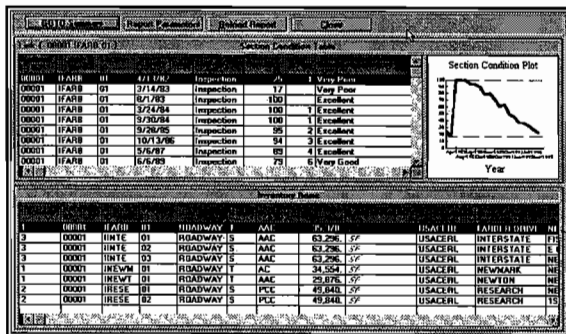


The Model Equation and Stats tab enables the user to view the equation and statistical properties associated with the model.

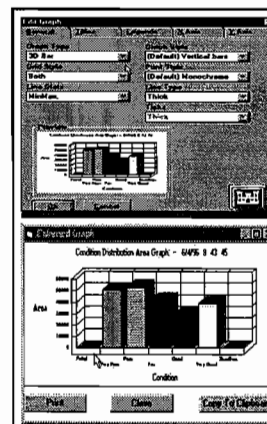




The summary menu option displays the network and branch information in table and graph format.

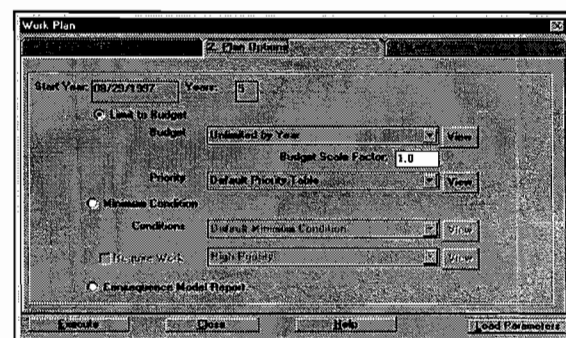
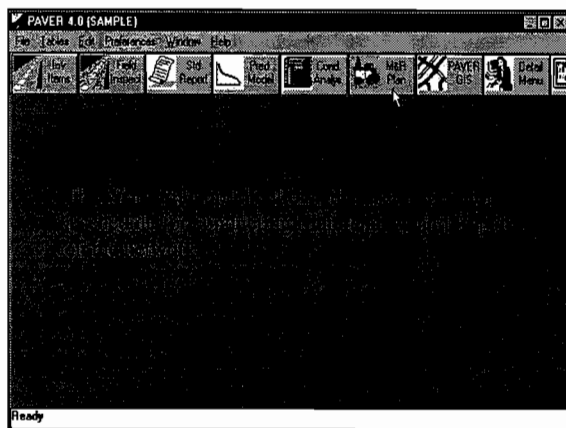


The detail menu allows the user to examine the condition of individual sections in the database.

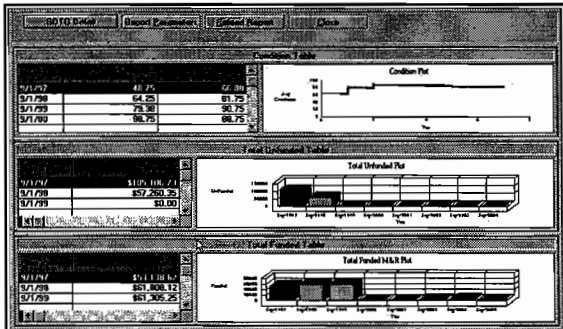


The graphs produced by PAVER can be customized to best illustrate the users desired information.

