

2.3 Working Units

A. Roadway Design Files

The current Caltrans standard design presentation software (MicroStation CONNECT) defines a design file by U.S. Survey Foot with Master Unit set to "US Survey Feet" and Sub Unit set to "Survey Tenths". The resolution for roadway design files is "10,000 per Distance US Survey Foot". These standard values define the size of the working area of the design file. Caltrans roadway seed files have the settings shown below:

📕 Design File Settings		\times
Category	Linear Units	
Active Angle	Eormat: MU 🔻	
Active Scale Angle Readout Axis Color Fence Grid Isometric Locks Snaps Stream Views Working Units	Master Unit: US Survey Feet Label: FT Sub Unit: Survey Tenths Label: TN Accuracy: 0.123 Custom Advanced Settings	
	Resolution: 10000 per Distance US Survey Foot Working Area: 1.70591E+08 Miles Solids Area: 81.3442 Miles Solids Accuracy: 4.29497E-06 US Survey Feet Edit	
	Focus Item Description Select category to view.	
	<u>O</u> K Cancel	

Figure 1 – Current roadway design file working unit settings

Older Caltrans roadway MicroStation seed files used Master Unit and Sub Units as shown in the following picture:



Design File Settings	
Category	Modify Working Unit Settings
Active Angle Active Scale Angle Readout Axis Color Element Attributes Fence Grid Isometric Locks Snaps Stream Views Working Units	Linear Units <u>F</u> ormat: <u>MU</u> ▼ <u>M</u> aster Unit: Feet ▼ Label: FT <u>S</u> ub Unit: Tenths ▼ Label: TN <u>A</u> ccuracy 0.123 ▼ <u>C</u> ustom
	Advanced Settings Resolution: 10000 per Distance Foot Working Area: 1.70591E+008 Miles Solids Area: 81.3442 Miles Solids Accuracy: 4.29497E-006 Feet
	Focus Item Description Select category to view.

Figure 2 – Older roadway design file working unit settings

When an existing MicroStation design file created using older Caltrans MicroStation V8i seed file is opened using MicroStation CONNECT, the Master unit and Sub unit should automatically switch to US Survey Feet and Survey Tenths. If working units for an existing MicroStation design file opened using MicroStation CONNECT does not display the Working Unit settings as shown in Figure 1, the file may have been created using International feet.

To maintain the California coordinate system in the design files for all roadway projects, the resolution must remain at 10,000. Changing this value will change the coordinates and the linear measurement of elements.

B. Structure Design Files

Current design files for Structures bridge design are based on 1'-0" = 1'-0" with the Master Unit set to "US Survey Feet" and the Sub Unit set to "US Survey Inches." The resolution and working area are set as shown in the following picture:

Format:	MU 🔻		
Master Unit:	US Survey Feet 🔹	Label:	
Sub Unit:	US Survey Inches 🔹 🔻	Labe <u>l</u> : "	
Accuracy:	0.1234 👻		
		Custom	
Advanced Setting	gs —		
Resolution:	1728000 per Distance US Survey Foot		
Working Area:	987218 Miles		
Solids Area:	0.470742 Miles		
Solids Accuracy:	2.48551E-08 US Survey F	eet	
		Edit	

Figure 3 – Current structures design file working unit settings

Older Caltrans structures MicroStation files used different Master Unit and Sub Unit as shown in the following picture:

Modify Working Unit Settings				
Linear Units				
<u>F</u> ormat:	MU	•		
Master Unit:	Feet	-	Label: '	
Sub Unit:	Inches	-	Labe <u>l</u> : "	
<u>A</u> ccuracy	0.1234	•		
			<u>C</u> ustom	
L				
Advanced Settings				
Resolution:		1728000 per D	istance Foot	
Working Area:		987218 Miles		
Solids Area:		0.470742 Miles	S	
Solids Accuracy:		2.48551E-008	Feet	

Figure 4 - Older Structures design file working unit settings

There are much older versions of Structures seed files that used a different resolution and working area too. Those settings are shown in the following picture:

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Resolution:	1152000 per Distance Foot			
Working Area:	1.48083E+006 Miles			
Solids Area:	0.706113 Miles			
Solids Accuracy:	3.72827E-008 Feet			
Figure 5 - Obsolete structures design file working unit settings				

It is not necessary to update structures files already created with the older settings shown in figure 4 and 5 above. The project should be completed using those settings.

The resolution and working area for a Structures design file differs from a roadway design file.

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