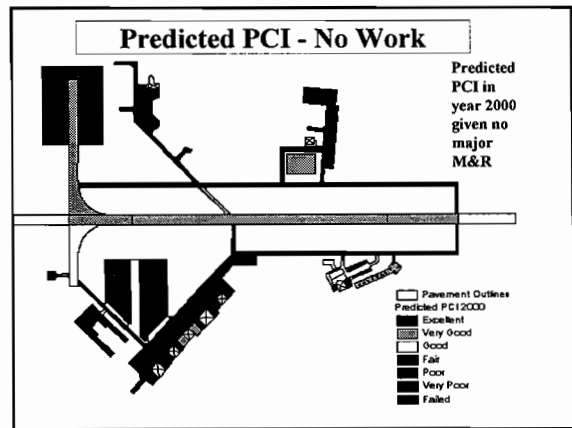
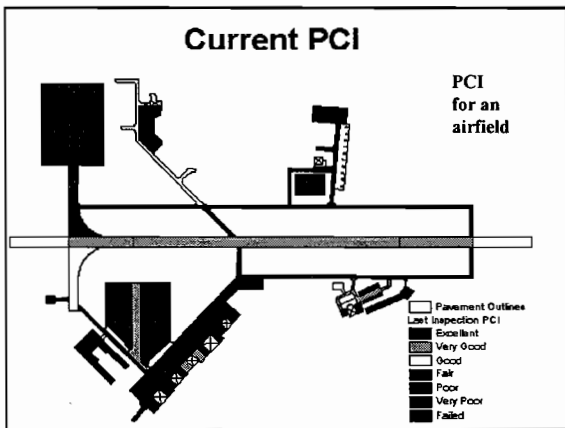
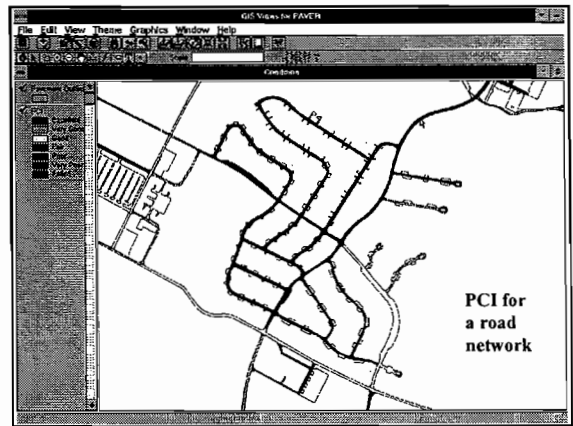
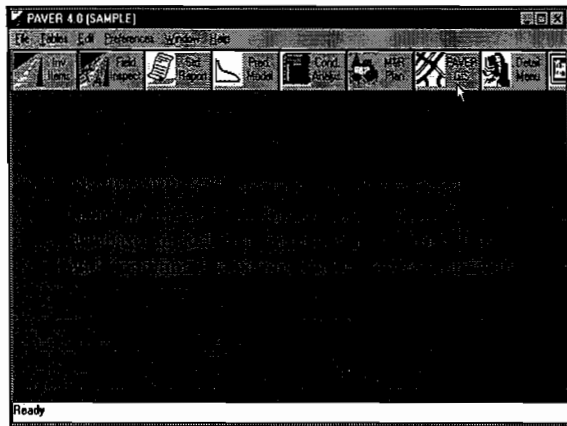
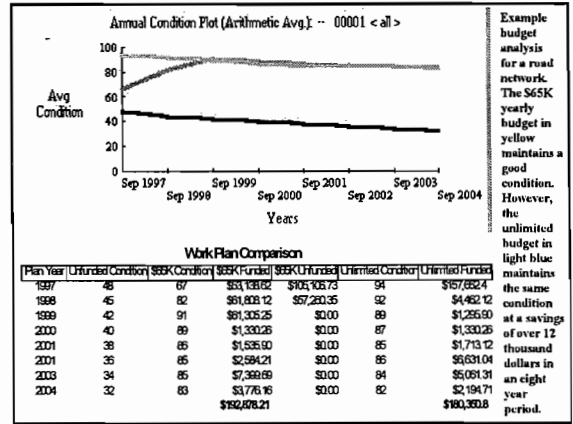
In addition, the graphs can be printed separately or copied to the clipboard to be imported into other presentation software.

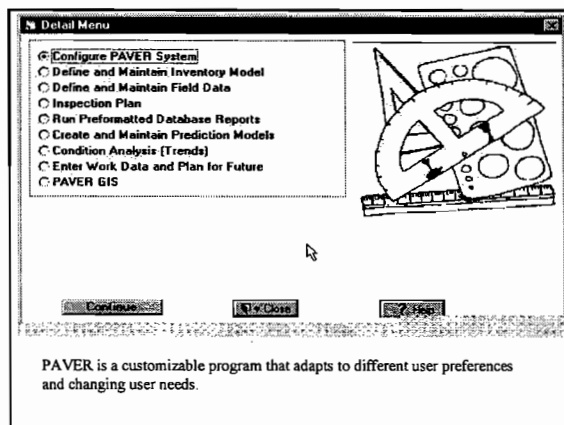
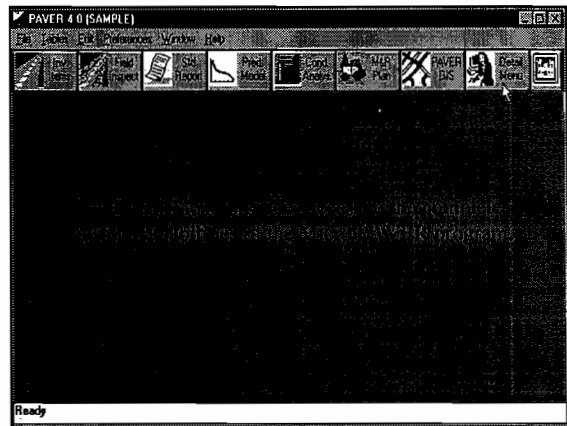
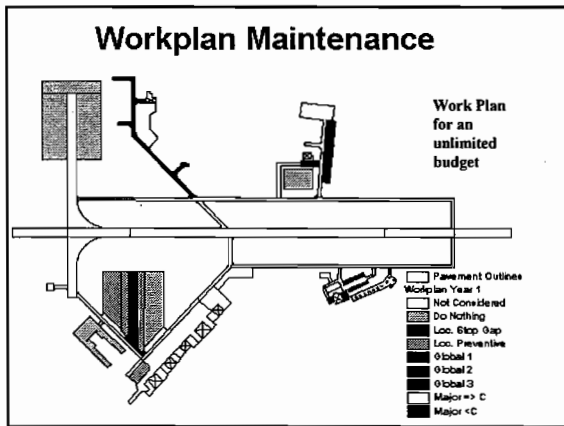


The Work Plan allows the users to develop maintenance and repair strategies for different budget scenarios.



At the summary level, the work plan output shows the average network condition before and after repair, as well as funded and unfunded M & R.





### Point of Contact

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 U.S. Army Construction Engineering Research Laboratory  
 (217) 373-7214
- Air Force - HQ Air Force Civil Engineering Services Center,  
 (904) 283-6330
- Navy - Naval Facilities Command, (610) 595-0597

Entering a New Section

If a new section number is entered, the following screen appears:

NEW SECTION DEFINITION

Network ID 00001    Branch Number R1230    Section Number A1  
(new secFamily DEFAULT)

From \_\_\_\_\_ To \_\_\_\_\_

Zone \_\_\_\_    Section Category \_    Pavement Rank \_    Surface Type \_\_\_\_

Section Length \_\_\_\_0 feet

Section Width \_\_\_\_0 feet

Section Area \_\_\_\_\_0 square feet

Last Construction \_\_/\_\_/\_\_

alpha-numeric field

F1    F2 Keys F3    F4    F5    F6    F7    F8    F9    F10Done

In this example, the new section A1 has been entered.

Continue entering data according to the following formats:

- 2) From - This may be a description of up to 25 alpha-numeric characters which identifies the location of the beginning of the section.
- 3) To - This may be a description of up to 25 alpha-numeric characters which identifies the location of the end of the section.
- 4) Zone - The zone may be up to 4 alpha-numeric characters which identify any zone the section may belong to. Zones may define such things as funding sources or maintenance zones.
- 5) Section Category - The section category is a letter which the agency may choose to represent different categories. Valid entries are: A-Z,0-9. (i.e., Y = Family Housing, N = Non-Family Housing.)
- 6) Pavement Rank - This is a required field. Valid entries are: A, B, C, D, E, N, P, S, T, X. The following table shows the significance of each of these entries.

A = Principal	E = Residential	T = Tertiary
B = Arterial	N = Not Applicable	X = Other
C = Collector	P = Primary	
D = Industrial	S = Secondary	



7) Surface Type - This is a required field. Valid surface types are:

- AAC (asphalt overlay over asphalt concrete)
- ABR (asphalt over brick)
- AC (asphalt concrete)
- ACT (asphalt over cement treated base)
- APC (asphalt overlay over portland cement concrete)
- APZ (asphalt over pozzolanic base)
- BR (brick)
- COB (cobblestone)
- GR (gravel)
- PCC (portland cement concrete)
- PVB (paving blocks)
- ST (surface treatment)
- X (other)

**Note:** If PCC is selected as the surface type, four additional prompts will appear on your screen: Slab Length, Slab Width, Number of Slabs, and Joint Length. These will be discussed later in this section.

8) Section Length - Enter the length of the section in feet (meters). Section length can be a decimal not greater than 9,999,999.00.

9) Section Width - Enter the width of the section in feet (meters). Section width can be a decimal not greater than 9,999,999.00.

10) Section Area - If the section length and width have been entered, the section area in square feet (square meter) is automatically calculated. If section length and width information has not been entered, or the actual section area is different than the calculated area, you may enter a decimal number not greater than 9,999,999.00.

**WARNING:** It is possible to enter a section length and section width which causes that the product calculated for section area to exceed the section area's field size. Please try to avoid this by not creating any sections that are that large.

11) Last Construction - Enter the last date that major maintenance and repair (M & R) was applied to the section (M & R work that would bring the PCI up to 100). The date must be entered in the following date format: MMM/DD/YYYY or YY (for example, APR/25/1986 or APR/25/86).